

ROLE OF THE NET ASSETS IN ASSESSING THE RELEVANCE OF EARNINGS

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Abstract *This study considers that in Sri Lankan share market, the accounting variables would significantly explain the contemporaneous price, provided that Ohlson (1995) model implicate market efficiency. The study also attempts to explore the benchmarking role of net assets in assessing the value relevance of earnings and dividends. The results indicate positive significant relevance of net assets, earnings, and dividends for explaining the price, independently. Pooled and fixed-year effect results of the model imply incremental relevance of accounting variables. However, this is not consistent with year-wise analysis, thus implying that Sri Lankan share market might be of weak form efficiency. The findings are repeatedly confirmed with the fixed-sector results, which are almost similar to fixed-year effect results. The benchmarking role of net assets in exploring the incremental relevance of earnings becomes meaningful only with the pooled analysis. Differently, the relevance of dividends is explored with the proxy role for future earnings, beyond current earnings.*

Keyword: *Accounting Variable, Value Relevance, Net Assets, Earnings, Dividends, Ohlson.*

INTRODUCTION

Various studies have assessed the informativeness of earnings in explaining the equity prices (e.g., Dang et al., 2011; Dontoh et al., 2007; Senthilnathan, 2009a, 2009c, Brief and Zarowin, 1999) and returns (e.g., Nikbakht and Aflatooni, 2010; Lin and Ramond, 2007; Kousenidis et al., 2009; Senthilnathan, 2009a; Francis and Shipper, 1999; Easton and Harris, 1991). The value relevance of earnings has been investigated mostly with the benchmarking role of book value (e.g., Collins et al., 1999) and market price of equity (e.g., Senthilnathan, 2009a, 2009c). This study investigates the relevance of earnings for explaining the equity price beyond net assets.

Ohlson (1995) relates accounting variables, with their clean surplus relation (Walker, 1997), to share price and becomes a base for many value relevance studies (Smith, 2003; Lu, 2005; Hand and Landsman, 2005; Senthilnathan, 2009a; Nilsson, 2003; Khodadadi and Emami, 2009; Omura, 2005; Ota, 2000; Silvestri and Veltri, 2012; Zeng, 2001; Gregory et al., 2005). This study reformulates Ohlson (1995) with net assets in place of book value to explore its benchmarking role for assessing the relevance of earnings of the Sri Lankan firms.

The study results confirm significant relevance of earnings as consistent with Ohlson (1995) with the significant benchmarking role of net assets in pooled, fixed year, and fixed sector analyses. In Ohlson (1995), dividend irrelevancy

is a basic assumption. Inconsistently, our model explores positive significant incremental contribution of dividends to explain yearend share price, since the dividends declared after fiscal yearend price would be the proxy for expected dividends and this information has been incorporated in the year end price.

When share prices reflect all available information in market, the market is efficient. Fama (1970) indicates three different informational market efficiencies of share prices: strong, semi-strong, and weak forms of efficiencies.¹ While share prices incorporate new information in a market, the market seems efficient and the information in share prices can be useful to investors. Share prices are therefore considered as the estimators of a firm's value over time. In this context, by citing Fama (1965), Senthilnathan (2009b) indicates "in the efficient market, equity price acts as the proxy for all information in the market, since the equity price immediately incorporates new information that is useful to investors. Therefore, the equity price is regarded as the best estimator of an investment value in a portfolio".

This study also indicates that the share prices of the firms listed in the Colombo Stock Exchange (CSE) have significant

1 Strong form efficiency means that share prices reflect all publicly available and insider private information of firms, while semi-strong efficiency implies that share prices reflects all publicly available information and the weak form efficiency of market is that share prices reflect all information contained in past prices (Fama, 1970).

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information on net assets, earnings and dividends. The results of yearly and sector-based analyses are not consistent with the results of pooled, fixed year and fixed sector analyses, thus implying the weak form efficiency of the Sri Lankan share market. The rest of this paper is organized as background and literature; method; data presentation, analysis and discussion, and conclusion.

BACKGROUND AND LITERATURE

Generally, Ohlson (1995) is accepted for the markets in developed countries for their informational efficiency. Market is efficient, if share prices reflect the information about a firm's individual characteristics and earnings information. When the accounting variables represent earnings potential of a firm, the information of accounting variables should be useful for explaining its equity price. Nilsson (2003) argues that no fundamental analysis is useful, if the market is inefficient. As accounting numbers are useful to fundamental analysis, Ohlson's (1995) model implies market efficiency. Thus, this study applies Ohlson (1995) to explore the potential efficiency of Sri Lankan share market in terms of accounting variables.

The activities of Sri Lankan stock market were initially governed by the Colombo Brokers Association during the period 1896-1985. The Colombo Stock Exchange has started managing the operations of the Sri Lankan stock market since 1985, and gained memberships in the International Federation of Stock Exchanges and the South Asian Federation of Exchanges. The Colombo Stock Exchange conducts many activities, functions, and services to have successful operations for informational efficiency of the stock market.²

Many studies endorse empirical proof of utilizing Ohlson (1995) and seem generally consistent with the markets in developed countries like Japan, USA, UK, etc. (e.g., Ota, 2001; Vazquez et al., 2007; Silvestri and Veltri, 2012). The markets in these countries appear to be semi-strong informational efficiency, where share prices reflect all of

publicly available information. It is notable that Ohlson's (1995) model becomes meaningful in these efficient markets for exploring the relevance of accounting variables. Thus, utilizing Ohlson (1995) for investigating market efficiency is possibly useful.

Nilsson (2003) indicates by citing Scott (2003) that if the stock market is inefficient, financial statements cannot be useful to value a firm. He also argues by citing Kothari (2001) that no fundamental analysis is useful, if the market is inefficient; and however, basic/fundamental accounting variables can play a meaningful role in the equity valuation process, if the market is efficient. All these arguments imply usefulness of Ohlson (1995) in efficient markets in valuing a firm with accounting variables.

Further, Nilsson (2003) by referring to Holthausen and Watts (2001) indicates "*in most value relevance studies, market efficiency is assumed*". However, Nilsson (2003) also explores the consistency of coefficient estimates of accounting variables and this mostly takes place with efficient market assumptions. This implies that in efficient markets, the consistent coefficient estimates of accounting variables with their theoretical references can be confirmed. When such estimates in a market deviate from the theoretical references in valuation models, it is possible to question how the market itself validates to the informational efficiency.

According to Fama (1970), efficient market refers to the term "*security prices fully reflect all available information*". Kothari (2001) indicates that the informational efficiency of markets is very much appealing to market players, such as "*investors, managers, standard setters, and other market participants*". He also indicates that financial information has impacts on share prices and contributes to studies in market efficiency. Therefore, this study attempts to explore level of information efficiency in Sri Lankan stock market and the importance of the accounting information for explaining the share price by utilizing Ohlson (1995).

Abeysekara (2001) indicates possibility of predicting short term stock return in Sri Lankan stock market, thus questioning weak-form efficiency of the market, while Samarakoon (1998), and Abeyratna and Power (1995) confirm the weak-form efficiency of the market. This implies the extent to which the accounting numbers are useful to explain equity price is verifiable, thus examining whether the Sri Lankan share market is efficient at least to have the value relevance of accounting numbers. The study therefore infers that market is at least of semi-strong efficiency, if there are consistent results of pooled, fixed-year and fixed-firm analyses. In this context, this study examine the role of net asset in place of book value in Ohlson (1995) to assess the relevance of earnings and dividends, Ohlson's (1995) model is transformed accordingly.

² The Colombo Stock Exchange (CSE) offers certain core functions and services to facilitate investors operating in the Sri Lankan stock market. They are: (a) listing companies to raise debt and equity capital, convertibles, warrants, asset securitizations, etc; (b) providing trading facilities for the secondary trading of all securities that are listed; (c) providing on-line market data and other market related products; (d) posting trade clearing, settlement, and registration and depository facilities for all secondary market transactions; (e) transferring of technology to other exchanges; (f) relevant trainings; etc. (CSE – Annual Reports 2006, 2007, 2010 and 2011).

METHOD

Study Model

Ohlson (1995) utilizes book value, earnings, and other earning related information for equity valuation. However, unlike Ohlson (1995), this study considers net assets, earnings, and dividends only. For this purpose, the Ohlson (1995) model is reformulated by utilizing clean surplus relation and balance sheet equation among accounting numbers.³

Ohlson (1995, 2001) values a firm with the following equation together with the assumptions said above.

$$P_t = y_t + \alpha_1 x_t^a + \alpha_2 v_t \quad (1)$$

where P_t = equity share price at time t,

y_t = book value at time t,

α_1 = parameter of autoregressive process of earnings,

x_t^a = abnormal earning per share at time t,

α_2 = parameter of other earnings related information and

v_t = other earnings related information.

Using Ohlson's (1995) model (equation (1)), together with clean surplus relations and balance sheet equation of accounting numbers, this study reformulates the Ohlson (1995) model (see Appendix 1) into:

$$P_t = NA_t(1 - \alpha_1 r) + x_t[\alpha_1(1 + r)] - d_t(\alpha_1 r) + \alpha_2 v_t \quad (2)$$

where P_t = equity share price at time t,

NA_t = (total assets – total debts) = net assets at time t,

3 The clean surplus relation is given by $y_t = y_{t-1} + x_t - d_t$, where y_t = closing book value at time t, y_{t-1} = closing book value at time t-1 or opening book value at time t, x_t = earnings for the period t and d_t = dividend at time t; and balance sheet equation is given by $(y_t = y_{t-1} + x_t - d_t) = (NA_t = \text{total assets} - \text{total debts})$, where NA_t = net assets at time t.

α_1 = parameter of autoregressive process of earnings,

r = risk free rate of interest,

x_t = earnings per share at time t,

d_t = dividend per share at time t,

α_2 = parameter of other earnings related information and

v_t = other earnings related information.

This study considers the basic form of accounting equation (i.e., opening book value + earnings – dividends = a firm's net assets) for assessing the net asset value, irrespective of goodwill value, for explaining the equity price at a fiscal yearend.

Using equation (2) above, this study performs empirical regression analysis. Hence, the empirical linear regression model of this study is:

$$P_{i,t} = \beta_0 + \beta_1 NA_{i,t} + \beta_2 x_{i,t} + \beta_3 d_{i,t} + u_{i,t} \quad (3)$$

where β_0 = constant,

β_1 = coefficient estimate of net assets per share,

β_2 = coefficient estimate of earnings per share,

β_3 = coefficient estimate of dividends per share and

$u_{i,t}$ = error term of i^{th} firm at time t.

Data

Due to data restrictions, ten-year data (2001-2010) are considered from selected listed companies (65 in 12 sectors from 277 in 20 sectors – see Appendix 2 for details) in the Colombo Stock Exchange. Initially, only about 549 firm-years data were available for analysis; and from them, the negative values (152 firm-years) of net assets (NA), earnings (EPS) and unrecorded dividends (DPS), and unusable data (9) for cross-section were eliminated. This has resulted in 388 firm-years. To ensure the non-inclusive of the outliers, lower and upper data of 10% (each 5%) have been eliminated

Table 1: Descriptive Statistics of the Variables

Description	Net assets per share (NA_t)	Earnings per share (x_t)	Dividends per share (d_t)	Equity price per share (P_t)
Mean	96.3178	12.0613	3.0919	96.7265
Standard Deviation	149.96273	16.78681	3.03676	108.84950
Coefficient of Variance	1.55696	1.39179	0.98217	1.12533
Minimum	3.30	0.06	0.04	10.50
Maximum	1264.95	135.76	28.40	624.97
Number of Data	352	352	352	352

*Data Source: Annual Reports of the Firms Available in the Colombo Stock Exchange

Table 2: Correlations Analysis

Measure		Equity price per share (P_t)	Net assets per share (NA_t)	Earnings per share (x_t)	Dividends per share (d_t)
P_t	Pearson Correlation	1	0.686***	0.692***	0.629***
	Sig. (2-tailed)	.	0.000	0.000	0.000
NA_t	Pearson Correlation	0.686***	1	0.778***	0.428***
	Sig. (2-tailed)	0.000	.	0.000	0.000
x_t	Pearson Correlation	0.692***	0.778***	1	0.550***
	Sig. (2-tailed)	0.000	0.000	.	0.000
d_t	Pearson Correlation	0.629***	0.428***	.550***	1
	Sig. (2-tailed)	0.000	0.000	0.000	.

*** = Correlation is significant at the 0.01 level; Number of observations = 352

*Data Source: Annual Reports of the Firms available in the Colombo Stock Exchange

as outliers from 388 firm-years that has resulted as 352 firm-years (from 65 firms) for our final analysis.

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

Descriptive Statistics

Results indicate net assets ranges 3–1265 (mean value 96.32 and standard deviation 149.96); earnings 0.06–136 (mean value 12.06 and standard deviation 16.79); dividends 0.04–28.40 (mean 3.09 and standard deviation 3.04); and equity price 10.50 to 624.97 (mean value 96.73 and standard deviation 108.85). The coefficient of variance for dividends has lower dispersion than other variables, comparatively.

Correlation Analysis

Overall, correlation analyses confirm significant positive relationships of contemporaneous equity price to net assets (Barkham and Ward, 1999; Liow, 2003), earnings (Senthilnathan, 2009c; Alfaraih and Alanezi, 2011; Graham and King, 2000; Karunaratne and Rajapakse, 2010; Graham and King, 2000) and dividends (Rees, 1997). Particularly, Senthilnathan (2009c) reveals that in comparison, earnings, and contemporaneous price have higher correlation coefficient ($R=0.635$) than the relationship between earnings and next period's equity price ($R=0.555$), thus satisfying our modeling with earnings. The results indicate positive significant correlation of dividends with equity price ($R=0.629$, $p<0.01$). Ohlson's (1995) model endorses negative relationship between them (see equation (2)). The positive significant correlation ($R=0.629$, $p<0.01$) between them in this study is not consistent with Ohlson's (1995) specification. However, the dividends declaration

would take place after confirming the fiscal yearend price. Hence, dividends in this study possibly explore a positive relationship with equity price, since the dividends declared (after the formation of fiscal yearend price) would have been representing the information on expected dividends, which has been incorporated in the yearend equity price.

Further, correlations between independent variables indicate positive significant relationships of net assets with earnings ($R=0.778$, $p<0.01$) and dividends ($R=0.428$, $p<0.01$), and that of earnings and dividends ($R=0.550$, $p<0.01$). These results of correlation between independent variables imply low level of multicollinearity between any of them.⁴

Year-based Cross-Sectional Linear Regression Analysis

Pooled and Fixed-Year Effect Results

The pooled and fixed-year results consistently indicate significant value relevance of net assets, earnings, and dividends incrementally. The estimated intercept and coefficients of independent variables reveal that they significantly contribute to explain yearend price. Liow (2003) indicates significant explanatory power of the additional investments on net assets for explaining the equity price of real estate firms. He identifies that net asset is a proxy for fundamental value to capture the equity price changes. Our result endorses Liow (2003) consistently, though all firms in the Colombo Stock Exchange are not real estate companies. The net asset that explains the price is due to its proxy role for book value.

4 The higher level of multicollinearity can be indicated by the significant (positive or negative) relationship between independent variables, generally when $R \geq 0.9$ or $R \leq -0.9$ (where the variance inflation factor $VIF > 5$).

Table 3: Cross-Section Year Based Regression Results of Analysis

Year	β_0		β_1		β_2		β_3		Adjusted	Firm-
	t-statistics		t-statistics		t-statistics		t-statistics		R ²	years
Pooled	15.0739	***	0.271959	***	1.325196	***	12.76725	***	0.619194	352
	2.628038		3.362599		2.614478		5.940249			
Fixed	12.11002		0.266581	***	1.150244	**	13.80291	***	0.674675	352
year	0.577766		3.590164		2.316072		7.194405			
2001	-25.4682	**	0.577677	***	0.799587		10.49171	**	0.816979	25
	-2.45038		4.08487		0.701468		2.162457			
2002	2.539629		0.054133		0.172481		14.75958	***	0.289176	21
	0.226092		0.429639		0.199525		3.924865			
2003	-7.41804		0.426043	***	0.224097		15.64779	***	0.848521	30
	-1.27966		5.931476		0.493186		7.184493			
2004	7.382194		0.094129		2.737178	***	9.183532	**	0.916087	28
	1.258111		0.567001		8.69696		2.650668			
2005	38.94356		0.150356		6.706617		-4.7365		0.414314	28
	1.302545		0.27777		1.132254		-0.25437			
2006	16.58641		0.996816	***	-3.68547		20.91576	***	0.708364	47
	1.522926		2.713022		-1.456		3.080976			
2007	21.73037	**	0.34953	***	-0.01298		12.85545	***	0.725855	49
	2.164876		4.186423		-0.01899		5.515141			
2008	8.816839		0.072571		1.705757		16.97971	***	0.827139	50
	1.1801		0.456558		0.900329		7.228474			
2009	24.3835	**	0.058625		2.046169		9.74411	*	0.617275	39
	2.661887		0.403738		1.207163		1.915172			
2010	14.58088		0.353319	***	3.716402	*	16.99789	***	0.772712	35
	1.238433		4.123565		1.967427		3.09531			
Average	10.20771		0.31332		1.440983		12.2839		0.693642	
Measure	0.782493		2.317406		1.382332		3.650319			

*Data Source: Annual Reports of the Firms Available in the Colombo Stock Exchange

In this table, i = firm's indicator; P_t = equity price, NA_t = net assets per share, x_t = earnings per share and d_t = dividends per share at the end of the fiscal year; β_0 = constant, β_1 = coefficient estimate of net assets, β_2 = coefficient estimate of earnings, β_3 = coefficient estimate of dividends and u_t = error term. The t -statistic is estimated using White's (1980) heteroskedasticity consistent covariance. For coefficient estimates, first row of this table consists of estimates of coefficients of independent variables and constant; and next row indicates t -statistic for the respective coefficient estimates. The significance of a coefficient estimate is identical with the p value, where *** is for $p \leq 0.01$, ** is for $p \leq 0.05$, and * is for $p \leq 0.10$. Last two columns show the adjusted R² and firm-years utilized for the analysis.

$$P_{i,t} = \beta_0 + \beta_1 NA_{i,t} + \beta_2 x_{i,t} + \beta_3 d_{i,t} + u_{i,t} \quad (3)$$

Alfaraih and Alanezi (2011) explore the incremental positive significant relevance of earnings and book value

for explaining contemporaneous price. Thus, this study also consistently reveals the significant contribution of incremental earnings together with net assets, which is in place of book value. Senthilnathan (2009c) spells the relevance of incremental earnings and contemporaneous price for explaining next yearend price, thus implying usefulness of earnings for explaining contemporaneous price. Silvestri and Veltri (2012), Collins et al. (1997), Rees (1997), Barth et al. (1998), and Karunarathne and Rajapakse (2010) also reveal positive incremental significant pooled regression coefficients of earning for explaining the equity price, thus considerably supporting our results.

Year-based pooled results reveal positive incremental relevance of dividends to explain significantly the equity price variation. Generally, there are three aspects to be considered in relation to dividends: dividends expected (to be declared), dividend declared, and dividends pay out.

Expected dividend and dividends declaration might cause a positive change in price. However, after the dividends payout, the price will definitely has a negative relationship with it and this is how Ohlson's (1995) model implies.

In this study, consistent with Rees (1997), dividends explore positive coefficient estimates (12.767, $p < 0.01$) for explaining yearend price, since the dividends declared after the yearend price in the study model would represent the incorporated information of expected dividends in the price. In application of this nature, the empirical result of relationship between dividends and price is possibly inconsistent with, and deviate from, Ohlson's (1995) reformulated model (see equation (3)).

Year-Wise Regression Results

The year-wise results reveal that the considerable contribution to explain the variation of yearend price is with net assets and dividends, incrementally. However, the dividends dominate incremental significant relevance to yearend price, compared to net assets and earnings (see 2001 - 2010, except 2005 and 2009). The incremental relevance of net assets is somewhat more than the earnings in the yearly analysis. Note that in yearly analysis, the incremental significant coefficient estimates for both net assets and earnings have not been resulted simultaneously. This implies that earnings might be considered as a proxy for net assets. Notably, no variable has significant coefficient estimate for year 2005.

Indicatively, net assets reveal significant incremental value relevance to the yearend price only for 2001, 2003, 2006, 2007 and 2010; and not for the rest. However, year-wise results indicate that net assets have no consistent information for valuing a firm, thus questioning the role of net assets for its informational role, and implying investors cannot rely on net assets, for explaining the variation of yearend price.

Year-wise results reveal significant incremental value relevance of earnings for year 2004, and for other years, the earnings are insignificant. Notably, though overall year-wise regression results of earnings reveal irrelevant incremental relationship for explaining contemporaneous price, the pooled and fixed year results indicate positive significant incremental value relevance of earnings for explaining the yearend price. Our results are inconsistent compared to Senthilnathan (2009a, 2009c), and Alfaraih and Alanezi (2011), which mostly confirm year-wise incremental significant value relevance of earnings. Thus, it is possible to question whether the year-wise earnings information is useful for explaining equity price in the Sri Lankan context. It is also notable that incremental relevance of dividends dominates earnings in the year-wise results, though Miller and Modigliani (1961) and Ohlson (1995) term irrelevance of dividends.

The year-wise results of dividends on equity price explore positive significant incremental relevance, except for years 2005 and 2009. Unlike other independent variables, dividends have comparatively and consistent relevance with the pooled and fixed-year results. Beyond (a) Miller and Modigliani's (1961) explanation of dividend irrelevance, (b) Ohlson's (1995) assumption of accepting the same of dividend irrelevance for his simplified model, and (c) Ohlson's (1995) model reformulation (insisting negative relationship of dividends with price), this study results in positive significant incremental value relevance of dividends, since (a) the dividends are proposed after the fiscal year end; and (b) the information of dividends to be proposed (not the contemporaneous earnings information) would have acted as the proxy for future earnings by the end of each year. This is inconsistent with the assumption of Ohlson (1995) that current earnings can be the proxy for future earnings, since this study reveals the proxy role of dividends for future earnings, beyond current earnings.

Overall Results of Year-based Analysis

In summary, pooled and fixed year effect results reveal all the independent variables have incremental positive significant value relevance. The year-wise incremental results indicate dominant explanatory power of dividends over net assets and earnings, thus possibly implying the proxy role of dividends for future earning, since many studies confirm earnings as the crucial measure of explaining share price (e.g., Rees, 1997; King and Langli, 1998; Chen et al., 2001). This may endorse weak form efficiency of Sri Lankan market as indicated by Abeyratna and Power (1995) and Samarakoon (1998). However, year-wise analysis indicates that earnings are less incremental value relevance, compared to net assets. In brief, for the time horizon 2001-2010 as a whole in cross-section, all the variables are useful for explaining the contemporaneous price.

CROSS-SECTIONAL SECTOR-BASED REGRESSION ANALYSIS

Pooled, Fixed-Sector Effect and Sector-Wise Results

Equation (3) is tested for the sectors as a whole and individually (see Table 4 and Appendix 2 for sector coding, and Table 5 sector-based results). The pooled estimates are the same and these results are compared with fixed-sector estimates. The fixed-sector results also reveal almost similar significant coefficient estimates and incremental relevance of the independent variables.

In this table, i = firm's indicator; P_t = equity price, NA_t = net assets per share, x_t = earnings per share and d_t = dividends per share at the end of the fiscal year; β_0 = constant, β_1 = coefficient estimate of net assets, β_2 = coefficient estimate of earnings, β_3 = coefficient estimate of dividends and u_t = error term. The t -statistic is estimated using White's (1980) heteroskedasticity consistent covariance. For coefficient estimates, first row of this table consists of estimates of coefficients of independent variables and constant; and next row indicates t -statistic for the respective coefficient estimates. The significance of a coefficient estimate is identical with the p value, where *** is for $p \leq 0.01$, ** is for $p \leq 0.05$, and * is for $p \leq 0.10$. Last two columns show the adjusted R^2 and firm-years utilized for the analysis. Final column of this table denotes two measures: the number of firms (at the top) and number of firm-years for each sector.

$$P_{i,t} = \beta_0 + \beta_1 NA_{i,t} + \beta_2 x_{i,t} + \beta_3 d_{i,t} + u_{i,t} \quad (3)$$

Table 4: Sectors with Sector Code

Sector Code	Sectors
10	Bank, Finance and Insurance
20	Beverage Food and Tobacco
30	Chemical and Pharmaceuticals
40	Construction and Engineering
50	Diversified Holdings
80	Hotels and Travels
100	Investment and Trust
110	Land and Property
120	Manufacturing
130	Motors
140	Oil Palms
150	Plantation

*(Source: Annual Reports of the Firms Available in the Colombo Stock Exchange)

Note: The Sector Codes are Assigned by this Study for Every Sector as Indicated in Appendix 2.

The sector-wise regression results reveal that the accounting variables do not constructively represent the incremental value relevance, thus implying inefficient feature of Sri Lankan stock market. It is notable that only the sector: Banks, Finance and Insurance (sector code 10) reveals incremental significant value relevance for all three variables, but inconsistently with negative coefficient estimate for earnings significantly ($\beta_2 = -1.247$, $p < 0.05$). In this context for the same sector (10), as in previous results of yearly analyses, the dividends play a proxy role for future earnings significantly. However in comparison, earnings have substantial significant positive contribution to explain the price (see sectors 20, 30, 50, 80 and 130 in Table 5), thus implying the incremental value relevance of earnings

for sectors: Beverage, Food and Tobacco, Chemicals and Pharmaceuticals, Diversified Holdings, Hotels and Travels, and Motors, respectively.

Notably, significant incremental role of net assets is identified only with three sectors (10, 100 and 130). There are no consistent results for net assets among the sectors. Liow (2003) indicates significant incremental relevance of net assets in property companies. In this study, the sector: Land and Property (110) does not reveal such relevance of net assets with the price, i.e., inconsistently with Liow's (2003) findings. This may also be a sign of weak form efficiency or informational inefficiency of the Sri Lankan stock market. Specifically, as Ohlson (1995) indicates, six sectors (20, 30, 50, 80, 100 and 150) reveal negative coefficient estimates of dividends, but not significantly. All of the incremental significant positive transformations of dividends to explain the price are for four sectors: 10, 40, 120 and 140. However, there are no consistent results of independent variables in all sectors.

Overall Results of Sector-Based Analysis

In summary, sector-based regression results indicate that pooled, fixed-year and fixed-sector results are almost the same for the time span 2001-2010. However, variables' incremental states are different and not consistently reported, even in comparison between the results of year-based and sector-based analyses. Sector-wise results reveal different incremental value relevance of independent variables to explain the price, compared to year-wise results. Indicatively, the sector-wise earnings have produced more useful accounting information to determine the price than year-wise. At the same time, net assets and dividends have lost their incremental relevance for explaining the price at an acceptable significant level. This is not consistent with year-wise regression results in relation to dividends in particular. Overall sector-wise results indicate that earnings have more incremental significant value relevance than other two independent variables to explain the contemporaneous equity price.

CONCLUSION

This study compares the incremental relevance of net assets, earnings and dividends for explaining the contemporaneous equity price in Sri Lankan share market. Therefore, a reformulated incremental value relevance model has been used to explain the price by using Ohlson (1995). Hence, this study attempts to associate the accounting variables with equity price with the reformulation for examining the market efficiency in Sri Lankan share market.

Table 5: Cross-Section Sector-based Regression Results of Analysis

Sector	β_0		β_1		β_2		β_3		Adjusted	Firms
Based	t-statistics		t-statistics		t-statistics		t-statistics		R ²	Years
Pooled	15.0739	***	0.271959	***	1.325196	***	12.76725	***	0.619194	65
	2.628038		3.362599		2.614478		5.940249			352
Fixed	26.98361		0.208111	***	1.825867	***	10.93805	***	0.65258	65
Sector	1.426238		2.746379		3.64905		5.615366			352
10	-8.42151		0.58336	***	-1.24663	**	18.9462	***	0.695463	11
	-1.01803		5.355745		-2.51813		5.480107			72
20	-12.8824		0.854026	*	6.675974	**	-4.10743		0.594204	4
	-0.95351		1.775765		2.184105		-0.51192			20
30	54.55884	***	-0.02292		3.816183	***	-2.76867		0.819231	5
	3.3781		-0.28451		5.807552		-0.47198			38
40	-18.1335		-0.66701		0.621722		40.4868	**	0.882135	2
	-1.55487		-1.23098		0.333061		2.467387			10
50	111.6627	**	-0.83785		12.55561	**	-18.0121		0.723767	4
	2.299093		-1.56901		2.768318		-0.72194			21
80	25.25766	*	0.200998		15.20701	***	-9.96817		0.692233	7
	1.947543		0.932061		3.33722		-0.88871			25
100	-1.52109		0.702002	**	2.029737		-3.06349		0.856593	6
	-0.13599		2.713643		1.389973		-0.57427			23
110	-0.75316		0.326373		0.811976		16.95174	*	0.52381	4
	-0.05272		0.988866		1.325485		2.074125			14
120	17.01885		0.163489		0.939072		9.987844	**	0.23844	11
	1.540599		1.437273		1.44478		2.127649			69
130	-16.8443		0.571928	***	2.682181	***	6.910779		0.661988	4
	-0.79921		3.822319		2.868384		1.040557			30
140	185.8092	***	-0.15638		-2.65862	*	19.551	***	0.887711	3
	3.618022		-0.6567		-1.89778		11.54786			11
150	1.275219		0.420438	*	2.858797	*	-3.02292		0.562102	4
	0.217843		1.806822		2.087377		-0.55086			19
Average	28.08555		0.178205		3.691084		5.990968		0.67814	
Measure	0.707239		1.257608		1.594195		1.7515			

*Data Source: Annual Reports of the Firms Available in the Colombo Stock Exchange

This study considers the yearend price in Sri Lankan share market with the argument that the accounting variables in the reformulated model would significantly explain the contemporaneous price, provided that Ohlson (1995) implicate market efficiency. In this context, the study attempts to explore on efficiency of the Sri Lankan share market and the benchmarking role of net assets in assessing the relevance of earnings and dividends.

The correlation results indicate positive significant value relevance of net assets, earnings and dividends, independently. Pooled and fixed-year effect results of the model imply incremental value relevance of accounting variables. However, this is not consistent with year-wise analysis, thus implying that Sri Lankan share market is not

efficient and it might be of weak form efficiency. This is repeatedly confirmed with the results of fixed-sector analysis that are almost similar to fixed-year effect results. The benchmarking role of net assets in exploring the incremental relevance of earnings becomes meaningful only with the pooled fixed-year and fixed-sector analyses.

Notably, but differently from Ohlson (1995), the relevance of dividends is explored, since the dividends are proposed after the fiscal yearend; and the information of dividends to be proposed (not the contemporaneous earnings information) would have acted as the proxy for future earnings by the end of each fiscal year. Hence, the dividends reveal positive significant incremental relevance, beyond earnings.

REFERENCES

- Abeyratna, G. & Power, D. M. (1995). A test of the weak-form of the efficient market hypothesis: Evidence daily data from the Colombo Stock Exchange - Sri Lanka. *Journal of Social Science*, 18(1&2), 41-53.
- Abeysekera, S. P. (2001). Efficient market hypothesis and the emerging capital market in Sri Lanka: Evidence from the Colombo Stock Exchange. *Journal Business Finance & Accounting*, 28(1-2), 249-261.
- Alfaraih, M. & Alanezi, F. (2011). The usefulness of earnings and book value for equity valuation to Kuwait stock exchange participants. *International Business & Economics Research Journal*, 10(1), 73-89.
- Barkham, R. J. & Ward C. (1999). Investor sentiment and noise traders: Discount to net asset value in listed property companies in the U.K. *Journal of Real Estate Research*, 18(2), 291-312.
- Barth, M. E., Clement, M. B., Foster, G. & Kasznik, R. (1998). Brand values and capital market valuation. *Review of Accounting Studies*, 3(1-2), 41-68.
- Brief, R. P. & Zarowin, P. (1999). The value relevance of dividends, book value and earnings, Working Paper, Dept. of Accounting, New York University. Retrieved from <http://people.stern.nyu.edu/rbrief/zarowin.pdf>. (accessed on November 13, 2011).
- Collins, D. W., Pincus, M. & Xie, H. (1999). Equity valuation and negative earnings: The role of book value of equity. *The Accounting Review*, 74(1), 29-61.
- Collins, D. W., Maydew, E. L. & Weiss, I. S. (1997). Changes in the value-relevance of earnings and book value over the past forty years. *Journal of Accounting and Economics*, 24(1), 39-67.
- Dang, L., Brown, K. F. & McCullough, B. D. (2011). Apparent audit failures and value relevance of earnings and book value. *Review of Accounting and Finance*, 10(2), 134-154.
- Dontoh, A., Radhakrishnan, S. & Ronen, J. (2007). Is stock pricing a good measure for assessing value-relevance of earnings?: An empirical test. *Review of Managerial Science*, 1(1), 3-45.
- Easton, P. D. & Harris, T. S. (1991). Earnings as an explanatory variable for returns. *Journal of Accounting Research*, 29(1), 19-36.
- Fama, E. F. (1965). The behavior of stock market prices. *The Journal of Business*, 38(1), 34-105.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical works. *Journal of Finance*, 25(2), 383-417.
- Francis, J. & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research*, 37(2), 319-352.
- Graham, R. C. & King, R. D. (2000). Accounting practices and the market valuation of accounting numbers: Evidence from Indonesia, Korea, Malaysia, the Philippines, Taiwan and Thailand. *The International Journal of Accounting*, 35(4), 445-470.
- Gregory, A., Saleh, W. & Tucker, J. (2005). A UK test of an inflation-adjusted Ohlson Model. *Journal of Business Finance & Accounting*, 32(3&4), 487-534.
- Hand, J. R. M. & Landsman, W. R. (2005). The pricing of dividends in equity valuation. *Journal of Business Finance & Accounting*, 32(3-4), 435-469.
- Holthausen, R. & Watts, R. (2001). The relevance of the value relevance literature for financial accounting standard setters. *Journal of Accounting and Economics*, 31(1-3), 3-75.
- Karunaratne, W. V. A. D. & Rajapakse, R. M. D. A. P. (2010). *The value relevance of financial statements' information: With special reference to the listed companies in Colombo Stock Exchange, Conference paper, University of Kelaniya*. Retrieved from <http://repository.kln.ac.lk/id/eprint/126>. (accessed on December 31, 2012).
- Khodadadi, V. & Emami, M. R. (2009). Using panel data analysis methods in Ohlson (1995) model to predicting abnormal earnings. *International Bulletin of Business Administration*, 6, 40-49.
- Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, 31(1-3), 105-231.
- Kousenidis, D. V., Ladas, A. C. & Negakis, C. I. (2009). Value relevance of conservative and non conservative accounting information: Evidence from Greece. *The International Journal of Accounting*, 44(3), 219-238.
- Lin, S. W. & Ramond, O. J. (2007). Value relevance of comprehensive income and its components: Evidence from major European capital markets. Retrieved from http://www.cereg.dauphine.fr/cahiers_rech/drmfinance0209.pdf. (January 16, 2011).
- Liow, K. H. (2003). Property company stock price and net asset value: A mean reversion perspective. *Journal of Real Estate Finance and Economics*, 27(2), 235-255.
- Lu, Q. F. (2005). Bayesian forecasting of stock prices via the Ohlson (1995) model. (Unpublished Master Dissertation). Worcester Polytechnique Institute, Worcester. Retrieved from http://www.wpi.edu/Pubs/ETD/Available/etd-050605-155155/unrestricted/Flora_Thesis_May_2005.pdf. (accessed on October 31, 2011).
- Nikbakht, Z. & Aflatooni, A. (2010). The value relevance of earnings components in two different GAAPs. *Business Intelligence Journal*, 3(2), 101-112.
- Nilsson, H. (2003). Essays on the value relevance of financial statement information. Department of Business

- Administration, Studies in Business Administration, Umea University, B(50), 1-26.
- Ohlson, J. A. (1995). Earnings, book value and dividends in equity valuation. *Contemporary Research*, 11(2), 661-687.
- Ohlson, J. A. (2001). Earnings, book values, and dividends in equity valuation: An empirical perspective. *Contemporary Accounting Research*, 18(1), 107-120.
- Omura, T. (2005). The relationship between market value and book value for five selected Japanese firms. (Unpublished Master Thesis). Queensland University, Queensland. Retrieved from http://eprints.qut.edu.au/16150/1/Teruyo_Omura_Thesis.pdf. (accessed on October 31, 2011).
- Ota, K. (2000). A new improvement to the Ohlson (1995) model empirical evidence from Japan, Department of Commerce, Kansai University, Japan. Retrieved from <http://ssrn.com/abstract=232672>. (accessed on October 31, 2011).
- Ota, K. (2001). A test of the Ohlson (1995) model empirical evidence from Japan, Department of Commerce, Kansai University, Japan. Retrieved from <http://ssrn.com/abstract=287513>. (accessed on November 10, 2011).
- Rees, W. P. (1997). The impact of dividends, debt and investment on valuation models. *Journal of Business Finance and Accounting*, 24(7-8), 1111-1140.
- Samarakoon, L. P. (1998). Mean reversion in stock prices in an emerging market: Sri Lanka evidence, *Proceedings of the annual research session*, Faculty of Graduate Studies (pp. 301-316), University of Sri Jayewardenepura, Colombo, Sri Lanka.
- Senthilnathan, S. (2009a). *The equity prices and accounting variables - The role of the most recent prior period's price in value relevance studies*. Saarbrücken, Germany, LAP LAMBERT Academic Publishing (ISBN: 978-3-659-10372-8).
- Senthilnathan, S. (2009b). The efficient market, random walk and the Ohlson (1995) model, Working Paper. Retrieved from <http://ssrn.com/abstract=1524083>. (accessed on November 2, 2011).
- Senthilnathan, S. (2009c). The information perspective and usefulness of accounting information, Working Paper. Retrieved from <http://ssrn.com/abstract=1406788>. (accessed on November 13, 2011).
- Silvestri, A. & Veltri, S. (2012). A test of the Ohlson model on the Italian stock exchange. *Accounting & Taxation*, 4(1), 83-94.
- Smith, D. J. (2003). The information value of earnings excluding goodwill amortization in publicly listed New Zealand companies. (Unpublished Master Dissertation), Massey University, New Zealand.
- Vazquez, R. D., Valdes, A. L. & Herrera, H. V. (2007). Value relevance of the Ohlson model with Mexican data, *Contaduriay Administracion, Universidad Nacional Autonoma de Maxico*, September-December, 22(3) 33-52.
- Walker, M. (1997). Clean surplus accounting models and market-based accounting research: A review. *Accounting and Business Research*, 27(4), 341-355.
- Zeng, T. (2001). Feltham- Ohlson frame work: The implication of corporate tax, Working Paper Series. Retrieved from <http://ssrn.com/abstract=277908>. (accessed on November 2, 2011).

APPENDIX

Appendix 1: Reformulation of Ohlson's (1995) Model

Basic and simplest form of Ohlson's (1995) model as indicated in "3.1 Study Model" is

$$P_t = y_t + \alpha_1 x_t^a + \alpha_2 v_t \quad (A1)$$

Clean surplus relationship of accounting variables is

$$y_t = y_{t-1} + x_t - d_t \quad (A2)$$

where

y_{t-1} = opening book value at time t,

x_t = earnings per share at time t and

d_t = dividends per share at time t.

Therefore,

$$y_{t-1} = y_t + d_t - x_t. \quad (A3)$$

Abnormal earning per share = (earnings per share – cost of capital)

$$x_t^a = x_t - r \cdot y_{t-1} \quad (A4)$$

where r = risk free rate of interest.

Substituting equations (A2) and (A4) in equation (A1) result in

$$P_t = (y_{t-1} + x_t - d_t) + \alpha_1 (x_t - r \cdot y_{t-1}) + \alpha_2 v_t \quad (A5)$$

Summarizing equation (A5) gives

$$P_t = (y_{t-1} - \alpha_1 r \cdot y_{t-1}) + (x_t + \alpha_1 \cdot x_t) - d_t + \alpha_2 v_t \quad (A6)$$

and

$$P_t + d_t = y_{t-1}(1 - \alpha_1 r) + x_t(1 + \alpha_1) + \alpha_2 v_t \quad (A7)$$

In a basic form of balance sheet equation as preliminary gives that (opening book value + earnings – dividends = a firm's net assets), i.e.,

$$y_{t-1} + x_t - d_t = y_t = NA_t \quad (A8)$$

and

$$y_{t-1} = NA_t + d_t - x_t, \quad (A9)$$

where NA_t = (total assets – total debts) = net assets at time t.

Substituting equation (A9) in equation (A7) result in

$$P_t + d_t = (NA_t + d_t - x_t)(1 - \alpha_1 r) + x_t(1 + \alpha_1) + \alpha_2 v_2 \quad (A10)$$

Summarizing equation (A11) gives

$$P_t + d_t = NA_t(1 - \alpha_1 r) + d_t(1 - \alpha_1 r) - x_t(1 - \alpha_1 r) + x_t(1 + \alpha_1) + \alpha_2 v_2 \quad (A11)$$

$$P_t + d_t = NA_t(1 - \alpha_1 r) + d_t(1 - \alpha_1 r) + x_t(1 + \alpha_1 - 1 + \alpha_1 r) + \alpha_2 v_2 \quad (A12)$$

and

$$P_t = NA_t(1 - \alpha_1 r) + d_t(1 - \alpha_1 r - 1) + x_t(\alpha_1)(1 + r) + \alpha_2 v_2 \quad (A13)$$

Final reformulation is:

$$P_t = NA_t(1 - \alpha_1 r) + x_t[\alpha_1(1 + r)] - d_t(\alpha_1 r) + \alpha_2 v_2 \quad (A14)$$

The above equation (A14) provides a base for deriving the empirical regression model of this study.

Appendix 2: Sample Firms of This Study

Sector code	Sectors	Total firms	Firms selected	Firm-years data
10	Bank Finance and Insurance	57	11	72
20	Beverage Food and Tobacco	21	4	20
30	Chemical and Pharmaceuticals	11	5	38
40	Construction and Engineering	3	2	10
50	Diversified Holdings	16	4	21
60	Foot Were and Textiles	5	-	-
70	Health Care	6	-	-
80	Hotels and Travels	35	7	25
90	Information Technology	2	-	-
100	Investment and Trust	10	6	23
110	Land and Property	18	4	14
120	Manufacturing	36	11	69
130	Motors	6	4	30
140	Oil Palms	5	3	11
150	Plantation	18	4	19
160	Power and Energy	7	-	-
170	Services	7	-	-
180	Stores and Suppliers	4	-	-
190	Telecommunication	2	-	-
200	Trading	8	-	-
Total		277	65	352

Source: Annual reports of the firms available in the Colombo Stock Exchange

Note: The sector codes are assigned by this study and the firms selected are based on the data availability.