

# **VALUE RELEVANCE OF AGGREGATED VS DISAGGREGATED BOOK VALUE AND EARNINGS: EVIDENCE FROM MALAYSIAN HIGH-TECH FIRMS**

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## **Abstract**

*This study is aimed at investigating the value relevance of aggregated and disaggregated book value and earnings of high-tech firms listed on Bursa Malaysia for the period from 2003-2008. Using the Ohlson (1995) basic and modified equity valuation models, this study investigated whether disaggregated book value and earnings could explain the variation in market value better than aggregated book value and earnings. The results of the basic model show that the explanatory powers of both book value and earnings are fluctuating with book value is in a decreasing trend whereas earnings is in an increasing trend. The results of the modified models show that disaggregated book value and earnings could explain the variation in market value better than aggregated book value and earnings.*

**Keywords:** *market value; book value; earnings; high-tech firms; Malaysia.*

## **Introduction**

Brown, Lo and Lys (1999) suggested that the relevance of book value and earnings has been declining over the last 40 years. Similar findings were also

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found by later researchers like Dontoh, Radhakrishnan and Ronen, (2004) and Cortijo, Palmon and Yezegel (2006). There are a few reasons for the declining relevance of book value and earnings suggested by previous researches. They are: changing business environment from traditional capital-intensive economy to a high technology service oriented economy (Dontoh et al., 2004) or loss of information due to aggregation (Kothari, 2001), and to the extreme extent market price (value) is not a suitable measure to assess value relevance of accounting earnings (Dontoh et al., 2004). According to them, not only do earnings lose their predicting contents but stock price are even worse. Since they did not suggest any new measures to replace market price (value), we stick to the established theory (model) that market price (value) is the most suitable measure to assess the value relevance of accounting numbers.

Xu and Cai (2005) and Hadi (2006) have conducted their studies to respond to the issues. In their study, they broke earnings into sales, cash flow and earnings (Xu and Cai, 2005) and sales, gross income, operating income and net income (Hadi, 2006) in their models. However, their studies were not able to fix the problem completely because first, they only disaggregated earnings and second, their results are not consistent with the theory (Ohlson, 1995) that earnings (including sales, operating profit or earnings itself) should be positively related to market value. While Xu and Cai (2005) found that sales better explain variations in market value than earnings and cash flow, Hadi (2006) found that sales, gross income and net income are negatively related with market value.

Since Hadi (2006) and Xu and Cai (2005) only used income statement model that disaggregated earnings into component and leave book value components for future studies, we believe that a combination of either disaggregated book value or earnings in our valuation models could produce more meaningful results. Therefore, this current study investigated the value relevance of book value and earnings of Malaysian high-tech firms using the Ohlson, (1995) basic and modified equity valuation models. The models were used to compare the value relevance of firms' book value and earnings when balance sheet and income statement components were disaggregated. There were several reasons for choosing Malaysian high-tech firms for the period from 2003-2008 as the sample of the study. First, as suggested by previous researchers (Xu and Cai, 2005; Dontoh et al., 2004 and Liang and Yao, 2005), high-tech firms might be the most affected sectors in terms of declining value relevance. High-tech firms invested a large amount of money in intangibles, such as research and development (R&D), and might not be recognised by the market. As a result, earnings and book values of those firms are underestimated by the market or less value relevant.

Secondly, as far as our literature research is concerned, Malaysian high-tech firms have not been investigated for this matter. Thirdly, the study conducted by Hadi (2006) covers a sample of only up to 2003. Therefore, our sample period from 2003-2008 is to complement the period gap. Finally, we expected that the result of the study would be different from Xu and Cai (2005) because of differences in sample characteristics. Xu and Cai (2005) reported:

*“The ten-year mean for stock price per share is \$16.049, for the reported net income per share after taxes but before extraordinary items is a loss of \$0.843, for cash flows from operations per share is a negative \$0.064, and for sales per share is \$7.612. The data itself is revealing. During the ten-year period, stock price of the high-tech “New Economy” firms can be as high as \$850 and as low as 3 cents. The mean of earnings per share is negative every single year and cash flows from operations are also negative five out of the ten years, with a negative mean for all ten-year observations.”*

Whereas, for the Malaysian scenario, Table 2 shows a consistent positive mean for earnings and book values for 5 consecutive years from 2003-2008. At the same time, Xu and Cai (2005) studied a developed market whereas Malaysia is an emerging market where its market efficiency is in a weak form position (Barnes, 1986; Kim & Shamsuddin, 2008; Laurence, 1986; Saw & Tan, 1989).

The objectives of this study were to investigate (1) whether book values and earnings of Malaysian high-tech firms are value relevant, (2) whether book value and earnings continue to be value relevant throughout the period under study, (3) whether disaggregated book value could explain the variation in market value better than aggregated book value, and (4) whether disaggregated earnings could explain the variation in market value better than aggregated earnings. Data were collected from Datastream for high-tech firms listed on Bursa Malaysia starting from year 2003 to 2008.

The rest of this paper is arranged as follows: Section 2 provides the review of literature and development of hypotheses of the study; Section 3 describes the methodology employed in the study; Section 4 presents the descriptive, correlation and regression results of the study; and, Section 5 discusses the conclusions reached by the study.

## **Review of Literature and Hypotheses Development**

### **Brief History of Value Relevance of book Value and Earnings and their Declining State**

Value relevance study is a study of the association between market and accounting numbers. This type of study is not new and has existed for more than 40 years ago (Lee, 2001). It started in 1968 when Ball and Brown published their prominent paper that associated earnings with return. Since then, there have been many other studies done. Another influential paper was written by Ohlson, (1995) that associated market value with book value and earnings. According to Stober, (1999), Ohlson’s valuation models (1995) provide structure for empirical work on the relationship between equity values and (current) accounting numbers as Ohlson, developed a theory that share price can be expressed as weighted average of book value and earnings. Ohlson (1995) suggested that the best equity valuation model should contain value that will be realised if a firm is liquidated (book value of net asset) and flow of current year fund that will predict future flow of funds (net income).

At that time there was no question as to whether the value relevance of book value and earnings were rising or declining until a study conducted by a group of researchers (Collins, Maydew and Weiss, 1997) disclosed that value relevance of book value and earnings was in fact fluctuating (Brown et al., 1999), and Brief and Zarowin (1999) found that value relevance of book value and earnings was declining. These findings (Collins et al., 1997; Dontoh et al., 2004; Brief and Zarowin, 1999) was a surprise to other researchers of value relevance studies. However, a similar result was found by other researchers (Dontoh et al., 2004; Cortijo et al., 2006; Bae and Jeong, 2007; and Pourcheydari, Aflatooni and Nikbakhat, 2008).

Some reasons were given for the declining state in value relevance including scale factor (Brown et al., 1999), non-information based trading (Dontoh et al., 2004), change of business model (Maines, Bartov, Fairfield and Hirst; 2002) and loss of information due to aggregation of accounting numbers (Kothari, 2001).

Based on Dontoh et al. (2004) and Xu & Cai (2005), the following hypotheses were developed.

H<sub>A1</sub> : Book value and earnings of Malaysian high-tech firms are value relevant.

H<sub>A2</sub> : Value relevance of book value and earnings of Malaysian high-tech firms is declining.

### **Value Relevance of Aggregated and Disaggregated Book Value and Earnings**

There are a large number of studies that have been testing the value relevance of either aggregated book value, or aggregated book value and earnings. Among the studies are a study conducted by Landsman (1986) who used aggregated book value which was replicated by Ibrahim, Raudah Danila, Haslinda Yusoff and Yatim, (2002). Brief and Zarowin (1999) used aggregated book value, earnings and dividends. Amir (1993), Louder, Khurana and Boatsman, (1996) and Aboody (1996) also used aggregated accounting numbers. They found that those aggregated accounting numbers are value relevant.

In addition to aggregated book value, Landsman (1986) and then followed by Ibrahim et al. (2002) disaggregated book value into total asset (TA) and total liabilities (TL). They found more significant results produced by disaggregated book value. Ohlson and Penman (1992) also disaggregated book value into components to explain the variations in return. They found that disaggregated book value contains incremental value relevance over aggregated book value.

Xu and Cai (2005) and Hadi (2006) used equity valuation models that incorporate disaggregated earnings. Prior to that, Abad, Garcia-Borbolla, Laffarga, Larran and Pinero, (1999), as cited in Giner and Reverte, (1999) decomposed earnings into ordinary profit, extraordinary profit and income taxes, whereas Ballas (1996)

disaggregated earnings into operating income, net financing expenses, exceptional income, depreciations and tax expense. Ohlson and Penman (1992) also disaggregated earnings into gross margin, operating expense, depreciation and amortisation, taxes, extra -ordinary items and other items. Ohlson and Penman (1992) indicated their reasons for disaggregating book value and earnings in their study:

*“These two summary measures achieve pre-eminent status by serving as primary indicators of a firm’s value. However, the disclosure of the line items clearly suggests that the accountant is aware of the insufficiency of earnings and book value as determinants of value”*

Giner and Reverte (1999) added:

*“practising accountants and financial analysts often suggest that certain earnings components provide less information than other components for valuing the companies’ shares...due to the fact that...the nonrecurring ones are less likely to be representative of the normal operations of the firm... having a high transitory component.”*

Liang and Yao, (2005) decomposed earnings into gross profit, marketing expense, R&D, operating expense and other expenses. These items are relevant in explaining the market value of the firms.

Aggregated book value comprised of many components that can be broken into tangible non-current assets (TNCA), intangible assets (ITA), current assets (CA) and current liabilities (CL). Similarly, aggregated earnings can be broken into operating profit (OPRO), depreciation (DEP), finance cost (FC) and tax expense (TE).

Naturally, assets and expenses are debits, and liabilities and revenues are credits. When debits and credits items are combined together to form an aggregated book value and aggregated earnings, their different signs (positive and negative) may set off each other’s explanatory powers. As a result, aggregated book value and earnings lose their value relevance.

Finally, let us consider the conclusion made by Liang and Yao (2005) regarding information provided by aggregated and disaggregated earnings components,

*“...the numbers in the financial statements do in fact still have information content regarding the corporate market value, but if we only care about the net income and ignore its component items, the information provided by the financial statements is not at all effective... since the net income alone does not provide enough information content to explain the differences between market value and book value. Conversely, the component items of net income...can benefit the corporation in the future and thus possess higher explanatory power in relation to the corporate value.”*

The above literature have set a basis for researchers to investigate if disaggregated book value and earnings can explain the variation in market value better than aggregated book value and earnings. The above discussions lead to the development of the following hypotheses:

H<sub>A</sub> 3 : Disaggregated book value has incremental value relevance over aggregated book value for Malaysian high-tech firms.

H<sub>A</sub> 4 : Disaggregated earnings has incremental value relevance over aggregated earnings for Malaysian high-tech firms.

## Research Methodology

This study looked at the Malaysian high-tech firms listed under Bursa Malaysia provided by Thomson DataStream. The data were collected for a period from 2003 to 2008 as the period covered by Hadi (2006) was up to only 2003. A sample of 162 high-tech firms, comprised electronic firms, software and computer services firms, technology firms, telecommunication firms and support services firms are used. The data were processed and analysed using standard multiple regression method provided by SPSS. In this study, standard regression method produced better adjusted R<sup>2</sup> as compared to stepwise regression method. Standard regression, instead of excluding correlated independent variables, allows the researcher to decide whether to include or exclude the independent variables as long as their degree of tolerance does not fall below .05 and variance inflation factor (VIF) does not exceed 10.00 (Kutner, Nachtsheim, Neter, & Li, 2004).

Table 1: Breakdown of Sample

Sectors	No. of firms
Electronics and electricity	41
Software and computer services	56
Technology	26
Telecommunication	10
Support services	29
Subtotal	162
Less: Firms with missing data	(11)
Less: Outliers	(6)
Final sample	145

We utilised the basic equity valuation model found by Ohlson (1995) to investigate whether book value and earnings are value relevant. From the model, we investigated whether book value and earnings of Malaysian high-tech firms are value relevant. We also investigated the trend of the value relevance of book value and earnings throughout the period under study (year by year) using the following model:

$$MV_{it} = a + a_1 E_{it} + a_2 BV_{it} + \varepsilon_{it} \quad (1)$$

Where:

$a$  is constant

$a_1$  and  $a_2$  are coefficients for variable  $E$  and  $BV$

$MV_{it}$  is the market value of firm  $i$  equity at end of year  $t$

$E$  is the earnings of firm  $i$  for year  $t$

$BV$  is the book value of equity of firm  $i$  at end of year  $t$

$\epsilon$  is the error.

Following the claim that value relevance of book value and earnings are declining (Brown et al., 1999; Dontoh et al., 2004; and Cortijo et al., 2006), we modified the Ohlson (1995) basic model to accommodate the use of disaggregated book value and earnings instead of aggregated book value and earnings.

Book value or net assets can be separated into tangible non-current assets (TNCA), intangible assets (ITA), current assets (CA) and current liabilities (CL). When these components are used to substitute the book value in Model 1, the new model is as follows:

$$MV_{it} = a + a_1 E_{it} + a_2 TNCA_{it} + a_3 ITA_{it} + a_4 CA_{it} + a_5 CL_{it} + \epsilon_{it} \quad (2)$$

Where,

$TNCA_{it}$  is non-current assets of firm  $i$  at end of year  $t$ ,

$ITA_{it}$  is intangible assets of firm  $i$  at end of year  $t$ ,

$CA_{it}$  is current asset of firm  $i$  at end of year  $t$ , and

$CL_{it}$  is current liabilities of firm  $i$  at end of year  $t$ .

Similar to book value, earnings can also be separated into operating profit (OPRO), depreciation (DEP), finance cost (FC) and tax expense (TE). When these components are used to substitute earnings, the new model is as follows:

$$MV_{it} = a + a_1 OPRO_{it} + a_2 DEP_{it} + a_3 FC_{it} + a_4 TE_{it} + a_5 BV_{it} + \epsilon_{it} \quad (3)$$

Where,

$OPRO_{it}$  is operating profit of firm  $i$  for the year  $t$ ,

$DEP_{it}$  is depreciation expense of firm  $i$  for the year  $t$ ,

$FC_{it}$  is finance cost of firm  $i$  for the year  $t$ , and

$TE_{it}$  is tax expense of firm  $i$  for the year  $t$ .

The adjusted  $R^2$  of Models 2 and 3 were compared with the adjusted  $R^2$  of Model 1 to investigate whether the disaggregated book value and earnings contain incremental value relevance over the aggregated book value and earnings.

## **Results**

### **Descriptive Analysis**

Our final sample comprised of 145 Malaysian high-tech firms listed on both the main board and second board of Bursa Malaysia as at 30 October 2008. The means of  $MV$ ,  $E$

and BV of pool sample are greater than zero. The year-by-year samples also show the same. This is different from Xu and Cai (2005), whereby their sample comprise of firms with earnings and cash flow of less than zero.

Table 2 below shows the breakdown of the cases.

Table 2: Summary of Cases

Year		MV (RM'000)	E (RM'000)	BV (RM'000)
2003-2004	Mean	222392	6887	160290
	Min	9060	-88984	234
	Max	3253201	191162	1819902
	SD	450574	33406	272728
	N	120	120	120
2004-2005	Mean	162820	8288	123092
	Min	11000	-59848	-613591
	Ma	2476630	82262	2043473
	SD	295878	18397	265755
	N	103	103	103
2005-2006	Mean	117390	5205	113845
	Min	6006	-170309	2729
	Max	2098839	149870	1748017
	SD	235410	26427	215040
	N	132	132	132
2006-2007	Mean	152288	7674	101723
	Min	7813	-127052	-521442
	Max	2077851	178969	1899844
	SD	280658	27592	213734
	N	145	145	145
2007-2008	Mean	135365	10470	115248
	Min	2527	-94177	-14528
	Max	1469187	247595	1808254
	SD	220077	32037	218410
	N	145	145	145
Total	Mean	156066	7430	121553
	Min	2527	-170309	-613591
	Max	3253201	247595	2043473
	SD	303856	28372	235812
	N	645	645	645

### **Correlations between Variables for Pool Sample**

Correlation tests of pool sample between market value, earnings and book value reveal that market value is significantly correlated with book value and earnings at .01 levels. As shown in Table 3, book value is also significantly correlated with earnings. The strong correlations between market value and book value, market value and earnings and book value and earnings confirms the accounting theory that market value is associated with book value and earnings (Landsman, 1986; Ohlson, 1995). Previous year earning is able to estimate current year earnings and that amount (previous year



earnings) is included in current year book value. Therefore, a strong correlation between book value and earnings is not surprising.

Table 3: Correlations between MV, E and BV (Pool sample)

		E	BV
MV	Coefficient	.634	.651
	<i>p</i> value	.000	.000
E	Coefficient		.620
	<i>p</i> value		.000

Table 4a: Correlations between MV, E and Aggregated Book Value Variables (Pool Sample)

		E	TNCA	ITA	TCA	TCL
MV	Coefficient	.634	.685	.275	.459	.441
	<i>p</i> value	.000	.000	.000	.000	.000
E	Coefficient		.640	.361	.501	.507
	<i>p</i> value		.000	.000	.000	.000
TNCA	Coefficient			.584	.663	.710
	<i>p</i> value			.000	.000	.000
ITA	Coefficient				.528	.579
	<i>p</i> value				.000	.000
TCA	Coefficient					.927
	<i>p</i> value					.000

Table 4a shows the results of correlation test between MV, E and book value components. When book value is disaggregated, MV, E and all book value components are correlated with each other at .01 levels. The strongest correlation (indicated by its correlation coefficient and *p* value) is found between TCA and TCL. This is not surprising because most of the firms financed their current assets using current liabilities. Significance of the variables is measured by their *p* values, whereas the strength of the variables is measured by their correlation coefficients.

Table 4b: Correlations between MV, BV and Aggregated Earnings Variables (Pool Sample)

		BV	OPRO	DEP	FC	TE
MV	Coefficient	.651	.622	.621	.274	-.008
	<i>p</i> value	.000	.000	.000	.000	.833
BV	Coefficient		.703	.817	.532	.153
	<i>p</i> value		.000	.000	.000	.000
OPRO	Coefficient			.669	.484	.465
	<i>p</i> value			.000	.000	.000
DEP	Coefficient				.398	.057
	<i>p</i> value				.000	.145
FC	Coefficient					.054
	<i>p</i> value					.185

Table 4b shows the results of correlation test between MV, BV and earnings components. We find that MV is significantly correlated with BV and all E components except for TE. We also find that BV is significantly correlated with all E components. All E components are also significantly correlated to each other except for TE. TE is only correlated to BV and OPRO. Obviously tax expense is not incurred for the purpose of generating revenue; therefore, it is not associated to market value. However, it is associated to operating profit because operating profit contributes to taxable income.

### **Regression of Equity Valuation Model**

As mentioned in our earlier section on research methodology, we utilised equity valuation model as suggested by Ohlson (1995) to our sample. Table 5 shows the results of Model 1. For the period of 2003-2008, book value and earnings of Malaysian high-tech firms are value relevant. This is evidenced by their adjusted  $R^2$ , standardised coefficients, p values of .000 and high t values. The adjusted  $R^2$  of .508 indicates that the model is good and shows that variations in book value and earnings of the firm can explain 50.8% of the variations surrounding the market value of the firms.

We also find that book value is stronger than earnings in explaining market value of Malaysian high-tech firms for the period of 2003-2008. This claim is evidenced by the higher standardised coefficient and t value of book value (.418 and 11.874 respectively) as compared to earnings (.375 and 10.638 respectively). The positive standardised coefficients and t values of both book value and earnings indicate their positive linear relationship with market value.

The implication of the result is that the book value and earnings have information content that have been valued properly by investors when they make valuation decision. Based on the results of pool sample, we have sufficient evidence to accept  $H_{A1}$  that book value and earnings of high-tech firms are value relevant.

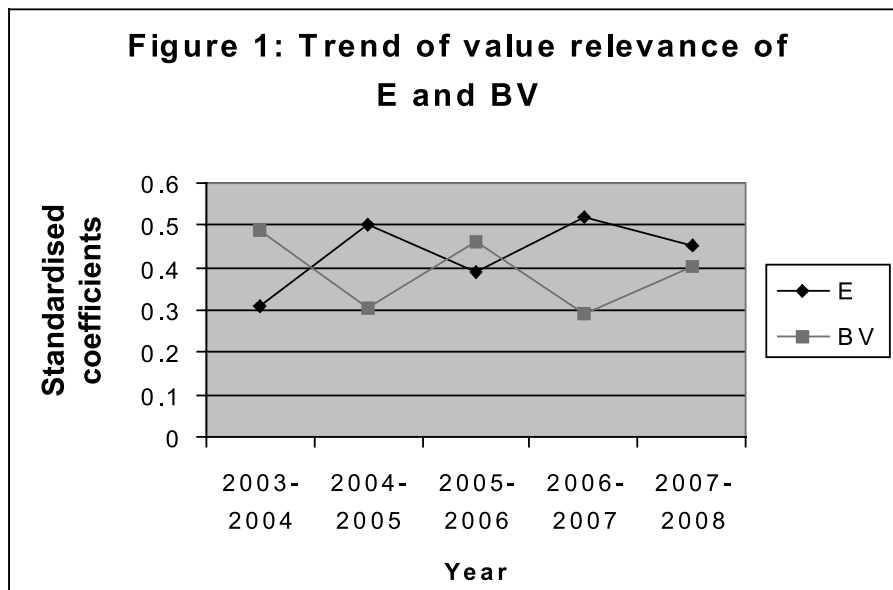
Our analysis of year-by-year samples provided evidence that value relevance of combination of book value and earnings of Malaysian high-tech firms is not in a declining trend. Their adjusted  $R^2$  from 2003 to 2008 is in increasing trend (from .497 in 2003-2004 to .694 in 2007-2008). Therefore, we have enough evidence to reject  $H_{A2}$ . With regard to individual coefficient of book value and earnings, we find that the value relevance of E and BV are fluctuating from 2003 to 2008. For E, the standardised coefficient trend is fluctuating in an increasing trend. For BV, the standardised coefficient is also fluctuating, but shows a declining trend (see Table 5 and Figure 1 below).

Value Relevance of Aggregated vs Disaggregated Book Value and Earnings

Table 5: Results of  $MV_{it} = a + a_1E_{it} + a_2BV_{it} + \epsilon_{it}$

Year	Measures	E	BV	Adj. R <sup>2</sup>
Pool sample	Std. coef.	.375	.418	.508
	T value	10.678	11.874	
	P value	.000	.000	
2003-2004	Std. coef.	.308	.490	.497
	T value	3.901	6.209	
	P value	.000	.000	
2004-2005	Std. coef.	.500	.303	.499
	T value	5.951	3.603	
	P value	.000	.000	
2005-2006	Std. coef.	.390	.463	.536
	T value	5.733	6.802	
	P value	.000	.000	
2006-2007	Std. coef.	.519	.291	.549
	T value	6.926	3.876	
	P value	.000	.000	
2007-2008	Std. coef.	.451	.405	.674
	T value	4.941	4.435	
	P value	.000	.000	

Note: std. coef. refers to standardised coefficient



To add value to findings of previous researchers (Hadi, 2006; Xu and Cai, 2005; Ohlson and Penman, 1992), we utilised Model 2 to see whether disaggregating book value can increase the value relevance of book value compared to the basic model. Table 6 shows that disaggregated book value has an incremental value relevance (adjusted R<sup>2</sup> increases by 5.6% from .508). An increase in adjusted R<sup>2</sup> implies that disaggregated book value provides more information content than aggregated book value, and is able to explain better the variation in market value. Furthermore, this model shows that the standardised coefficients of all variables are significant and positive except for ITA and CL which are significant but negative. This test indicates that when book value is disaggregated, TNCA, ITA, CA and CL contain information more than BV that can predict market value of firms. The negative coefficient sign for ITA indicates that ITA is not positively related to MV. It tells us that the market believes that the higher the investment is in ITA, the riskier is the firm. Therefore, the market discounts the value of those firms. From the results of Model 2, we have sufficient evidence to accept H<sub>A</sub>3. The implication of the results is the investors recognise and put value on information provided by individual item rather than aggregated item.

Table 6:  $MV_{it} = a + a_1E_{it} + a_2TNCA_{it} + a_3ITA_{it} + a_4CA_{it} + a_5CL_{it} + \epsilon_{it}$  (pool sample)

Measures	E a <sub>1</sub>	TNCA a <sub>2</sub>	ITA a <sub>3</sub>	CA a <sub>4</sub>	CL a <sub>5</sub>	Adj.R <sup>2</sup>
			Pool			
Std. coef.	.322	.621	-.161	.256	-.306	.564
t value	9.414	14.256	-4.808	3.659	-4.078	
P value	.000	.000	.000	.000	.000	
			2003-2004			
Std. coef.	.294	1.052	-.135	.829	-1.286	.685
t value	4.517	10.982	-1.688	3.696	-4.578	
P value	.000	.000	.094	.000	.000	
			2004-2005			
Std. coef.	.407	.748	-.265	-.417	.293	.628
t value	5.333	7.154	-3.422	-2.556	2.170	
P value	.000	.000	.001	.012	.032	
			2005-2006			
Std. coef.	.315	.731	-.141	.043	-.158	.603
t value	4.842	6.520	-1.978	.521	-.725	
P value	.000	.000	.050	.802	.470	
			2006-2007			
Std. coef.	.523	.251	.016	.379	-.366	.547
t value	6.245	2.487	.226	2.948	-2.736	
P value	.000	.014	.822	.004	.007	
			2007-2008			
Std. coef.	.456	.508	.028	1.040	-1.115	.724
t value	5.301	5.647	.491	6.551	-6.483	
P value	.000	.000	.625	.000	.000	

Our analysis of year-by-year sample provides evidence that for each year from 2003-2008, the adjusted R<sup>2</sup> of Model 2 exceed adjusted R<sup>2</sup> of Model 1 except for 2006-2007 which was reduced by .2% from .549 to .547. However, the changes does not significantly affect the credibility of Model 3 because the rest of the years support the model.

The next step was to utilise Model 3 to investigate whether disaggregated earnings can provide better explanation of variations in market value than aggregated earnings. The results of this test, as summarised in Table 7, show that disaggregated earnings provide better explanation of the variations in market value. It is evidenced by the increase in adjusted R<sup>2</sup> by 6.5% compared to Model 1 (.573-.508).

Table 7:  $MV_{it} = a + a_1OPRO_{it} + a_2DEP_{it} + a_3FC_{it} + a_4TE_{it} + a_5BV_{it} + \epsilon_{it}$  (pool sample)

	OPRO a <sub>1</sub>	DEP a <sub>2</sub>	FC a <sub>3</sub>	TE a <sub>4</sub>	BV a <sub>5</sub>	Adj.R <sup>2</sup>
Pool						
Std. coef.	.607	.002	-.205	-.337	.379	.573
t value	12.493	.036	-6.206	-10.124	7.124	
P value	.000	.971	.000	.000	.000	
2003-2004						
Std. coef.	.387	-.229	-.355	-.332	.604	.614
t value	3.762	-1.753	-4.012	-4.169	4.004	
P value	.000	.083	.000	.000	.000	
2004-2005						
Std. coef.	.734	-.410	-.292	-.806	.129	.616
t value	7.252	-3.416	-3.302	-6.726	1.316	
P value	.000	.001	.001	.000	.192	
2005-2006						
Std. coef.	.767	.423	-.308	-.170	-.017	.737
t value	9.327	3.502	-5.358	-2.116	-.128	
P value	.000	.001	.000	.036	.898	
2006-2007						
Std. coef.	.747	.189	-.097	-.505	.341	.557
t value	6.525	1.369	-1.504	-3.675	2.296	
P value	.000	.173	.175	.000	.023	
2007-2008						
Std. coef.	.540	-.228	-.325	-.089	.774	.666
t value	4.006	-1.813	-4.151	-1.022	5.505	
P value	.000	.072	.000	.309	.000	

This result confirms the result of previous study done by Liang and Yao (2005) that earnings alone does not provide enough information about firm performance but information about earnings components can benefit the corporation in the future and thus possess higher explanatory power in relation to the corporate value.

Despite the increase in the adjusted  $R^2$ , not all components of earnings are significant and positively correlated with market value. OPRO is strongly and positively related to MV, whereas FC and TE are strongly and negatively correlated to MV. However, no significant relationship was found between DEP and MV. The positive and negative relationship between earnings components and MV is expected because of the nature of the items i.e. assets and revenues will be positively related and expenses and liability are negatively related.. From the results of Model 3, we have sufficient evidence to accept  $H_A4$  that states disaggregated earnings have incremental value relevance over aggregated earnings.

Our analysis of year-by-year sample using this model provides evidence that for each year from 2003-2008, the adjusted  $R^2$  of Model 3 exceed adjusted  $R^2$  of Model 1 by 4.9% to 22.9%. This indicates that the value of information contained in disaggregated earnings exceeds the value of information contained in aggregated earnings in each year.

## **Conclusion, Implication, Limitation and Future Research**

Basically, we studied the value relevance of book value and earnings of Malaysian high-tech firms for a period from 2003 through 2008. We utilised the basic and modified Ohlson (1995) models. We incorporated disaggregated earnings and book value in the modified models.

We found that our sample characteristics are different from Xu and Cai (2005) even though the sector selected are similar. They studied a sample of high-tech firms from a developed and efficient market where earnings and cash flow are on average less than zero. In contrast, our sample is from an emerging and less efficient market. These differences lead to different findings.

The results of this study do not confirm the claim by Brown et al. (1999) that value relevance of book value and earnings (measured by adjusted  $R^2$ ) are declining. Our pool sample test suggests that book value is stronger than earnings in a pool sample comprising five years data. However, based on yearly sample, the relevance of book value is in a declining trend whereas, earnings is in a rising trend.

Our Models 2 and 3 managed to provide a better explanation to Malaysian high-tech firms' market value. Disaggregated book value and earnings are able to increase the explanatory power of book value and earnings of the pool sample. The equity valuation models that incorporate disaggregated book value and disaggregated earnings have their adjusted  $R^2$  greater than the model with aggregated book value and earnings. Therefore, we can conclude that book value and earnings are still relevant in explaining the market value, but investors like to place value on individual item rather than aggregated items.

The implication of the results is the information provided by aggregated book value and earnings do not provide enough information to the market. The market and the investors

require more information rather than those numbers. In this context, book value and earnings should be decomposed into their components to provide more information about firms' performance and future benefits that will flow to the firms in future and hence assist the market to form the firms' value.

Generalisation of the results is our limitation. The results of this study is not generalisable to other sectors in Bursa Malaysia Securities, because the sample of the study is only Malaysian high-tech sectors.

In future, research may focus on individual sector, as firms within the same sector share common unique characteristics that may be applicable to that sector only. To support this claim, an earlier study of Malaysian property sector for the same period (Kadri, Aziz, and Ibrahim, 2009) reported that book value and earnings of property sector provide a higher  $R^2$  than current study. Alternatively, all sectors are selected as sample. After that regressions are conducted to test the full sample and sector-by-sector so that comparisons can be made.

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