

RESEARCH ARTICLE

How Does Value Relevance of Accounting Information React to Financial Crisis?

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Abstract: The relevance of financial reports rests on the value relevance of accounting information. Since accounting information is value relevant only when used by investors to reflect stock valuations, it takes trust from the users of financial information over the financial statements. The heightened volatility of markets during periods of financial distress or crisis raises the imperative to determine the value of financial information during these periods. The great recession of 2008 also victimized East Asia, and firm strategies were influenced by resulting economic shocks. In this study, we aim to determine how value relevance of accounting information differ before, during, and after the 2008 global financial crisis. We employed panel data regression analysis to cover selected accounting information and market valuation data of publicly listed non-financial firms in Asia for the years 2000 to 2016. We find inconsistencies in relative value relevance of Asian firms throughout the period, that is, before, during, and after the crisis. We recommend for future research to widen the scope of our study to include countries outside Asia.

Keywords: Value Relevance, Global Financial Crisis, Accounting Information

JEL Classifications: G01, G32, M41

Financial statements bear accounting information, with the principal purpose of enabling stakeholders to make guided investment decisions. According to Omokhudu and Ibadin (2015), financial statements contain corporate financial information that is equally useful as to the level of aid it provides in investment decision making. Hence, this raises the imperative to ensure the reliability of the statements' information content. Reliability of financial reports rests on the value relevance of accounting information. Value relevance, as identified by Francis and Schipper (1999, p. 320), "is the ability of financial statement information to capture, or summarize information that affects

share values." However, would accounting numbers lose value relevance when it becomes difficult to trust financial statements—specifically at times of financial turmoil like a global financial crisis?

Given that markets are more volatile and unpredictable during times of financial distress, it is essential to evaluate whether financial statements retain value relevance during a crisis. Numerous studies focused on the effects of the 2008 crisis to the United States, its neighboring countries, and the Middle East (Beltratti, Spear, & Szabo, 2013; Devalle, 2012; Tahat & Alhadab, 2017), and the impact of the 1997 Asian financial crisis to regions in East Asia. However, minimal studies examine the influence of the 2008

great recession to East Asian countries despite its injurious repercussions to the region.

Thousands of firms either liquidate or undergo merger and acquisition during a financial crisis. To endure the difficulties, companies naturally practice earnings management that has been empirically observed to reduce value relevance (Tahat & Alhadab, 2017). The observed relationship sparked interest on how the global financial crisis (GFC) alongside Asia's resilience may have affected the value relevance of information, particularly on book value per share, earnings per share, and operating cash flows per share. Would this characteristic be evident in value relevance when compared with that of other countries during the same period? We focused on publicly listed firms in East Asia for the period covering 2000 to 2016.

The heightened volatility of markets during periods of financial distress requires the determination of value relevance during these periods. East Asia has also been victimized by the great recession of 2008, and firm strategies were influenced by resulting economic shocks. In this study, we aim to determine how value relevance of accounting information differ before, during, and after the 2008 global financial crisis. Thus, we aim to answer the question: *How does value relevance of accounting information differ before, during, and after the 2008 global financial crisis?* Accounting information may be in the form of financial ratios (e.g., book value per share and earnings per share) or tangible bottom line figures (e.g., cash flow from operations). These aforementioned information content may be compared in terms of relative or incremental value relevance that, hence, leads us to the following specific objectives:

- To evaluate the value relevance (VR) of book value of equity (BV), earnings per share (EPS), and cash flow from operations (CFO) among listed non-financial firms in East Asia (Hong Kong, Indonesia, Malaysia, Philippines, Singapore, and Taiwan) around the 2008 GFC;
- To determine whether CFO exhibits greater value relevance over BV and EPS among listed non-financial firms in East Asia;
- To determine which among the three accounting measures, CFO, BV, and EPS, exhibit incremental and/or relative VR.

Aligned with these objectives, we proceed to the framework of our study, particularly, valuation theories and financial reporting practices by which we evaluate the relationship between accounting information and capital markets' information (Holthausen & Watts, 2001; and Beaver, 2002), as discussed succeedingly.

Framework of the Study

We use capital structure theory as our primary foundation to determine the relationship between debt and market value of the firm. As theorized by Modigliani and Miller (1958), the market value of a firm is affected by its own growth potential, aside from the riskiness of the firm as an investment itself (Klimczak, 2008), thus:

$$V_j = S_j + D_j = E(x_j) / \rho k$$

where V_j stands for firm j value, S_j is the value of its stock, D_j is the value of its debt, $E(x_j)$ is its expected return on assets, and ρk is the capitalization rate for all companies in its risk class.

In addition, to determine whether value relevance of earnings is affected around the period of crisis, we use Ohlson model, which suggests that value relevant information influence expected abnormal earnings and that value relevance is also affected by the previous year's ability of financial information to affect share values, given by:

$$p_t = b_t + \sum_{\tau=1}^{\infty} R^{-\tau} E_t(x_{t+\tau}^a)$$

$$v_{t+1} = \gamma v_t + \eta_{t+1}$$

where the market price of equity at time t (p_t) is the sum of the BV at time t (b_t), and the expected earnings ($E_t(x_{t+\tau}^a)$) growing at a rate less than R ($R^{-\tau}$); while v_t = value relevant information left uncaptured by accounting, x = abnormal earnings, ε , η , are mean zero disturbance terms, and ω and γ are the contribution of its own lag (Lo & Lys, 2000).

Furthermore, our study is grounded on direct valuation theory, which states that changes in equity market values are caused by the people updating their knowledge about the firms' EPS, and BV (Holthausen & Watts, 2001). While we aim

to determine whether BV and EPS exhibit value relevance around the 2008 global financial crisis, this approach uses actual observable information lifted from financial reports for the period covering 2000 to 2016 to determine the willingness of the people to pay for a good rather than inferring only from consumers' market behavior.

Related Literature

According to Francis, LaFond, Olsson, and Schipper (2004), value relevance is one of the most important attributes of accounting information. Value relevance is the capacity of financial content to be summarized and reflected in share prices (Hellström, 2005). It is represented by the statistical association between accounting information, such as EPS or BV, with the firm's corresponding share price.

Value Relevance

Value relevance (VR) may be analyzed via two approaches—the relative and the incremental—wherein each addresses different research questions and requires different tests for statistical significance. Incremental VR refers to the additional information content provided by an accounting measure in comparison to another; while relative VR refers to the measure providing greater information content. Empirical results suggest that relative and incremental VR could be influenced by firm-specific or economy-wide exogenous shocks as studied by Davis-Friday, Eng, and Liu (2006) and Graham, King, and Bailes (2000) during the 1997 Asian financial crisis. They concluded that VR of both BV and EPS weaken during a financial collapse. Further decomposing such value relevance, Tahat and Alhadab (2017) found strong evidence suggesting that incremental information content of accounting measures have been sustained around the 2008 GFC, while the relative information content of the same variables slightly declined during the crisis.

Financial Reporting and Investor Confidence Amid the Crisis

In the past, several global markets have suffered financial distress, causing selected accounting information to be unreliable and irrelevant to users of accounting information (Beltratti et al., 2013). The global financial crisis severely disturbed investor

confidence, which then affected corporate earnings and stock market performance, initiating the failure of several firms (Arthur, Tang, & Lin, 2015). Analysts and researchers have argued whether or not accounting played a significant role during the crisis, that is, whether fair value measurement and whether different standard adaptations increased or decreased investor confidence (Liao, Kang, Morris, & Tang, 2013). Thus, another question arises: would the management adjust their strategies to influence investor confidence during a financial crisis?

Arthur et al. (2015) determined that the management have a strong incentive to increase investor confidence during a crisis by providing reliable financial statements, with or without proper earnings management. Vichitsarawong, Eng, and Meek (2010) found that financial distress can negatively affect the value relevance of accounting information, especially book values of financial instruments and earnings figures of Thai companies during the 1997 crisis. Meanwhile, Davis-Friday et al. (2006) had similar findings for Asian countries, namely, Indonesia, South Korea, Malaysia, and Thailand.

Tahat and Alhadab (2017) reviewed value relevance through firms belonging in the UK FTSE index during the GFC, while Choi, Kim, and Lee (2011) covered firms from nine Asian countries during the 1997 Asian financial crisis. Given that Asian countries responded to the GFC differently, there exists a gap in how the value relevance of information in Asia is affected during the GFC. Analyzing this may demonstrate whether incremental and relative value relevance differed in the more resilient Asia.

Methodology

From the data we extracted from the Wharton Research Data Services or Compustat, we included in this study publicly listed non-financial firms in Asia, particularly Hong Kong, Indonesia, Malaysia, Philippines, Singapore, and Taiwan, covering the period 2000 to 2016.

We adopted and expanded the study of Tahat and Alhadab (2017) to develop the following regression models over three periods such as pre-crisis time from 2000 to 2007, in-crisis time from 2008 to 2009, and post-crisis time from 2010 to 2016. Following the suggestions of Akbar, Shah, and Stark (2011) and

Bepari, Rahman, and Mollik (2013), we included control variables such as size for scale factor, book-to-market ratio (BM) for growth opportunities, and leverage and liquidity ratios for risk factor of firms.

$$\text{Model 1: } MV_{it} = \alpha_0 + \beta_1 BV_{it} + \beta_2 Size_{it} + \beta_3 BM_{it} + \beta_4 Leverage_{it} + \beta_5 Liquidity_{it} + IND + Year + \varepsilon_{it} \quad (1)$$

$$\text{Model 2: } MV_{it} = \alpha_0 + \beta_1 EPS_{it} + \beta_2 Size_{it} + \beta_3 BM_{it} + \beta_4 Leverage_{it} + \beta_5 Liquidity_{it} + IND + Year + \varepsilon_{it} \quad (2)$$

$$\text{Model 3: } MV_{it} = \alpha_0 + \beta_1 BV_{it} + \beta_2 EPS_{it} + \beta_3 Size_{it} + \beta_4 BM_{it} + \beta_5 Leverage_{it} + \beta_6 Liquidity_{it} + IND + Year + \varepsilon_{it} \quad (3)$$

$$\text{Model 4: } MV_{it} = \alpha_0 + \beta_1 BV_{it} + \beta_2 EPS_{it} + \beta_3 CFO_{it} + \beta_4 Size_{it} + \beta_5 BM_{it} + \beta_6 Leverage_{it} + \beta_7 Liquidity_{it} + IND + Year + \varepsilon_{it} \quad (4)$$

Value relevance of book value (BV) and earnings per share (EPS) were tested in models 1, 2, and 3 while model 4 was used to estimate value relevance of operating cash flows per share (CFO). We aimed at determining the most appropriate model for the different panel regressions utilized.

Results and Discussion

As presented in Table 1, BV, EPS, CFO, and Size are positively correlated with the market value of equity per share (MVPS) and found to be significant at 1% level. Since variables were found to be correlated, we also subjected the estimates to multicollinearity using variance inflation factor and was within the tolerable level. Moreover, we subjected the models to further tests such as Wald's test, Breusch-Pagan Lagrange multiplier, and Hausman test to determine the best panel econometric tool for estimation.

The Value Relevance of BV and EPS

Models 1 and 2, which cover book value (BV) and earnings per share (EPS) indicated three significant findings. Firstly, information contained in the financial reports are critical to determine how viable a firm could be in the long run while it also shows how able a firm could be to survive a crisis such as the great recession. As presented in Table 2, the significant coefficients of BV in all periods suggest consistent incremental value relevance of BV. Also, the relative value relevance peaked during the crisis period, which suggests that the presence of uncertainty in the economy might have compelled the investors to rely more on the financial statements in coming up with investment decisions because these present the fundamentals of a firm. Secondly, it suggests that users of financial reports may have higher regard on financial position than financial performance during the in-crisis period. As shown

Table 1
Correlation Matrix

	MVPS	BV	EPS	CFO	Size	BM	Leverage	Liquidity
MVPS	1							
BV	0.5712***	1						
EPS	0.3526***	0.3780***	1					
CFO	0.3779***	0.6611***	0.2378***	1				
Size	0.3532***	0.2122***	0.1365***	0.1792***	1			
BM	-0.0009	0.1110***	0.048***	0.0257	-0.0465***	1		
Leverage	-0.0003	0.0056	-0.009	0.0052	0.0096	-0.0777***	1	
Liquidity	-0.0059	-0.0109	-0.0035	-0.0057	0.022	-0.0955***	0.0108	1

*** indicate significance at the 1% level of significance

in Table 3, EPS presented a decreasing incremental value relevance during the in-crisis period relative to BV which we find consistent for all periods. Our findings validate the studies made by Davis-Friday et al. (2006) and Graham et al. (2000) that both conclude that BV and EPS weaken during a financial collapse.

Thirdly, having BV and EPS in the same equation, however, yielded slightly different results. Table 4 illustrated the value relevance of both BV and EPS. Incremental value relevance of BV dropped during the crisis while incremental value relevance of EPS

only became significant after the crisis. Similarly, the relative value relevance was still highest during the crisis while it slightly declined after the crisis. In general, the explanatory power of model 3 was higher than that of models 1 and 2. These findings are slightly different from the Tahat and Alhadab (2017) study that found strong evidence suggesting that incremental information content of accounting measures has been sustained before, during, and after the 2008 global financial crisis, while the relative information content of the same variables declined during the crisis.

Table 2

Model 1. The Value Relevance of BV

MVPS	Pre	In	Post
BV	0.926515***	0.012542***	0.618261***
Size	157.2662***	10.78696	44.29546*
BM	-29.7621***	5.57128***	-195.238***
Leverage	26.12697	0.958279**	-3.09991
Liquidity	0.206863*	1.06932	-0.14011
Constant	-3471.86***	-218.042	-990.476
Adj. R²	0.8812	0.9993	0.9132
Mean VIF	2.27	5.45	2.53

*, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

Table 3

Model 2. The Value Relevance of EPS

MVPS	Pre	In	Post
EPS	1.618645**	-0.06023*	3.14806**
Size	186.6774***	8.052665	44.14382
BM	-9.7387	1.84733***	-90.5759***
Leverage	-0.86161	0.510698*	-8.21124
Liquidity	0.180124**	0.817087	0.010911
Constant	-4088.19***	185.019	-981.669
Adjusted Rsquared	0.8455	0.9993	0.9159
Mean VIF	2.21	4.00	2.45

*, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

Table 4
Model 3. The VR of Both BV and EPS

MVPS	Pre	In	Post
BV	0.976721**	0.002466	0.435543***
EPS	-0.23815	-0.05619	2.25852***
Size	159.5729***	12.19997	-12.5709
BM	-30.6749**	6.666478***	-191.438***
Leverage	25.56834	0.966533*	-10.8526
Liquidity	0.209374*	0.975336	-0.02661
Constant	-3529.29***	-250.29	278.4984
Adjusted Rsquared	0.8813	0.9993	0.9571
Mean VIF	2.30	6.24	2.56

*, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

Table 5
Value Relevance of BV, EPS, and CFO

MVPS	Pre	In	Post
BV	0.985884**	0.011845	0.405322***
EPS	-0.19332	-0.05524	2.154126***
CFO	-0.16322	-0.0046	-0.1866
Size	161.0983***	11.91634	-9.20373
BM	-31.0303**	6.625737***	-181.297***
Leverage	25.81319	0.953106*	-10.3225
Liquidity	0.209197*	0.981219	-0.02498
Constant	-3562.27***	-243.913	208.4555
Adjusted R-squared	0.8814	0.9993	0.9590
Mean VIF	2.31	20.82	2.58

*, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

Value Relevance of Operating Cash Flows

Table 5 exhibited the value relevance of operating cash flows per share (CFO) together with BV and EPS around the crisis. As shown, CFO does not exhibit incremental value relevance in the pre, during, and post-crisis as it is statistically insignificant at 5% level. Thus, CFO did not present greater value relevance. The result is incongruent with the studies conducted by Choi et al. (2011) and Tahat and Alhadab (2017).

Both argued that the operating cash flows provide significant information to investors due to its non-discretionary nature.

Conclusion and Recommendation

Understanding the value relevance of accounting information on a firm's market value allows investors to readily adjust their investment strategies

and make informed decisions to achieve their objective—allocating resources towards more profitable investments. Examining the relationship in three periods establishes the consistency at which information can be relied on and puts emphasis on the figures that prove more relevance given the prevailing economic condition, thus making investors flexible and adaptable.

Using four models, this study examined the incremental and relative value relevance of BV, EPS, and CFO. The first model isolated the value relevance of BV. For the three sub-periods analyzed, that is, before, during, and after the crisis, the incremental value relevance of BV was consistent. On the other hand, its relative value relevance increased during the crisis while its post-crisis relative value relevance was higher compared to its pre-crisis value.

Similarly, the second model included EPS and excluded BV and CFO. In contrast to BV, there was an absence of incremental value relevance for EPS during the crisis; while its incremental value relevance was consistent before and after the crisis. Similar to BV, the relative value relevance of EPS also increased during the crisis. However, this cannot be attributed to EPS because it is statistically insignificant.

Combining BV and EPS in model 3, there was an increase in the relative value relevance of these ratios before, during, and after the crisis. Consistent with models 1 and 2, both BV and EPS had lost their incremental value relevance during the crisis. Meanwhile, the incremental value relevance of BV was consistent before and after the crisis; while EPS has significantly increased its incremental value relevance right after the global financial crisis.

With the inclusion of CFO as an independent variable in model 4, it was determined that CFO did not exhibit incremental value relevance before, during, and after the 2008 global financial crisis. Moreover, the results show that BV and EPS are indeed significant in the prediction of a firm's value. Similar to the results of model 3, BV was incrementally value relevant before and after the crisis, while there was an increase in the incremental value relevance of EPS after the crisis.

Consistent with the previous estimations, all these financial ratios are insignificant during the 2008 Global Financial Crisis. Thus, these accounting ratios have truly lost their incremental value relevance during the crisis. Generally, there was an increase in relative

value relevance, with a slight decrease after the crisis. This sheds further analysis on the importance of BM in predicting the firm's value as it is the only financial ratio significant before, during, and after the crisis. Such could be explained by the fact that in times of financial distress, investors rely less on reported ratios and instead rely on indicators which reflects market estimates. This is consistent with Fama and French (1992) who argued the ability of BM to predict variations in stock returns. Hence, this emphasizes the importance of BM in determining value relevance and provides deeper insight why the value relevance of BV, EPS, and CFO increases from pre-crisis and post-crisis even if these ratios are statistically insignificant during the crisis.

Overall, the results have similarities, although not entirely, with the research conducted by Tahat and Alhadab (2017) on firms belonging to the U.K. FTSE Index. Firms in the FTSE Index exhibited consistent incremental value relevance throughout all three periods, whereas firms belonging to Asia lacked incremental value relevance for EPS during the crisis. The relative value relevance of Asian firms increased during the crisis, which is contrary to what happened with the U.K. firms.

In both cases, combining BV and EPS led to higher explanatory power and consequently higher value relevance. This is consistent with theories, direct valuation and capital structure, that indicate the significance of BV and EPS in conducting capital allocation decision. Previous studies conducted by Harris, Land, and Moller (1994) and Tahat and Alhadab (2017) also emphasized the increasing significance of incorporating the two factors.

Operating cash flow per share did not show any relative or incremental value relevance. The result is incongruent with the studies conducted by Choi et al. (2011) and Tahat and Alhadab (2017). Both argued that the operating cash flows provide significant information to investors due to its non-discretionary nature. Results from this study, however, concluded otherwise. Some studies claimed that earnings management or manipulation is evident during a crisis, and this practice leads to the loss of relevance of operating cash flows and other measures. The inconsistency and incongruence between some of the results obtained in this study compared to past studies conducted may be attributed to the varied characteristics of Asian economies.

The findings of this study have several implications, especially to the management and the different stakeholders. Given the consistent value relevance of book value per share (BV), earnings per share (EPS) before and after the crisis, and a decrease in value relevance of such information during the crisis, efforts should be targeted at enhancing the relevance of this information during this period.

Regulatory efforts must centralize on the quality and reliability of such information. Key accounting regulators and standard setters like the FASB and the IASB are encouraged to strive to enhance the decision usefulness of financial statements before, during, and after a crisis.

During the absence of financial crises, investors can confidently rely on the values and information presented in the financial statements, knowing fully well that financial information explains the movements in a firm's key performance indicators, such as its market value.

However, in periods of crisis, the lack of value relevance in corporate financial information deem them unreliable, and as such, strictly relying on them may not lead to optimal decisions. Investors should instead determine alternative sources of information that provide accurate and reliable estimates. Finding alternative methods of analysis may also prove useful during a period of crisis.

This study evaluates the value relevance of accounting information before, during, and after the 2008 global financial crisis for Asian countries, namely, Hong Kong, Indonesia, Malaysia, Philippines, Singapore, and Taiwan. Using four models, this study examined the incremental and relative value relevance of BV, EPS, and CFO. Such research can be further elaborated and improved through several ways. The study could be enhanced by including countries outside Asia, by evaluating specific economic regions (i.e., EU and ASEAN), by extending the time span of the study, or analyzing financial firms which were excluded in this our sample.

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