บทความวิจัย

Equity Valuation and Fair Value Accounting

Poombordee Bordeelertrit

Lecturer of Department of Accounting,

Thammasat Business School, Thammasat University

ABSTRACT

This study investigates the effect of fair value accounting on equity valuation. This study uses large sample analysis which studies the relative performance in terms of bias and accuracy of equity valuation models, Residual Income Valuation Model (RIVM) and multiple-based model using Price-to-Book ratio (P/B), across the U.S public firms from 2009-2013 with different Fair-Value-to-Total-Assets-Ratio. The result shows that estimated intrinsic value derived from RIVM has less bias and is more accurate in low-fair-value-ratio group of firms. However, there is no evidence supporting the argument that P/B outperforms in terms of bias and accuracy, if firms have high level of fair value. Additionally, by comparing both models, P/B performs better than RIVM in terms of bias and accuracy in both groups of firms.

Keywords: Equity Valuation, Fair Value

* I am appreciated for the sponsorship of this research by Thammasat Business School, Thammasat University.

บทความวิจัย

การประเมินมูลค่าส่วนของผู้ถือหุ้นกับการบัญชีมูลค่ายุติธรรม

ภูมิบดี บดีเลิศฤทธิ์

อาจารย์ประจำภาควิชาการบัญชี

คณะพาณิชยศาสตร์และการบัญชี มหาวิทยาลัยธรรมศาสตร์

บทคัดย่อ

งานวิจัยฉบับนี้ศึกษาผลกระทบของการบัญชีมูลค่ายุติธรรมต่อการประเมินมูลค่าส่วนของผู้ถือหุ้น งานวิจัยนี้ได้ใช้วิธี วิจัยกลุ่มตัวอย่างขนาดใหญ่ ศึกษาถึงประสิทธิภาพของวิธีการประเมินมูลค่าส่วนของผู้ถือหุ้น โดยใช้วิธีกำไรส่วนเกิน (Residual Income Valuation Model: RIVM) และวิธีอัตราส่วนมูลค่าหุ้นต่อมูลค่าตามบัญชี (Price-to-Book: P/B) โดยพิจารณาจากความคลาดเคลื่อน (Bias) และความถูกต้อง (Accuracy) กลุ่มตัวอย่างที่ใช้ ในการวิจัยนี้ ได้แก่ กลุ่มบริษัทมหาชนในประเทศสหรัฐอเมริกาในช่วงระหว่างปี ค.ศ. 2009-2013 ซึ่งแบ่งกลุ่มตามอัตราส่วน มูลค่ายุติธรรมต่อสินทรัพย์รวม (Fair-Value-to-Total-Assets-Ratio) ทั้งนี้ ผลจากการวิจัยแสดงให้เห็นว่า ประมาณการ มูลค่าของส่วนของผู้ถือหุ้นโดยวิธีกำไรส่วนเกิน (RIVM) ของกิจการที่มีอัตราส่วนมูลค่ายุติธรรมต่อสินทรัพย์รวมในระดับต่ำ (Low-fair-value-ratio) มีความคลาดเคลื่อน (Bias) น้อยกว่าและมีความถูกต้อง (Accuracy) มากกว่ากิจการที่มี อัตราส่วนดังกล่าวในระดับสูง (High-fair-value-ratio) อย่างไรก็ตาม ไม่พบหลักฐานที่สนับสนุนความเห็นที่ว่าวิธีอัตราส่วนมูลค่าหุ้นต่อมูลค่าตามบัญชี (P/B ratio) นั้นมีประสิทธิภาพที่ดีกว่าวิธีกำไรส่วนเกิน (RIVM) ในส่วนของความคลาดเคลื่อน (Bias) และความถูกต้อง (Accuracy) ในกรณีที่กิจการมีระดับมูลค่ายุติธรรมในระดับสูง (High-fair-value-ratio) ทั้งนี้ในการเปรียบเทียบระหว่างสองวิธีดังกล่าวในทั้งสองกลุ่มตัวอย่างพบว่าวิธีอัตราส่วนมูลค่าหุ้นต่อมูลค่าตามบัญชี (P/B ratio) มีประสิทธิภาพดีกว่าในเรื่องของความคลาดเคลื่อน (Bias) และความถูกต้อง (Accuracy)

คำสำคัญ: การประเมินมูลค่าส่วนของผู้ถือหุ้น มูลค่ายุติธรรม

1. Introduction

The use of fair value accounting has been a controversial topic amongst accounting researchers. As fair value consists of various approaches and judgements to measure assets and liabilities, it is still questionable as to whether it provides relevant information for investors or not. For example, Penman (2007) states that fair value makes income statements unreliable because of difficulties of matching concept between revenue and expense. However, it can provide a useful balance sheet for analysing firms' value. Although this research shows correlation between fair value and valuation performance, there is no empirical research which analyses the performance of valuation models related to fair value accounting. Therefore, the relative performance of the valuation models and financial analysts' valuation practice related to fair value accounting will be examined in this research.

Large sample analysis investigates the performance of a flow-based valuation approach (RIVM) and multiple-based approach (P/B) of U.S public firms from 2009–2013 in relation to Fair-Value-to-Total-Asset ratios. The performances of the models can be determined in terms of bias and accuracy. Statistical tests, including the t-test, Wilcoxon rank sum test, singed rank test, univariate regression, and multiple regression, will then be performed to analyse the performances.

This study is constructed into 4 sections. Section 1 is the introduction. Section 2 is the literature review that summarises important empirical evidence and related academic findings of accounting valuation models. Section 3 is the large sample analysis study that is the comparison of performance of valuation models in relation to degree of fair value. Finally, section 4 is the conclusion.

2. Literature review

2.1 The use of an accounting number in equity valuation

Accounting information is of paramount importance to equity valuation. Accounting figures (especially earnings numbers and any potential contents released by businesses), can be typically processed by analysts to calculate reliable stock returns (Ball and Brown, 1986 and Beaver, 1986). In other words, accounting data is supposed to be superior in some perspective. Additionally, Lee (1999) studies a role of an accounting system involving in valuation models, the RIVM in particular. He also notes that historical financial statements are useful in fundamental analysis in order to make projection of expected payoffs, since they provide an accounting trail and an analytical mechanism for forecasting.

Even though there are academic papers proving the availability of historical-based accounting numbers in valuation, accounting data could be distorted by some factors. For example, Atiase (1985) observes differences in the stock price responding to earnings announcements and finds that accounting data from small firms are less reliable than one from larger companies. This can imply that the size of company has an impact on the degree of accuracy. Another factor contributing to informativeness of accounting

numbers is the firm's liquidation. When a company's current earnings are not supposed to be a good indicator because the company is in financial distress, it will not be useful for valuation (Ou and Sepe, 2002). Apart from the unstable financial circumstance, non-accounting sources, such as analysts' recommendations, also partition in explaining stock price.

2.2 Accounting-Based Valuation Method

There are two main approaches associated with accounting-based valuation. Firstly, the accounting flow-based approach which calculate firms' value from the concept of the present value. It also requires more variables such as cost of equity, risk-free rate and growth rate. Secondly, the multiples-based approach which determines the values from financial ratio of set of the firms such as P/B.

2.2.1 Accounting forecast flows-based – Residual Income Valuation Model (RIVM)

Accounting-Based Valuation Method used in this study is the residual income valuation model. The model is derived from the assumption on the present value of expected dividend and the clean surplus relationship (CSR), the latter of which is all changes in assets and liability, excluding the dividend in the income statement during the period (Ohlson, 1995). CSR formula is presented as follows:

$$BVE_t - BVE_{t-1} = NI_t - DIV_t \quad (2.1)$$

This can be rearranged in terms of accounting income as follows:

$$NI_t = BVE_t - BVE_{t-1} + DIV_t \quad (2.2)$$

Where:

BVE_t = Accounting book value of shareholder's fund at time t

NI_t = Accounting income for period t

DIV_t = Net distribution to shareholder which are dividends paid to shareholders less proceeds of shares issued at time t.

Furthermore, the difference between accounting earning and required return on capital employed is defined as the equation 2.3:

$$RI^e_t = NI_t - r_e BVE_{t-1} \quad (2.3)$$

Where:

RI^e_t = Residual income for period t

r_e = Cost of shareholder's fund (cost of equity)

Then, equation 2.2 can be replaced into equation 2.3 to acquire the RIVM equation. The RIVM can be represented in the equation 2.4:

$$V^E_t = BVE_t + \sum_{T=1}^{\infty} \frac{E_t[RI^e_{t+T}]}{(1+r_e)^T} \quad (2.4)$$

Where:

V^E_t = Value of equity at time t

$E_t[RI^e_{t+T}]$ = The expected of residual income over the forecast horizon T

The RIVM is widely used among financial analysts and academics. There is a lot of empirical evidence of RIVM suggesting that it can perform better than other models. For example, Frankel and Lee (1998) study the usefulness of RIVM in forecasting cross-sectional stock returns. They conclude that the use of RIVM in estimating firm value may provide an effective result in predicting stock returns. This research study is also supported by Lee and Swaminathan (1999) who find that the U.S stock return can be predictable when using this assumption. This can imply that RIVM is useful for forecasting a firm value.

However, there are some drawbacks arguably outweighing its benefits. Ohlson (2005) claims that RVIM depends mainly on book value construct and CSR, which is a weak assumption. The model also has another pitfall. That is, it does not take into account extra earnings of firms added from the difference between issued shares' prices and their market value, which can lead to inefficient estimation (Penman, 2013).

2.2.2 Multiple-based valuation model

The Multiple-based valuation model refers to the method of comparable consisting of the process of identifying comparable firms and measures for the comparable firms such as earnings, book value or sales (Penman, 2013). An average or median of these multiples will be calculated to get to firm value (Penman, 2013). The target firm's value based on the multiple-based valuation model is shown as the following formula:

$$V_{i,t} = VD_{i,t} \times \theta_{i,t} \quad (2.5)$$

Where:

$V_{i,t}$ = Value of target firm i at time t

$VD_{i,t}$ = Value driver of target firm i at time t

$\theta_{i,t}$ = Benchmark multiple of comparable firms of target firm i and time t

To improve the performance of the valuation, several dimensions of the equity valuation model have been analysed by multiple researchers.

2.2.2.1 Peer Firms Selection

The process of selecting comparable firms as the benchmark is considerably sensitive. If comparable firm classification is narrowed to the point where it becomes close to the target firm, it can lead to having a less pricing error (Alford, 1992 and Liu et al., 2002). This implies that the selection of comparable firms has a significant role in the process of this valuation model.

2.2.2.2 The timeliness of the value driver figures

Another crucial point demanding critical attention within the multiple-based valuation approach is the process of multiple selection. There are various measures used by analysts, resulting in different estimated value of target firms. In practice, users compare historical numbers to forward numbers to decide which numbers yield a higher degree of valuation accuracy. Baker and Ruback (1999) compare industry value divers based on EBITDA, EBIT and revenue for 22 industries in S&P 500. The result shows that EBITDA outperforms all others. Nevertheless, Kim

and Ritter (1999) investigate peer firm multiples for valuing initial public offerings (IPOs). They claim that using forward earning in P/E multiples can provide greater valuation accuracy.

2.2.2.3 The value driver selection

The simple benchmark valuation based on price multiples, in particular P/E and P/B, is widely used in the investment community. However, P/B is used in this research. P/B valuation model is shown as follows:

$$P/B = \frac{price}{bkvlps} \text{ if } bkvlps > 0 \qquad (2.6)$$

Where:

P/B = Firm value form price-to-book value model (reported book value)

bkvpls = Book value per share (reported)

price = Price per share at the end of forth month after fiscal year end

Penman (1996) suggests that P/B strongly represents return on equity better than P/E ratio. This is due to a better indicator of P/B value in reflecting future profitability. As P/B is essentially related to profitability of firms, P/B multiple is very likely to perform well, if it is used in firms whose earnings have not been affected by unusual earnings such as financial firms which have regulatory restrictions (Damodaran, 2009).

2.2.2.4 Benchmark multiple Calculation

Due to numerous numbers of realised value drivers of the peer multiples, these figures have to be aggregated to be a single number being a perfect estimator for applying upon the driver of the target firm. There are four methods of benchmark multiple procedures which are arithmetic mean, median, weighted average and harmonic mean.

Accordingly, median and harmonic mean are generally used in the equity valuation research. Baker and Ruback (1999) recommend that harmonic mean is appropriate for being a representative rather than simple mean which can provide overestimate value. Hence, harmonic mean is used in this research.

$$\text{(1) Harmonic mean } \frac{price}{\frac{1}{n}\sum_{j=1}^{n}\frac{VD_j}{P_j}} \qquad (2.7)$$

Where:

P_j = The price of j^{th} comparable firm

VD_j = The value driver of j^{th} comparable firm

2.2.2.5 Benefits and Drawback of Multiple-based Valuation model

Using multiple-based valuation model to value the target firms can create both advantages and disadvantages to users. Suozzo et al. (2001) suggest that multiples related to value judgements can reboot consequences of the valuation that provides useful information to investors. Moreover, it is simpler than alternatives that avoid complex assumptions such as discounted cash flow, which might potentially mislead precision.

Apart from its brightness, Penman (2013) states about the valuation method's difficulty, which is the process of selecting peer companies. There are many conditions associated with choosing paired firms including size, region, product and industry.

This will eventually be a complicated procedure for investors.

2.3 Related Study in Context of Fair Value Accounting

2.3.1 The Definition of Fair Value Accounting

Fair Value approach has been a controversial accounting topic among financial researchers, practitioners and regulators since it was introduced as accounting theory; it was introduced in the late 1980s on Statement of Financial Accounting Concept, which provides guidance on how to recognise and value items (Emerson et al., 2010). Fair value measurement has been used since the introduction of the International Financial Reporting Standard (IFRS) in 2005. This initially allows companies to measure some financial instruments, such as derivatives, using fair value accounting. This issue has been continually developed in widespread public accounting standards. In the recent evolution in them, the International Accounting Standard Board (IASB) released IFRS 13 - Fair Value Measurement, effective on annual periods beginning on or after 1 January 2013 and defines fair value as follow:

> "Fair Value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (IASB, 2009, p. 2).

2.3.2 The Discussion about Fair Value

Being an advance accounting practice that consists of many judgements, fair value becomes a questionable headline of whether fair value is useful for investors or not. It is argued that the implementation of fair value yields relevance and reliability. Earlier empirical papers, such as Barth and Landsman (1995) and Landsmen (2007) suggest that fair value can facilitate investors to receive more informative accounting datasets.

In addition, Carroll et al. (2003) investigate the relationship between fair value for investment securities in closed-end mutual funds market and stock price as well as stock return. They find that there are significant correlations between these factors. This means that fair value has incremental informativeness for these traded securities.

Penman (2007) addresses the issue of the usefulness of fair value and indicates that this measurement will be effective when the one-to-one condition between market prices, or exit prices, and shareholder value holds. This relationship is associated with level 1 fair value measurement. Nevertheless, he also emphasises an arbitrage strategy related to fair value approach and notes that it will be inverse when firms are participated in arbitrage transactions.

There is also a counter-argument against fair value such as untrustworthy management causing manipulation of fair value measures. For example, Benston (2006) investigates the reason of Enron's failure, and concludes that fair value measurement was used to overestimate its many ranges of assets, resulting in the firm collapsing.

Laux and Leuz (2009) also state there are potential problems related to fair value, which they concede, is the trade-off between relevance and reliability. They state that in the economic

recession, financial instruments' prices in the market which are measured using fair value approach will be relevant to the financial institutions that are going to sell these financial assets. However, these prices will not be reliable to other banks that also have them but they do not intend to sell the assets. This means that other financial institutions have to use these prices as a benchmark to unwillingly revaluate their financial assets and unfortunately realise losses for revaluation, although they should not be affected by the economic meltdown. This issue is suspected to be one of the causes of financial crisis.

In addition, Penman (2007) point out several drawbacks of fair value accounting. For example, it can lead to mismatching between assets and liabilities, resulting in excess earnings in an income statement. Plus, with subjective estimates of the level 3 permitting in using unobservable inputs, the fair value can introduce estimate errors into both the balance sheet and the income statement.

In conclusion, the literature suggest that fair value accounting is highly likely to be value-relevant as it is one of the requirements of SFAS No.157 and IFRS 13. It is thus worth analysing the effect of fair value on equity valuation.

2.3.3 Fair Value and Valuation

Although several studies document that fair value measurements can achieve reliability of accounting informant, it can directly provide greater uncertainty of equity valuation.

Penman (2007) states that fair value accounting provides informative book value for valuation; however, reported earnings are insufficient for this purpose. In other words, historical cost produces the effective income statement which is used as an essential tool for conveying information and performance management. This is consistent with the study of Barth and Landsman (1995), who suggest that in the ideal world of fair value accounting, this approach can make all line items on the balance sheet relevant for valuation. On the other hand, earnings are redundant. Therefore, they would be inappropriate figures to be used in valuation models.

The idea that income statement is not relevant for valuation due to fair value accounting is supported Barth et al. (1995). They investigate the impact of fair value accounting on earnings volatility by focusing on the U.S. banks from 1971 to 1990, and conclude that the degree of volatility of earning based on fair value is higher than one based on historical cost. This can imply that if companies which are based on historical cost accounting use the valuation model that applies earnings such as residual income model, the valuation model will provide an estimated value which is close to market price as Penman (2007) show in his study.

Fair value accounting is highly likely to have a considerable impact on stock valuation models. When fair value is adapted in financial report, it is believed that fair value can generate volatile earnings which, in turn, leads to valuation errors. On the other hand, balance sheet provides more reliable information for the valuation process.

Consequently, the impact of fair value accounting in valuation model should be examined to prove these beliefs.

3. Large Sample Analysis

We have so far seen that each valuation model has both advantages and disadvantages. In this section, the study of valuation models performances, namely residual income valuation and multiple-based valuation, will be examined. Accuracy is used as a performance measure. The most accurate value estimated is those with the smallest absolute forecast error. Moreover, the bias in the OLS regression will be used to evaluate the ability of explaining the variation in market price.

The structure of large sample analysis is outlined. Firstly, hypothesis development will be explained. This will be followed by research design. Empirical finding and robustness test will be later discussed followed by conclusion.

3.1 Hypothesis Development

The large sample analysis is mainly inspired by the study of Courteau et al. (2007) who investigated the superiority of accounting valuation models by comparing flow-based accounting approach and multiple-based valuation approach. Additionally, the study of Penman (2007), who documents the effect of fair value accounting in the valuation models, will be used in this research in order to observe whether the fair value account has significant effect on the models.

There are many equity valuation models that are widely used by analysts for predicting stocks' performance. As mentioned in the literature review, the flow-based accounting model and multiple-based model are essential methods that use various types of accounting figures and ratios. For the flow-based accounting model, RIVM is suggested to be remarkably outstanding in terms of bias, accuracy and explanability among other accounting flow-based valuation models (Francis at el., 2000 and Penman and Sougiannis, 1998). Thus, RIVM is used as the representative of this category of equity valuation model in this research. P/B ratio is used as the representative of multiple based valuation model to investigate the different outcomes between models based on earnings and another based on book values.

The study of Penman (2007), illustrates that the residual income model valuation that relied mainly on historical cost accounting numbers can get the intrinsic value which close to the market price. He also highlights that there is no clear point as to how fair value accounting can enhance the valuation. This issue is consistent with the studies of Barth and Landsman (1995) and Barth et al. (1995) who document that fair value provides less reliable earnings. This means that earnings based mainly on fair value accounting is less reliable than one relied mainly on historical cost accounting. Therefore, Fair-value (assets and liabilities)-to-Total-Assets-Ratio is adapted to both models in this study and hypotheses are developed as following;

Hypothesis 1: Firms with Low-Fair-Value-to-Total-Assets-Ratio have less bias and are more accurate in the residual income model than firms with High-Fair-Value-to-Total-Assets-Ratio.

Hypothesis 2: Firms with High-Fair-Value-to-Total-Asset-Ratio have less bias and are more accurate in the multiple-based valuation model that uses P/B ratio than firms with Low Fair-Value-to-Total-Assets-Ratio.

The study of Courteau et al. (2007) documents that the RIVM provides a better performance on predicting stock prices than multiple-based models. This is consistent with the studies of Copeland, Koller and Murrin (2000) who document the superiority of flow-based accounting valuation models over the multiple based valuation. Hence, RIVM is expected to provide a better performance than P/B ratio.

Hypothesis 3: RIVM is outperforming the multiple-based valuation model using P/B ratio with firms that have High-Fair-Value-to-Total-Assets-Ratio in terms of bias and accuracy.

Hypothesis 4: RIVM is outperforming the multiple-based valuation model using P/B ratio with firms that have Low Fair-Value-to-Total-Assets-Ratio in terms of bias and accuracy.

All hypotheses are tested at 5% significance level.

3.2 Research Design

3.2.1 Sample data

The original sample in this large sample analysis comes from available data for U.S public companies from different industries between 2009 and 2013. The data comes from 3 sources: Compustat, I/B/E/S and CRSP. The first source provides accounting variables shown in firms' financial statements such as total assets, total liabilities, and fair value of asset in each level. The second is the source for analysts' forecasted items such as forecasted earnings per share. CRSP is used to obtain companies' beta.

The initial data has 33,552 observations. However, some samples are eliminated in order to gain better statistical results. Eventually, this large sample analysis consists of 6,705 observations, as presented in Table 1.

In order to obtain less volatile figures and better results of statistical test, samples are selected only for the period from 2009-2013, which is post-financial crisis period and after introduction of SFAS No. 157. Moreover, the samples with negative and missing values of book value of equity per share, forecast earnings per share one-year ahead and two-year ahead, beta, total fair value asset, total fair value liabilities and total fair of assets and liabilities in each level and others relevant variables are then eliminated. Then, to reduce the effect of extreme outliers, 1% of both tails are excluded. Finally, the remaining samples are 6,705 observations that are to be tested.

Table 1 Number of Observations for Large Sample Analysis in Each Process

Details of Sample Selection	Number of Observation
Original data	33,552
Deleting missing values of TFVA, TFVL, DVC, Price, BVEPS, EPSPX EPS1, EPS2	(20,952)
Deleting sample between period 2005–2008	(1,778)
Deleting negative values of BVEPS, PRC, EPSPX, EPS1, EPS2	(3,506)
Deleting outliers 1% on both sides for PRC EPS1, EPS2, BVEPS	(363)
Deleting outliers 1% on both sides for both residual income valuation model and multiple based valuation model and missing value of Multiple based valuation model	(248)
Total pooled Samples	6,705
Sample consider as High-Fair-Value-to-Total-Assets-Ratio	3,352
Sample consider as High-Fair-Value-to-Total-Assets-Ratio	3,353

The table delineates the sample selection process. The sample firms were initially identified from Compustat, I/B/E/S and CRSP. I require firms to have price information in Compustat, I/B/E/S and CRSP.
To avoid the financial crisis effect, I focus on information after 2008.
To avoid the effect from extreme outliers, I eliminated 611 observations.
TFVA = Total fair value assets; TFVL = Total fair value liabilities; DVC = Dividends Common, Price = stock prices 4 months after fiscal year end; BVEPS = Book value per shares, EPSPX = Earnings per shares excluding extraordinary items; EPS1 = Analyst forecasted earnings per shares t+1; EPS2 = Analyst forecasted earning per shares t+2.
Fair-Value-to-Total-Assets-Ratio = (Total fair value assets + Total fair value liabilities) / Total Assets.

3.2.2 Division by Fair-Value-to-Total-Assets-Ratio

This research adapts the study of Halioui and Gharbi (2012) who examine the relationship between fair value accounting and the failure risk of financial firms in America. They also define fair value ratio as the sum of assets and liabilities recognized or disclosed at fair value. This ratio is similar to the approach used by Nissim and Penman (2007) who assess the merit of fair value in the banking companies. Consequently, to allocate firms with high/low degree of fair value, this ratio will be used in this study and median will be used to categorise the data in to high and low degree of the ratio. The formula of the ratio is presented as follow;

$$\text{Fair-Value-to-Total-Assets-Ratio} = \frac{\text{Total Fair Value (Assets and Liabilities)}}{\text{Total Assets}}$$

3.2.3 Theoretical Models

This large sample analysis covers two valuation models, RIVM and Multiple-based Valuation model. The latter method adapts P/B ratio. RIVM is chosen because it can provide a better estimated intrinsic value, if the accounting earnings based mainly on historical cost (Penman, 2007). Therefore, it can be compared to the book value model. P/B multiple is selected because it takes into account a book value that can be compared with RIVM which is based on earnings.

3.2.4 Multiple-Based Valuation Model Specification

The design of multiple-based valuation model as its formula to compute forecast intrinsic values is discussed in this section.

3.2.4.1 Comparable Firms Selection

Although the research of Alford (1992) suggests that using three-digits of Standard Industrial Classification or SIC codes can lead to a better valuation accuracy, sets of peer group companies in this study are based on two-digit of SIC codes. The reason for using these criteria is that it can provide larger observations remaining for this test, as the number of peer companies has to exceed more than ten firms in each industry.

3.2.4.2 Benchmark Multiple Selection

Harmonic mean method of P/E and P/B based on each year and each group of industry is used instead of median or mean method because it has a superior valuation result over others estimators (Liu et al., 2002).

3.2.4.3 Valuation of Target Firms

Intrinsic values of target firms are calculated by using benchmark multiple of comparable firms multiplied by the value driver of the target firm as shown in the flowing formula:

$$V^{E}_{i,t} = \text{Value Driver}_{i,t} \times \text{Harmonic Mean Benchmark Multiples}_{i,t}$$

Where $V^{E}_{i,t}$ is estimated value of equity for target firm i at time t.

3.2.5 Residual Income Valuation Model Specification

The design of accounting-flow based valuation model, its assumptions and equation to calculate estimated intrinsic value are provided in this section.

3.2.5.1 Cost of Equity

Cost of equity is an element of RIVM to be firstly considered. It is used in this accounting valuation instead of cost of capital. This method is used in the study of Fama and French (1997). It is calculated by a capital assets pricing model (CAPM) as follow:

$$r_E = r_f + \beta[E(r_m) - r_f] \quad (3.1)$$

Where:

r_E = Cost of equity

r_f = Risk free rate

β = Firm's beta (Firm's betas are obtained from CSRP.)

$E(r_m)$ = Expected rate of return on market portfolio

$E(r_m) - r_f$ = Market risk premium (MRP).

The risk free rate of the CAPM model is obtained by averaging the risk rate from the period between 2009 and 2013 (Source: Damodaran, 2016). Cost of equity of the same firm is recalculated in each year.

The MRP is the difference between expected rate of return and risk free rate. This study will adopt MRP at 5%, which has been earlier adopted by Jorgensen, Lee and Yoo (2011).

3.2.5.2 Long term growth rate

I calculated the intrinsic value of target firms by assuming perpetual growth rate equal to 2% (based on the assumption that it is equal to rate of inflation), which is consistent with Francis et al. (2000). Also, the discounted perpetuity of forecasted fundamentals after year 2 is also used to calculate the terminal value for RIVM.

3.2.5.3 Dividends Pay-out ratio

I calculated the dividends pay-out ratio by common dividends divided by net income. If the dividends are not paid, the value estimates are set to be zero. A two-year forecast is determined to be a forecast horizon in this study.

3.2.5.4 Valuation of target firms

Valuation model:

$$V_0^E = BVEPS_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_1}{\rho_E^3} + \ldots + \frac{RE_T}{\rho_E^T} + \frac{\left(\frac{RE_{T+1}}{\rho_E - g}\right)}{\rho_E^T} \quad (3.2)$$

When: terminal value > 0, and book value > 0

Where:

$BVEPS_0$ = Book value of equity per share at time zero

RE_T = Residual income at time T

ρ_E^T = One plus cost of equity at time T

g = One plus growth rate

RE_T = Residual income at time t;

$RE_t = NI_t - (r_E \times I_{t-1})$

NI_t = Net income at time T

r_E = Cost of equity

I_{t-1} = Capital investment at time t–1

3.2.6 Performance Evaluation

Signed valuation error and valuation errors are performed to evaluate performance of both forecast intrinsic values computed by multiple-based valuation model using P/B multiples and RIVM. The formulas are shown as follow;

Signed valuation error

$$VE_t^T(\cdot) = \frac{P_t - P_t^T(\cdot)}{P_t} \quad (3.3)$$

Absolute valuation error

$$AVE_t^T(\cdot) = |VE_t^T(\cdot)| \quad (3.4)$$

Where:

P_t = The firm's stock price at time t

P_t^T = The intrinsic price at time t calculated by the model from earnings forecast up to horizon T

Signed valuation error measures bias while absolute valuation error measures accuracy of valuation models. If these figures are close to zero, it implies that the model performance is less biased and more accurate. These implements are consistent with empirical valuation analysis of Francis et al. (2000).

Furthermore, median is used for comparison between groups due to the lower sensitivity of extreme outliers, which is supported by the study of Damodaran (2009) which indicates that median is more stable than other indicators.

3.3 Empirical Findings

This section will summarise descriptive statistics and statistical performance evaluation.

3.3.1 Descriptive Statistics

This section will analyse descriptive statistic of variables and valuation error. Firstly, statistical properties for input variables (stock price, forecasted earnings, book value of equity per share) will be presented. Secondly, descriptive of valuation errors (prediction errors for three valuation models) will be provided, serving as background for further statistic test.

3.3.1.1 Descriptive Statistics of Input Variables

The variables' descriptive statistics of observations are presented in the following table. This table is divided into 3 panels, which are pooled samples, high and low degree of Fair-Value-to-Total-Asset-Ratio.

Panel A of Table 3.2 presents a summary of the descriptive of significant variables of pooled samples. It shows that the median of the Fair-Value-to-Total-Assets-Ratio 0.04 will be used as benchmark to divide pooled samples into 2 types basing on high/low of the fair value ratio. For panel B and C, it can be clearly seen that means

Table 2 Summary Statistic of significant variables by Degree of fair value ratio

Panel A: Pooled Samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Price	6,705	36.95	26.02	2.70	4.17	31.12	122.66	183.11
EPS1	6,705	2.18	1.64	0.09	0.17	1.79	8.01	11.44
EPS2	6,705	2.52	1.80	0.18	0.29	2.08	8.81	12.84
BVEPS	6,705	14.85	10.47	0.81	1.66	12.32	49.29	69.51
TFVA	6,705	1,532.95	18,733.46	0.00	0.00	50.42	17,643.00	645,458.60
TFVL	6,705	500.75	8,787.97	0.00	0.00	2.90	4,835.00	433,922.60
TA	6,705	11,762.00	49,904.01	13.80	51.79	1,884.00	15,7818.00	1,654,790.00
TFV_TA	6,705	0.13	0.19	0.00	0.00	0.04	0.77	1.85

Table 2 Summary Statistic of significant variables by Degree of fair value ratio (Cont.)

Panel B: High-Fair-Value-to-Total-Assets-ratio Samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Price	3,352	34.91	25.69	2.70	4.17	28.99	133.40	182.06
EPS1	3,352	2.02	1.60	0.09	0.16	1.64	8.04	11.27
EPS2	3,352	2.33	1.74	0.18	0.27	1.90	8.78	12.50
BVEPS	3,352	13.45	10.06	0.81	1.51	10.67	48.98	69.51
TFVA	3,352	2,939.64	26,416.57	0.00	0.00	189.37	37,610.07	645,458.60
TFVL	3,352	948.60	12,408.80	0.00	0.00	2.24	11,462.00	433,922.60
TA	3,352	12,684.04	64,154.13	13.80	46.13	1,489.40	16,4971.00	1,654,790.00
TFV_TA	3,352	0.25	0.20	0.04	0.04	0.19	0.90	1.85

Panel C: Low-Fair-Value-to-Total-Assets-ratio samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Price	3,353	39.00	26.19	2.70	4.17	33.60	120.18	183.11
EPS1	3,353	2.35	1.66	0.09	0.18	1.95	7.95	11.44
EPS2	3,353	2.71	1.83	0.18	0.31	2.29	8.83	12.84
BVEPS	3,353	16.25	10.68	0.93	1.87	13.86	50.10	67.85
TFVA	3,353	126.69	549.01	0.00	0.00	8.88	2,107.00	12,078.00
TFVL	3,353	53.03	351.27	0.00	0.00	3.24	801.85	12,800.00
TA	3,353	10,840.23	29,404.04	14.12	65.09	2,381.70	14,2953.00	33,3795.00
TFV_TA	3,353	0.01	0.01	0.00	0.00	0.01	0.04	0.04

Panel A provides descriptive statistics of pooled sample. Panel B and C provides descriptive statistics of high Fair-Value-to-Total-Asset-Ratio group and Low Fair-Value-to-Total-Asset-Ratio group.

Price = stock prices 4 months after; EPS1 = Analyst forecasted earnings per shares t+1; EPS2 = Analyst forecasted earning per shares t+2.

BVEPS = Book value per shares; TFVA = Total fair value assets; TFVL = Total fair value liabilities; TA = Total Assets.

TFV_TA = Fair-Value-to-Total Assets-Ratio: (Total fair value assets + Total fair value liabilities) / Total Assets.

The currencies of variables are in USD, excluding TFV_TA

and medians of each panel are not far apart, so it can indicate that there is no problem in these observations. The mean of stock prices and book value of equity per share of low fair value ratio firms, USD 39.00 and USD 16.25, are higher than those of high fair value ratio firms, USD 34.91 and USD 13.45. This is due to the higher value of book value of equity per share.

3.3.1.2 Descriptive Statistics of Valuation error

Descriptive statistics of signed and absolute valuation errors are shown in the below table for multiple-based valuation using P/B multiples, and RIVM.

Table 3 Summary of Statistic of Valuation Errors

Panel A: Pooled Samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Signed Valuation error (Bias)								
RIVM	6,705	–0.499	0.260	–0.904	–0.883	–0.547	0.321	0.593
P/B	6,705	–0.007	0.541	–0.871	–0.813	–0.097	1.684	2.212
Absolute Valuation error (Accuracy)								
RIVM	6,705	0.518	0.220	0.000	0.020	0.547	0.883	0.904
P/B	6,705	0.425	0.334	0.000	0.007	0.368	1.684	2.212

Panel B: High-Fair-Value-to-Total-Assets-ratio Samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Signed Valuation error (Bias)								
RIVM	3,352	–0.521	0.252	–0.904	–0.887	–0.574	0.295	0.584
P/B	3,352	–0.049	0.520	–0.869	–0.811	–0.146	1.621	2.212
Absolute Valuation error (Accuracy)								
RIVM	3,352	0.538	0.215	0.002	0.021	0.574	0.887	0.904
P/B	3,352	0.414	0.319	0.000	0.007	0.362	1.621	2.212

Panel C: Low-Fair-Value-to-Total-Assets-ratio samples								
	N	Mean	SD	Min	P1	P50	P99	Max
Signed Valuation error (Bias)								
RIVM	3,353	–0.477	0.266	–0.904	–0.879	–0.520	0.342	0.593
P/B	3,353	0.035	0.558	–0.871	–0.818	–0.052	1.793	2.202
Absolute Valuation error (Accuracy)								
RIVM	3,353	0.498	0.224	0.000	0.018	0.522	0.879	0.904
P/B	3,353	0.436	0.349	0.000	0.007	0.374	1.793	2.202

Panel A reports results of signed and absolute prediction errors for pooled sample.
Panel B reports results of signed and absolute prediction errors for High-Fair-Value-to-Total-Assets-Ratio Samples.
Panel C reports results of signed and absolute prediction errors for Low-Fair-Value-Assets-to-Total-Assets-Ratio samples.
The High-Fair-Value-to-Total-Assets-Ratio sample consists of the firms in the top 50 quartile of Fair-Value-to-Total-Assets-Ratio; the Low-Fair-Value-to-Total-Assets-Ratio sample consists of the firms in the bottom 50 quartile of the ratio.

Terminal values for each valuation model, RIVM and Multiple-based using P/B ratio are computed. They discount into perpetuity the stream of forecasted fundamentals after T = 2 with the assumed growth at 2%. The estimated terminal values for pooled samples for RIVM and P/B are, on average, 15.792 and 31.640.

Panel A of Table 3, both models, RIVM and P/B for pooled sample tend to underestimate stock prices, with mean (median) signed valuation error of –52% (–57.4%) for RIVM, and –7% (–9.7%) for P/B. In the test of accuracy, absolute valuation error, the median accuracy of P/B of 36.8% is significantly less than the median of RIVM of 54.7%.

Panel B of Table 3 reports signed and absolute valuation errors for high-fair value-to-total-assets-ratio. Summary statistics show that both models also provide underestimated intrinsic values. For absolute valuation errors, the median of P/B of 36.2% is less than the median of RIVM of 57.4%. Moving to the panel B, showing signed and absolute valuation errors for Low-Fair-Value-to-Total-Assets-Ratio, it is noticeable that mean of signed valuation error of 3.5% is positive, meaning it is overestimated value; however, the median of P/B of –5.2% means the opposite result. In the of accuracy aspect, in the sample, it shows the same result as high fair value ratio group.

In summary, in terms of bias and accuracy, means of valuation error of multiple-based valuation using P/B ratio for both signed and absolute errors are less than means of valuation errors of RIVM. It can thus be implied that multiple-based valuation has higher power of predictive estimated intrinsic value than RIVM. Other tables also show the same results.

3.3.2 Analysis of Valuation Performance

This section analyses the comparison of performance evaluation across firms with different Fair-Value-to-Total-Assets-Ratio and across different models.

3.3.2.1 Comparison of Valuation Errors Across Degree of Fair Value

Bias and accuracy statistics for each of the model, RIVM and P/B, and high-low groups are calculated. Mean and median values are reported in Table 4. In order to evaluate performance of the model in different degree of Fair-Value-to-Total-Assets-Ratio, two statistical tests are performed. Firstly, two-sample t test is used to test that the mean of valuation errors obtained from each model in each group is equal to those in another group. The second statistical test, Wilcoxon rank sum test is used to test equality of medians. The results are shown in then following Table 4.

Table 4 Comparisons of the Bias and Accuracy of Value estimates Across Degree of Fair Value

Panel A: Signed Valuation Errors (Bias)						
	Two-Sample t tests (Mean of Valuation Errors)			Wilconxon Tests (Median of Valuation Errors)		
	High Fair-Value	Low Fair-Value	T Value	High Fair-Value	Low Fair-Value	Z Value
RIVM	–0.521	–0.477	7.069	0.574	0.522	7.417
P/B	–0.049	0.035	6.394	–0.146	–0.052	6.335

Panel B: Absolute Valuation Errors (Accuracy)						
	Two-Sample t tests (Mean of Valuation Errors)			Wilconxon Tests (Median of Valuation Errors)		
	High Fair-Value	Low Fair-Value	T Value	High Fair-Value	Low Fair-Value	Z Value
RIVM	0.538	0.498	–7.520	0.574	0.522	–7.417
P/B	0.414	0.436	2.716	0.362	0.374	1.662

Bias (accuracy) equals the signed (absolute value) of the valuation error, difference between the forecast attribute and its realisation, scaled by the share price.

Penal A (B) report t-test and Wilcoxon tests of singed (absolute) valuation error between RIVM and P/B.

The High-Fair-Value sample consists of the firms in the top 50 quartile of Fair-Value-to-Total-Assets-Ratio; The Low-Fair-Value sample consists of the firms in the bottom 50 quartile of the ratio.

Panel A in Table 4 reports statistical tests for signed valuation errors (Bias). For the t-test, both RIVM and P/B multiple show t-values at 6.660 and 5.065 compared to 5% significance level, meaning that the null hypothesis could be rejected. This means that the mean prediction errors obtained from both methods are not equal. The Z-tests show values at 7.330 and 5.345 these are more than 1.96, meaning the median prediction errors are not equal either. Consequently, it can concluded that for Low-Fair-Value-to-Total-Assets-Ratio sample, in term of bias, both RIVM and P/B multiple can provide better estimated values than the High-Fair-Value-to-Total-Assets-Ratio group. This is due to the means and medians of lower group being closer to zero than the ones from another group.

Panel B in Table 4 shows statistical tests for absolute prediction errors (Accuracy). Regarding RIVM, two-sample test and Z test provide values of –7.164 and –7.326, which are lower than 1.96 (at 5% significance level. This means that the null hypothesis could be rejected. This also means that there is no equality in mean and median between the two groups.

However, for the P/B multiple, T-Value and Z-Value are in the range between –1.96 and 1.96, meaning that the null hypothesis cannot be rejected. This means that there is no significant difference in mean and median in both samples.

In summary, by comparing both models between two groups, high fair value and low fair value, it can be concluded that the intrinsic values obtained from RIVM for low fair value ratio group outperforms those for high fair value ratio

group. Nonetheless, there is no evidence showing that the estimated stock prices computed by P/B multiple for higher fair value group outperforms the lower group.

3.3.2.2 Comparison of Valuation Errors Across Models - Bias Aspect

Comparisons of bias and accuracy valuation errors among valuation models have been analysed. Statistical tests have been provided to investigate statistical significant differences.

Two statistic tests, which are paired t-test (two-tailed) and Wilcoxon signed rank test (two- tailed), are performed. The first is tested for the different means of the models, and the latter is tested for different medians of those models.

Bias statistics for each model is computed; median and mean values of those models are reported in Table 5. For all statistical tests both Paired t-test and Wilcoxon signed-rank test, at

Table 5 Comparisons of the Bias of Value Estimates Degree Across Models

Panel A: Pooled Samples					
	Paired t test			Wilcoxon signed-rank test	
	Mean of Signed Errors	T Value Versus P/B		Median of Signed Errors	Z Value Versus P/B
RIVM	–0.499	–0.001		–0.547	–70.669
P/B	–0.007	–		–0.097	–

Panel B: High-Fair-Value-to-Total-Assets-Ratio Samples					
	Paired t test			Wilcoxon signed-rank test	
	Mean of Signed Errors	T Value Versus P/B		Median of Signed Errors	Z Value Versus P/B
RIVM	–0.521	–83.411		–0.574	–49.913
P/B	–0.049	–		–0.146	–

Panel C: Low-Fair-Value-Assets-to-Total-Assets-Ratio samples					
	Paired t test			Wilcoxon signed-rank test	
	Mean of Signed Errors	T Value Versus P/B		Median of Signed Errors	Z Value Versus P/B
RIVM	–0.477	–84.508		–0.520	–50.024
P/B	0.035	–		–0.052	–

Panel A reports the result of Pair t test and Wilcoxon signed-rank test of signed valuation error for pooled sample. Panel B (C) reports the result of Pair t test and Wilcoxon signed-rank test of signed valuation error for High-Fair-Value-to-Total-Assets-Ratio Samples (Low-Fair-Value-Assets-to-Total-Assets-Ratio samples).

The High-Fair-Value sample consists of the firms in the top 50 quartile of Fair-Value-to-Total-Assets-Ratio; The Low-Fair-Value sample consists of the firms in the bottom 50 quartile of the ratio.

Bias equals to signed difference between the forecast attribute and its realisation, scaled by the share price.

5% significance level, T-Value and Z-Value are less than –1.96 and over 1.96. This means that there are significant differences in means and medians between RIVM and P/B. Bias measures in Panel A report that the median RIVM (P/B) forecast understates realised abnormal earning by 57.4% (9.7%) of security price. This result is consistent with high fair value ratio and low fair value ratio groups, which are reported in Panel B and C. The first group shows that P/B prediction errors are approximately 25% of RIVM prediction errors (14.6%versus 57.4%) to roughly 100% for the latter group (5.2% versus 52%). More importantly, the finding also shows that P/B is less biased than RIVM in both low and high fair value ratio samples.

3.3.2.3 Comparison of Valuation Errors Across Models - Accuracy Aspect

In terms of accuracy aspect, absolute prediction errors will be analysed in Table 6. The results of t-test and Wilcoxon signed-rank test show that T values and Z values for all groups in Panel A, B and C in Table 6 are over 1.96 (at 5% of significance level). This means that mean and median of each group are significantly different. Median in Panel A indicates that P/B is more accurate than RIVM by 17.9% (36.8% versus 54.7%). In high-fair-value-ratio sample and low-fair-value-sample, P/B is also more accurate than RIVM by 21.1% and 14.8% respectively. Accordingly, I find that P/B multiple model performs better than RIVM in terms of accuracy in both groups with different level of fair value ratio.

Table 6 Comparison of the Accuracy of Value Estimates Across Models

Panel A: Pooled Samples

	Paired t test		Wilcoxon signed-rank test	
	Mean of Absolute Errors	T Value Versus P/B	Median of Absolute Errors	Z Value Versus P/B
RIVM	0.518	17.644	0.547	30.449
P/B	0.425	–	0.368	–

Panel B: High-Fair-Value-to-Total-Assets-Ratio Samples

	Paired t test		Wilcoxon signed-rank test	
	Mean of Absolute Errors	T Value Versus P/B	Median of Absolute Errors	Z Value Versus P/B
RIVM	0.538	17.704	0.574	25.815
P/B	0.414	–	0.362	–

Table 6 Comparison of the Accuracy of Value Estimates Across Models (Cont.)

Panel C: Low-Fair-Value-Assets-to-Total-Assets-Ratio samples					
	Paired t test			Wilcoxon signed-rank test	
	Mean of Absolute Errors	T Value Versus P/B		Median of Absolute Errors	Z Value Versus P/B
RIVM	0.498	7.872		0.522	17.320
P/B	0.436	–		0.374	–

Panel A reports the result of Pair t test and Wilcoxon signed-rank test of absolute valuation error for pooled sample. Panel B (C) reports the result of Pair t test and Wilcoxon signed-rank test of absolute valuation error for High-Fair-Value-to-Total-Assets-Ratio Samples (Low-Fair-Value-Assets-to-Total-Assets-Ratio samples).

The High-Fair-Value sample consists of the firms in the top 50 quartile of Fair-Value-to-Total-Assets-Ratio; The Low-Fair-Value sample consists of the firms in the bottom 50 quartile of the ratio.

Accuracy equals to absolute value of the difference between the forecast attribute and its realisation, scaled by the share price.

3.4 Robustness Tests

The robustness tests are performed to investigate the sensitivity of the original results based on previous assumptions. The tests are performed on the assumption of RIVM by changing terminal growth rate. In addition, based on the assumption that financial firms normally have high volume of fair value of financial assets and liabilities, sample data which consists of only financial firms and exclude financial firms will be analysed. This will be to check whether industry affiliation affects the results. Moreover, the samples have been recategorised into three groups: high, median and low, by deleting middle group to check robustness of results. According to the results, there is no change in interpretation of the result.

4. Conclusion and Limitation

This research studies how fair value accounting effects equity valuation. The large sample analysis studies the performance of valuation models (RIVM and P/B) across firms with high and low fair value ratio. The results indicate that firms with Low-Fair-Value-to-Total-Assets-Ratio have less bias and are more accurate in the residual income model than firms with High-Fair-Value-to-Total-Assets-Ratio. This result is consistent with the research of Penman (2007). Moreover, in comparison between the two models, empirical results suggest that the value estimates derived from P/B are less biased and more accurate than those derived from

RIVM across both high and low fair value groups. This result is inconsistent with the study of Courteau et al. (2007).

There are two limitations in this study. The first one is the limited number of prior studies into valuation models, in relation to fair value accounting. Secondly, the Fair-Value-to-Total-Assets-Ratio used in this study is based on the research of Nissim and Penman (2007) and Halioui and Gharbi (2012). However, this ratio ignores assets that are not recognised, for example intangible assets. That will effect on how to divide companies into high and low fair value. Thus, because of the limitation of time study, further developed topics in relation to fair value accounting are highly recommended to study in the future.

REFERENCES

Alford, A. (1992). The effect of the set of comparable firms on the accuracy of the price-earnings valuation method. *Journal of Accounting Research, 30*, 94–108.

Atiase, R. K. (1985). Predisclosure information, Firm Capitalization and Security Price Behavior Around Earning Announcements. *Journal of Accounting Research, 23*, 21–36.

Baker, M. and Ruback, R. S. (1999). Estimating Industry Multiples. *Working paper*. Harvard University.

Ball, R. and Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research, 6*, 159–178.

Barth, M. E. and Landsman, W. R. (1995). Fundamental Issues Related to Using Fair Value Accounting for Financial Reporting. *American Accounting Association Accounting Horizons, 9*, 97–107.

Barth, M. E., Landsman, W. R., and Wahlen J. M. (1995). Fair Value accounting: Effects on banks' earnings volatility, regulatory capital, and value of contractual cash flows. *Journal of Banking & Finance, 19*, 577–605.

Beaver, W. (1968). The information content of annual earnings announcements. *Journal of Accounting Research, 6*, 67–92.

Benston, G. J. (2006). Fair Value accounting: A cautionary tale from Enron. *Journal of Accounting and Public Policy, 25*, 465–484.

Carroll, T. J., T. J. Lindmeier and K. R. Petroni. (2003). The reliability of fair value versus historical cost information: Evidence from closed-end mutual fund. *Journal Accounting, Auditing & Finance, 18*, 1–23

Copeland, T. E., Koller, T., and Murrin, J. (2000). *Valuation: Measuring and Managing the Value of Companies*. New Jersey: Wiley.

Courteau, L., Gray, P., Kao, J. L., O'Keefe, T., and Richardson, G. D. (2007). *Construction Intrinsic Value Estimates of Equity Using IBES and Value Line Forecasts of Fundamentals*. Working Paper, University of Bolzano.

Damodaran, A. (2009). *Valuing Financial Service Firms in the Post-Crisis Era*. Working Paper, New York University.

Damodaran, A. (2016). Musings on Market. Accessed on June 14, 2016 from http://aswathdamodaran.blogspot.se/2016/01/january-2016-data-update-2-interest.html.

Emerson, D. J., Karim, K. E., and Rutledge, R. W. (2010). Fair Value Accounting: Ahistorical Review of the Most Controversial Accounting Issue in Decades. *Journal of Business & Research, 8*, 77–86.

Fama, E. F. and French K. R. (1997). Industry costs of equity. *Journal of financial economics, 43*, 153–193.

FASB. (2006). *Statement of Financial Accounting Standards No. 157: Fair Value Measurements*. Norwalk, CT: Financial Accounting Standards Board.

Francis, J., Olsson, P., and Oswald, D. (2000). Comparing the accuracy and explainability of dividend, free cash flow and abnormal earnings equity value estimates. *Journal of Accounting Research, 38*, 45–70.

Frankel, R. and Lee, C. M. C. (1998). Accounting valuation, market expectation, and cross-sectional stock returns. *Journal of Accounting and Economics, 25*, 283–319.

Halioui, K., and Gharbi, L. (2012). Does Fair Value for Financial Instruments Constitute a New Channel of Contagion?. *Global Business and Management Research, 4*, 60–75

IASB. (2009). *ED/2009/5 Fair Value Measurement. London: International Accounting Standards Board*.

Jorgensen, B. N., Lee, Y. G., and Yoo, Y. K. (2011). The valuation accuracy of equity value estimates inferred from conventional empirical implementations of the abnormal earnings growth model: US evidence. *Journal of Business Finance & Accounting, 38*, 446–471.

Kim, M. and Ritter, J. R. (1999). Valuing IPOs. *Journal of Finance Economic, 53*, 409–437.

Landsman, W. R. (2007). Is fair value accounting information relevant and reliable? Evidence from capital market research. *Accounting and Business Research, 37*, 19–30.

Laux, C. and Leuz, C. (2009). The crisis of fair value accounting; making sense of the recent debate. *Accounting, Organizations and Society, 34*, 826–834.

Lee, C. M. C. (1999). Accounting-based valuation: Impact on business practices and research. *Accounting Horizons, 13*, 413–425.

Lee, C. M. C. and Swaminathan, B. (1999). Valuing the Dow: A bottom-up approach. *Financial Analysts Journal, 55*, 4–23.

Liu, J., Nissim, D., and Thomas, J. (2002). Equity valuation using multiples. *Journal of Accounting Research, 40*, 135–172.

Nissim D. and Penman, S. (2007). Fair Value accounting in the Banking Industry. *Center for Excellence in Accounting and Security Analysis*, 1–72.

Ohlson, J. A. (1995). Earnings, Book Values and Dividends in Equity Valuation. *Contemporary Accounting Research, 11*, 661–687.

Ohlson, J. A. (2005). On Accounting-Based Valuation Formulae. *Review of Accounting Studies, 10*, 323–347.

Ou, J. A. and Sepe, J. F. (2002). Analysts earnings forecasts and the roles of earnings and book value in equity valuation. *Journal of Business Finance & Accounting, 29*, 287–316.

Penman, S. H. (1996). The Articilation of Price-Earnings Ratios and Market-to Book Ratios and the Evaluation of Growth. *Journal of Accounting Research, 34*, 235–259.

Penman, S. H. (2007). Financial reporting quality: is fair value a plus or a minus?. *Accounting and Business Research, 37*, 33–44.

Penman, S. H. (2013). *Financial Statement Analysis and Security Valuation*. New York: McGraw-Hill Higher Education.

Penman, S. H. and Sougiannis, T. (1998). A comparison of dividend, cash flow, and earnings approaches to equity valuation. *Contemporary Accounting Research, 15*, 343–383.

Suozzo, P., Cooper, S., Sutherland, G., and Deng, Z. (2001). *Valuation Multiples: A primer*. United Kingdom: UBS Warburg.

JAP