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Review and Comments on Accrual Accounting Valuation Models

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Abstract

Early work by Miller and Modigliani (1961) proposes that a firm's value is irrelevant to its dividend policy and relevant to its risk (i.e., earnings risk, volatility risk...) (Modigliani and Miller 1958). Inspired by Miller and Modigliani's works, a line of research has developed accrual accounting valuation models based on the results of dividends policy irrelevance (i.e., Feltham and Ohlson, 1995; Ohlson, 1995; Penman, 2010; and etc.). Because of the profound effects of the accrual accounting valuation models on academic research and investment practices, any possible improvements will not be trivial. This paper reviews two popular accrual accounting valuation models and provides some comments on these models and future research suggestions for this line of research.

Keywords: Equity valuation, Book value, Residual earnings, Abnormal earnings growth, Clean surplus relation, Dividend, risk, Cost of capital

1. Introduction

Modigliani and Miller (1958) (hereafter MM58) bring up a question: "What is the cost of capital to a firm?" The MM58 points out that the required cost of capital is related to risk and proposes that "the market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate ρ_k appropriate to its class (MM58, pp. 268)." Miller and Modigliani (1961) (hereafter MM61) suggest that a firm's value is irrelevant to its dividend policy but shall solely reflect its future earnings and growth. (Note 1)

Inspired by the results (in MM58 and MM61 that the cost of capital of a firm is related to its risk and the firm's value is irrelevant to its dividend policy), Feltham and Ohlson (1995) and Ohlson (1995) formulate valuation models using accrual accounting data: contemporaneous and future earnings, book values, and dividends. These valuation models are called the residual income model (hereafter RIV), or more generally, the abnormal book growth model (ABG) (Ohlson, 2009, page 233) because these models show that the abnormal growth of book value is the key driver of a firm's value that is captured by its book value (Penman, 2010, page 169). Using the ABG model (or RIV), (Note 2) a line of research on value relevance predicts and tests valuation effects of book value, any other accounting data or/and events that researchers believe impact the firm's value.

The ABG model (or RIV) assumes the clean surplus accounting condition: the change in book value equals the difference between earnings and dividends net of capital contribution. However, in general, this accounting condition is "dirty" (Note 3) because publically traded firms use accruals accounting according to U.S. GAAP. This weakness casts a doubt on the reality and application of the residual income model although the model has been used widely in academic research, Wall Street practices, and various financial applications.

To overcome this weakness, Ohlson and Juettner-Nauroth (2005) propose that the abnormal earnings growth valuation model (AEG) does not require the clean surplus condition. However, concerns about the clean surplus assumption in the accounting data valuation models have not been completely solved after two decades since Feltham and Ohlson (1995) and Ohlson (1995) shed light on the relationship between a firm's value and its residual earnings and book value.

Because of the profound effects of the accounting data valuation models on academia and practice, any improvement of these models would be appreciated by researchers and practitioners. Instead of a criticism of these models, this paper provides suggestions that might be helpful to increase ABG (RIV)'s usefulness and to relax the clean surplus assumption.

The RIV model predicts that a firm's value equals its current book value plus discounted future residual earnings under the clean surplus condition. The AEG model predicts that a firm's value equals the present value of future expected earnings and the present value of capitalized abnormal earnings. However, the comprehensive earnings used in the valuation model are not clean because they include dirty surplus items (other comprehensive income in the shareholder equity statement). Also, accrual accounting depends on people's subjective judgments involved in developing income numbers. The later may give good opportunity for firms to manipulate their earnings (i.e., earnings management). This paper offers a few suggestions for future research on improving the models by incorporating dirty accounting at a certain level. However, since this paper does not derive a model theoretically, any suggestions made here may be subject to theoretical proof.

This paper is organized as follows: the next section reviews the background of accrual accounting valuation models. Section 3 compares the applications of the accrual accounting valuation models and the dividend discount model using numerical examples. Section 4

provides my suggestions on relaxing the clean surplus condition and comments on discount rate selection. Section 5 summarizes and concludes the paper.

2. Accrual Accounting Valuation Models

This section reviews accrual accounting valuation models extending the valuation framework of MM 61.

2.1 Abnormal Book Value Growth Model (ABG)

Based on the results of MM 61 that dividends are value irrelevant, Ohlson (1995) proposes a model that a firm's market value relates to its current and future earnings, book values, and dividends. There are three assumptions in the valuation model.

Assumption 1 (PVED): As in the standard neoclassical models of security valuation, the present value of expected dividends (PVED) determines the market value. Risk neutrality applies so that the discount factor equals the risk-free rate (i.e., an economy has investors with risk neutrality and homogenous beliefs).

The market value of the firm:

Present value of expected dividends assumption (PVED):

$$P_t = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t(\bar{d}_{t+\tau}) \quad \text{(A1)}$$

Assumption 2 (CSR): Let y_t = (net) book value (BV) at date t; and x_t = earnings for the period (t-1, t).

Regular owners' equity accounting applies: accounting data and dividends satisfy the clean surplus relation, and dividends reduce BV without affecting current earnings.

$$y_{t-1} = y_t + d_t - x_t \quad \text{(A2a)}$$

$$\text{and } \partial y_t / \partial d_t = -1, \ \partial x_t / \partial d_t = 0 \quad \text{(A2b)}$$

Combining A1 and A2, we have (Ohlson 1995, page 667)

$$P_t = y_t + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t(\bar{x}^a_{t+\tau}) \quad (1)$$

Where $\bar{x}^a_t \equiv x_t - (R_f - 1) y_{t-1}$, the residual earnings.

Assumption 3: A linear model frames the stochastic time-series behavior of abnormal earnings. This variable is defined as current earnings minus the risk-free rate times the beginning of period BV, which is earnings minus a charge for the use of capital.

In short, the ABG valuation model, a more general form of RIV, can be expressed as (Ohlson 2009, page 244):

$$P_0 = y_0 + \sum_{t=1}^{\infty} R^{-t} z_t \quad (2)$$

Where $z_t \equiv y_t + d_t - Ry_{t-1}$; and R=1+r (>1), the discount factor, an exogenous constant.

2.2 Abnormal Earnings Growth Model (AEG)

Because the analyses of ABG borrow the clean surplus relation assumption, some researchers doubt whether the results of the ABG model hold in the dirty surplus accounting setting. Ohlson and Juettner-Nauroth (2005) propose an abnormal earnings growth valuation model (AEG) with the claim that the model does not depend on the clean surplus relation. This model represents the present value of expected dividends model (PVED) by capitalizing on forward earnings plus present value (PV) of capitalized increments in the future expected earnings (adjusted for earnings arising from retained earnings) (i.e., PV of abnormal earnings growth) (Ohlson, 2009, page 233).

Conceptually, the AEG model can be expressed by equation (2) also, where $z_t \equiv x_{t+1}/r + d_t - R\,x_t/r$ (Ohlson 2009, page 245). Please refer to the short proof of the model in the Ohlson's (2009, page 257) 8th endnote.

These accrual accounting based valuation models are not affected by dividend policies, share issues, or share repurchases. Please refer to the full length of analyses of these points by Feltham and Ohlson (1995), Ohlson (1995 and 2009), Ohlson and Juettner-Nauroth (2005), and Penman 2010 (Chapters 3 and 5).

These ABG and AEG models have been documented in textbooks and applied in practice. The next section illustrates few numerical examples using the accrual accounting valuation models and the dividends discounted model.

3. Applications of Accruals Accounting Valuation Models

Penman (2010) illustrates how to use ABG and AEG models to predict a firm's value (Chapter 5 and 6).

3.1 Abnormal Book Value Growth Model Application (Note 4)

Penman (2010, page 153) suggests:

Residual earnings = comprehensive earnings – (required return for equity x Beginning-of-period book value)

$RE_t = Earn_t - (\rho_E - 1)*B_{t-1}$

Where, ρ_E ($\geq$1, same as R in equations 1&2) is required return for book value (B) at time t-1. This required return for equity is also called the equity cost of capital. The reason we use comprehensive earnings in valuation but not net income is because the comprehensive earnings are counted into owners' equity, not net income.

After modified equation (2) above, we have (Penman, 2010, page 163):

$$\text{Value of common equity } (V_0^E) = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_3}{\rho_E^3} + \ldots. \quad (3)$$

When we apply this model to equity valuation, there are three possible scenarios related to the residual earnings.

Case 1, a firm does not have any residual earnings ($RE_i \leq 0$) since year i. For example, let i=3 for the illustration purpose, then the equation (3) reduces to equation (4).

$$V_0^E = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_3}{\rho_E^3} \quad (4)$$

Case 2, the residual earnings (RE_{t+i}) in year t+i, the year beyond forecast horizon, will continue at the same amount as that in the last year of the forecast horizon (year t). Then, we need to count into the continued value of the residual earnings beyond the horizon. To simplify the estimation, we assume the subsequent residual earnings be a perpetuity. Then, we can rewrite equation (3) as (5).

$$V_0^E = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_3}{\rho_E^3} + \cdots \frac{RE_t}{\rho_E^t} + [\frac{RE_{t+1}}{\rho_E - 1}]/\rho_E^t \quad (5)$$

And the continued value of the residual earnings in subsequent year t (CV_t) is expressed as $CV_t = \frac{RE_{t+1}}{\rho_E - 1}$; and the PV of CV_t as $[\frac{RE_{t+1}}{\rho_E - 1}]/\rho_E^t$.

Case 3, the subsequent residual earnings grow at a rate of g, sometime referred to as the steady-state condition for the firm. The difference between case 3 and case 2 is that case 2 has g=100% , which indicates there is no growth in case 2. Then, we can rewrite equation (3) as (6).

$$V_0^E = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_3}{\rho_E^3} + \cdots \frac{RE_t}{\rho_E^t} + [\frac{RE_{t+1}}{\rho_E - g}]/\rho_E^t \quad (6)$$

Numerical Example

We use Apple's financial data from 2008 to 2013 to show how an analyst can use the ABG model to predict Apple's value in year 2008 within different forecast horizons assuming we perfectly predict the earnings per share (EPS), book value per share (BVPS), and dividend per share (DPS). That means that, in year 2008, we know the actual EPS, BVPS and DPS for

years over 2009-2013. We also assume the equity discount factor is 10% for the purpose of illustration even though the situation is not real.

Table 1. Financial data of Apple from 2008 to 2013 (Note 5)

	2008	2009	2010	2011	2012	2013
EPS ($/per common share)	6.81	9.25	15.16	28.42	44.49	40.11
DPS		0.00	0.00	0.00	2.65	11.40
BVPS	25.10	35.16	52.18	82.45	125.86	137.40
ROCE	0.27	0.26	0.29	0.34	0.35	0.29
RE		6.74	11.65	23.20	36.25	27.52
Growth in ROCE			0.11	0.19	0.03	-0.17
Growth in RE			0.73	0.99	0.56	-0.24
Growth in Book value		0.40	0.48	0.58	0.53	0.09
Discount factor		1.10	1.21	1.33	1.46	1.61
PV of RE		6.13	9.63	17.43	24.76	17.09

EPS: dollar amount of comprehensive earnings per common share outstanding at the end of fiscal year t.

DPS: dollar amount of dividend distributed per common share outstanding at the end of fiscal year t.

BVPS: dollar amount of book value per common share outstanding at the end of fiscal year t.

ROCE: Return on common equity for year t.

RE: Residual earnings per common share outstanding in year t.

Residual earnings =comprehensive earnings – (required return for equity x beginning-of-period book value). $RE_t = Earn_t - (\rho_E - 1)*B_{t-1}$

Growth in ROCE: $(ROCE_t-ROCE_{t-1})/ROCE_{t-1}$

Growth in RE: $(RE_t-RE_{t-1})/RE_{t-1}$

Growth in Book Value: $(BVPS_t-BVPS_{t-1})/BVPS_{t-1}$

Discount factor: factor used to discount a value back to present.

PV of RE: present value in year t of residual earnings per common share outstanding over the forecast horizon.

Table 1 shows financial data for Apple from 2008 to 2013. Values of EPS, DPS and BVPS are dollars per common share. The EPS is computed as the comprehensive income in year t divided by the number of common shares outstanding at the end of year t.

First, we estimate Apple's value in year 2008 using a 3 year forecast horizon. In 2008, an analyst wants to estimate Apple's value using the "forecasted" (Note 6) data over

2009-2011.We can see that it is problematic if we use the present value of the expected dividends model (PVED) because there is no dividend distribution from 2009 to 2011. However, we know Apple's value can't be zero in 2008. Actually, its closing price was $124 on September 26, 2008, one day before Apple's fiscal year ends. One may be curious to ask whether the firm is underpriced or overpriced if using ABG to predict the firm's value.

Table 2a. (ABG model numerical example). Forecasted value of Apple with a three year forecast horizon using data from 2009 to 2011

	PV of RE (2009-2011)	33.18		
Case 1)	Value per share in 2008	58.28		
Case 2)	CV of RE (2011)	232.03		
	PV of CV	174.33		
	Value/PS (using data 2009-2011)	232.62		
	CV of RE	464.07	RE/(R-g), g=107%	773.45
Case 3)	PV of CV	348.66		581.10
	Value/PS (using data 2009-2011)	406.95		639.39

Table 2b. (ABG model numerical example). Forecasted value of Apple with a five year forecast horizon using data from 2009 to 2013

	PV of RE (2009-2013)	75.03		
Case 1)	Value per share in 2008	100.13		
Case 2)	CV of RE (2013)	275.23		
	PV of CV	170.90		
	Value/PS using data 2009-2013	271.03		
	CV of RE	550.47	RE/(R-g), g=107%	917.45
Case 3)	PV of CV	341.80		569.66
	Value/PS (using data 2009-2013)	441.93		669.80

CV of RE: valuation for continued residual earnings subsequent to forecast horizon.

PV of CV: present value of CV term in valuation.

Value/PS: forecasted value of the firm per common share outstanding.

g: residual earnings growth. We assume g=105% (and 107%) in the above illustration.

R: required rate of return in year t. We assume this R is constant over the forecast horizon.

Table 2a exhibits different values of the firm under the three scenarios we discussed above.

Case 1 valuation assumes no residual earnings after 2011. Therefore, the valuation of the firm in year 2008 is the sum of its book value per share (BVPS =$25.1) and the present value of residual earnings from 2009 to 2011 ($33.18).

V_0^E= 25.1+33.18 = 58.28

One may think that Apple's stock is overpriced if comparing this $58.28 value to its stock price, $124.

Case 2 assumes that residual earnings (RE) will continue beyond the forecast horizon. This continued RE will be as same amount as the RE in the last period of the forecast horizon. Then, we need to add this continued value (CV) from the residual earnings beyond forecast horizon to the valuation equation. In table 2a, we see the CV, which is $CV_t = \frac{RE_{t+1}}{\rho_E - 1} =$ 23.20/0.1 =230.2. The present value of CV_t is 174.33 if we discount it by 10%, the rate of required cost of capital.

Then, the value of the firm is:

V_0^E= 25.1+33.18 + 174.33= 232.62

We can see the value of the firm increase dramatically with this CV term in the valuation equation. Immediately, we see that Apple's stock is underpriced ($124< $232.62)!!! We shall buy Apple's stock at this moment.

Now, we look at case 3. In this scenario, we assume that RE continuously grows at the rate g (>100%) beyond the forecast horizon. We need add this continue growth RE value to the valuation equation. For example, if REs grow at g= 105% beyond forecast horizon, then:

$$CV_t = \left[\frac{RE_{t+1}}{\rho_E - g}\right] = 23.20/(1.1\text{-}1.05) = 464.07$$

Present value of CV_t = 348.66

Accordingly, the value of the firm is:

$$V_0^E = 25.1+33.18 + 348.66 = 406.95$$

We can adjust forecast the growth rate g. If we let g=107% beyond the forecast horizon, the PV of CV_t = 581.10, and the firm's value is 639.39 correspondingly. We can see the driver of the firm's value is the RE and the growth in future RE. Actually, Apple's stock price reached $705.04 on September 4, 2012 although its closing price did not hold at such high level. Analyses here just show how one can make money by using accrual accounting valuation model wisely. Well, a nature question may rise immediately: how can one predict Apple's earnings so accurately? That is a challenge for academia, practitioners (i.e., sophisticated financial analysts, institution investors, and etc…). The topic of forecasting earnings has been

covered widely in accounting literature and won't be discussed in this paper for the sake of briefness.

Table 2b shows the valuation exercise using five years as a forecast horizon. We can see that the values of the firm with five year forecast horizon are not quite different from those estimated using three year forecast horizon above. We also find out that dividend distribution does not affect the valuation of the firm (Apple began distribute dividends in 2012).

The next subsection illustrates how to predict a firm's value using the abnormal earnings growth model (AEG), still using Apple's financial data.

3.2 Abnormal Earning Growth Model (AEG) (Note 7**)**

Referring to Penman (2010, page 201), we have:

Abnormal earnings growth= Cum-Dividend$_t$ – Normal Earn$_t$

$$= [Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E * Earn_{t-1}$$

The cum-dividend earnings are those produced from taking the dividends and reinvesting them back into the account.

Value of equity = capitalized forward earnings +extra value for abnormal cum-dividend earnings growth

$$V_0^E = \frac{Earn_1}{\rho_E - 1} + \frac{1}{\rho_E - 1}\left[\frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \frac{AEG_4}{\rho_E^3} + \cdots.\right]$$

$$= \frac{1}{\rho_E - 1}[Earn_1 + \frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \frac{AEG_4}{\rho_E^3} + \cdots.] \quad (7)$$

Numerical Example

Table 3 illustrates a numerical example of how to forecast a firm's value using the abnormal earnings growth model (AEG).

Table 3. (AEG model numerical example) Forecasted values of Apple with a four year forecast horizon using data from 2009 to 2012

	2008	2009	2010	2011	2012	2013
EPS ($/per common share)	6.81	9.25	15.16	28.42	44.49	40.11
DPS		0.00	0.00	0.00	2.65	11.40
Discount factor		1.10	1.21	1.33	1.46	1.61
DPS reinvested ($0.1*DPS_{t-1}$)						0.27
Cum-Div Earnings		9.25	15.16	28.42	44.49	40.37
Normal Earnings		7.49	10.17	16.68	31.26	48.94

	($1.1*EPS_{t-1}$)						
	Abnormal Earnings Growth		1.76	4.99	11.74	13.23	-8.57
	PV of AEG		1.60	4.13	8.82	9.04	-5.32
	PV of AEG 2009-2012	23.58					
	Total earnings to be capitalized	30.39					
Case 1)	Value /PS (No AEG after 2012)	303.90					
Case 2)	CV (AEG growth, g=105%)	264.61					
	PV of CV	180.74					
	Value /PS	484.63					

We assume the discount factor is 10%, which is an arbitrary number and just for the illustration purposes.

The cum-dividend earnings are earnings produced from taking back the dividends and reinvesting them into the account.

Normal earnings = $\rho_E * Earn_{t-1}$, where ρ_E is the return rate on equity, $Earn_{t-1}$ is the earnings in previous year.

Abnormal earnings growth= Cum-Dividend$_t$ – Normal $Earn_t$ = $[Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E * Earn_{t-1}$, where ρ_E is the return rate on equity, d_{t-1} is the dividends in previous year.

PV of AEG: present value of abnormal earning growth.

CV of AEG: valuation for continued abnormal earnings growth subsequent to forecast horizon.

PV of CV: present value of CV term in valuation.

Value/PS: Forecasted value of the firm per common share outstanding.

g: abnormal earnings growth. We assume abnormal earnings grow at a consistent rate of 105%.

R: required rate of return in year t. We assume this R is consistent over the forecast horizon.

We use a four year forecast horizon in our analyses of AEG model because of Apple's data restrictions. The AEG model analyses need to valuate abnormal earnings growth (AEG) within and beyond a forecast horizon. Apple began to have a negative AEG since 2013. If we use five years as the forecast horizon, we will run into a problem: the continued value of subsequent abnormal earnings growth is negative in case 2. Apple is preferred over other

companies for the purpose of comparison with the value prediction application using the ABG model above.

Valuation of case 1 is based on a forecast that AEG will be zero after the forecast horizon, year 2012. Case 1 capitalizes the earnings per share for year 2008 ($6.81) and the abnormal earnings growth (AEG) form 2009 to 2012. The present value of the total AEG from 2009 to 2012 is $23.58 per common share outstanding using 10% as the required return rate. Using 10% as the discount rate is arbitrary and only for illustration purposes. Section 4 discusses more details about discount factor selection. The total value of earnings to be capitalized in year 2008 is $30.39(= 6.81+23.58) per common share outstanding. Similar to PVED, we capitalize the current period earnings and PV of AEG in the forecast horizon using equation (7) to have the estimated value of Apple in 2008.

$$V_0^E = (6.81+23.58)/(1.1-1)= 303.9$$

This value is close to the value estimated in case 2 using ABG model.

Case 2 assumes that subsequent AEGs after the forecast horizon continue to grow beyond the forecast horizon, so we add a continuing value that incorporates this growth. Assuming that the AEG constantly grow at a rate of 105% subsequent the forecast horizon, in year 2012, we have a value (CV) of $264.61 for the continued abnormal earnings growth beyond the year 2012. The present value of this CV term in 2008 is $180.74. Then, we have the estimated Apple's value in 2008 is

$$V_0^E = (6.81+23.58)/(1.1-1) +180.74 = 484.63$$

The AEG valuation model shows the value driver is abnormal earnings growth. Both case 1 and case 2 predict that Apple was underpriced in 2008 compared to its stock closing price of $124 on September 27, 2008.

As we discussed previously, PVED model is problematic in predicting Apple's value. PVED would value year 2013 most; however, both ABG and AEG models predict a lower value since 2013 because of decreases in book value growth and in abnormal earnings growth. The closing price of Apple decreased to $479.95 on Sep. 28, 2013 from $647.79 on Sep. 29, 2012 which is shown in Table 4. (Note 8) It is not difficult to see that its price has moved to converge with its intrinsic value estimated by ABG and AEG.

Table 4. Stock closing prices of Apple at the ends of the fiscal years of 2008-2013

	Sep. 27, 2008	Sep. 25, 2009	Sep. 24, 2010	Sep. 23, 2011	Sep. 28, 2012	Sep. 27, 2013
Close Price/Per Share	$124.00	$176.33	$282.65	$390.92	$647.79	$479.95

Apple's stock closing prices at the ends of fiscal years of 2008-2013. Data were obtained from finance.yahoo.com.

4. Comments and Discussion on Accrual Accounting Valuation Models

It is beneficial to use ABG and AEG are that we need not worry about a firm's dividend policy in the equity valuation as proposed by MM61 and it is easy to see the value drivers. However, as we reviewed in section 2, both ABG and AEG rest on the assumption that the change in book value in the current period equals to the current earnings deducted dividends distributed, the clean surplus relation (CSR). Even though both models do not use this condition (CSR) in valuation models, the process of deriving these models assume CSR without exception.

Some researchers are concerned that the CSR will reduce the usefulness of the accrual accounting valuation models (ABG and AEG). Some studies in accounting suggest using the growth in the number of employees to check whether a firm's earnings growth is due to earnings management or true earnings growth. Therefore, I think that valuation work using ABG and AEG may consider adding a control parameter or variable representing the true growth in book value or in abnormal earnings. The growth number should not be a "managed" (or manipulated) number.

The other concern about the accruals accounting valuation models is the discount factor used in the models. Modigliani and Miller (1963) correct the their statement (in MM58) on the relation between tax and a firm's value and restate that a leveraged firm has a higher value compared to a non-leveraged firm holding other conditions constant for the tax shield effect on cost of capital. Miller (1977) further suggests that a firm's capital structure affects its value for the tax shield to debt. A firm's default risk increases with the increase in leverage, which influences the equity cost indirectly. Therefore, the discount factor used in the accrual accounting valuation models is sort of arbitrary and lacks solid theoretical proof.

In the illustrations above, we use 10% as a discount factor or a rate of required returns, which is quiet arbitrary and just for illustration purposes. MM58 introduces risk into the cost of capital. Later research has shown that many factors may influence the cost of equity: such as a firm's capital structure, operating environment, the nature and characteristics of business… Therefore, discount rate selection will be questionable too. However, this issue will be encountered by other valuation models too. This issue may not be problematic for accrual accounting valuation models compared with other peer valuation models in finance textbooks (i.e., free cash flows (FCF), dividend discount models (PVED)…).

We are not aware of current research that has settled the above two issues on CSR and discount factors. It may be interesting to see future research (both theoretical and empirical) on these topics.

5. Conclusion

This paper reviews Miller and Modigliani's (MM) valuation framework of dividend policy irrelevance and subsequent accrual accounting valuation models inspired by MM. One can see that accrual accounting models (i.e., ABG and AEG) have some advantages over traditional valuation models such as free cash flows (FCF) and PVED. Accrual accounting models not only do not depend on dividend distribution policies but also show value drivers

that increase a firm's value (i.e., REs and AEGs). The paper also discusses the disadvantages of the accruals accounting valuation models that rely on clean surplus relation and issues of discount factor selection. The later one is disputable not only for accrual accounting valuation models but also is common in traditional valuation models (i.e., FCF, PVED).

Future research may theoretically improve accrual accounting valuation models, apply these models in empirical work in new avenues, or use these models in valuation practices in business.

In short, the purpose of this paper is not to criticize the accrual accounting valuation models but to appreciate them by attempting to improve them.

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Notes

Note 1. "Thus, we may conclude that given a firm's investment policy, the dividend payout policy it chooses to follow will affect neither the current price of its shares nor the total return to its shareholders." (MM61, p.414)

Note 2. This paper uses the terms of RIV and ABG models interchangeably.

Note 3. Please refer to the detailed discussion on dirty surplus accounting by Penman 2010 (pages 39, 262-263).

Note 4. Please refer ABG model application details to Penman (2010) chapter 5.

Note 5. All data are obtained from www.sec.gov. website and finance.yahoo.com.

Note 6. We know that data used in this Apple example is not "forecasted" data but real data from sec.gov. website. Here, we call "forecasted data" just for illustration purpose.

Note 7. Please refer the AEG application details to Penman 2010 chapter 6.

Note 8. Table 4 shows Apple's closing prices at the end of fiscal years 2008-2013.