

A CRITICAL ANALYSIS OF ECONOMIC VALUE ADDED

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Abstraksi

Tujuan utama yang ingin dicapai dalam perusahaan adalah memaksimalkan kekayaan pemegang saham. Untuk dapat mengetahui seberapa efektif penciptaan kekayaan tersebut maka dibutuhkan suatu alat yang tepat dalam menilai perusahaan. Mengingat banyaknya kelemahan yang terdapat pada pendekatan tradisional yang selama ini dipakai maka digunakanlah *economic value added* (EVA) dalam penilaian perusahaan. Artikel ini akan membahas konsep dan perhitungan EVA yang pada dasarnya merupakan pengembangan model *residual income*. Meskipun EVA diakui banyak memberikan keuntungan tetapi model ini ternyata juga masih memiliki beberapa kelemahan. Selain itu juga dijelaskan salah satu alternatif dari EVA yang dikenal dengan nama *refined economic value added* (REVA) dan kapan model ini sebaiknya dipakai oleh perusahaan.

Keywords: residual income, economic value added, EVA, EVA adjustments, refined economic value added, REVA

1. Introduction

The primary goal of corporate management is to create value for its stockholders. To maximize value effectively managers need the corporate valuation model. Generally managers use the traditional approach for valuing the firm such as discounted cash flows. This model provides for a rich and thorough analysis of all the different ways in which a firm can increase value, but it can become complex as the number of inputs increases. It is also very difficult to tie management compensation systems to a discounted cash flow model since many of the inputs need to be estimated and can be manipulated to yield the results management wants.

If the markets are assumed to be efficient, we can replace the unobservable value

from the discounted cash flow model with the observed market price and reward or punish managers based on the performance of the stock. Thus, a firm whose stock price has gone up is viewed as having created value, whereas on whose stock price has fallen has destroyed value. Although market prices have the advantage of being up to date and observable, they are also noisy. Even if markets are efficient, stock prices tend to fluctuate around the true value, and markets sometimes do the mistakes. Thus a firm may see its stock price go up and its top management rewarded, even as it destroys value. Conversely, the managers probably be penalized as its stock price drops, even though they may have taken actions that increase the value. The other problem

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with the stock prices as the basis for compensation system is that they are available only for the entire firm. Thus, stock prices cannot be used to analyze the managers of individual divisions of a firm. To overcome these shortcomings many firms now are using an alternative to the traditional valuation model called economic value added (EVA).

2. The Theory of EVA

EVA, an acronym for economic value added is the registered tradename of Stern Stewart & Company used for valuation measure. Basically, EVA is not a new idea and in fact it is identical to residual income (RI). Generally, RI is measured by deducting a capital charge from the firm's profit. The exact way on how either profit or cost of capital is measured, is not specified at all. The only crucial assumption made in most cases is that the sum of accrued earnings measuring the firm's operating profit equals the sum of cash flows from operating and financing activities (Bausch, 2003). According to Young & O'Byrne (2001), there are three distinctive features to differ EVA from RI:

1. EVA draws on advances in capital market theory unavailable to the early users of RI, to derive credible estimates for the cost of equity. By reclaiming the RI concept as their own, and by trying it to performance measurement, EVA's early proponents focused an unprecedented degree of attention on the cost of capital, especially in companies that link managerial pay to EVA.
2. Conventional measures of RI accept operating profit as given. Some EVA proponents argue that any profit number

based on generally accepted accounting principles (GAAP), including RI, is likely to give a serious misleading impression of corporate performance. Perceived biases or distortions inherent in GAAP are corrected, providing presumably more credible measures of performance than unadjusted RI.

3. EVA advocates go much further than earlier proponents of RI in linking performance to management compensation. EVA is seen as a way of offering divisional management value-creating incentives similar to the stock options and other equity-based schemes set aside for top management. The case for EVA linked-compensation is based on the assertion that as EVA grows, so too does shareholder wealth.

Until now, EVA has attracted considerable attention as a valuation and incentive tool. EVA intends to measure the value added or the value generated by a firm for a given period of time. EVA recognizes that this value creation has to be measured after the firm has returned the amount invested and the return due to the creditors and shareholders that contributed to the amount invested.

2.1. Concepts

There are two operational ways of defining EVA namely an "accounting way" and a "finance way". From an accounting perspective, EVA is defined as the difference between the firm's net operating profit after taxes (NOPAT) and its weighted average *dollar* cost of capital. As a result, EVA differs from traditional accounting measures of corporate profit including EBIT (earnings

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before interest and taxes), EBITDA (EBIT plus depreciation and amortization), net income, and even NOPAT because it fully accounts for the firm's overall capital costs. This analytical difference is important to the firm's owners because EVA metric is net of both the direct cost of debt capital and the indirect cost of equity capital, as reflected in the shareholders' required return on common stock. In this context, EVA can be expressed in more general terms as:

$$\text{EVA} = \text{NOPAT} - \$ \text{ Cost of Capital}$$

The firm's dollar cost of capital is calculated by multiplying the percentage cost of capital by the amount of invested capital according to:

$$\$ \text{ Cost of Capital} = (\% \text{ Cost of Capital} / 100) \times \text{ Invested Capital}$$

In turn, the percentage cost of capital is obtained by taking a weighted average of the firm's after-tax cost of debt and equity capital as shown by:

$$\% \text{ Cost of Capital} = (\text{Debt weight} \times \% \text{ After-tax debt cost} + \text{Equity weight} \times \% \text{ Cost of equity})$$

Looking at those formula, we can see that EVA increases and value is created whenever a company can achieve any of the following:

1. Increased returns on existing capital. If NOPAT increases while holding cost of capital (WACC) and invested capital constant, EVA will increase.
2. Profitable growth. When an investment is expected to earn returns greater than the WACC, value is created. Even if a growth strategy is expected to reduce

NOPAT, value is created as long as the incremental NOPAT exceeds the WACC.

3. Divestment of value-destroying activities. Invested capital decreases when a business or division is sold or closed down. If the reduction in capital is more than compensated for by the improvement in the spread between NOPAT and WACC, EVA increases.
4. Longer periods over which it is expected to earn a NOPAT greater than WACC.
5. Reductions in the cost of capital.

From a finance perspective, EVA is defined in terms of how it relates to the firm's market value added (MVA). In this context, MVA is equal to the present value of the firm's expected future EVA. Additionally, since MVA is equal to the market value of the firm less the book capital employed in the business, it can easily be shown that EVA is related to the intrinsic value of the firm and its outstanding debt and equity. Stating these concepts in more general term yields the familiar value-based relationship between the firm's MVA and its EVA according to:

$$\begin{aligned} \text{MVA} &= \text{Firm value} - \text{Total capital} \\ \text{MVA} &= (\text{Debt} + \text{Equity value}) - \text{Total capital} \\ \text{MVA} &= \text{PV of expected future EVA} \end{aligned}$$

These general financial definitions have important implications for the firm's owners. Companies having positive EVA momentum should on balance see their stock prices go up over time as the increasing profits net of the overall capital costs leads to a

rise in the firm's MVA. In contrast, firms with returns on invested capital that fall short of the WACC should see share price declines as the adverse EVA outlook lowers the intrinsic (present) value of the firm.

Hence, by incorporating EVA into the company evaluation process, securities analysts and portfolio managers may enhance the overall pricing accuracy of their research recommendations. Also, with EVA corporate managers have an innovative financial tool for assessing whether their planned investment in real assets will lead to wealth creation (positive NPV) for the shareholders.

Firms are often evaluated based upon year-to-year changes in EVA rather than the present value of EVA over time. The advantage of this comparison is that it is simple and does not require the making of forecasts about future earnings potential. Besides that, it can be broken down by any unit like person, division etc., as long as one is willing to assign capital and allocate earnings across these same units. But there are things to note about changes in EVA (Damodaran, 2003). Focusing on year-to-year EVA changes has least side effects when:

- 1 Most or all of the assets of the firm are already in place, very little or none of the value of the firm is expected to come from future growth. This minimizes the risk that increases in current EVA come at the expense of future EVA.
- 2 The leverage is stable and the cost of capital cannot be altered easily by the investment decisions made by the firm. This minimizes the risk that the higher EVA is accompanied by an increase in

the cost of capital.

- 3 The firm is in a sector where investors anticipate little or not surplus returns, firms in this sector are expected to earn their cost of capital. This minimizes the risk that the increase in EVA is less than what the market expected it to be, leading to a drop in the market price.

On the contrary, focusing on year-to-year EVA changes can be dangerous for:

1. High growth firms, where the bulk of the value can be attributed to future growth.
2. Firms where neither the leverage nor the risk profile of the firm is stable, and can be changed by actions taken by the firm.
3. Firms where the current market value has imputed in it expectations of significant surplus value or excess return projects in the future.

2.2. Attributes

Van den Berg (2003) states that there are three important attributes of EVA as shown below:

1. *Temporal orientation.* There is an implicit assumption in using EVA that the future value of a firm is entirely a function of historic activity. Equity valuation is ultimately the discounted present value of future equity cash flows, and EVA is ultimately still based on historic events (Biddle et.al., 1997).
2. *System dynamics.* EVA is a measurement of a stock of value (added) even though it is typically measured over a period of one year. There is no indication of the rate of change in value addi-

tion during the year. Comparing EVA at the end of two different periods could result in an average rate of change of EVA between those two points in time.

3. *Causal direction.* Empirical evidence does not appear to support the theory that EVA is linked to share value. Biddle et al. (1997) discovered that there is little evidence to support the Stewart claim that EVA is superior to earnings in its association with stock returns or with firm value. In no case did EVA significantly outperform Earnings Before Extraordinary Items (EBEI) in tests of relative information content. On the contrary, in most cases the evidence suggests that earnings outperformed EVA. Further, while the charge for capital and adjustments for accounting distortions show some marginal evidence of being incrementally important, this difference did not appear to be economically significant (Biddle et al., 1997).

Chen and Dodd (2001) examined the value relevance of three measures: operating income, residual income, and EVA. Their study found that all three measures have little information content in terms of value-relevance. Contrary to the claim of EVA advocates, the data did not support the assertion that EVA is the best measure for valuation purposes. Results are consistent with prior studies that find accounting-based information explains little of the variation in stock returns between firms. Relatively low R^2 suggest that over 90% of the variation appears to be attributable to non-earnings-based information. This shows that if firms desire to more closely align organizational metrics with stock value,

a measurement paradigm other than EVA will have to be developed.

2.3 Advantages of EVA

In most cases, the articles referenced cited many positive aspects of EVA. Stephens and Bartunek (1997) state that EVA aligns employee behavior with value creation; it can be used to separate employee incentive compensation from the traditional accounting measures; and the concept is relatively easy to communicate. Milunovich and Tsuei (1996) believe that using EVA encourages capital discipline by making managers consider the cost of capital used.

From the viewpoint of corporate management, Jackson (1996) stated that EVA provides the opportunity for an increase in managerial accountability as a result of its ability to measure the required economic return on all investments. Further, he asserts that the process can be customized to fit the needs of the organization and that it can change management behavior when used effectively. Tully (1993) adds that EVA allows managers, as well as investors, to look at their business operations and quickly see whether the firm is becoming more or less valuable. Chamberlain and Campbell (1995) see EVA as the one measure that combines the income statement and the balance sheet and helps to discourage managers from achieving short-term profits at the expense of long-term goals.

Jackson (1996) also notes that EVA has the ability to transform DCF (used mainly to evaluate multi-year investments) into a simple, readily adaptable measure of annual (or quarterly) corporate operating performance. Mayfield (1997) takes this compari-

son one step further by stating EVA has the advantage over DCF because it allows management to see a connection between operating and strategic investment decisions.

O'Byrne (1996) stated that EVA provides the operating performance measure and valuation multiples that are needed to link the theory to practice. Specifically, his study shows that multiples of positive EVA are significantly higher than those of negative EVA, implying that companies with negative EVAs have value that is higher than what would be expected if the market valued all EVA at the same multiple. In addition, this study shows that multiple of capital tend to decline with size, implying that the market assigns higher multiples to a given level of EVA for smaller companies.

3. EVA Adjustments

Some users of EVA adjust profits prepared under GAAP to correct for the perceived inadequacies of standard financial reporting practice. They hope that the adjustments will produce more reliable EVA figures (see Appendix 2). According to Young & O'Byrne (2001) EVA accounting adjustments are designed primarily to:

1. Reserve the conservative bias in GAAP that requires successful efforts accounting and expensing R&D costs. The logic behind successful efforts accounting approach is that assets should be of future value to the firm. If an asset's value is significantly impaired, and so too is the company's ability to extract economic benefits from it, the asset should be written down or if worthless, disappear entirely from the balance sheet.
2. Make the accounting return on capital

a better proxy for the economic, or internal rate of return by 1) substituting sinking fund and economic depreciation for amortization and depreciation by the straight line method; 2) recognizing future period cash costs on a present-value basis (e.g., deferred tax expense, bad debt expense, and warranty expense)

3. Increase accountability for shareholder funds by 1) eliminating pooling of interest accounting; 2) recognizing off-balance-sheet debt; 3) recognizing stock options as a business expense.
4. Limit management's ability to manage earnings by eliminating accruals for bad debts and warranties.
5. Eliminate noncash charges such as goodwill amortization and deferred tax expense
6. Make current EVA a better measure of market value by 1) excluding non-operating income and assets; 2) capitalizing part of the capital charge.

Because these adjustments make EVA to be more complex, companies should select accounting adjustments which are consistent with their goals. So, these adjustments will differ from company to company. Young & O'Byrne (2001) suggest four criteria for evaluating accounting adjustments:

1. Is the adjustment based on sound finance theory?
2. Does the adjustment have a significant impact on the EVA measure that is used for incentive compensation?
3. Does the adjustments significantly improve's EVA's ability to explain returns and market values?
4. Is the adjustment likely to have a significant impact on managerial decision

making?

4. The Critics of EVA

While many seem to feel that EVA is problem free and the answer to corporate management's quest for a true measure of performance, it is not without limitations. Keys et al. (2001) state that using EVA as a valuation tool has several limitations as discussed below :

1. Managers will have fewer choices in financing operations.
Because the imputed cost of common equity will normally be higher than the cost of borrowing, EVA will increase as the debt-to-equity ratio increases. This can lead to the disproportional borrowing, thus resulting in a highly leveraged capital structure. To avoid this problem, Stewart proposes the use of the weighted average cost of capital in calculating EVA. However, he provides no specific guidelines on how this targeted capital structure should be determined.
2. Risky projects will be accepted and moderately risky projects will be rejected.
The use of a higher cost of capital will make the riskier investments, these are projects with higher potential return to be accepted, while projects having moderate potential returns and risks will be rejected. Either one of these actions may be inconsistent with a company's goals. Projects accepted to increase EVA may be too risky for some companies. Similarly, some projects rejected based on EVA may be acceptable for some companies.
3. EVA is too complex.

EVA calculations will be very complex if manager made all the recommended adjustments, so manager will have to be given significant training. Cates (1997) states that it is difficult to verify EVA results because adjustments are generally not published. He adds that the results also depend on assumptions and judgments that can vary from company to company, making it difficult to conduct reliable comparisons. This supported by Peterson & Peterson (1996) who note that data required in determining adjustments is difficult to obtain and that estimates of a firm's EVA are sensitive to the cost of capital estimation.

4. EVA is easy to manipulate.

EVA calculations are based on conventional accrual accounting methods, thus may be manipulated by biasing the estimates required in these methods. For example, depreciation rates, estimates of bad debts, and amortization rates could all be manipulated to increase EVA.

5. EVA is a short-term measure.

Both income and capital used in EVA calculations are short-term measures of performance. Income is generated for one year and capital at one point in time (or the average for a year). Short-term performance can be easily manipulated to the detriment of long-term performance. Dillon & Owers (1997) believe that single-year focus in maximizing current year EVA may lead to problems in the future. To prevent the managers from sacrificing long-term EVA from sacrificing long-term EVA for the short run, Stewart recommends the use of an

EVA incentive plan that sets a limit on the amount of bonus paid while banking the difference (Stephens & Bartunek, 1997).

6. EVA is a single performance measure that includes no measures of quality or time.

Using any single performance measure can lead to the detriment of other aspects of performance. For example, EVA includes no direct measures of quality or of time-based competition.

7. EVA should not be used for capital budgeting.

Net Present Value (NPV) is better than EVA for capital budgeting because it uses cash flows and takes the time value of cash flows into consideration. EVA does neither. Instead, EVA selects projects that should be rejected while rejecting projects that should be accepted.

5. REVA: An Alternative to Accounting Based EVA

Critics of EVA argue that the book value-based EVA measurement framework does not capture the investors' opportunity costs as EVA does not take into account that investors expect a return on the market value of the firm. If investors sell the firm for its market value and invest their proceeds in assets identical in risk, they could expect to earn a return equal to the firm's WACC on the firm's overall market value and not only on the book values of the firm's investment shown in the balance sheet. Consequently, the capital charge to reflect this opportunity cost of investors (Richter & Honold, 2000). Besides that, mainly practitioners argue that

EVA does lack comparability in case of identical business with different book values of their respective investment. For example there is a difference between divisions with respect to the internal vs external growth strategies in the past. As a consequence of external growth in the past acquired goodwill is part of the capital in these division while other division, although yielding the same future cash flow have a small asset base. Thus the EVAs of the division without acquired goodwill exceeds the EVA of other divisions due to a lower capital charge (Bausch et.al, 2003).

Bacidore et al. (1997) have offered a new measure they named REVA (Refined Economic Value Added) to overcome these drawbacks of EVA. Compared to EVA, the basis used for the capital charge in REVA calculation is the market value of the firm rather than book values of its assets so it captures investor's opportunity costs correctly. Besides that, it uncouples the capital charge from the age of a division's assets and from the extent to which acquired goodwill is part of the division's assets. As results REVA produces a higher capital charge than EVA, if the firm's market value exceeds the book values of its assets, and vice versa. But because it is measured from market values, and market values are usually available only at the firmwide level, REVA can be used only at the corporate level. EVA would be still be needed at lower levels of the organization.

However, REVA's usefulness as a performance measure is suspect. REVA has a severe pitfall as any changes in market values (which incorporate expectations of future performance for the long term) are in-

cluded into capital charge but not in a corresponding measure into the net operating profit. Only if these changes are realized in the accounting accruals, e.g. by an impairment of assets, both profit measurement and capital charge do match under an REVA regime.

5.1. Interpreting a Negative REVA

Although REVA is hugely negative, which is always the case for the most successful value creators, the implications of the current year's performance for future EVAs could result in a higher share price (Young & O'Byrne, 2001). One of the REVA's creators argues that the measure's real value is detecting mispriced securities and not as a measure of corporate performance. Companies with highly negative REVAs would be viewed as relatively overpriced, while highly positive REVAs stocks would be seen as underpriced. The problem with this logic is that nearly all companies with large EVA growth expectations impounded in their existing share price will have a negative REVA. It is of course questionable whether all companies be overpriced.

Under the REVA approach, invested capital is measured on the basis of total market value, including the capitalized value of future growth opportunities. Meanwhile, NOPAT is based entirely on current operating performance, ignoring, as does any short-term financial measure, the value creating effects of investing activities (such R & D) that may deliver huge amounts of EVA in the future.

If a company is systematically creating future growth value, its capital charger

under REVA will increase from one year to the next. REVA will always ignore value-creating activities that are not reflected in the current year's operating results, while charging management for a capital base that includes the capitalized value of such activities from previous year. The irony of REVA is that those companies that are most successful in creating future growth opportunities, and therefore the companies with the highest excess return will have the lowest (most negative) REVAs.

6. Conclusion

Considering many weaknesses involved in traditional valuation approach, most companies now are well advised to use EVA as a measurement for value creation, which actually is another version of a long known and compelling concept called residual income. To make EVA more reliable companies should make some recommended accounting adjustments based on their specific needs. However, EVA is not the superior indicator of business and management performance. This is demonstrated by showing various general limitations of using EVA. So, companies that implement EVA should take the limitations of EVA explicitly into account. Besides that, companies would better consider to combine using another valuation tool such as REVA instead of EVA. With regards to the incentive systems, REVA would be appropriate to be used in corporate level while EVA is still be needed at lower levels of the organization.

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Appendix 1
**Definitions of NOPAT Components, The Cost of Capital and
Capital Components**

NOPAT COMPONENTS

Income available to common stock – income available for common stock dividends

Interest expense after taxes – interest expense on all interest-bearing debt (including imputed interest expense on noncapitalized leases, provided management intends to employ a leased asset on a relatively permanent basis) minus tax savings on interest.

Preferred dividends – dividends paid on preferred stock.

Minority interest provision – the income attributed to minority shareholders of a subsidiary company in consolidated income statements.

COST OF CAPITAL COMPONENTS

Cost of capital = $[y \times (\text{Equity} / \text{Capital})] + (1-t) \times b \times (\text{Debt} / \text{Capital})$, where y is the return that equity investors require for a given company and for a given leverage position (debt to equity ratio) of this company.

t is the marginal corporate tax rate; b is the interest rate at which current debt can be replaced.

Here equity is the sum of common equity, preferred stock, and minority interest as well as equity equivalents components of capital. Debt is all interest-bearing debt.

CAPITAL COMPONENTS

Common equity – accounting book value of common stock, additional paid-in capital, and retained earnings.

Interest-bearing debt – accounting book value of all interest-bearing debt and present value of noncapitalized leases discounted using an imputed interest rate, provided the company intends to employ these leased asset on a relatively permanent basis.

Preferred stock – accounting book value of preferred stock.

Minority interest – accounting book value of the interest held by minority shareholders in a subsidiary company shown in the consolidated financial statements.

Equity equivalents – accounting reserves that are usually created as a result of non cash accrual charges to income.

Deferred tax reserve – cumulative difference between the accounting provision for income taxes and taxes actually paid.

LIFO reserve – reserve usually presented in notes to financial statements by companies employing a LIFO valuation of ending inventory. This reflects the difference between the FIFO and LIFO valuation of ending inventory.

Cumulative goodwill amortization – cumulative accounting amortization of goodwill. The difference between goodwill initially and currently reported.

Unrecorded goodwill – goodwill that would have been recorded in a business combination had the combination been accounted for using the purchase method instead of the pooling of interest method.

(Net) capitalized intangibles – research and development expenditures capitalized and amortized over the estimated payoff period (instead of charging them to income immediately).

Bad debt and other reserves – accrual accounting provision made to estimate the amount of uncollectible receivables; other reserves such as inventory obsolescence reserve and warranty reserve.

Source : Revised from Stewart III, G.B. (1991). *The quest for value*, New York: Harper Collins

Appendix 2
Adjustments Suggested for Calculating EVA

Stern Stewart & Co. proposes the following operations and adjustments for converting from book value to what it calls 'economic book value'. They recommend performing similar adjustments in the book NOPAT.

Operations for calculating the "Economic book value"	Operations for calculating the "Economic NOPAT"
Equity book value + debt book value + preferred stock + minority interest (equity)	Earnings available for common stock + interest (1- tax rate) + preferred stock + minority interest (earnings)
BOOK VALUE	NOPAT
ADJUSTMENTS + deferred taxes + LIFO reserve + cumulative depreciation of goodwill + uncapitalized goodwill + allowance for bad debts + allowance for stock obsolescence + accrued R & D expense - cumulative depreciation of R & D + capitalization of non-cancelable contracts + accrued losses from sale of assets	ADJUSTMENTS + increase in deferred taxes + increase in LIFO reserve + depreciation of goodwill + increase in allowance for bad debts + increase in allowance for stock obsolescence + R & D expenses - depreciation of R & D + implicit interest of non-cancelable contracts + losses from sale of assets