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Economic Value Added (EVA): A Literature Review

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Abstract

Traditional accounting based performance measures fail to assess the true economic return of a firm. In this regard Economic Value Added (EVA) reflects true economic profit of a firm. This paper explores the role, limitations, foundation, computation of economic value added (EVA) from the established literature. In addition, this paper addresses a few adjustments into residual earnings to reach into EVA. Finally a few numerical examples to introduce key adjustments have been provided. However, there are some other adjustments that are not addressed in this paper. Hence, considering all the financial adjustments in computing EVA can make the paper more worthy of knowledge sharing and dissemination. EVA is termed as a better performance measure across the firms.

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1.0 Introduction

It is well recognized in finance literature that maximization of shareholders' wealth is the ultimate objective of a firm. Here, maximization of the share price makes a bridge with the maximization of the wealth. In this circumstance, a good performance measure helps to assess a firm's performance in terms of wealth maximization (ACCA Global, 2011). A number of firms still use profit based performance measures failing to take into account opportunity cost like cost of equity capital (ACCA Global, 2011). Moreover, profit based performance measure like accounting profit is altered due to accrual based earnings management and real earnings management. The accountants' discretion sometimes plays a role in altering the accounting profit due to use and implication of accounting standards (ACCA Global, 2011). Economic value added acts in fixing out the drawbacks embedded in traditional profit based performance measures and allows the firms meet the ultimate objective.

Value added refers to the increase in wealth of an organization. It is a popular concept in measuring income (Haller and Stolowy, 1998). It inherits underlying concept from macro-economics, especially related to the calculation of national income, measured by the performance of an economy known as National Product or Domestic Product (Haller and Stolowy, 1998). Other than the common usages, value added has also been used as a performance indicator in different areas of business administration (Haller and Stolowy, 1998).

Accounting value added in each year in shareholders' wealth is the net profit of each year added to the book value of shareholders' wealth (equity). Accounting value added can't not address over-investment and under-investment problems. It ignores opportunity costs (implicit costs). It is not a fact rather an opinion due to the application of accounting standards. The main objective of this paper is to explore the role, foundation, computation, and limitations of economic value added (EVA) from the literature. In addition, this paper addresses the key adjustments into residual earnings (RI) to reach into EVA.

2.0 Why Economic Value Added (EVA)?

Accounting profit cannot take into account the opportunity cost. The opportunity cost of any designated alternative is the greatest net benefit lost for taking that alternative. EVA as a financial measure comes very closer to capture true economic profit through consideration of opportunity cost and in modern finance EVA is less debatable among the practitioners and a good performance measure directly associated with the creation of shareholders' wealth (Shil, 2009). EVA gives more emphasis on creation of value for the shareholders by the management and it is quite different from other measures as all other measures largely depend on accounting data which are mostly historic (Shil, 2009). EVA has been implemented by a large number of firms to drive managers create value for the shareholders (Dodd and Chen, 1996). Firms may intentionally pay tax to validate that they have been profitable and create false impression in shareholders' mind (Shill, 2009). EVA rectifies this error and fixes out all distortions underlying in the accounting data (Shill, 2009). Financial decision relying on accounting information may ache a company (Stewart, 1991). Relying on adjusted financial data, economic value added measures value and help a firm flourish (Makelainen and Roztocki, 1998; Stewart, 1991). Following the conventional trend, to evaluate the financial performance, Earnings Per Share (EPS) is the key financial measure (Stewart, 1991). However EPS is grounded on past data and not adjusted for current use. Due to embedded limitations in EPS, still managers prefer EPS figures as they claim that good EPS attracts

investors and affect stock prices (Stewart, 1991). In this chase of rising EPS to attract investors, financial strengths of firms are usually compromised (Stewart, 1991). Economic Value Added attempts to improve efficiency and value creation of firms (Shaked and Leroy, 1997; Stewart, 1991). To measure the increase in value made by a firm, EVA uses data from accounting statements (Makelainen and Roztocki, 1998). It accounts all the relevant issues associated to growth of a firm including costs related to growth of the firm in terms of outlay of funds (Stewart, 1991). It measures net benefits by taking into account what all the benefits cost (Stewart, 1991). Stewart (1991) first studied the relationship between EVA and share price with market data of 618 US firms and revealed the strong relationship between them. He has revealed that market value of a firm is equivalent to book value of equity and present value of future EVA. The bonus plan could be established based on EVA. Wallace (1997) explored the effect of introducing management bonus plans counting on residual income (economic profit) and found better performance in the firms using EVA. It has been revealed that the bonus systems drive manager to outperform the normal performance so that after paying bonus the return to the shareholders would be more than it would be without the bonus systems. It is obvious that due to the excessive bonus the benefits to the shareholders might become condensed. This afterwards brings the issue of agency conflict in front. Hence EVA based bonus systems can mitigate agency problems. EVA plays the role in establishing a clear and accountable links between capital investment, strategic thinking, operating decisions, and shareholder value (Singer and Miller, 2003). EVA works as a reliable gauge of a firm's growth in future (Fisher, 1995) as well as an effective measure of the quality of managerial decision (Lehn and Makhija, 1996).

3.0 Research Methodology

A number of research articles have been reviewed from Google Scholar. All concepts have been collected from those papers apart from some text books. In this regards four terms-value added, economic value added, residual earnings, and economic profit have been used to ensure good search of related articles.

4.0 Foundation of Economic Value Added (EVA)

Although economic value added has been first trademarked by Stern and Stewart & co. in 1990, the conceptual underpinning of EVA is not new. For example, the concept of EVA underlines concept of residual income introduced by Alfred Marshall in the 1890s. The conceptual underpinning of EVA was derived from a well-established microeconomic literature regarding the link between firm's earnings and wealth creation (Bell, 1998). Since unadjusted measure could be misrepresentative in theory and practice, it is inevitable to give emphasis on the adjustments of accounting profit to address the opportunity cost of capital (Marshall, 1920). Marshall (1920) also concluded that *"the gross earnings of management which a man is getting can only be found after making up a careful account of the true profits of his business and deducting interest on his capital".*

Solomon (1965) mentioned the difference between net earnings and the cost of capital as 'economic profit', a measure of wealth creation. The residual income is defined as the difference between after tax operating profit and a charge on the firm's invested capital. The charge on the invested capital is known as weighted average cost of capital. EVA is somewhat a variation of the residual income. It denotes economic profit created by a firm after deducting the cost of resources including both debt and equity capital. It is an economist performance measurement where economists consider charges for all resources in

computing the profit including the opportunity cost and this profit is referred as pure profit or rent and financial analysts call it as economic value added (EVA) (Solomon, 1965). Therefore, the important concept of EVA is not whether a firm is making adequate return rather it ensures that return is adequate to cover the cost of capital invested in the firm and to have any return after offsetting the cost of capital. In other words, is there any remaining value after charging cost of capital which is charged at a market demanded return? Therefore, a firm may reveal positive net income to the public and claim that it is profitable by the current business setting, competitive environment, and standards. However, given the state of the profit, the firm can have negative economic value added if the profit is not adequate enough to cover the equity cost of capital at the required rate of return.

To recapitulate, a number of firms can report profit even if they are not creating value over the period. Hence, sometimes even firms with profit cannot generate value if they do not have adequate return to offset the cost of debt capital and cost of equity capital. Therefore, investors will eschew from the firms consistently exhibiting negative EVA over the periods, resulting the transfer of funds elsewhere. Stern and Stewart & co. advised some adjustments to both after tax operating income and capital invested to reach at EVA. Generally, residual income and EVA are the two proxies of economic profit. The EVA is the most refined form of economic profit. This study will explore the idea of economic valued added through the path of residual income. Some numerical hypothetical examples will be provided to make the concept clear.

4.1 Residual Income (RI): Residual income, a measure of economic profit, is left over amount after compensating company's stockholders and all other providers of capital (Stern et al., 1995). Hence, contrary to the profit calculation according to accounting standards, residual income is calculated by deducting finance charge of all type of capital (debt and equity) from net operating profit after tax. General formula used to calculate residual income is given below-

$$RI = NOPAT - WACC \times CI \qquad \textbf{(1)}$$

$NOPAT =$ Net Operating Income After Tax

$WACC =$ Weighted Average Cost of Capital

$CI =$ Capital Invested

4.2 Net Operating Profit After Tax (NOPAT): A firm's cash generation ability is measured by NOPAT ignoring the capital structure (Dierks and Patel, 1997). Stewart (1991) has defined it as "Sales – operating expenses – taxes". That is, net operating income after tax measures the performance of business from its core activities and in doing so, net operating income after tax excludes the tax benefit derived from using debt in capital structure. It does not consider extra ordinary revenue and expenses and also does not consider tax on extra ordinary income. The multiple ways to compute NOPAT are as follows.

Approach-1: $NOPAT = OP - [TC + Int \times t]$ **(2)**

$OP =$ Operating Profit

$TC =$ Total Tax Charge

$Int =$ Interest Expenses

$t =$ Tax Rate

Damodaran (2000) provides another two ways for calculating NOPAT.

Approach-2: $NOPAT = EBIT(1-t)$ **(3)**

$EBIT =$ Earnings before Interest and Taxes

Approach-3: $NOPAT = NI + Int(1-t)$ **(4)**

$NI =$ Net Income

NOPAT is financial distortion free metric. Only operating income and tax on only operating income disregarding tax benefit from debt financing are considered in calculating net operating income after tax. Therefore, tax benefit derived from using debt, considered as financial distortion, has been added back.

4.3 Weighted Average Cost of Capital (WACC): One can define cost of capital as what one should pay for the fund used (Stewart, 1991). Finding out the cost of capital is complicated (Stewart, 1991). In this regard, weighted average cost of capital is usually computed (Copeland et al., 1996). Weighted average cost is the combination of firm's cost of debt and cost of equity (Stewart, 1991). To determine weighted average cost of capital, various parts of capital are examined and weighting factor of each part is applied (O'Byrne, 1996). Formula for weighted average cost of capital (WACC) is given below-

$$WACC = W_E \times R_E + W_P \times R_P + W_D \times R_D(1-t) \quad \textbf{(5)}$$

$W_E =$ Weight on Common Shares (Percentage of Common Shares of Total Fund).

$W_P =$ Weight on Preferred Shares (percentage of Preferred Shares of Total Fund).

$W_D =$ Weight on Debts (Bond, Debentures, or Long Term Notes) (Percentage of Debt of Total Fund).

$R_E =$ Required Rate of Return on Common Shares or Simply Cost of Common Shares.

$R_P =$ Required Rate of Return on Preferred Shares or Simply Cost of Preferred Shares.

$R_D =$ Required Rate of Return on Debts or Simply Cost of Debt.

$(R_D \times t)$ is known as tax shield on cost of debt. Due to the interest expense on debt, we get tax shield benefit i.e. $(D \times R_D \times t)$. D is the total debts in firm's capital structure.

Interest rate of debt is termed as cost of debt. It is widely accepted that an industry average interest rate can be used. The cost of preferred stocks can be found dividing annual dividend paid by the value of preferred share. The cost of common shares is represented by the opportunity cost of the suppliers of funds. Determining the cost of common shares is very difficult. To find out the cost of common stocks, it is better off to look at past costs (Stewart, 1991). Many researchers suggest using capital assets pricing model (CAPM) to estimate the cost of common shares. Nowadays CAPM is widely used in computing the cost of common shares. The cost of common shares under CAPM is defined as-

$$R_E = R_f + (R_M - R_f)\beta \qquad \textbf{(6)}$$

R_f = Risk Free Rate of Return (Return of T-Bill and T-Bond usually works as a proxy of Risk Free Rate of Return).

R_M = Average of Stock Market's Periodic Return.

β = Sensitivity of a Particular Stock's Return with Respect to Changes in Market Return. For example, $\beta = 1.1$, it means that if market return goes up by 10%, the stock return will go up 11% and if market return goes down by 10%, the stock return will go down by 11%.

The β of a share is estimated from the following equation-

$$Y_t = \alpha + \beta X_t + \varepsilon_t \qquad \textbf{(7)}$$

Y_t = Periodic Return of a Particular Share.

X_t = Periodic Return of Stock Market.

However, the beta of the firm not listed in stock exchange is not readily available. In that case, firstly, we need to find out publicly-traded companies that generate income from similar operations as the private company. Secondly, we need to find out the equity beta (levered beta) for each of the selected firm. Thirdly, we need to find out the unlevered beta (asset beta) for each of the selected firm. Fourthly stage, we need to find out the average unlevered beta by dividing the sum of all unlevered beta with number of the firms. Finally, we need to convert the average unlevered beta to the levered beta by using the target capital structure. The converted levered beta is known as the beta of the private firm. The equity beta is estimated from equation (7).

To clarify how to compute the beta of a private limited firm-A, an example has been given below:

Step-1: Say there are three similar firms-firm-X, firm-Y, and firm-Z listed in stock exchange. Their amount of equity, amount of debt, the tax rate, and the equity betas are given below.

Step-2: Finding out the equity (levered) betas of the selected similar firms.

Items	Firm-X	Firm-Y	Firm-Z
Amount of equity	USD 200	USD 200	USD 300
Amount of debt	USD 100	USD 200	USD 200
Tax rate	0.4	0.35	0.38
Equity beta	1.1	1.25	0.9

Step-3: Finding out the unlevered betas of the selected firms.

Items	Firm-X	Firm-Y	Firm-Z
1+ (1-t)D/E	1.30	1.65	1.41
Unlevered equity beta	0.85	0.76	0.64

***D/E = Debt to equity ratio; t = Tax rate.

Step-4: Finding out the average of unlevered betas of the similar firms.

Items	Firm-X	Firm-Y	Firm-Z	Average
Unlevered equity beta	0.85	0.76	0.64	0.75

Step-5: Converting average unlevered beta of the similar firms to levered beta of private firm using target capital structure of the private firm.

Items	Target Capital Structure
Debt	40%
Equity	60%
Tax Rate	40%
Equity Beta [0.75*(1+(1-t)D/E)] = β	1.05

Therefore, we can use 1.05 as the levered beta of the private firm-A.

4.4 Capital Invested (CI): The capital which is invested in operating asset is used to calculate capital charge, hence residual income. As only operating assets cause NOPAT, it is the best measure of capital in this case. However, it is quite difficult to compute the invested capital for a firm than for a particular project. In a firm, more projects are aggregated and the expenses are distributed across all projects. Using market value of the firm may be one solution however we need a measure of the market of value of assets to judge the quality of assets in place. Since it is difficult to estimate the market value of the assets, analysts usually prefer to use the book value of capital instead of the market value of capital invested (Damodaran, 2000). Bacidore et al. (1997) suggested to use the cost of capital on the opening market value of the firm's equity plus debt. However, it is convenient and popular to take beginning book value of invested capital. Banerjee (2000) has provided the logic for taking beginning invested capital is that a company would at least take a year to earn a return on investment. Two approaches can be used to calculate capital invested- **Financing approach** (adding all interest bearing debts (both short and long term) to owner's equity) and **Operating approach** (subtracting all non-interest bearing liabilities from total assets).

4.5 Economic Value Added (EVA), The Most Refined form of Economic Profit: EVA refines the Residual Income (RI) and is referred as the true economic profit or rent. After adjusting some items with RI, EVA can be found. Therefore, EVA is defined as-

$$EVA = [NOPAT \pm Adj.] - WACC \times [CI \pm Adj.] \quad \textbf{(8)}$$

$Adj.$ = Accounting Adjustments.

From the above Equation (8), we can say that Residual income can be converted to economic value added incorporating Accounting adjustments into consideration. Accounting adjustments are taken under consideration to eliminate accounting distortion which results from using accounting principles.

4.6 A Few Financial Adjustments in Residual Earnings to Get Economic Value Added (EVA): There are some adjustments made with RI to reach at EVA (Horngren et al., 2019 and ACCA Global, 2011). These are explained below.

Adjustment in research, development, promotion, training, and customer development expenditures: Expenditures of research and development, promotional activities, training activities, and customer development must be added with the operating profit and must be capitalized due to their long term effect on the firm. Those expenditures provide benefits for a longer term. For example, apparently firms record immediately training expense and advertising expense as current year expense. But these expenses provide benefits for more than one period.

Adjustment in depreciation: The depreciation on fixed assets based on accounting standard should be added back to profit. Later economic depreciation should be charged on the fixed assets and must be recorded as expense in the income statement. For example, under the straight line method, each year same amount of depreciation is charged. However, under economic substance, each year value erosion of the fixed asset is not the same.

Adjustment in allowance for doubtful debts and deferred tax provision: Capital employed must incorporate provision for doubtful debts and deferred tax provisions. Provision for doubtful debt and deferred tax provision usually arise due to conservatism principle in financial accounting. Any income recoded in the income statement due to changes in those items must be deducted from NOPAT and any expense recorded in the income statement due to changes in those items must be added with NOPAT.

Adjustment in operating lease: Charges under the operating lease must be added once again to the NOPAT. Under the finance lease there are interest and depreciation of leased assets. Interest must be added back to NOPAT and accounting depreciation of leased assets must be superseded with the economic depreciation.

Adjustment for LIFO reserve: Through LIFO reserve a firm can defer taxable income. To keep the LIFO reserve a firm follows LIFO cost flow assumption to value the inventories. The total reserve must be added back to the invested capital and the increase in reserve would be added to the NOPAT unlike the decrease in reserve which would be deducted from the NOPAT.

Adjustment in tax: Use taxes paid rather than tax expenses.

5 .0 Limitations of Economic Value Added (EVA)

The EVA is not out of limitations too. Because of giving emphasis on long term investments by firms, sometimes EVA does not match to objectives of the firms and the actual EVA of long term investment cannot be computed in objective basis (Shil, 2009). Perhaps EVA is not an appropriate primary performance indicator for firms that expect positive cash flow in future with large scale investment today (Shil, 2009). Calculation of cost of equity capital by CAPM varies from time to time and as a result betas for different time frame are not unique. Hence, cost of equity capital might be inaccurate in EVA calculation. A firm could be quite profitable in the long run with a lot of assets in its balance sheet but it shows negative EVA today (Shil, 2009). Due to a number of adjustments in accounting profit and capital employed, calculation of EVA is sometimes complicated.

6.0 Conclusion

True economic profit cannot be computed following the traditional performance measures like net profit and earnings per share. In this regard economic value added (EVA) plays the role. It highlights the true economic profit of a firm. It fixes out all the problems engraved in accounting profit based on historical data through a series of adjustments. Following the established literature, this paper highlights the role, limitations, foundation, and computation of EVA. In addition, this paper provides some examples to compute EVA. This paper will help the managers to implement EVA in performance analysis instead of other popular financial measures like net profit and earnings per share. This paper also addresses a few key adjustments in computing EVA. This paper has addressed only a few adjustments to reach at EVA from RI. There are still a number of adjustments that can be addressed in future studies. Stern and Stewart co. so far identified 160 adjustment made to reach at economic value added. Considering all adjustments could make the paper more worthy of knowledge

dissemination. This paper helps the managers and practitioners to implement economic value added in firms and other enterprises.

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Appendix: A

1. Operating lease adjustment:

Leased asset value = $ 20000, lease term = 5 years, Market interest rate = 12%

$$Minimum\ lease\ payment = \frac{20000}{\{\frac{1-\frac{1}{(1+.12)^5}}{0.12}\}} = \$5548$$

If we want to calculate EVA at the end of year-1 then:

- We have to add $5548 with operating Profit
- We have to add PV of next four years lease payments with invested capital
- We have to deduct economic depreciation of the leased asset from the operating profit

$$PV\ of\ next\ 4\ years\ lease\ payments = \frac{5548}{1.12} + \frac{5548}{1.12^2} + \frac{5548}{1.12^3} + \frac{5548}{1.12^4} = \$16851$$

Let the economic depreciation rate is 10%.

- Add $5548 and deduct $2000 (.10*20000) from operating profit.
- Add $16851 with invested capital.

2. Depreciation adjustment:

- Add accounting depreciation and less economic depreciation.
- Adjust change in accounting depreciation and economic depreciation with the invested capital.

For example, economic depreciation in 2009 is $3000 and in 2010 is $2500. The accounting depreciation in each year is 4000.
Therefore,

- Add $4000 and deduct $2500 from operating profit of 2010.
- Add $1000 (4000-3000) with the beginning invested capital of 2010.

3. Adjustment of LIFO reserve:

$$LIFO\ reserve = FIFO\ inventory - LIFO\ inventory$$

- Only the change in LIFO reserve would be adjusted with operating profit. Increase would be added and decrease would be deducted.
- Beginning LIFO reserve would be added with invested capital.
  For example, LIFO reserve in 2009 is $12000 and in 2010 is $15000.
- Add $3000 (15000-12000) with operating profit
- Add $12000 with the beginning invested capital

For example, LIFO reserve in 2009 is $12000 in 2010 is $10000

- Less $2000 (12000-10000) from operating profit
- Add $12000 with the beginning invested capital

4. Provision for doubtful debt adjustment

- Add increase in provision and less decrease in provision from operating profit
- Add beginning provision with the invested capital.

For example, provision in 2009 is $2000 and in 2010 is $3000

- Add $1000 (3000-2000) with operating profit
- Add $ 2000 with the beginning invested capital

For example, provision in 2009 is $3000 and in 2010 is $2000

- Less $1000 (3000-2000) with operating profit
- Add $ 3000 with the beginning invested capital

5. Tax adjustment

To calculate EVA, we have to use cash tax.

Let

$Cash\ Tax = C_T$

$Accrual\ Tax = A_T$

$Deferred\ Tax = D_T$

$Tax\ sheild\ on\ interesxt\ expense = Interest * Tax\ Rate = T_s$

$Cash\ Tax = A_T + \Delta D_T + T_s$

$Adjusted\ Operating\ Profit = Operating\ prfit\ before\ tax - Cash\ Tax$

Appendix: B

Comprehensive Example-3: Calculate EVA and RI from the following excerpts:

Particulars	$
Total Revenue	20,000.00
Total Operating Expenses:	
R&D	(2,000.00)
Administrative and selling	(4,000.00)
Employee Training	(5,000.00)
Operating Profit	9,000.00
Interest	(2,000.00)
Tax Expenses	(1,050.00)
Net Profit	5,950.00

Tax paid	1,000.00
Tax Rate	15%
Duration R&D	4 Years
Duration of Training Expenses	5 Years
Total Assets	20,000.00
Current Liabilities	500.00
Invested Capital	19,500.00
WACC	12%

Solution:

Accounting Distortion in income (DII)	**$**
Allocation of R&D	(500.00)
Allocation of Training	(1,000.00)
R&D	2,000.00
Training	5,000.00
Total Distortion in R&D and Training	5,500.00
Tax adjusted distortion in R&D and Training	4,675.00
Tax expenses	1,050.00
Tax paid	(1,000.00)
Total Distortion	4725.00

Accounting Distortions in Capital (DIC)	$
Allocation of R&D	(500.00)
Allocation of Training	(1,000.00)
R&D	2,000.00
Training	5,000.00
Total Distortion	5,500.00
Tax adjusted distortion	4,675.00

Calculation of Residual Income	$
NOPAT	7,650.00
WACC*Invested Capital	(2,340.00)
Residual Income	5310.00

Calculation of EVA	$
NOPAT	7,650.00
Distortions in Income(DII)	4725.00
WACC*(IC+DIC)	(2,901.00)
EVA	9474.00

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