

## ECONOMIC VALUE ADDED: THEORY AND IMPLICATIONS

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Rupali Gupta\*

### ABSTRACT

*Gone are the days when profit maximization and wealth maximization were identified as goals of the company. Today's wisdom perceives value maximization as the main aim of the company. Managers of the company are responsible for this maximization of shareholders' value. EVA (Economic Value Added) is a value based performance measure that gives significance to value creation by the management to the owners. It is an internal management performance measure that compares net operating profit to the total cost of capital. Stern Stewart & Company is credited with devising this trademark concept in 1990. The usability of EVA depends on the quality of accounting information. Since under conventional accounting system, the traditional accounting information suffers from several distortions, it fails to provide sufficient information for computing true EVA. Therefore, there is a need to adjust EVA in line with accounting system, management philosophy and the degree of demand of such a system. This paper attempts to provide a theoretical foundation for EVA discussing its concept, background, definition, adjustments, calculation and other related issues. The paper shall help in better understanding of the logics of successful implementation of EVA.*

**KEYWORDS:** EVA, NOPAT, WACC, Net Operating Profit after Taxes, Capital Employed, Cost of Capital.

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### Introduction

The financial performance measure that captures the true economic profit of the firm more closely than any other measure is the Economic Value Added (EVA). It holds less debate and is a significant measure in the modern economics and finance area. It is directly associated in creating shareholders' wealth over the period of time. The very logic behind using EVA is that value is created when the return on firm's economic capital employed exceeds its cost of capital. It emphasizes on how much value is created by the management or the shareholders. In other words, it is an internal management performance measure. It is well known fact that accounting mostly produces historical data or distorted data which may not reflect the real status of the company. EVA is different from those traditional methods and tools that rely upon accounting information. EVA thus demands making adjustments to accounting data for making it economically viable.

In conventional accounting, the companies showing profit may not be profitable in real. The old profit concepts are ineffective parameters in explaining whether the reported profit covers the cost of capital and fail to indicate the clear surplus. Peter Drucker in his article in Harvard Business Review puts the matter as, "Until a business returns a profit that is greater than its cost of capital, it operates at a loss. Never mind that it pays taxes as if it had a genuine profit. The enterprise still returns less to the economy than it devours in resources... until then it does not create wealth, it destroys it." A common practice followed by companies is to prove that they have made profit for their shareholders by paying taxes.

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\* Senior Research Fellow, Faculty of Commerce, Banaras Hindu University, Varanasi, Uttar Pradesh, India.

However, it is explicitly recognized that the capital employed by the management carries a cost and therefore must be paid as if it were a wage. This correction is done by EVA besides adjusting for distortions that are very much prevalent with the information generated by conventional accounting. EVA is therefore most demanded tool in every situation since it succinctly summarizes how much and from where a company created wealth. A large number of companies have implemented EVA to motivate managers to create shareholder value (Dodd & Chen, 1996). The decision role is very simple; a positive number tells us that the company more than covered its cost of capital and has created shareholders' wealth. Whereas, a negative number indicates that the company did not make enough profit to cover the cost of doing business and that the shareholders' wealth is destroyed (Stewart, 1991). In effect, EVA is the same as residual income (RI) that has been in existence for several decades, with the only difference of handling of accounting information (Dodd & Chen, 1997). EVA makes potentially over 160 adjustments to the traditional accounting data for removing the existing distortions (Stewart, 1991; Blair, 1997). Calculation of RI disregards these distortions.

An earnest effort has been in this paper to present and justify EVA as a value based performance measure. This is an attempt to produce a manual or guideline that is all inclusive theoretically to readers who are unaware with the technicalities of EVA. EVA with its definition and historical background is presented first. Later, steps to simplify EVA implementation process are identified. Next, advantages of using EVA are discussed with reference to other performance measurement tools. Last but not the least, limitations of EVA is mentioned.

### **Historical Background**

The concept of EVA is not new. EVA is a variation of the residual income (RI), an accounting performance measure, defined as the difference between firm's accounting profits [usually the operating profit after tax (Biddle et al. 1997; p.302) less capital charge. The capital charge is calculated by multiplying the book value of firm's assets with its weighted average cost of capital (WACC) (Bromwich & Walker, 1998; p.391). EVA makes adjustments to the residual income for calculating income and capital. RI considers only the accounting figure and an attempt is made to remove the possible distorting effect of GAAP accounting. Alfred Marshall, in 1890, was the earliest to mention the concept of residual income (Wallare, 1997; p.1). According to Marshall, economic profit is defined as the total net gains less the interest on invested capital at the current rate. According to Dodd & Chen (1996, p.27) the idea of residual income appeared first in accounting theory literature early in the past century by e.g. Church in 1917 and by Scovell in 1924 and appeared in management accounting literature in 1960s. Also the concept was discussed by Finnish academics and financial press in 1970s. It was defined as good way to complement ROI control (Virtanen, 1975; p. 111). Residual income was less popular in 1970s or before and was not recognized to be an important performance measure in a number of companies. However, EVA with the concept of residual income has gained wide publicity in the recent years. Moreover, EVA along with other residual income measures is on a strengthening trend. Furthermore, a great deal of companies is adapting EVA as a performance measurement tool. EVA is marked with a concept of Market Value Added and thus it offers a sound link to market variations.

The value added concept finds its roots in the early 1990's. This measure which was registered and trademarked by the New York based consulting firm Stern Stewart & Co. In 1990's has been adopted by several major corporations of the world leading EVA to have successful stories from the very beginning. There is ample amount of empirical literature that measures the strength of relationship between market return and accounting income measures. O' Byrne (1996; p.125) is of the view that "EVA unlike NOPAT (net operating profit after taxes) or other earning measures like net income or earnings per share, is systematically linked to market value. It should provide a better predictor of market value than other measures of operating performance". According to Chen & Dodd (1997), EVA measures provides more information in terms of stock return association than the traditional accounting measures, but that traditional measures should not be entirely replaced by EVA since measures such as E/P, ROA and ROE have incremental value in monitoring firm performance. They do not find any significant difference between EVA and the traditional RI in terms of stock return association. EVA is also evaluated as a management tool from the point of view of accounting measurement. Pleiffer (2000) considers mathematically EVA vs. Discounted Cash Flow Methods for resolving internal agency problems in decentralized decision making. Besides the theoretical discussion, the numerical behaviour of EVA under different conditions needs to be understood and also EVA's numerical association to the accounting measures like ROI, ROE and profitability measures such as TRR needs to be explained.

### EVA Definition

Maximization of shareholders' value is the primary financial objective of any firm. Management should find means to create value for their owners. EVA can be defined as the amount of economic value added by the management for their owners. According to the basic concept of EVA, a firm can only create value for its shareholders (i.e. add economic value) if it earns a return on its capital in excess of its cost of capital. By now, it is established that accounting profits are inefficient in representing real value created for the owners. Nevertheless, accounting profit is required to start with the calculation. It is required to be converted to the economic profit. The distortions pertaining to the conventional accounting are identified and the accounting profit is adjusted to make it distortion free which finally gives the amount of EVA. EVA is defined by Stewart (1990, p. 137) as Net Operating Profit after Taxes (NOPAT) subtracted with a capital charge. Algebraically, it can be written as:

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - \text{Capital Costs} \\ \Rightarrow \text{NOPAT} &= \text{NOP} (1-T) - \text{Capital Employed} * \text{Cost of Capital} \\ \Rightarrow \text{Adjusted NOP} &= \text{NOP} (1-T) - \text{Capital Employed} * \text{WACC} \\ \Rightarrow \text{Adjusted NOP} &= \text{NOP} (1-T) - [\text{Capital Employed} * \{ (R_E * \frac{E}{CE}) + (R_D * \frac{D}{CE}) (1-T) + \dots \}] \\ \Rightarrow \text{Return} &= \text{Capital Employed} * \text{WACC} \\ \Rightarrow \{ \text{Rate of ROI} - \text{WACC} \} &= \text{Capital Employed} \dots \dots \dots \text{eq. 1} \end{aligned}$$

The above derivation makes it clear that computation of EVA needs a number of adjustments to be done. The accounting distortions in the net operating profits are adjusted and a capital charge at the weighted average cost of capital is subtracted from the NOPAT to reach to the amount of EVA. Thus there are three factors that are required to be computed for EVA:

- Adjusted earnings before interest but after tax i.e. NOPAT,
- Weighted average cost of capital (WACC), and
- Capital Employed

The amount of EVA thus reached explains what happens to the shareholders' wealth. The shareholders' value is created and increases when returns are greater than the cost of capital i.e. when EVA is positive. Contrarily, shareholder value is destroyed or decreases when the returns are less than the capital charge, i.e. when EVA is negative.

### EVA as a Management Tool

EVA is superior to accounting profits as a measure of value creation because it recognizes the cost of capital and, hence the riskiness of a firm's operations (Lehn and Makhija, 1996; p.34). EVA is more widely used as value based performance measurement tool. This section compares EVA with some accounting based performance measurement tools as well as some other value based measures.

#### • EVA vs. Traditional Measures

EVA incorporates common accounting based items such as net operating profit, equity capital and interest bearing debt. It differs from the traditional tools for the reason that it takes into account the cost of capital. The accounting rate of return (ARR) and the extent to which it approximates the true return measured with IRR was studied by Solomon and Laya (1967). Harcourt (1965), Solomon Laya (1967), Livingston and Solomon (1970), Fischer and McGowan (1983) and Fischer (1984) concluded that the difference between ARR and IRR is so large that the former cannot be used as an indication of the later (De Villiers, 1997; pp.286-87).

Return on capital is considered as good performance measure among all traditional measures. It is calculated by different companies using different formulas and is given different names. For example, return on Investment (ROI), Return on Equity (ROE), Return on Net Assets (RONA), Return on Assets (ROA), Return on Capital Employed (ROCE), etc. The main drawbacks underlying these accounting based rates of return is that the return for shareholders is not necessarily maximized by maximizing these rates of return. Making decisions based on rates of return alone is similar to assessing products based on percentage of gross margin and sales, where product which has the highest gross margin- sales percent may not be the most profitable product. EVA and ROI hold the same difference as that of between NPV and IRR. Although good, but IRR alone cannot be relied upon for assessing two investment projects.

Long since, from shareholder's perspectives, NPV (Net Present Value) or Discounted Cash Flow (DCF) is acknowledged as theoretically best analytical tools. Mathematically, EVA gives the same results

in valuation as DCF or NPV (Stewart, 1990; p.3). It should be remembered that in corporate control, EVA and NPV go hand in hand as also RI and IRR. While the later tell us about the rates of return, the former identify the impact on wealth of shareholders. IRR can always be used along with NPV for taking investment decisions and ROI can always be used with EVA for company performance. However, the concentration should not be to maximize ROI and IRR and the decision should not be based on these two metrics alone. The additional information provided by ROI and IRR is not of much importance in making decisions. When the aim is to maximize return to shareholders, maximizing rate of return do not matter much. EVA and NPV hold commanding role in corporate control.

- **EVA vs. Other Value Based Measures**

In addition to EVA, there are a good number of value based measurement tools that are used for the same purpose. Some are developed by consulting industries while others by academicians. Table 1 gives a quick review to some of these measures.

**Table 1: Some of the Other Value Based Measures in Addition to EVA**

Value- Based Measure	Developed By	Calculation
Cash Flow Return on Investment (CFROI)	Boston Consulting Group (BCG) and HOLT value Associates	CFROI (Gross Cash Flow/Gross Assets) is calculated in two steps. First, inflation-adjusted cash flows are compared with the inflation-adjusted gross investment. Then, the ratio of gross cash flow to gross investment is translated into an internal rate of return by recognizing the finite economic life of depreciating assets and the residual value of non-depreciating assets such as land and working capital (Myers, 1996).
Cash Value Added (CVA)	Academicians	$CVA = \text{Operating Cash Flow (OCF)} - \text{Operating Cash Flow Demand (OCFD)}$ . OCF is the sum of Earnings before Depreciation, Interest and Tax (EBDIT, adjusted for non-cash charges), working capital movement and non-strategic investments. OCFD represents the average capital costs per year (in absolute terms) that is constant over the investment period. (Ottoson & Weissenrieder, 1996)
Shareholder Value Added (SVA)	Dr. Alfred Rappaport and LEK / Alcar Consulting Group	Estimated future cash flows are discounted to present value to calculate the value of the firm continuously. Measuring the current performance is based on comparing these cash flow estimates and period's real cash flow (Rappaport 1986, p.183).
Adjusted Economic Value Added (AEVA)	Academicians	It is unlike to EVA in the sense that it uses current value of assets instead of book values.
Refined Economic Value Added (REVA)	Academicians	It uses the market value of the firm in the beginning of the period instead of book value (Bacidore et al 1997, p.15).

Some of the measures are more efficient than EVA since they incorporate and are based on cash flows. However, many of these are complicated and difficult to calculate as compared to EVA. They demand more subjective data. EVA is the most widely used value based performance measure (Myres, 1996; p.42) probably just because it happens to be easier concept compared to others. One of the most important things that are required for the implementation of EVA is that the people in organization understand and get committed towards EVA (Kinkeman, 1997).

#### **Steps in the Computation of EVA**

The computation of EVA requires some basic steps. These are mentioned below which can be modified according to the nature of business or processes where it has been used.

##### **Step 1: Collect and Review Financial Statements**

EVA is based on the financial data that is provided by traditional accounting system. These data are readily available either in income statements or balance sheet both of which are general purpose financial statements.

##### **Step 2: Distortions to be Identified and Adjustments Made**

Computation of EVA requires around 164 adjustments (identified by Stern Stewart) to be made to GAA and internal accounting treatments to improve the measure of operating profits and capital. Since data required are collected from financial statements which are mandatorily prepared under GAAP, it is bound to suffer from distortions which need to be identified and removed through adjustments. This requires a sound understanding of the concept and technicalities of EVA. Moreover, what is required is

tailored EVA. Each company should develop a tailored definition of EVA, considering the organization structure, business mix, strategy, and accounting policies which should be simple and precise at the same time.

### Step 3: Identify the Capital Structure of the Company

A company's capital structure denotes the amount of money invested in the company. It is mix of debt instruments, preferred and common stock on a company's balance sheet. Two methods can be employed for computing the capital structure of the company. First, adding all interest bearing debts (both long and short term) to owners' equity, also called as direct method. Second, by subtracting all non-interest bearing liabilities from total liabilities (total assets).

### Step 4: Determine Company's WACC

Calculation of EVA for a company requires estimation of the cost of capital. The cost of capital depends on so many factors such as financial structure, business risk, current interest level, investors' expectations, macro-economic variables, income volatility, etc. Weighted average cost of capital is among some financial management tools available to calculate the cost of capital. Information required for computing WACC are:

- Components of capital employed iv equity, debt, etc.
- The respective weights of various components into total amount of capital employed.
- Factors affecting the risk and return of various components in a capital structure.
- Standalone cost of all such components in a capital structure.

The overall cost of capital is the weighted average of the various components of capital structure. The cost of each component of capital employed- debt, preferred stock or equity stock- is the return that the equity must forego if they are to invest in the firm's securities (Kolb and DeMong, 1988). A common method employed for estimating the cost of equity is the *Capital Asset Pricing Model* stated in equation 2 as:

$$R_E = R_f + \beta (R_M - R_f) \dots\dots\dots \text{eq. 2}$$

Thus, CAPM postulates that the cost of equity ( $R_E$ ) is equal to the risk free rate of return (return on risk free security) plus a company's systematic risk called beta ( $\beta$ ) multiplied by the market risk premium ( $R_M - R_f$ ) which is the difference between the market rate of return and the risk free rate of return. Calculating cost of other components of capital structure is relatively simple and publicly available in most of the cases. Standalone cost of each component of capital structure can be filled in equation 3 to calculate the WACC given as:

$$WACC = (R_{cs} * W_{cs}) + (R_{ps} * W_{ps}) + (R_d * W_d)(1 - T_c) + (R_x * W_x) \dots\dots\dots \text{eq. 3}$$

### Step 5: Calculate Net Operating Profit after Taxes

Net Operating Profit after Tax (NOPAT) is derived from NOP simply by deducting calculated taxes from NOP. Before that, adjustments need to be made to the accounting profit to convert into economic profit.

$$\text{NOPAT} = \text{Net Operating Profit} - (\text{Net Operating Profit excess of depreciation and Reserves}) * \text{Tax Rate} \dots\dots\dots \text{eq. 4}$$

### Step 6: Calculation of Economic Value Added

Finally EVA can be calculated by subtracting capital charge from the NOPAT.

$$\text{EVA} = \text{NOPAT} - \text{capital Employed} * \text{WACC} \dots\dots\dots \text{eq.5}$$

A positive EVA indicates that shareholder value is created, whereas a negative EVA indicates that the shareholder value is destroyed.

### Limitations of EVA

EVA, although a superior performance measurement tool; is not free from limitations. Some of them are mentioned below:

- EVA is criticized for its short term suitability. Some companies focusing on long term investments find EVA as less suitable for them.
- Again since the future returns cannot be measured but only estimated, true EVA for long term investments cannot be measured objectively.
- EVA is less suitable as primary performance measure for companies that make heavy investments today whose cash flows can be expected only at a distant future.
- Due to inflation and other such factors periodic EVA fails to estimate the value added to shareholders.

- It is possible that a company may have many un-depreciated new assets in the balance sheet and it can show negative EVA even if the business is profitable in the long run. Thus EVA may suffer from wrong periodizing.
- Another drawback of EVA is that it does not have incremental value in predicting. Whereas traditional measures were commonly used for distress prediction.

### Conclusion

EVA has evolved as strong value based performance measure among the list of management tools from the date it is particularly marked by Stern & Stewart Company in 1990. It has gained wide publicity in the corporate world and is increasingly used by a large number of companies. EVA estimates the firm's true economic profit rather than the accounting profit and identifies the real value created for shareholders by subtracting the cost of capital from the firm's profit. It measures the economic additional value produced by the firm to its shareholders over and above the weighted average cost of capital employed. The idea behind multiplying WACC and capital investment is to assess a charge for using the invested capital. This charge is the amount that investors as a group need to make their investments worthwhile. It is seen as an internal management performance measure and readily accepted by both, the shareholders as well as the management. The main challenge comes with its implementation for the first time. The tool, if not welcomed at the very beginning shall not produce fruitful results. The simplicity of EVA is however an important feature which facilitates its successful implementation. EVA is however not free from limitations. The conventional accounting data that produces time barred data causes some major limitations. This makes computation of true EVA- a challenge. Nevertheless, this problem can be solved by building a team that will look after the successful implementation of the tool. It will tailor the EVA. The team shall be responsible for finding all distortions and the ways to adjust them to convert accounting profit into economic profit. Since EVA has advantages and disadvantages, decision should not be based only on EVA. Rather, other measures and information should also be considered simultaneously to improve and maintain its efficacy. Last but not the least; correct management philosophy is always important.

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