EVA for Small Manufacturing Companies

Narcyz Roztocki
Kim LaScola Needy
University of Pittsburgh
Department of Industrial Engineering
1048 Benedum Hall
Pittsburgh, PA 15261
412-624-9830 (phone); 412-624-9831 (fax)
roztocki@pitt.edu and kneedy@engrng.pitt.edu

Abstract

This paper examines introducing Economic Value Added as a performance measure for small manufacturing companies. Advantages and disadvantages of using Economic Value Added as a primary measure of performance as compared to sales, revenues, earnings, operating profit, profit after tax, and profit margin are investigated. The Economic Value Added calculation using data from a small company's income and balance sheet statements is illustrated. Necessary adjustments to these financial statements, that are typical for a small company, are demonstrated to prepare the data for the Economic Value Added determination. Finally, potential improvement opportunities resulting from using Economic Value Added as a performance measure in small manufacturing companies are discussed.

Keywords

Economic Value Added, Small Manufacturers, Small Business, Performance Measure

Introduction

In the nineties, value-based performance measures, such as Economic Value Added have gained immense popularity. Economic Value Added, commonly known by its registered trademark EVA, is already used by more than 250 large companies (Blair, 1997). The literature reports that more and more large companies are deciding to adopt the EVA performance measure as the guiding principle for their corporate policy (Tully, 1998). This development has created business opportunities for the many consulting firms supporting large corporations. Stern Stewart & Co., for example, has been able to generate approximately $50 million in revenue a year from EVA consulting (Clinton & Chen, 1998).

Frequently, EVA is regarded as a single, simple measure that gives a real picture of stockholder wealth creation (Tully, 1998). The reports claim that implementing an EVA policy triggers a company's stocks to rise (Burkette & Hedley, 1997) and its leading managers to act more like owners (Tully, 1993). In addition to motivating managers to create shareholder value and being a basis for management compensation (Stern, Stewart, & Chew, 1989), value based performance measurement systems have further practical advantages. An EVA system helps managers to make better investment decisions, identify opportunities for improvement and consider short-term as well as long-term benefits for the company (Stewart, 1994). Furthermore, studies suggest that EVA is an effective measure of the quality of managerial decisions (Lehn & Makhija, 1996) as well as a reliable indicator of a company's value growth in the future (Fisher, 1995). In summary, constant positive EVA values over time will increase company value, while negative EVA implies value depreciation.

Even though EVA is one of the hottest managerial tools, reports about its implementation in small companies do not exist. Numerous existing reports concentrate on EVA implementations in large multinational corporations only. The purpose of this study has been to examine if small manufacturing companies with less than 100 employees currently use or plan to use EVA as their primary performance measure. In addition, we examine how Economic Value Added can be

calculated in a small manufacturing company using common financial data.

Methodology

Our study consisted of two main steps: interviews with managers in small manufacturing firms and development of an Economic Value Added model for small manufacturing firms.

To gain a better understanding of what is known about the EVA performance measure in small companies, we interviewed approximately 30 managers in six small manufacturing companies mainly within the Pittsburgh area. These managers held positions such as President, Vice-President, or Treasurer. The first objective of these interviews was to find out how much these managers knew about EVA. The second objective was to identify which performance measures were currently being used and which, if any, were going to be introduced in the future. The third objective was to identify why EVA is rarely used in small businesses.

The final objective was to identify how to calculate Economic Value Added for a *typical* small manufacturing company. The Economic Value Added methodology for small manufacturing companies, which is proposed as a result of this study will be referred to as *eva* from this point forward. The use of the lower case letters emphasizes the objective of this system: an easy-to-use and inexpensive, but robust method developed for the needs of small companies.

Because our study represents a small sample size, our conclusions are more anecdotal in nature as opposed to being based on statistical analysis.

Results of Interviews

None of the companies that we interviewed were using EVA. Although some of the managers who were interviewed were familiar with the term EVA, they stated that they had never heard of a small manufacturing company using this financial performance measure. To determine how well a particular company is doing, decision-makers look mainly at results, such as sales, growth in sales, gross profit, profit after income tax and revenues. They believed that the reason why the EVA method is probably so seldom used in small companies is that it is relatively new and believed to be too complex. They knew of no literature or software that would enable them to implement an inexpensive and efficient EVA system.

Economic Value Added Calculation

The proposed method to calculate Economic Value Added for small manufacturers, or *eva*, contains five main steps. These steps will be outlined below. In the following section, these steps are illustrated with one of the manufacturing companies with which we have worked.

Step 1: Review the company's financial data

Nearly all of the needed information to perform an *eva* calculation can be obtained from the company's income statements and balance sheets. Some of the needed information may also be included in the notes to financial statements. In many cases, the two most current years of data will be sufficient.

Step 2: Identify the company's Capital (C)

Generally Accepted Accounting Principles (GAAP) are often misleading in describing a company's real financial position (Clinton & Chen, 1998). Because of this deficiency, Stewart proposes up to 164 adjustments to regain the real picture of a firm's financial performance (Stewart, 1991; Blair, 1997). The objective of these adjustments is to eliminate financing distortions in a company's Net Operating Profit after Tax (*NOPAT*) and *Capital* (Stewart, 1991). According to this approach, some accounting items such as costs for research and product development, restructuring charges, and marketing outlays are considered more as capital investments as opposed to expenses (Stewart, 1991).

A company's capital, *C*, is all of the money invested in the company. A company's capital can be estimated by adding all debts (short-term or long-term) to owners' equity. An alternative way, is to subtract all non-interest-bearing liabilities from total liabilities (or total assets).

Step 3: Determine the company's Capital Cost Rate (CCR)

One major challenge of the Economic Value Added calculation for a company is to estimate its capital cost. In fact, for a small company, estimating its capital costs is perhaps the hardest

part in the *eva* calculation. Capital cost depends on the company's financial structures, business risks, current interest level, and investors' expectation. A common method to identify the cost of capital for a company is to calculate its weighted average cost of capital (WACC) (Copeland, Koller, & Murrin, 1996). The WACC is comprised of costs for all capital sources, such as bank debts, corporate bonds, and shareholder's equity (Copeland, Koller, & Murrin, 1996).

Unfortunately, the WACC calculation, although practical for large companies, is less practical for small companies. For instance, many small companies would have difficulty estimating their cost of debt because their debt is not traded publicly. In addition, they are not rated in Moody's Bond Record. Estimating the cost of equity represents an even bigger challenge. For large companies, the Capital Asset Pricing Model (CAPM) is a common method in estimating their cost of equity (Copeland, Koller, & Murrin, 1996). CAPM postulates that the cost of equity is equal to the return on risk-free security plus a company's systematic risk, called beta, multiplied by the market risk premium (Copeland, Koller, & Murrin, 1996). For large publicly traded companies, betas are published regularly by services such as Value Line (Reimann, 1988). For small companies, since their betas are not published, regression analysis may be used in order to estimate their betas (Ross, Westerfield, & Jaffe, 1999). The next obstacle in the capital cost estimation represents the determination of market risk premium. For large U.S. companies, the recommended market risk premium is 5 to 6 percent (Copeland, Koller, & Murrin, 1996; Stewart, 1991). For publicly traded small companies, the market risk premium is significantly higher with values around 14 percent. (Ross, Westerfield, & Jaffe, 1999). To our knowledge, a market risk premium for privately held companies with less than 100 employees has not been published.

Taking into accounting these obstacles of estimating the cost of capital for a small company, we propose a method derived from the WACC estimation and the CAPM model which has been adapted to the needs of small companies. We call this estimated cost of capital

cost rate *CCR* so as to discriminate between it and the WACC method commonly used for large companies. The *CCR* for a particular company can be estimated as follows:

$$CCR = \qquad\qquad (1)$$
$$CCR_{Debt} \times (Debt/(Debt+Equity))(1\text{-}t)$$
$$+ CCR_{Equity} \times (Equity/(Debt+Equity))$$

Where *t* represents the company's tax rate. CCR_{Debt} can be estimated as follows:

$$CCR_{Debt} = Prime\ Rate + Bank\ Charges \qquad (2)$$

Where the average *Bank Charges* for small manufacturing companies with which we consulted was one to two percent per year. CCR_{Equity} can be estimated as follows:

$$CCR_{Equity} = RF + RP \qquad\qquad (3)$$

Where *RF* is the risk free investment rate and *RP* is the risk premium investment rate. *RF* can be estimated using a yield-to-maturity rate for 10-year government bonds. In contrast, *RP* reflects the risk resulting from investing in a company's equity. The riskier the investment, the higher the *RP*. Table 1 suggest various *RP* ranges depending upon the investment risk.

Table 1. Suggested Range for Risk Premium RP

RP Ranges	Investment Risk
6 % and less	Extremely low risk, established profitable company with extremely stable cash flows.
6 % - 12 %	Low risk, established profitable company with relative low fluctuation in cash flow
12 % - 18 %	Moderate risk, established profitable company with moderate fluctuation in cash flow
18 % and more	High business risk

Step 4: Calculate the company's Net Operating Profit after Tax (NOPAT)

NOPAT is a measure of a company's cash generation capability from recurring business activities and disregarding its capital structure (Dierks & Patel, 1997). Some of the adjustments to *NOPAT*, although valid for a large company, are seldom applicable for a small firm. On the other hand, some of the adjustments applicable for a small company, are seldom applicable for a large company. For example, some researchers observed that an owner-manager's salary in a small business represents a much larger fraction of revenues that in a large company (Welsh & White J. F., 1981). Based on this observation, we can assume that some of the owner-manager's regard their relatively high salary as a part of their compensation for the money invested in company.

To remove the distortion, an adjustment is needed. From the data given on the income statement, *NOPAT* was calculated as follows:

$$
\begin{aligned}
NOPAT = \quad & \textit{Net Profit after Tax} \qquad (4)\\
+\ & \textit{Total Adjustments}\\
-\ & \textit{Tax Savings on Adjustments}
\end{aligned}
$$

Step 5: Calculate Economic Value Added

Finally, the *eva* can be calculated by subtracting *Capital Charge* from *NOPAT* as follows (Stewart, 1991; Reimann, 1988):

$$
\begin{aligned}
eva\ &=\ NOPAT - Capital\ Charge \qquad (5)\\
&=\ NOPAT - C \times CCR
\end{aligned}
$$

If the *eva* is positive, the company created value for its owners. If the *eva* negative, owner's wealth was reduced.

Illustration

As a practical example of the proposed *eva* calculation for small manufacturing firms, we illustrate the methodology using data from one of the companies in the Pittsburgh area with which we have been working. This company is managed by three owner-managers and has approximately 40 employees. The majority of the company's business is in the area of electrical devices, such as motors, generators and electrical industrial equipment. In order to preserve the company's anonymity, we will refer to this company as Pitt Products throughout this paper. Financial data has been simplified to allow the reader to concentrate more on the calculations rather than on the accounting details.

Step 1: Review the company's financial data

The necessary information for the *eva* calculation can be found on the company's income statement, balance sheet and the notes to the financial statements. Table 2 shows a summary of Pitt Product's income statement for 1998 and Table 3 contains its balance sheet for 1997 and 1998.

Note that in the income statement, depreciation is included in the accounting category "Selling, general and administrative expenses." If needed, exact depreciation figures can be obtained from the notes to financial statements.

Table 2. Pitt Products Income Statement for 1998 (in thousands of dollars)

Sales	5,620
Cost of goods sold	(3,513)
SG&A expenses	(1,743)
Income from operations	**364**
Other income	0
Earnings before interest and taxes	**364**
Interest expense	(44)
Pretax income	**320**
Taxes (40%)	(128)
Net income	**192**

Step 2: Identify the company's Capital (C)

The company's *Capital*, according to this methodology, is defined as all money invested in the company regardless of its source (bank loans or owners' equity). *Capital* (using an operating approach) can be estimated by subtracting all non-interest-bearing current liabilities from total liabilities (or total assets). In the case of Pitt Products, accounts payable and accrued expenses represent non-interest-bearing current liabilities. For the *Capital* estimation, some authors recommend using starting capital for a given period (Stewart, 1991). Accordingly, we have estimated the *Capital* of Pitt Products using the 1997 balance sheet entries. In some cases, averaging balance sheet entries may be

recommended (Copeland, Koller, & Murrin, 1996). Table 4 presents Pitt Products *Capital* estimation.

Table 3. Pitt Products Balance Sheet (in thousands of dollars)

ASSETS	1997	1998
Current assets		
Cash	21	28
Accounts receivable	668	768
Inventory	852	892
Prepaid expenses	33	43
Other current assets	26	31
Total current assets	**1,600**	**1,762**
Fixed assets		
Computer equipment	76	84
Furniture and fixtures	15	19
Motor vehicles	30	31
Equipment	157	168
Other fixed assets	22	35
Total fixed assets	**300**	**337**
TOTAL ASSETS	**1,900**	**2,099**
LIABILITIES		
Current Liabilities		
Accounts payable	510	589
Short-term debt	104	120
Accrued expenses	190	211
Total current liabilities	**804**	**920**
Long-term liabilities		
Bank loan/long-term debt	496	550
Total long-term liabilities	**496**	**550**
Owners' equity		
Common stock	25	25
Retained earnings	575	604
Total owners' equity	**600**	**629**
TOTAL LIABILITIES	**1,900**	**2,099**

Table 4. An Estimation of the Capital Employed by Pitt Products (operating approach) (in thousands of dollars)

Total Liabilities	1,900
Accounts Payable	(510)
Accrued Expenses	(190)
Capital	**1,200**

An alternative way to estimate a company's *Capital* (financing approach) is by adding all its financial sources, such as short-term debt, long-term debt, and owners' equity (Stewart, 1991).

Table 5. An Estimation of the Capital Employed by Pitt Products (financing approach) (in thousands of dollars)

Short-term debt	104	9 % of total capital
Long-term debt	496	41 % of total capital
Owner's equity	600	50 % of total capital
Capital	**1,200**	

Assuming that all book values are good estimators of market values and in order to keep this illustration simple, no adjustments to capital have been made. Furthermore, since no owner's equity or Pitt Products' bank debt is traded on a financial market, we have assumed that the values on the balance sheet are good estimators of market values.

Step 3: Determine the company's Capital Cost Rate (CCR)

Lets assume, for simplicity, that the current Prime Rate is eight percent and that Pitt Products is paying current Prime Rate plus one percent by borrowing new money, independent if they ask for short-term or long term debt. In this case, the pre-tax CCR_{Debt} will be nine percent (using equation 2):

$$CCR_{Debt} = Prime\ Rate + Bank\ Charges$$
$$= 8\% + 1\% = 9\%$$

For the cost of equity calculation, let assume, again for simplicity that the yield-to-maturity of 10-year government bonds is five percent. Pitt Products management, believe that *RP* of seven percent is adequate because its business is well established and returns vary only marginally. Having this information and using equation 3, CCR_{Equity} can be calculated as follows:

$$CCR_{Equity} = RF + RP$$
$$= 5\% + 7\% = 12\%$$

Next, the *CCR* can be calculated using Pitt Products' capital structure as shown in Table 5 and using equation 1, as follows:

$$CCR = 9\% \times (600/(600{+}600))(1{-}0.4)$$
$$+ 12\% \times (600/(600{+}600))$$
$$= 2.7\% + 6\% = 8.7\%$$

Step 4: Calculate the company's Net Operating Profit after Tax (NOPAT)

The objective of the various adjustments is to eliminate financing and accounting distortions (Stewart, 1991). One of the adjustments used to eliminate financing distortions made in the *NOPAT* calculation for Pitt Products was to take into account the company's interest expenses. *NOPAT* is a measure of a company's cash generation ability from recurring business activities (Dierks & Patel, 1997). Let assume that in Pitt Product's case that all financing will be made using owner's equity. Thus, no interest expenses will be incurred. However, with this financing approach, tax savings are lost. In this case, Pitt Product's profit will increase by the interest savings ($42,000) less the tax shield on interest expenses. Tax shield, or tax savings, on interest expenses can be estimated by multiplying the interest expenses by the tax rate. In addition, owner-managers stated that they regard approximately $50,000 of their salaries as a kind of compensation for their investment in the company.

Because Pitt Product's income statement does not show categories, such as Research & Development, market-building outlays, employee training, unusual write-offs or gains, there were no further adjustments needed.

Finally, the *NOPAT* was calculated using the above information together with equation 4 as follows:

$$NOPAT = \text{Net Profit after Tax}$$
$$+ \text{Total Adjustments}$$
$$- \text{Tax Savings on Adjustments}$$
$$= 192 + (42 + 50) - (42 + 50) \times 0.4$$
$$= 248.4$$

Step 5: Calculate Economic Value Added

Next, the company's *eva* was calculated using equation 5 as follows:
$$eva = NOPAT - \text{Capital Charge}$$

$$= NOPAT - C \times CCR$$
$$= 248.4 - 1,200 \times 0.087 =$$
$$= 248.4 - 104.4$$
$$= 144$$

In summary, Pitt Products created a positive value of $144,000 for its owners in 1998.

Results

The Pitt Products' owner-managers believed that the process and results of the *eva* calculation provided them with valuable insight into the financial health and performance of their company. For example, they learned that by carefully using debt they could reduce the company's capital cost and realize tax savings.

The Pitt Products' owner-managers assured us that in the future they would continue to calculate *eva* on a three-month basis and compare the changes. Armed with this new approach, they expect improvement in their business performance because the *eva* approach is more consistent with a business objective of wealth creation as opposed to traditional performance measures such as sales or profit. In addition, Pitt Products' owner-managers feel that *eva* will help them to better manage their company's financial resources.

Conclusions

Independent of the size of an organization, long-term shareholder wealth creation is equally important for all for-profit organizations. Surprisingly, many small manufacturing companies still rely on traditional performance measures, such as profit, profit margin, sales volumes, earnings, as the primary measures of their business performance. Since these measures only partially capture a company's true business performance, they can give a false indication of the firm's long-term health outlook.

The managers, who we interviewed in small manufacturing firms, feel that they lack the time and technical ability needed to implement some of the emerging managerial tools, such as *eva*. Managers in small companies are often owners and the decisions that they make often represent both investors' as well as managers' interests in the business. The constant and somewhat overwhelming demand of the daily operational

decisions leaves little time for them to carefully assess the importance of proper investment decisions. In addition, small companies often find themselves in a very reactive position; they are shunned by banks and are highly dependent on just a few customers for business.

The unique challenges facing small manufacturing firms do not change the economic principle that to prosper and grow successfully, a company over time needs to generate average returns that are higher than its capital costs. If a company is not able to show long-term returns which are higher than its capital costs, its long-term existence, independent of the company's size or its business field, will be in jeopardy.

In many cases implementing *eva* in a small company may be a first move toward continuous improvement and a future adoption of modern strategic managerial tools. For example, once *eva* implemented in a company, it may then be able to be integrated with Activity-Based Costing (ABC). This integrated ABC-and-EVA costing and performance measure system would help to better manage both capital and cost (Roztocki & Needy, 1998).

In this paper we have illustrated a simplified methodology that allows the major pieces of Economic Value Added to be used by small manufacturing firms, while eliminating all of the details that a small enterprise would find cumbersome to implement. In most cases, the additional effort in calculating *eva* is outweighed by the value of the additional information showing improvement opportunities.

Mr. Narcyz Roztocki is currently a Ph.D. candidate in the Industrial Engineering Department at the University of Pittsburgh. He is the author of several papers on Activity-Based Costing, Economic Value Added, Integrated ABC-and-EVA costing and performance measure system. Dr. Kim LaScola Needy is an Assistant Professor of Industrial Engineering at the University of Pittsburgh. She has published numerous articles on Activity-Based Costing, Economic Value Added, Integrated ABC-and-EVA costing and performance measure system.

REFERENCES

Blair, A. (1997, January). EVA Fever. *Management Today,* 42-45.

Burkette, G. D., & Hedley, T. P. (1997, July). The Truth About Economic Value Added. *CPA Journal, 67*(7), 46-49.

Clinton, B. D., & Chen, S. (1998, October). Do New Performance Measures Measure Up? *Management Accounting, 80*(4), 38-43.

Copeland, T., Koller, T., & Murrin, J. (1996). *Valuation Measuring and Managing the Value of Companies.* New York, NY: John Wiley & Sons, Inc.

Dierks, P. A., & Patel, A. (1997, November). What is EVA, and How Can It Help Your Company? *Management Accounting, 79*(5), 52-58.

Fisher, A. B. (1995, December 11). Creating Stockholder Wealth. *Fortune, 132*(12), 105-116.

Lehn, K., & Makhija, A. K. (1996, May-June). EVA & MVA as Performance Measures and Signals for Strategic Change. *Strategy & Leadership, 24*(3), 34-38.

Reimann, B. C. (1988, January-February). Managing for The Shareholder: An Overview of Value-Based Planing. *Planing Review,* 10-22.

Ross, S. A., Westerfield, R. W., & Jaffe, J. (1999). *Corporate Finance.* Irwin McGraw-Hill.

Roztocki, N., & Needy, K. L. (1998). An Integrated Activity-Based Costing and Economic Value Added System as an Engineering Management Tool for Manufacturers. *Proceedings from the 1998 ASEM National Conference*, 77-84.

Stern, J. M., Stewart, G. B., & Chew, D. H. (1989). *Corporate Restructuring and Executive Compensation.* Cambridge, MA: Ballinger Publishing Company.

Stewart, G. B. (1991). *The Quest for Value: A Guide for Senior Managers.* New York, NY: Harper Business.

Stewart, G. B. (1994, Summer). EVA: Fact and Fantasy. *Journal of Applied Corporate Finance, 7*(2), 71-84.

Tully, S. (1993, September 20). The Real Key to Creating Wealth. *Fortune,* 38-40, 44, 45, 48, 50.

Tully, S. (1998, November 9). America's Greatest Wealth Creators. *Fortune,* 193-204.

Welsh, J. A., & White J. F. (1981, July-August). A Small Business is not a Little Big Business. *Harvard Business Review, 59*(4), 18-32.