INTEGRATING THE ABC METHOD OF COSTS CALCULATION AND CASH VALUE ADDED

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Abstract

In our paper we intend to explore the possibility of integrating the ABC method of cost calculation with cash based value measure, i.e. the Cash Value Added. Our purpose is to develop an instrument for the management of productive companies that will allow them to administrate the process of value creation at the level of individual products or services.

The activity based costing (ABC) method of cost calculation can be extended to the way of allocating the capital costs to individual products and services. In the same time, the value based measures can register the shareholders' value creation process only at the company level and not for the individual products or services as they lack the information regarding the assignment of capital costs to those products.

By integrating the calculus of Cash Value Added in the ABC method we consider that the managers will get an important managerial tool for the efficient allocation of the investment capital for the various products or services, given their real profitability, which can be determined by including capital costs in the overall cost of the products or services.

Keywords: The company value, value based measures, ABC method, operating costs, capital costs, economic profit, cash value added
JEL classification: G30, G39

1. INTRODUCTION

Each company has to generate a sufficient economic profit during a certain time period in order to be able to secure capital under favourable conditions for its investment projects and to guarantee its sustainable development.

The best motivation for improving the level of the value based management measures (such as the Economic value added – EVA^{TM} or Cash value added - CVA) is provided by

the decisional processes that occur at the basic activities of each company, such as the production process and the customer relations.

The activity based costing method (ABC) is a modern managerial accounting instrument, relying on the idea that the indirect expenses are generated by a certain number of support activities required in order to develop efficient productive processes in each and every company.

Many productive processes consume indirect resources and the products (projects or processes) require these activities, and as a result, the cost of the products is influenced by the cost of these indirect resources. The ABC method does not offer only precise data regarding the level of costs, but also relevant information about their origin.

Inside the companies where the ABC method has been implemented the managers have administrated the costs in a more efficient way, eliminating the activities that did not add value or did not lead to the improvement of the productive processes [Cooper, 1988].

Yet, even the most impressive cost reductions did not automatically imply an improvement in the value creation process and often the shareholders' wealth was left the same or even decreased. The ABC method, although is precise enough in determining the costs, cannot ensure a proper management of the overall capital costs [Hubbell, 1996].

Even if the importance of the non-financial measures of the company results (as it is the case with the ones included in the Balanced Scorecard, devised by the American economists Kaplan and Norton) has increased considerably lately, the two authors do not propose ignoring the quantification of the company activity from the financial perspective [Kaplan and Norton, 1996]. Kaplan and Norton maintained that the failure of converting increased operational performance into a better financial performance should send the managers back to the drawing table to reconsider the company strategy or the way the strategy is implemented.

On the other hand, the *value based measures* (such as Economic value added, Cash value added, Cash flow return on investments) have experienced an important expansion in the last 15-20 years as they have shown to express in a much simpler and exact manner the process of value creation and of increasing the company value. The basic idea with those measures is that the company management can focus its attention on the level of a single economic measure. If the level of that single measure is positive and increasing, the company performs well and the direction is the appropriate one. If the level of that measure is negative or decreasing, the company is on the wrong track, no matter the level of accounting profit or other traditional measures [Dincă, 2001].

However, the correlation between the evolution of the value based measures and the evolution of the market value has yet to be proven, as a study by Pablo Fernandez [Fernandez, 2002] reveals.

The cash value added (CVA) is a concept based entirely on cash flow and it was developed by the Swedish economists Erik Ottoson and Fredrik Weissenrieder in the middle of the 1990's [Ottoson and Weisenrieder, 1996].

The cash value added (CVA) model includes only cash items, i.e. Earnings before depreciation, interest and tax (EBDIT), Working capital movement and Non-strategic investments.

The CVA is determined as the difference between the Operating Cash Flow (OCF) and a cash flow requirement, the Operating Cash Flow Demand (OCFD):

$$\mathbf{CVA = OCF - OCFD} \qquad \mathbf{(1)}$$

The OCFD represents the cash flow needed to meet the investor's financial requirements on the company's strategic investments, i.e. the capital cost (interests and dividends). Instead of measuring the investor's opportunity cost of capital in percentage terms, the CVA model uses the investor's opportunity cost of capital in cash terms.

The strategic investments are the investments that contribute directly to the consolidation and improvement of the company capacity to perform efficiently and to increase its market share.

In its turn, the OCF is determined as the sum of earnings before depreciation, interest and taxes (EBDIT), the modification of the working capital from one year to the precedent one (**ΔWK)** and non-strategic investments (NSI), respective the investment the company makes to maintain the income producing capacity of the strategic investments:

$$\mathbf{OCF = EBDIT + \Delta WK - NSI} \quad \mathbf{(2)}$$

The CVA of a period is a good estimate of the cash flow generated above or below the investor's requirement for that period. This analysis can be done at each level of the company and the CVA for the company is the aggregate CVA of its Strategic investments. Compared to the market-based measures, such as market value added (MVA), the Cash Value Added (CVA) can be calculated at the business unit level. Compared to the stock measures, CVA is a flow and can be used for performance evaluation over time. Compared to the accounting profit measures, such as EBIT, Net Income and Earnings per share, the Cash Value Added (CVA) has an economic profit foundation, maintaining that a business must cover both the *operating costs* and the *capital costs*.

Another variant of CVA appears as part of the Boston Consulting Group system of proposed measures, which also includes the *Cash Flow Return on Investments (CFROI)* and the *Total Shareholder Return (TSR).* The CVA measure proposed by Boston Consulting Group can be determined in two ways. The first possibility is given by deducting the depreciation and amortization (DA), as well as the capital costs from the company gross cash flow [Vâlceanu, Robu and Georgescu, 2005]:

$$\mathbf{CVA = GCF - DA - Capital\ costs} \quad \mathbf{(3)}$$

The second possibility is given by multiplying the margin between the Cash flow Return on Investments (CFROI) and the percentage rate of the capital cost (RCK) with the gross investment of the company (GI):

$$\mathbf{CVA = (CFROI - RCK) \times GI} \quad \mathbf{(4)}$$

The problem with this variant of CVA is that it establishes no direct reference to the operating activity and to the concrete ways in which a company could improve its operational efficiency as a base for increased competitiveness and for adding economic value [Dincă, 2001].

The company managers need a conceptual instrument to allow them to administrate in an efficient manner both the operational and the capital costs. Several authors, such as William Hubbell and Narcyz Roztocki [Hubbell and Roztocki, 1998], or Kim LaScola Needy [Roztocki and Needy, 1999], have proposed an integrated system, based on the Activity Based Costing (ABC) method and the economic value added (EVA^{TM}), which can be used for increasing the shareholders' wealth and improving the cost structure. More recently, the topic was addressed by European authors such as Moisello [Moisello, 2005] or Arena and Azzone [Arena and Azzone, 2005].

In our opinion, the integration is possible even between the ABC method and a cash flow based measure, such as the cash value added (CVA).

The implementation of an integrated system between the ABC and a value based measure (such as CVA) is recommended especially to the companies that record high capital costs. The criterion according to which we can appreciate the existence of significant capital costs is the capital costs-indirect operating costs ratio, also known as the capital-operating ratio (C-O):

$$C\text{-}O = \frac{Capital\ costs}{Indirect\ operating\ costs}.$$

If the C-O ratio is bigger than 0.1 the companies could consider implementing an ABC-EVA^{TM} or ABC-CVA system. The 0.1 level is based on empirical studies made over several years by various analysts and researchers in this field.

2. THE METHODOLOGY OF INTEGRATING THE ABC METHOD AND CASH VALUE ADDED

As the management of the companies considers taking-up certain investments opportunities in projects, products or processes, the overall capital costs should be divided accordingly to the activities that are due to be realized by the mean of that capital. If the allocation of the capital costs to the corresponding operating activities is made arbitrarily, the production costs will become distorted, especially when the capital costs are not proportional to the operating costs.

The ABC method appeared as a mean for correcting a deficiency in the arbitrary allocation of the indirect operating costs for the products. In its turn, an ABC-value based measure integrated system distinguishes two types of activity costs: *operating costs* and *capital costs*. The operating costs express the consumption of economic resources within a company, whereas the capital costs describe the cost of the financing sources for the company. Both the operating costs and the capital costs can present only positive values.

The ABC-CVA integrated method

The possibility of integrating the ABC cost calculation method and a value based measure, i.e. the Cash value added (CVA) is presented in the following example, which illustrates the case of a fictitious productive division (noted as Y) which has two different production lines.

The method necessitates the defining of the structural elements of the cash value added (respectively the operating cash flow, the operating cash flow requirement, the strategic investments and the non-strategic investments). Once the level of CVA has been determined, the appreciations will be similar to the ones made for the ABC-EVA^{TM} systems, with the advantage of using only cash based data and measures. In our example we did not show the set-up of the ABC method to allocate the operating and capital costs to the two production lines, as it does not differ significantly from a usual employment of the ABC method, in which only the operating costs are assigned to the company's products/services [Roztocki, 2000].

Our approach requires the following steps:

a. The determination of the cash value added for the whole business unit, in order to see whether the unit is creating or destroying value;
b. The use of a slightly modified ABC method in order to allocate both the operating and the capital costs for the elements composing the business unit;

c. The calculus of the Cash value added for the elements composing the business line in order to find whether the individual elements are creating or consuming value;
d. Taking the appropriate measures to improve the efficiency of each component of the business unit, so all the components make a positive contribution to the value creation process at the level of the business unit.

We will try to exemplify these four steps for the Y department.

a. *To demonstrate the mechanisms of the method we use the data from the profit and loss account for the Y department, which is presented in table no. 1 below. In order to simplify the reasoning we assumed a 0% marginal profit tax rate. The value of the strategic investment, based on which we calculate the cost of the capital (the operating cash flow requirement), is of 800,000 Lei, distributed equally for the two production lines, the economic duration life is of 10 years and the average overall cost of the capital is 12.6% (100,800/800,000 or the Operating Cash flow demand/Strategic investment).*

Table no. 1- The calculus of the cash value added for the Y department

The measure	Absolute values - in Lei -	Weights (as % of the sales)
Strategic investment	800,000	80
Sales turnover	1,000,000	100
The cost of goods sold	480,000	48
Administrative and selling expenses	326,000	32.6
EBDIT	194,000	19.4
Non-strategic investments	108,000	10.8
Operating cash flow (OCF)	86,000	8.6
Operating cash flow demand (OCFD)	100,800	10.8
Cash value added	-14,800	-1.4

The profit and loss account of the Y department reveals a profitable unit, with an operating cash flow margin of 8.6%. Nevertheless after the deduction of the capital costs, expressed by the operating cash flow requirement, we can notice that this productive unit has consumed economic value during the analyzed period. Or, the operating cash flow is below the level of the cost of the capital required to generate this cash flow.

As a result, at the level of the overall company the managers will try to seek ways for increasing *the gross margin* of the respective department (increasing the selling prices and lowering the costs) or for increasing the *efficiency of employing the productive assets*. They will ask the managers of the respective production unit to cut down the selling/administrative expenses as weight in total sales turnover or to increase the selling prices,

the reduction of the support expenses, the decrease of the level of stocks and accounts receivable, attempting to remove the less value-creating elements.

b. In order to determine the efficiency of the two productive lines we will apply an ABC type analysis, using the table no. 2 below.

Table no. 2 - The ABC type analysis

Measure	Overall company		Fabrication line 1		Fabrication line 2	
	Amounts in Lei	% of Sales	Amounts in Lei	% of Sales	Amounts in Lei	% of Sales
Strategic investment	800,000		400,000	667	400,000	1000
Sales revenues	1,000,000	100	600,000	100	400,000	100
Costs of goods sold	480,000	48	240,000	40	240,000	60
Selling expenses	326,000	32,6	190,000	31.66	136,000	34
EBDIT	194,000	19,4	170,000	28.34	24,000	6
Non-strategic investments	108,000	10.8	48,000	6.0	60,000	15
Operating cash flow	86,000	8.6	122,000	20.33	(36,000)	(9)
Operating cash flow demand	100,800	10.8	71,600	11.93	29,200	7.3
Cash value added (CVA)	(14,800)	(1.48%)	50,400	8.4	(65,200)	10.87

c. The financial situation presented in table no. 2 reveals that the fabrication line no. 1 has no problems. Its efficient production processes and good clients' relations will allow it to obtain high operating margins. The profitability and CVA level problems are obviously originated in the fabrication line no. 2. The managers' efforts do not have to be oriented toward the overall reduction of the operating expenses of this line, but rather onto the identification of the measures which will ensure the sustainable increase of the line profitability.

d. The connection between the ABC and CVA methods is illustrated at the base of the table no.2, through the level of the cash value added (CVA) measure. The CVA analysis increases the importance of this connection beyond the boundaries of the standard profitability analysis. It unveils to the managers a whole range of possibilities concerning the improvement of both the operating margins and of the efficiency of using the assets of the fabrication line no. 2.

The ABC analysis of the assets employed reveals that the production line 1 requires only 667 lei in assets in order to generate 1000 lei in sales, whereas the production line 2 requires 1000 lei in assets to generate the same 1000 lei of sales.

This difference exists as a result of the different stock and account receivable policies applied by the managers of the two production lines.

The managers of production line no. 1 have established close relations with the suppliers and clients that allow them to operate with low levels of work-in-process and stocks of finite products. Moreover, their well-designed commercial credit policy and good customer relations induce low accounts-receivable levels.

In contrast, the production line no. 2 requires 1000 lei of assets at 1000 lei sales as it uses a significant level of stocks at all production levels, presents a deficient use of the working time available and its clients are paying way too slow.

The cost of capital for the two production lines offers a similar picture, even if it starts quite in the opposite way. The first production line can afford a 17.9% rate of the cost of capital (71,600/400,000) as it displays high production efficiency and a good rate of cashing up of the accounts receivable. In the same time, the production line no. 2 has to support only a 7.3% rate of the capital cost (29,200/400,000), but its poor operational efficiency cannot cover even this lower cost.

The transfer of the establishing and follow-up attributes connected with CVA from the department or company levels to the base activities' level and the determining of specific cash value added measures for different products and clients induces an increased motivation for the managers to increase the level of CVA of their functional subunits. Instead of adopting general measures of overall reduction of the costs, assets, products and accounts receivable, the managers can operate with much higher precision, exactly at the level of the specific activities, products or clients that presents negative CVA values.

The allocation of the assets to the products has to be simple and transparent. Some assets, such as the stocks, are directly allocable to the individual finite products. The strictly specialized assets, such as the special production equipment, dedicated tools and special devices, testing equipment, can be allocated to a reduced group of products that use those resources.

Other assets, such as general purpose assets, can be used by a wider group of products. In this case, the allocation of the assets can be made using the same cost objects of tariff-machine-hours type used for the allocation of the operating expenses (depreciation, maintenance, utilities) of the equipment onto the individual products. The latest trends in the global accounting theory and practice encourage the companies to capitalize several types of expenses, such as the research and development, marketing and promotion and to amortize them over a useful functional period. The allocation of the costs of such assets toward individual products has to be straight-forward.

As with the operating expenses, not all the assets costs allocations have to be made toward the final products. Some assets have an obvious connection with the behaviour of certain clients, such as the accounts receivable. In certain situations, some clients may require their suppliers to offer them special packing or dedicated service conditions, in which case the assets -the stocks - can be easy allocated to the respective client and not onto products. Also, the company can acquire specific equipment or can realize research related to the creation of a certain product or improving a technology for a certain client or a client segment. The capitalized value of these intangible assets can be allocated to the specific clients or client segments.

The ABC method has corrected the arbitrary allocation of the indirect operating expenses onto products and clients. The Cash value added has corrected the deficiencies of the financial accounting reports referring to the recognition of the capital costs as an economic expense for the determination of the real profit. When CVA and ABC are used in the same time the managers will get a more real image of the operating profitability and they can di-

rect their efforts and attention – thru the activity based strategic management – toward the activities that generate operating losses and can maintain, protect and expand the economically profitable operations.

The proposed method cannot bring by itself an improvement in the efficiency of the economic activity, but it can offer valuable information to the managers, helping them to direct the improvement process. The managers have to be decisive to take the necessary steps of the improvement process.

3. CONCLUSIONS

The integrated ABC- Cash value added method will assist the managers to understand that the capital investments are a precious resource, which have to be used in the most efficient way possible. The capital expenses that are proposed to be added to the activities and identified down to the level of products are meant to attract the attention upon the level of the capital employed and to assist the managers in knowing the capital costs associated with the production process.

The company management can get a distorted image of the profitability if they consider only the accounting net profit and it ignores the economic surplus obtained according to the integrated system between the ABC method and a value based measure. Once implemented, such an integrated system can be used as a managerial engineering tool, meant to prevent the managers to focus on the short term decisions, based on the accounting profit, which can destroy the medium and long term economic value.

The integration between the ABC method and a value based measure is obvious, because both instruments were created to solve certain distortions generated by the system of reporting the financial activities of the companies.

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