



Bringing Strategy Back into Financial Systems of Performance Measurement: Integrating EVA and PBC

Arabella Mocciaro Li Destri

*Associate Professor of Business Management. University of Palermo, Palermo, Italy.
e-mail: arabella.mocciaro@unipa.it. Corresponding author*

Pasquale Massimo Picone, Ph.D.

University of Catania, Catania, Italy. e-mail: pmpicone@gmail.com

Anna Minà, Ph.D.

University of Catania, Catania, Italy. e-mail: am.annamina@gmail.com

Received June 23, 2012 / revised September 22 / accepted September 27 / published online September 28, 2012.

DOI: 10.7350/BSR.A09.2012 - URL: <http://dx.medra.org/10.7350/BSR.A09.2012>

ABSTRACT

This paper proposes a performance and cost measurement system that integrates the Economic Value Added criteria (EVA) with Process Based Costing (PBC). The EVA-PBC methodology allows us to implement the EVA management logic non only at the firm level, but also at lower levels of the organization. We discuss the role of EVA-PBC methodology in bringing strategy back into financial performance measures.

Keywords: EVA, Processes, Capital Costs, Corporate Strategy, Business Strategy.

1. INTRODUCTION

The importance of performance measures within the strategy formulation process of large firms has grown considerably as a consequence of increased environmental turbulence and of the emphasis given to shareholder returns and superior profitability. Empirical studies (Grant, 2003) show how, as of the 1990s, strategic planning in large firms has turned increasingly from the analysis and control of strategy content to systems of performance management. Amongst the various types of performance measures, attention has been given primarily to firm-wide financial measures, such as net profit, operating profit, EVA, and profitability ratios like ROI and ROE. It has been argued (Grant, 2003; Grant & Visconti, 2006; Reed, 2005) that the reorientation in strategic planning systems towards performance management, combined with the widespread perception of the rise of a “new economy” in which historical cause and effect relationships no longer apply, have brought to focus excessively on short and medium term stockholder value rather than on the real causes underlying evolutionary success (Mocciaro Li Destri & Dagnino,

2004, 2005). This, in turn, has been highly detrimental to the effectiveness of firm strategies and performance over time.

Though these studies support the idea of moving away from financial performance measures and returning to a more conscious analysis of the fundamental relations between customer need, competition and strategy choice, in this paper we focus on shareholder value and argue that it is possible to elaborate performance measures which are able to connect shareholder value creation with the firms' capacity to create a positive fit between its internal resources and competences and its external environment. Thus bringing back into the picture, as a basis for the elaboration of effective performance measures, the role of causal relationships between correct strategic choices and value creation for shareholders.

In particular, by underscoring the subtle but important difference between the firms' capacity to create value through correct operational choices and valid strategies, on the one hand, and the epiphenomenal manifestation of variations in stockholder value on the financial markets (notably on stock markets), on the other hand, we underline the necessity for the former to exist in order for the latter to be the manifestation of true success, as opposed to an "image" of success which in reality is non-existent and often results from distorting accounting data. Our attention is therefore drawn to the firm's capacity to create value.

On the basis of this fundamental idea, in this paper we propose a performance and cost measurement system that integrates the Economic Value Added (EVA) firm-wide financial performance measure with the Process Based Costing (PBC) method. This integrated methodology allows to implement the EVA management logic not only at a firm level, but also at lower levels of the organization, thanks to the mechanisms of identification of costs related to single activities and processes entailed by the adoption of the PBC method.

Though the idea of combining EVA with a cost allocation mechanism is not entirely new, proposals have focused on the potential benefits tied to its combination with the activity-based accounting systems (Hubbell, 1996a, 1996b; Kee, 1999; Roztockki and La Scola, 1999; Roztockki, 2000). However, the characteristics of the PBC system allow managers to evaluate the degree to which firm strategies are conducing to a positive fit between the firm and its external environment, whereas the activity-based costing system is introspective and focuses on a level of analysis which is too low. PBC is a cost control system which is based on the examination of the processes underlying the firm's activities of resource acquisition-transformation and sale. It gathers information which supports the optimization of the firms' value chain (Johnson, 1988, 1992) and enriches the activity-based cost control system (Cooper & Kaplan, 1991; Turney, 1992) by consenting managers to control also for quality, production time spans and, mainly, for customer satisfaction (Lawson, 1994). The fact that PBC analyses the causes underlying firm costs, whilst traditional cost systems underscore where costs arise and whether they are in line with prefixed budgets, supports the reorientation from a perspective of mere cost control to one of cost management (Shank & Govindarajan, 1993; Castellano, Young, Anderson & Mclean, 2004) and process reengineering (Carr, 1993; Elzinga, Horak, Lee & Bruner, 1995). However, the PBC system fails to consider the costs connected to the firm's capital, thus evaluating firm processes on the basis of their capacity to increase sales or consent increases in productive efficiency and the flexibility (Dominici, 2010, 2008a, 2008b), and misses the dynamics and the effects of the financial leverage of the firm. Inappropriate management of the firm's capital is de facto overlooked by the PBC system and, therefore, the sole use of this measure of performance may be unable to pin point the firm processes that destroy value.

In consideration of the limitation of PBC and the need to implement EVA at a lower organizational level, it is possible to show how through the implementation of a model of performance evaluation based on the integration between EVA and PBC, firms may assess the contribution each product (or line of products) makes towards the creation (or destruction) of shareholder value.

This paper is organized as follows. In section two, we show the managerial implications of adopting the EVA evaluation system. In section three, we conduct a discussion on the key tenets of the EVA management logic at lower levels of the organization and the need to implement EVA with PBC. In section four, we implement a guiding scheme for the effective implementation of the EVA-PBC methodology. Finally, section five offers conclusions, underscoring the role of the EVA-PBC methodology in bringing strategy back into financial system of performance measures.

2. CONCEPTUAL PILLARS

The orientation toward value creation adopts a long-term perspective and overcomes the shortcomings of traditional accounting measures (Fruhan, 1979; Rappaport, 1986; Copeland, Koller & Murrin, 1990; Copeland, 1994; Damodaran, 2001; Guatri & Bini, 2005). On the other hand, the goal of shareholders' wealth pushes to recognize various measurements that effectively correlate with the value of their company. In fact, Chen and Dodd (1997a, 1997b) showed that accounting measures, taken in isolation, are unable to give details about the variability of value creation.

In the 1990s, EVA became affirmed as a one-period measure of the firms' capacity to create or destroy value. As observed by Abdeen and Haight (2002), EVA performance measure was implemented in AT&T, Coca-Cola, DuPont, Eli Lilly, Quaker Oats, Briggs and Stratton, and other American companies. Additionally, it is popular in other countries such as Australia, Canada, France, Germany, Mexico, and the UK (Worthington & West, 2001).

The fundamental idea underling the EVA evaluation system is that financial discounting of all future EVAs gives rise to the market value added (MVA):

$$MV_t = BV_t + MVA_t \quad (1)$$

where MV and BV indicate respectively the market value and book value.

The EVA value-based performance measure focuses on shareholder value and on the role of capital cost (Stewart, 1991) – that is, the costs of both debt and equity. Indirectly, it considers the firm's risk. In fact, EVA subtracts the minimum return on invested capital (both equity and debt). In turn, the level of the minimum required return on capital crucially depends on the risk of investing such capital in the specific firm analyzed. It, therefore, aims to reflect the efficiency of capital allocation. In a nutshell, EVA is given by the difference between revenues less all the costs associated with producing the revenues – including the costs of capital employed. Although EVA is tied to stockholder value creation, it is a financial performance measure that is causally connected to the firm's productive efficiency and strategic efficacy, as opposed to indicators that monitor epiphenomenal market variables such as the price/earning ratio.

EVA is configured as a residual income computed by deducting the cost of capital from the operating profit (Wallace, 1997; Shrieves & Wachowicz, 2001). It considers the firm's ability to achieve a return greater than the cost of capital:

$$EVA = NOPAT - WACC \cdot IC \quad (2)$$

where:

- NOPAT acronym of Net Operating Profit after Taxes.
- IC (invested capital) indicates the adjusted net capital: the sum of the ordinary shares, the postal equivalent equity, preferred stock, capital and reserves, and debt and financial leasing;
- WACC (Weighted Average Cost of Capital) is expressed in formal terms as $WACC = (K_e \cdot E + K_d \cdot D) / (D + E)$. The variables that influence the WACC are the cost of equity (K_e), the cost of debt capital (net of tax benefits) (K_d), and the values of the equity and debt (respectively, indicated with E and D).

Rather than focusing on specific aspects of computation, we focus on the managerial philosophy underlying the EVA method. The adoption of the EVA evaluation method influences managerial decision processes and the resource allocations which result from them. In particular, the EVA value-based planning system implies the diffusion within the organization of a pro-active search for all business opportunities which are able to create value, and the constant revision of the existing activities which are enable to create value. Differently from other alternative evaluation criteria, such as profit maximization, the discounting process entailed in the evaluation of the future financial benefits associated to an activity uses a measure of both the explicit costs (o real cost) of invested capital (i.e. the cost of debt) and the implicit cost (or opportunity cost) of the invested capital (i.e. the cost of equity). Though the entity of both components of the cost of capital are related to the risk associated to the investment in a specific firm (or activity), this is most evident in the cost of equity¹. The higher the probability that the future benefits associated to an investment diverge from the expected value, the higher is its perceived risk. Given the assumption of risk aversion, the higher the risk the higher the minimum remuneration required to compensate for it.

88 Thus, operationally each activity is evaluated considering both the quantity of future financial benefits it should generate (just like the adoption of a profit maximizing criteria entails) and their *quality*. By using the WACC as the discounting rate, EVA reduces the value of those activities whose future benefits are more difficult to foresee or more uncertain, whilst it increases the value of those alternatives which generate more stable and predictable economic and financial outcomes. This circumstance may lead to decisions which differ from those based on a profit maximizing (or other alternative) criterion, as the latter considers the quantity of future financial benefits of an alternative, but it does not account for the quality (or risk profile) of those benefits. By following the objective of increasing the EVA generated, the firm's management is not only searching for pathways which allow the firm to evolve toward activities which produce more than the minimum remuneration required by shareholders, but also to guarantee the firms' survival and healthy evolution. As such, EVA becomes an objective which is widely accepted and pursued by the firm stakeholders. Thus the degree of consensus and participation in firm goal setting and pursuing is particularly strong vis-à-vis profits maximizing criteria.

Sharma and Kumar (2010) summarize the most important EVA principles. First, building on Biddle, Bowen and Wallace (1999) and Lovata and Costigan (2002), EVA is considered a *helpful tool to reduce agency conflict*. Actually, the divergence of goals between ownership and management (Eisenhardt, 1989; Jensen e Meckling 1976; Jensen 1986; Stulz 1990) pushes to implement EVA as a parameter on which to base a remuneration scheme for management. This choice is able to change the manager-shareholder relationship, considering that value creation is

¹ For a detail analysis of the way risk contributes to the increase of the cost of equity, see the Capital Asset Pricing Model and the Build-Up Approach. An analysis of these methods is offered by Pratt and Grabowski (2008).

a valid metagoal in all moments of the firm's life, it overcomes the inefficient practices that continue to trade between the financial goals of executives and shareholders.

Second, EVA provides a *basis of information that explains the emergence of the firm's stock returns* (Chen and Dodd, 1997a; Erasmus, 2008; Kim, 2006; Palliam, 2006). As a consequence, the EVA logic supports efficient resource allocation processes. In fact, the distribution of resources within the firm is accomplished according to a logic known a priori. Consequently, the managers of business units perceive the resource allocation processes as a form of equitable distribution. In addition, when managers are unable to coordinate resources and assets to generate a positive EVA, his or her remuneration will be reduced on the basis of a rational measure. Under these conditions, EVA management philosophy discourages executives' requests for excess resources.

Third, EVA is *associated with market value* (Abate, Grant & Stewart, 2004; Biddle, Brown & Wallace, 1997; Holler, 2008; Kleiman, 1999; Lehn & Makhija, 1997; Turvey, Van Duren, Sparling & Lake, 2000; Tuvey & Sparling, 2003). Although opinion are mixed (Milunovich & Tsuei, 1996; Uyemura, Kantor & Petit, 1996; Bao & Bao, 1998; Worthington & West, 2004; Griffith, 2004; Ismail, 2006; Arabsalehi & Mahmoodi, 2011; Arabsalehi & Mahmoodi, 2012), EVA supports managerial decision better than accounting-based measures thanks to its association with the firm's market value (Milunovich & Tsuei, 1996; Uyemura, Kantor & Petit, 1996; Bao & Bao, 1998; Worthington & West, 2004).

While the three abovementioned EVA principles focus on corporate finance and governance issues, as well as processes of resource allocation among firm divisions, EVA's most important contribution is in the creation and dissemination of a corporate culture based on shareholders' wealth. In this sense, the adoption of the EVA logic maintains a positive influence on the operational and organizational routines with firms (Ehrbar, 1999; Singer & Millar, 2003).

3. KEY TENETS OF THE EVA MANAGEMENT LOGIC AT LOWER LEVELS OF THE ORGANIZATION

The EVA performance system is able to take into account the operating and financial variables underling value creation and, thus, promotes the improvement of effective strategic and operational actions. In addition, EVA is coherent with the metagoal of firm value creation because it pushes towards firm evolution paths which grant returns in excess of WACC and, hence, fosters the firms' capacity to meet the expectations of both debt and equity investors (Correia, Flynn, Uliana & Wormald, 2007).

To be effective, the EVA system requires that its logic is implemented at the operational level and, therefore, its measurement is considered also at lower organizational levels. This, however, raises the critical issue of the determination and the attribution to each organizational level of: operating results, operating costs, and financial costs. Obviously, "these allocations take on special meaning when management compensation is tied to them, as it is in an EVA-based financial management system" (Young, 1997, p. 343).

The idea of combining EVA with (more or less sophisticated) mechanisms for the allocation of costs is already known in literature (Hubbell, 1996a, 1996b; Roztocki, 2000; Roztocki & La Scola, 1999). However, previous proposals have focused on the benefits of connecting the EVA evaluation system with the activity-based costing criterion (Brimson, 1991; Cooper & Kaplan, 1991, 1992). Activity-based costing does not explain the effective correlation between the firm's choices and the creation of value for the consumer, since the concept of activity is too narrow to allow a consideration of the benefits perceived by customers. Conversely, in order to support an

effective application of the EVA logic to sustain managements' operational and strategic decision making, a costing system must provide a valid assessment of competitiveness of the firms' products and of the efficiency and effectiveness of the processes which lead to their production and commercialization (Lawson, 1994).

Moving from the ideas above, we propose an algorithm that allows the integration between EVA and the PBC system. Actually, the PBC system allows for an accurate examination of firm processes from the standpoint of the customers, who "are all those who receive that process output" (Anjard, 1996, p. 23). The PBC criterion collects a set of information that allows the optimization of the firm's value chain (Johnson, 1988, 1992) and improves the activity-based costing system by supporting the analysis of the quality, the production times and, mainly, the customer level of satisfaction (Lawson, 1996, 2002). In a nutshell, the PBC system encourages executives to think in terms of "end-to-end processes" rather than activities or functions (Hammer, 2007) and, in this perspective, it is configured as a costing system capable of linking strategic choices with operational areas. This attitude of the PBC system enables the expansion from a cost control perspective to a cost management view (Greenwood & Reeve, 1994; Shank & Govindarajan, 1993). Consequently, PBC is able to lay the foundation for the development of management processes (Kittredge, 2004; Becker, Kugeler & Rosemann, 2010) and *process reengineering* (Carr, 1993; Hammer & Champy, 1993; Elzinga, Horak, Lee & Bruner, 1995).

Although the PBC system overcomes a part of the traditional limits of cost accounting and activity-based costing, it neglects the analysis the cost of capital and the risk profile of investments. Therefore, PBC fosters an evaluation process based on higher sales or productivity without adequately considering the dynamics and effects of the firm's leverage ratio. In this perspective, the interpretive value of the assessment of the firms' strategic and organizational system conveyed by the pure PBC is partial because of the omission of the financial component of costs – both in terms of real cost and opportunity cost.

For the reasons mentioned, we proceed to integrate EVA and PBC; in doing so, we provide a "map" of firm performance and costs, considering the operational and financial risks, and the invested capital. The methodology assesses the congruence between the absorbed resources and commercial and production processes, and it considers the capacity to generate a return greater than the operating cost of capital invested, taking into account the risk profile associated with each division.

4. FORMULATION OF THE METHODOLOGY OF INTEGRATION EVA-PBC

The implementation of EVA at lower organizational levels, by combining it with the PBC system, is aimed to determine EVA values for each product (indicated as EVA_j). The integration methodology develops the computation of the operating costs through the PBC component, while it estimates the capital costs according to the EVA measure. In doing so, EVA-PBC includes in a single management tool, on the one hand, the benefits of process management from the PBC system and introduces elements which support the proper management of invested capital and risk from EVA:

$$\text{EVA}_j = (\text{NOPAT} - \text{Capital cost})_j \quad (3)$$

The benefits attributable to the adoption of the integrated EVA-PBC methodology is particularly precious in the context of business organizations that have the following characteristics:

- 1) significant impact of indirect operating costs;
- 2) significant capital costs and diversified composition of business risk between products.

Since condition (1) may be resolved through the adoption of a pure PBC, the decision to shift from a PBC system to an integrated EVA-PBC is closely related to the incidence of the cost of capital on the business's cost structure in general and the composition of business risk. Given the relevance of condition (2), the EVA-PBC methodology seems particularly appropriate for the evaluation of the performance of firms that operate in high-risk industries, multi-business firms in which there are processes with different risk profiles, and firms that are capital intensive. In diversified firms, the financial strategy aims to minimize the cost of capital at corporate level and, then, distribute financial resources among the different divisions. Unfortunately, when diversity in resources, opportunities and risk increases within a diversified firm, the resource flow may shift to the most inefficient divisions that are pushing for major investments. Specially in this context, the opportunity to implement EVA and PBC emerges. The function of the headquarter therefore becomes similar to a bank that directs firms' financial resources to the various divisions at a rate equal to the specific WACC on the basis of their risk profile².

Similarly to pure PBC, the key idea on which we build the EVA-PBC system is that process execution is the reason the firm claims costs. From this perspective, cost express the value of inputs used in processes, cost drivers are the logical link between individual processes and products and, similarly, capital is the real causal driver of the use of capital in a process and product. It is not uncommon to find a coincidence between the capital cost and operational cost drivers (Cooper & Slagmulder, 1999).

The steps to set up an EVA-PBC methodology of a product (or product line) are:

- 1) identification, description, and analysis of business processes;
- 2) allocation of resource costs among the various operational processes;
- 3) allocation of operating costs of the processes leading to various products;
- 4) cost allocation of financial resources among the various processes;
- 5) allocation of the financial costs of the processes of various products;
- 6) calculation of EVA performance at the product level.

The first three steps of the EVA-PBC methodology are similar to a pure PBC analysis. However, some variations must be made in order to maintain consistency with the performance indicator EVA, for example R&D and marketing expenses should be considered as capital investments rather than costs.

For the execution of Step 4, we note that the financial cost is composed of a real component (on the debt capital) and a component that is an "opportunity cost" (relative to equity). Consequently, the determination of financial costs for each process is a delicate and complex step. Preliminarily, we observe that:

- a) configuration of invested capital has to be consistent with the one indicated in the previous section for the EVA performance measure;

² It is worth underscoring that though the financial resources invested in the company (equity and debt) are generally obtained at the corporate level and are then internally distributed amongst the different divisions, the latter may enjoy (or suffer) different WACC. Such diversity in WACC levels between different division may be due simply to the fact that they operate in different nations and or industries and raise capital independently. However, more generally and more often, the different WACC levels are attributable to the different degrees of predictability of the future financial/economic benefits expected from the divisions' processes. These varying degrees of predictability define the perceived risk of investing capital in each process and, consequently, the minimum remuneration required by the corporate headquarter to maintain capital invested in each process (and division). The corporate WACC is therefore broken down into partial and weighted WACC for each division on the basis of the specific characteristics each of the latter present in terms of cash flow stability and contribution to the general risk profile of the set of firm processes. We are thankful to an anonymous referee for having pointed to the necessity to clarify this point.

- b) configuration of the WACC has to consider the actual financial structure. However, if EVA–PBC methodology is used as a tool for strategy formulation, then it may be appropriate to refer to the target capital structure;
- c) the composition of financial sources is considered the same for all strategic business units. Thus, the WACC variation is based exclusively on the risk that each strategic business unit supports³.

Investment capital is classified on the basis of its destination in *dedicated capital and non-dedicated capital*.

For non-dedicated capital, it is impossible to identify a causal relationship between the capital invested and object cost. In this context, the analyst could proceed in two ways:

1. to pay no attention to the cost of non-dedicated capital. As Moisello (2003) observes, costs of capital associated with non-dedicated capital can be omitted in EVA_j computation, because the managerial decisions that affect the product cost generally do not change the level of such investments;
2. to proceed with an accommodative solution, which assumes that the cost of non-dedicated capital is shared proportionally to the dedicated capital of each process.

If the causal relationship between investment and the product (or product line) is clearly recognizable, then the investment capital is dedicated. However, it can be classified as directly or indirectly related to the allocation. An example of a dedicated direct capital is the investment in a machine used exclusively for the production of a product type, while a plant that produces multiple products is configured as an indirect investment in dedicated capital.

In the case of direct dedicated capital to produce a given output (α), the estimated cost of capital invested per process $DCCP_\alpha$ is quite easy: multiply the direct dedicated capital invested in the process ($DCIP$) by the WACC of the division. By dividing the annual cost of direct dedicated capital invested in the process ($DCCP_\alpha$) by the total amount of capital drivers (A), we obtain the financial cost of each process (Step 4).

Table 1: Direct Dedicated Capital.

| Product | Capital Driver | WACC | Direct Dedicated Capital Invested in the Process | Cost of Direct Dedicated Capital Invested in the Process | Financial Cost of Direct Dedicated Capital Invested for Each Process |
|----------|----------------|------|--|--|--|
| α | A | WACC | $DCIP$ | $DCCP_\alpha = DCIP \cdot WACC$ | $DCCP_\alpha / A$ |

Finally, by multiplying the cost of the single process by the number of times that the process is activated for the production of a single product α (Step 5), it is attributed to the object of cost. If the firm presents only direct dedicated capital, EVAJ will be given by the sales price minus the operating and financial costs attributable to the processes required to obtain the product.

³ Please, see note number 2.

In the case of indirect dedicated capital, if the different strategic business units bear the same risk profile ($WACC_{\alpha} = WACC_{\delta} = WACC$), the algorithm for the calculation of the financial cost to the process is similar to the previous case. The total cost of the indirect dedicated capital invested in the process should be divided by the total amount of the capital drivers (where A and D, respectively, indicate the number of times that the capital driver is repeated for the total production of the products α and δ) to obtain the financial cost of each process (Step 4).

Table 2: Indirect Dedicated Capital under the Condition that Each Strategic Business Unit Presents the Same Level of Risk.

| Product | Capital Driver | WACC | Indirect Dedicated Capital Invested in the Process | Indirect Dedicated Cost of Capital Invested in the Process | Financial Cost of Indirect Dedicated Capital Invested for Each Process |
|----------|----------------|------|--|--|--|
| α | A | WACC | ICIP | $ICCP = ICIP \cdot WACC$ | $\frac{ICCP}{A + D}$ |
| δ | D | | | | |

Multiplying the cost of the single process by the number of times the process is activated for the production of a single product α (Step 5), allows to attribute it to the object of cost. This is also true for the product δ .

The third case is the allocation of indirect costs of dedicated capital if the strategic business units are characterized by different levels of risk (notwithstanding the same structure of funding sources). The algorithm of Step 4 becomes much more complex than in the previous cases.

Once the cost of capital is estimated for each strategic business unit ($WACC_{\alpha}$ e $WACC_{\delta}$) there is the need to estimate how much of the capital invested in the process is absorbed for the production of the product α and of the product δ . The value of the absorbed capital (AC) for the production of α and δ will be given respectively by $\frac{ICIP \cdot A}{(A+D)}$ and $\frac{ICIP \cdot D}{(A+D)}$. In Table 3, we estimate the total financial cost for each process underling individual products ($ICCP_{\alpha}$, $ICCP_{\delta}$) and, therefore, the financial cost for differentiated processes according to which the output is α or δ .

Table 3: Indirect Dedicated Capital under the Condition that Each Strategic Business Unit Presents Different Levels of Risk.

| Product | Capital Driver | WACC | Indirect Dedicated Capital Invested in the Process | Cost of Indirect Dedicated Capital Invested in the Process | Financial Cost of Indirect Dedicated Capital Invested for Each Process |
|----------|----------------|-----------------|--|--|--|
| δ | A | $WACC_{\alpha}$ | $AC_{\alpha} = \frac{ICIP \cdot A}{(A + D)}$ | $ICCP_{\alpha} = AC_{\alpha} \cdot WACC_{\alpha}$ | $ICCP_{\alpha} / A$ |
| Δ | D | $WACC_{\delta}$ | $AC_{\delta} = \frac{ICIP \cdot D}{(A + D)}$ | $ICCP_{\delta} = AC_{\delta} \cdot WACC_{\delta}$ | $ICCP_{\delta} / B$ |
| | A+D | | ICIP | $ICCP = ICCP_{\alpha} + ICCP_{\delta}$ Financial cost of process of Indirect Dedicated Capital Invested | |

Finally, by multiplying $ICCP_{\alpha}/A$ by number of times that the process is activated for the production of α (Step 5), it is possible to attribute the financial cost to the object of reference. Evidently, the evaluation procedure is similar for the processes underling the production of δ .

5. DISCUSSION

The EVA–PBC methodology represents an answer to the need for a methodology aimed towards the representation and evaluation of the economic performance obtained at low and intermediate organizational levels. In this section, we identify the contributions of our study, suggesting the role of the EVA–PBC methodology in supporting strategic choices, and summarize the main benefits and areas of application of the EVA–PBC methodology.

5.1. The Role of the EVA-PBC Methodology in Supporting Strategic Production Choices

An information system based on the EVA–PBC methodology is able to support managerial decisions better than a pure PBC system because it takes into account a broader spectrum of variables. In fact, the EVA–PBC methodology reveals the dynamics of “cross-subsidizing capital,” namely in those cases in which the higher performance of one process, based on a pure PBC evaluation, is offset by its unfavorable risk profile vis-à-vis other firm processes.

A second important aspect regards the accuracy of the PBC–EVA system: it actually considers the cost and risk associated with the firms’ investments. In this perspective, the EVA–PBC methodology is an information tool that provides the determinants of the cost of the financial resources invested in production processes. This allows us to gain the knowledge to more effectively assess the use of capital invested in the firms’ processes and develop appropriate improvement plans. The allocation of the cost of capital that the EVA-PBC methodology proposed allows is particularly important when each strategic business unit presents a different risk profile. In such cases, in fact, the process of resource allocation requires joint consideration of both the return and the risk of potential investment opportunities. Seeing as the EVA–PBC methodology considers the dynamics of risk, it also assesses the capacity of the managements’ strategic and operational choices to ensure the survival and development of the firm in the long run. These characteristics of the EVA–PBC methodology expand – compared to the pure PBC method – the ability to define the deployment of resources entailed by potential business.

In those cases in which the non-dedicated capital is attributed to each process (solution 2), for a multi business-firm the corporate level EVA is generated by the sum of the EVA of each product.

$$EVA = \sum_{j=1}^n EVA_j = \sum_{j=1}^n [NOPAT - \text{Cost of capital}]_j. \quad (4)$$

Conversely (when the analyst adopts the solution 1), the cost of non-dedicated capital must be subtracted from the result obtained in order to enucleate the corporate level EVA.

Given the known relationship between EVA and MVA, EVA links the operational and strategic choices regarding each product to the firm's overall value. In this perspective, the application of the PBC–EVA integrated model allows management to recognize the priorities for the creation of value – that is, changing the price, and studying a new structure to modify operating and financial costs.

More in detail, if EVA_j is negative – that is, the amount of operating and financial costs is greater than the revenues of its sales – then for that product the firm is vulnerable in terms of competitiveness and, consequently, it is necessary to evaluate a set of solutions (often jointly considered):

- *increase the selling price of the product.* This choice requires a comprehensive evaluation of the components of firm demand and industry competition. Indeed, if demand is overestimated, results can be harmful. In these conditions, due to a reduction in the production volumes, the weight of financial and operational costs per unit of output will be higher, and EVA_j will be worsened;
- *rationalization of demand for capital.* The main paths are to eliminate bottlenecks and manage excess capacity. In the latter case, it could be useful to increase the breadth of the business portfolio (launching a new product), as well resizing the firms' productive capacity through the policy of outsourcing and so on;
- *elimination of the product (or product line).* When EVA_j is strongly negative, sometimes the elimination of the product from the portfolio is the only reasonable strategic choice. However, there are important exceptions to the principle of convenience of the individual products. The first exception regards "strategic products", which are important to complete the range of products offered. The second exception is represented by "penetration products", which face an aggressive competition. They aim to enter into a contestable market, supporting losses, in order to successfully penetrate and capture a reasonable market share. The third exception concerns the possibility that one of products may have a negative EVA, but nonetheless absorbs part of the operational and financial costs of the equipment. As Cooper and Kaplan (1992: 8-9) argue, "before (...) dropping products, managers should verify that they can eliminate the resources no longer needed or can replace the lost volume with more profitable business. Thus before any decision is taken from activity-based product or customer costs, managers must assess the incremental revenue and spending consequences". Also, in the case of shared operational and/or financial costs between processes, eliminating a product which presents a negative EVA may (when the corresponding capital invested is retained) in turn lower the connected products' EVA and render them negative. The fourth exception regards the financial dynamics underling the diversification strategy. According to the internal capital market perspective, the diversification strategy provides a means of funding through an internal capital market, which saves transaction costs and the costs of information asymmetry associated with external finance and reduces the operational risk due to the

imperfect correlation among the cash flows of different business units. In this approach, products with a negative EVA may become part of an internal capital market which has the ability to combine the cash flows of many divisions that are dispersed via diversification strategy reducing the overall risk of corporations' portfolio of products⁴;

- *reduction of operating costs.* The main opportunities regard the elimination of bottlenecks and the exploitation of excess capacity;
- *search for an alternative product.* Also in this case, the strategic action aims to make use of excess capacity.

5.2. The Role of the EVA-PBC Methodology in Supporting Corporate Strategic Choices

The EVA–PBC integrated methodology creates a connection between the control and the finance area of the firm, aiming to overcome viewing only operational or financial aspects and encouraging synergistic actions to obtain reliable, useful information for the formulation, implementation and modification of the strategic plan coherently with market expectations (Magnanelli, 2010).

We identify the condition which renders the implementation of the EVA–PBC methodology particularly fruitful in the relevance of capital costs and the diverse composition of risk profiles between business units; however, it seems useful to underscore that the utility of such a performance measure is not limited to firms operating in high-risk or capital-intensive industries, as it nurtures a corporate culture that facilitates diffused entrepreneurial behaviors. In this perspective, the adoption of this model stimulates the firms' human resources to reciprocally collaborate and increase interactive communication, contributing to foster dynamic knowledge creation and diffusion processes on which firms' survival and success increasingly rest. On the basis of this complex approach, the proposed methodology allows to:

- *increase organizational efficiency*, as it considers both the operational costs and the financial costs tied to the amount of capital invested and the period of time necessary to carry out each process. In this perspective, this methodology supports the development of distributed product development as a “business approach that stems from the dramatic increase in outsourcing, partnerships, offshoring, and the global character of many companies” (Amaral, Anderson & Parker, 2011);
- *increase organizational efficacy*, by focusing attention on firm processes (rather than cost centers), it implicitly considers the quality of firm processes and products through the consideration of the value clients attach to the products obtained. EVA-PBC places strong emphasis on financial planning and control, as each business is expected to create value for shareholders.
- *creation and implementation of a system of incentives* that can be managed to *drive appropriate behavior among human resources*, as it consents to correlate the motivations of line managers and employees not only with the overall value created at the firm level but more specifically also with the value created by the processes to which they contribute directly. Therefore, the adoption of a systems approach to management information systems is functional to the creation of a corporate culture characterized by “widespread entrepreneurship” at each organizational level, from corporate to operational

⁴ This reason is usually weak due to the fact that diversification should be generally easier and cheaper for the shareholders than for the firm (Brealey, Myers, Allen, 2008).

levels. In fact, EVA-PBC involves a radical cultural transformation and builds self-confidence among the workers of the business entities that perform well;

- *drive the path of diversification and/or differentiation.* It provides a systematic and accurate assessment of investments in their financial and operational consistency for each business unit strategy and each product. This map is able to support a gradual, albeit partial, reduction of conflicts due to incompatibility of goals and to differences between the guidelines of managers from different functional units. In sum, EVA-PBC is a helpful managerial tool for maintaining a focus on the fruitful exchange of resources and capabilities and, thus, helps to avoid the “diversification traps” (Picone, 2012). EVA-PBC emphasizes the external market pressure on firm performance, thus if adopted without compromises it represents a concrete tool to aid managers to avoid the misallocation of resources and to implement a value-focused strategy.

6. CONCLUSIONS

The EVA-PBC methodology proposed in this paper highlights a means to obtain an awareness of the critical variables – operational and financial – at the basis of the firms’ improvement paths. Acquiring this knowledge about the variables underlying the creation of value, along with the implementation of a remuneration system based on EVA–PBC is able to generate a business environment that increases the motivations of human resources. In addition, it reconciles managerial initiatives with a willingness to collaborate and communicate to increase the EVA parameter. Obviously, this is a cultural process and, therefore, it tends to be slow, especially in SMEs.

From an operational perspective, the adoption of such an integrated model of performance measurement is an advanced management tool that entails control of production times, operational and capital costs; a progressive elimination of inefficient resource allocations, thanks to the visibility of the processes that are unable to create value; and the possibility to operate direct comparisons between the EVA produced by different business units, given that this performance measure neutralizes the differences in risk levels underling each strategic business unit.

Finally, we observe that the implementation of the EVA–PBC methodology requires a set of skills regarding planning and control, engineering, corporate finance, and human resources management. EVA-PBC implementation requires different cognitive and cultural backgrounds given the mutual interdependence among firm functions. In this perspective, the EVA–PBC methodology execution can pose more of a challenge than pure theory elaboration (Hall & Johnson, 2009) and good interpersonal skills are critical to facilitate cross-functional communication (Dosch & Wilson, 2010).

Future lines of research move in two directions: the first direction is to suggest methods for the accurate estimation of the cost of equity at the level of the strategic business unit. The second line of research aims to map the implementation of this integrated model and its influence on the capacity to inform strategic choices with data regarding the tendency of firm processes to contribute positively to shareholder value creation in the long term. In this perspective, the conduction of a comparative analysis of a number of case studies regarding multi-business firms and their long time performance could highlight potential benefits and pitfalls of this evaluation methodology and the consequences of its adoption for firm performance.

ACKNOWLEDGMENTS

The authors thank the Associate Editor Lucio Fuentelsaz and the two anonymous reviewers for their insightful comments on earlier drafts of the manuscript.

REFERENCES

- Abate, J. A., Grant, J.A., Stewart, III B.G. (2004). The EVA Style of Investing. *The Journal of Portfolio Management*, 30(4), 61-73.
- Abdeen, A. M., Haight, G.T. (2002). A Fresh Look at Economic Value Added: Empirical Study of the Fortune Five-Hundred Companies. *The Journal of Applied Business Research*, 18(2), 1-10.
- Amaral, J., Anderson, E. J. Jr., Parker, G. G. (2011). Putting It Together: How to Succeed in Distributed Product Development. *MIT Sloan Management Review*, 52(2), 51-58.
- Anjard, P. R. (1996). Process Mapping: one of Three, New, Special Quality Tools for Management, Quality and all Other Professionals. *Microelectron Reliab*, 35(2), 223-225.
- Arabsalehi, M., Mahmoodi, I. (2011). EVA or Traditional Accounting Measures; Empirical Evidence from Iran. *International Research Journal of Finance and Economics*, 65, 51-58.
- Arabsalehi, M., Mahmoodi, I. (2012). The Quest for the Superior Financial Performance Measures. *International Journal of Economics and Finance*, 4(2), 116-126.
- Bao, B.H., Bao, D. H. (1998). Usefulness of Value Added and Abnormal Economic Earnings: An Empirical Examination. *Journal of Business Finance and Accounting*, 25(1-2), 251-265.
- Becker, J., Kugeler, M. Rosemann, M. (2010). *Process Management: A Guide for the Design of Business Processes*. Springer.
- Biddle, G.C., Bowen, M.R., Wallace, J.S. (1999). Evidence on EVA. *Journal of Applied Corporate Finance*, 12(2), 69-79.
- Biddle, G.C., Brown, R. M., Wallace, J. S. (1997). Does EVA Beat Earning? Evidence on Associations with Stock Returns and Firm Values. *Journal of Accounting & Economics*, 24(3), 301-336.
- Brealey, R., Myers, S., Allen, F. (2008). *Principles of Corporate Finance*. McGraw Hill, New York.
- Brimson, J. (1991). *Activity Accounting. An Activity-Based Costing Approach*. John Wiley & Sons inc., New York.
- Carr, D. K. (1993). Managing for Effective Business Process Redesign. *The Journal of Cost Management for the Manufacturing Industry*, Fall, 16-21.
- Castellano, J. F., Young, S., Anderson, D., Mclean, W. (2004). Process-based Measurements: The Key to more Effective Decision Making. *Cost Management*. September/October, pp. 5-14.
- Chen, S., Dodd, J. L. (1997a). Usefulness of Accounting Earnings, Residual Income, and EVA: A Value Relevance Perspective. *Unpublished Working paper, Clarion University*.

- Chen, S., Dodd, J. L. (1997b). Economic Value Added (EVA): An Empirical Examination of a New Corporate Performance Measure. *Journal of Managerial Issues*, 9(3), 318-333.
- Cooper, R., Kaplan, R. S. (1991). *The Design of Cost Management System*. Prentice Hall, New York.
- Cooper, R., Kaplan, R. S. (1992). Activity Based System: Measuring the Cost of Resource Usage. *Accounting Horizons*, 6(3), 1-13.
- Cooper, R., Slagmulder, R. (1999). Integrating Activity Based Costing and Economic Value Added. *Management Accounting*, 80(7), 16-17.
- Copeland, T. (1994). Why Value Value. *The «McKinsey Quarterly»*, 4, 97-109.
- Copeland, T., Koller, T., Murrin, J. (1990). *Valuation. Managing the Value of Firmss*, McKinsey & Firm, New York.
- Correia, C., Flynn, D., Uliana, E., Wormald, M. (2007). *Financial Management* (6th edition). Cape Town: Juta & Company.
- Damodaran, A. (2001). *The Dark Side of Valuation: Valuing Old Tech, New Tech, and Economy Firms*, Prentice Hall, New York.
- Dominici, G. (2010). *From Business System to Supply chain and Production in Japan. Lean Production and its roots in Japanese Business Culture*. VDM Verlag Dr. Muller Aktiengesellschaft & Co. KG.
- Dominici, G. (2008a). Demand Driven Supply Chain ed Innovazione: il sistema logisitico-produttivo per la soddisfazione del cliente. In Purpura A., Fazio G. (eds), *Economia e Gestione dell'Innovazione nelle PMI*, 100-114. Milan: FrancoAngeli.
- Dominici, G. (2008b). Holonic Production System to Obtain Flexibility for Customer Satisfaction. *Journal of Service Science and Management*, 1(3), 251-254.
- Dosch, J., Wilson, J. (2010). Process Costing and Management Accounting in Today's Business Environment. *Strategic Finance*, August, 36-43.
- Ehrbar, A. (1999). Using EVA to Measure Performance and Assess Strategy. *Strategy, Leadership*, May-June, 20-24.
- Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review. *Academy of Management Review*, 14(1), 57-74.
- Elzinga, J., Horak, T., Lee, C. Y., Bruner, C. (1995). Business Process Management: Survey and Methodology. *IEEE Transactions on Engineering Management*, 42(2), 119-128.
- Erasmus, P. D. (2008). The Relative and Incremental Information Content of the Value Based Financial Performance Measure Cash Value Added (CVA). *Management Dynamics*, 17(1), 2-15.
- Fruhan, W. E. (1979). *Financial Strategy: Studies in the Creation, Transfer and Destruction of Shareholders Value*. Homewood, R.D. Irwin.
- Grant, R. M., Visconti, M. (2006). The Strategic Background to Corporate Accounting Scandals. *Long Range Planning*, 39(4), 361-383.

- Grant, R. M. (2003). Strategic Planning in a Turbulent Environment: Evidence from the Oil Majors. *Strategic Management Journal*, 24(6), 491-517.
- Greenwood, T. G., Reeve, M. (1994). Process Cost Management. *Journal of Cost Management*, winter, 4-19.
- Griffith, J. M. (2004). The True Value of EVA. *Journal of Applied Finance*, 14(2), 25-29.
- Guatri, L., Bini, M. (2005). *Nuovo trattato sulla valutazione delle aziende*. Università Bocconi, Milano.
- Hall, J. M., Johnson, M. E. (2009). When should a Process be Art, Not Science? *Harvard Business Review*, 87(3), 58-65.
- Hammer, M., Champy, J. (1993). *Reengineering the Corporation*, HarperCollins Publisher, New York.
- Hammer, M. (2007). The process audit. *Harvard Business Review*, 85(4), 111-123.
- Holler, A. (2008). Have Earning Lost Value- Relevance? Revisiting Latest Evidence on EVA. *The Business Review*, 10(2), 245-54.
- Hubbell, W. W. (1996a). A Case Study in Economic Value Added and Activities-Based Management. *Journal of Cost Management*, Spring, 38-49.
- Hubbell, W. W. (1996b). Combining Economic Value Added and Activities-Based Management. *Journal of Cost Management*, Spring, 19-28.
- Ismail, A. (2006). Is Economic Value Added more Associated with Stock Return Than Accounting Earnings? The UK Evidence, *International Journal of Managerial Finance*, 2(4), 343-354.
- Jensen, M., Meckling, W. (1976). Theory of The Firm: Managerial Behavior, Agency Costs and Capital Structure. *Journal of Financial Economics*, 3(4), 305-360.
- Jensen, M. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, 76(2), 323-329.
- Johnson, T. (1988). Activity Based Information a Blueprint for World Class Management Accounting, *Management Accounting*, June.
- Johnson, T. (1992). *Relevance Regained. From Top-Down Control to Bottom-Up Empowerment*. The Free Press, New York.
- Kee, R. C. (1999). Using Economic Value Added with ABC to Enhance Your Production-Related Decision Making. *Journal of Cost Management*. December, 3-15.
- Kim, G. W. (2006). EVA and Traditional Accounting Measures: which Metric Is a Better Predictor of Market Value of Hospitality Companies? *Journal of Hospitality & Tourism Research*, 30(1), 34-49.
- Kittredge, J. (2004). Process Management and Cost Management: Collaboration or Opposition?, *Cost Management*. September/October, 23-30.
- Kleiman, R. T. (1999). *Some New Evidence on EVA Firms*, *Journal of Applied Corporate Finance*, 11(2), 80-91.

- Lawson, R. A. (1994). Beyond ABC: Process Based Costing. *The Journal of Cost Management*, Fall, 33-43.
- Lawson, R. A. (1996). Process-based Costing at Community Health Plan. *Journal of Cost Management*, Spring, 31-43.
- Lawson, R. A. (2002). Managing the Cost of Capacity Using Process-based Costing. *Journal of Cost Management*, November/December, 24-29.
- Lehn, K., Makhija, A. K. (1997). EVA, Accounting Profits, and CEO Turnover: An Empirical Examination, 1985-1994. *Journal of Applied Corporate Finance*, Summer, 90-97.
- Lovata, M. L., Costigan, L. M. (2002). Empirical Analysis of Adopters of Economic Value Added. *Management Accounting Research*, 13(2), 215-228.
- Magnanelli, B. S. (2010). Il performance management a supporto dell'allineamento dell'impresa alle esigenze del mercato: la balanced scorecard nel settore farmaceutico. In De Bernardis L. (eds), *Allineare mercati, strategie e comportamenti. Dal paradigma di Bain a quello dei network*, 117-138, Milan: FrancoAngeli.
- Milunovich, S., Tsuei, A. (1996). EVA in the Computer Industry. *Journal of Applied Corporate Finance*, 9(2), 104-115.
- Mocciaro Li Destri, A., Dagnino, G. B. (2004). Time and Strategy: Towards a Multitemporal View of the Firm. *Journal of Managerial Psychology*, 18(9), 776-794.
- Mocciaro Li Destri, A., Dagnino, G. B. (2005). The Development of the Resource-Based Firm Between Value Appropriation and Value Creation. In Szulanski G., Porac J., Doz Y. (eds.) *Strategy Process (Advances in Strategic Management, Vol. 22)*, pp.153-188, Emerald Group Publishing Limited.
- Moisello, A. M. (2003). ABC & EVA: un'integrazione possibile. La valutazione del costo di prodotto nell'ottica della creazione di valore. *Economia Aziendale 2000 web*, www.ea2000.it.
- Palliam, R. (2006). Further Evidence on the Information Content of Economic Value Added. *Review of Accounting and Finance*, 5(3), 204-215.
- Picone, P. M. (2012). *Conglomerate diversification strategy and corporate performance*. Unpublished doctoral dissertation, University of Catania, Italy, <http://hdl.handle.net/10761/1167>
- Pratt, S. P., Grabowski, R.J. (2008). *Cost of Capital. Applications and Examples*. John Wiley & Son, Hoboken, New Jersey.
- Rappaport, A. (1986). *Creating Shareholders Value: the new standard for business performance*. Free Press, New York.
- Reed, J. (2005). Values and Corporate Responsibility: A Personal Perspective, In: Lorsch J.W., Berlowitz, L., Zelleke, A. (eds), *Restoring Trust in American Business*, MIT Press, Cambridge, MA.
- Roztock, N., La Scola, N.K. (1999). How to Design and Implement an Integrated Activity-Based Costing and Economic Value Added System. *Proceedings of the 1999 Annual Industrial Engineering Research Conference*.

- Roztock, N. (2000). The Integrated Activity-Based Costing and Economic Value Added Information System. *Proceedings of the Society for Advancement of Management (SAM) 2000 International Management Conference*.
- Shank, J. K., Govindarajan, V. (1993). *Strategic Cost Management*. The Free Press, New York.
- Sharma, A. K., Kumar, S. (2010). Economic Value Added (EVA) - Literature Review and Relevant Issues. *International Journal of Economics and Finance*, 2(2), 200-220.
- Shrieves, R. E., Wachowicz, J.M. Jr (2001). Free Cash Flow (FCF), Economic Value Added (EVA) and Net Present Value (NPV): A Reconciliation of Variations of Discounted Cash-Flow (DVF) Valuation. *The Engineering Economist*, 46(1), 33-52.
- Singer, J. A., Millar, D.L. (2003). Value-Based Management Done Right: The EVA Implementation at Harsco. *EVAuation*, 5(1), 1-8.
- Stewart, G. B. (1991). *The Quest for Value: A Guide for Senior Management*. Harper Business, New York.
- Stulz, R. (1990). Managerial Discretion And Optimal Financing Policies. *Journal of Financial Economics*, 26(1), 3-27.
- Turney, P. B. B. (1992). Activity Based Management. *Management Accounting*, January, 56-60.
- Tuvey, C., Sparling, D. (2003). Further Thoughts on the Relationship between Economic Value Added and Stock Market Performance. *Agribusiness*, 19(2), 255-267.
- Tuvey, C., Van Duren, E., Sparling, D., Lake, L. (2000). The Relationship between Economic Value Added and the Stock Market Performance of Agribusiness Firms. *Agribusiness*, 16(4), 399-416.
- Uyemura, D. G., Kantor, C. C., Petit, J. M. (1996). EVA for Banks: Value Creation, Risk Management and Profitability Measurement. *Journal of Applied Corporate Finance*, 9(2), 94-111.
- Wallace, J. S. (1997). Adopting Residual Income-Based Compensation Plans: Evidence of Effects on Management Actions. *Journal of Accounting & Economics*, 24(3), 275-300.
- Worthington, A. C., West, T. (2001). Economic Value-Added: A Review of the Theoretical and Empirical Literature. *Asian Review of Accounting*, 9(1), 67-86.
- Worthington, A. C., West, T. (2004). Australian Evidence concerning the Information Content of Economic Value-Added. *Australian Journal of Management*, 29(2), 201-224.
- Young, D. (1997). Economic Value Added: A Primer for European Managers. *European Management Journal*, 15(4), 335-343.