THE IMPLEMENTATION OF STRATEGIC MANAGEMENT ACCOUNTING BASED ON VALUE CHAIN ANALYSIS: VALUE CHAIN ACCOUNTING

Mustafa KIRLI
Celal Bayar University
Mustafa.KIRLI@bayar.edu.tr

Harun GÜMÜŞ
Celal Bayar University
Harun.gumus@bayar.edu.tr

—Abstract—

To compete successfully in today’s highly competitive global environment, companies have made customer satisfaction an overriding priority. They have also adopted new management approaches, changed their manufacturing systems and invested in new technologies. Strategic management accounting examines the decision-making linked with the business operations and strategic work of financial administration as support for the same. Strategic management accounting is a theory and practice of accounting that looks at an organization's cost position, cost advantages and product differentiation in order to make market decisions. The value chain is a systematic approach to examining the development of competitive advantage. The chain consists of a series of activities that create and build value. Value chain analysis refers to a structured method of analyzing the effects of all core activities on cost and/or differentiation of the value chain. With the growing division of labour and the global dispersion of the production of components, systemic competitiveness and so value chain analysis have become increasingly important. Value chain accounting is the combination of value chain analysis and accounting theory. Value chain accounting is an important part of value chain management and a further development of strategic management accounting. Value chain accounting is a new approach on accounting subject which is combined by the theories of value chain management, supply chain management, accounting management and information technology. From the analysis about value chain theory and strategic management accounting theory, this paper proposes an accounting management framework based on value chain analysis called value chain accounting.
Key words: Value Chain Analysis, Value Chain Costing, Value Chain Accounting.

JEL Classification: M21, M41

1. INTRODUCTION

Since late 20th century, many organizations in both the manufacturing and service sectors have faced dramatic changes in their business environment and many new management methods and manufacturing technologies have come into being in the fierce competitive environment in which international enterprises try to survive. There has been a significant reduction in product life cycles arising from technological innovations and the need to meet increasingly discriminating customer demands. To compete successfully in today’s highly competitive global environment companies have made customer satisfaction an overriding priority. They have also adopted new management approaches, changed their manufacturing systems and invested in new technologies. These changes have had a significant influence on management accounting systems (Drury, 2006: 5-6). The theory of value chain has brought about a new idea for enterprise management. In recent years, it is researched how to meet the needs for management by means of studying the value chain of enterprises. In a sense, the value chain management has penetrated into human mind, concerning with every aspect of enterprise management, such as accounting of value chain, human resource management of value chain, and cost management of value chain (Yang and Shang, 2007: 101).

The approach of the value chain analysis was put forward by Professor of Business Administration of American Harvard Business School, Dr. Michael E. Porter in his book “Competitive Advantage: Creating and Sustaining Superior Performance” in 1985. Porter mentioned among other things in this work the term of the "Value Chain", and stressed that the competitive competence of an enterprise depends not only on the optimization of the subfunctions, but efficient interlinking of the members of the chain. It is a kind of tool to confirm and analysis enterprise's competitive advantage. An enterprise has a lot of resources, ability and competition advantage, such as technological advantage, Human Resources advantage, management advantage, and innovative advantage, etc., if we consider an enterprise as a whole, and unable to identify these competition advantages, we must resolve the enterprise activity and confirm the competition advantages of enterprises through considering these individual activities and relations between each other (Xue, 2005: 1).

Every company has a value chain, although components may vary somewhat among companies. Because the activities in the chain involve costs, managerial
accounting involves planning and controlling all the value chain activities (Taner, 2008: 4-5). Value chain accounting is product of the combination of the value chain management theory, accounting theory and information technology. Value chain accounting by means of information technology, sets financial accounting and management accounting in the integration, the nature of this kind of value chain management activities determines the multi-function of accounting value chain (Wu, Fang and Xie, 2011: 225).

This paper is organized as follows. The introduction shed light to the background of value chain in strategic management. Section 2 explains the value chain concept. Section 3 investigates value chain analysis. Section 4 analyzes value chain accounting. The fifth section deals value chain costing as a strategic management accounting tool. The sixth section contrasts features of value chain costing and traditional management accounting systems. Finally, the seventh section includes the conclusion of this paper.

2. THE VALUE CHAIN CONCEPT

Every company’s business consists of a collection of activities undertaken in the course of designing, producing, marketing, delivering, and supporting its product or service. A company’s value chain consists of the linked set of value-creating activities the company performs internally. The value chain includes a profit margin because a markup over the cost of performing the firm’s value-creating activities is customarily part of the price (or total cost) borne by buyers—a fundamental objective of every enterprise is to create and deliver a value to buyers whose margin over cost yields an attractive profit (Thompson, Gamble and Strickland, 2005: 95).

These activities can be classified generally as either primary or support activities that all businesses must undertake in some forms. The basic idea is that a firm’s activities can be divided into nine generic types which are linked to each other and to the activities of its suppliers, channels and buyers. Five are the primary activities, which are directly concerned with the activities that create the products, market them deliver them and service, each of these primary activities has a linkage with support activities that can be useful to raise their effectiveness or efficiency. Four are the support activities that cross between the primary activities (Xue, 2005: 1). It is shown in Figure-1:
Figure-1: Porter’s Value Chain

According to Porter, the primary activities are (Thompson, Gamble and Strickland, 2005: 95):

1. Inbound Logistics: Activities, costs, and assets associated with purchasing fuel, energy, raw materials, parts, and components, merchandise, and consumable items from vendors; receiving, storing, and disseminating inputs from suppliers; inspection; and inventory management.

2. Operations: Activities, costs, and assets associated with converting inputs into final product form (production, assembly, packaging, equipment maintenance, facilities, operations, quality assurance, environmental protection).

3. Outbound Logistics: Activities, costs, and assets dealing with physically distributing the product to buyers (finished-goods warehousing, order processing, order picking and packing, shipping, delivery vehicle operations, establishing and maintaining a network of dealers and distributors).

4. Marketing & Sales: Activities, costs, and assets related to sales force efforts, advertising and promotion, market research and planning, and dealer/distributor support.

5. Service: Activities, costs, and assets associated with providing assistance to buyers, such as installation, spare parts delivery, maintenance and repair, technical assistance, buyer inquiries, and complaints.

According to Porter, the primary activities are (Xue, 2005: 7):
1. Firm Infrastructure: Serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management.

2. Human Resource Management: Consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel.

3. Technology: Pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs.

4. Procurement: Is the acquisition of inputs, or resources, for the firm.

Disaggregating a company's operations into primary and secondary activities exposes the major elements of the company's cost structure. Each activity in the value chain gives rise to costs and ties up assets; assigning the company’s operating costs and assets to each individual activity in the chain provides cost estimates and capital requirements. The combined costs of all the various activities in a company’s value chain define the company’s internal cost structure(Thompson, Gamble and Strickland,2005: 95).

3. VALUE CHAIN ANALYSIS

Value chain analysis was developed by Porter (1985), and in the accounting literature further developed by Shank (1989) and Shank and Govindarajan (1992 & 1993). Value chain analysis is used to analyze, coordinate and optimize linkages between activities in the value chain, by focusing on the interdependence between these activities(Abbeele, Roodhooft and Warlop,2011: 6). Value chain analysis is a mechanism that facilitates the optimization and coordination of interdependent activities in the value chain, which may cross organizational boundaries and accounting information is an important constituent of value chain analysis(Dekker,2003: 5). The central idea of the analysis is to break up “the chain of activities that runs from basic raw materials to end-use customers into strategically relevant segments in order to understand the behavior of costs and the sources of differentiation”(Shank and Govindarajan,1992: 180).

Value chain analysis gives us a framework of activities those inside and outside a firm, and makes the competitive strength of the firm combine together. So, it assesses the value of each activity which increases the products and services to a firm. The ability to perform particular activities and to manage the linkages
between these activities is a source of competitive advantage. Value chain analysis is a way of assessing competitive advantage by determining the strategic advantages and disadvantages of the full range of activities that shape the final offering to the end user. The goal of a firm is to maximize value creation and at the same time to reduce costs by minimizing. The costs and value drivers have been determined by every value activity. The value chain analysis has opened a road for the management with a powerful analysis tool of the strategic planning (Xue, 2005: 9). The competition between enterprise and the first kind competitor mainly is embodied in the price, production, service quality and marketing measures. Through “value chain analysis” to competitors, enterprise can find out their every unit value activity and analyze them how to perform value activities, through adopting the same analysis method with the method of value chain analysis for enterprise itself (Yang and Shang, 2007: 191).


- Improving quality by providing better understanding of customer requirements when products are assembled from multiple input sources (e.g. cars, computers...).
- Providing a way to evaluate competitive cost position and thereby improving strategic positioning.
- Reducing time when there is a great deal of interdependency between the participants in a value chain.
- Reducing cost by focusing attention on areas needing cost reduction and by reconfiguring the value chain.

The method of value chain analysis can be performed according as the stages. The principal stages of value chain analysis for strategic cost management are discussed below (Mageed, 2006: 124-138):

1. **Identify the value chain activities and disaggregate the firm into separate activities.**

A company should identify the specific value activities that it performs in the process of design, manufacturing, and customer service in the industry. In the value chain analysis for cost management, activities should be separated if they represent a significant or rapidly growing percentage of total costs.
2. Establish the relative importance of different activities in the total cost of the product.

Determining the optimal mix of value chain activities requires sound knowledge of the costs of activities and how they are allocated to different cost objects. Management needs to consider the company's business strategy and operating environment and then determine how to effectively invest the company's resources in various value chain activities.

3. Compare costs by activity.

To establish which activities the company performs relatively efficiently and which it does not, benchmark unit costs for each activity against those of competitors.

4. Identify cost drivers.

Costs of performing value chain activities can be driven up or down by three types of factors, structural cost drivers, executional cost drivers and operational cost drivers. Structural cost drivers determine the underlying cost base of organizations such as scale, scope, experience, technology used in the value chain, and supply cost. Executional cost drivers or management issues influence how well an organization manages the value chain in operation terms such as capacity utilization, product and process design, continued learning opportunities offered by TQM and continuous improvement programs, and internal and external linkages. Operational cost drivers (activity drivers) are those factors that drive the cost of operational activities. They include such factors as number of parts, number of moves, number of products, number of customer orders, and number of returned products.

5. Identify linkages and interrelationships in the value chain.

It is important not to think of the value chain merely as a set of independent activities. In the value chain, costs are associated with value-creating activities. Thus, by reducing the costs in the various activities of the value chain, the company may be able to reduce costs effectively. However, consideration must be given to linkages between activities. The cost of performing one activity will often be influenced by the way in which other activities are performed. Thus, the costs of activities should not be reduced independently, but they should be optimized together. This way it is possible to achieve an overall cost reduction throughout the whole value chain resulting in a competitive advantage.
6. **Identify opportunities for reducing costs and/or improving value.**

Opportunities to reduce costs are derived from many different sources within the value chain. Gaining and sustaining cost advantage may originate from one activity or many activities within the company, and controlling cost drivers and redefining the value chain can play a role in creating cost advantage. A company should exploit all the opportunities available for reducing costs in activities that do not influence the value to customer. Thus, for each value activity, a company should try to reduce costs in this activity and keep value constant or increase value.

### 4. VALUE CHAIN ACCOUNTING

The generation of the value chain is the result of the competition that enterprises pursue different competitive strategies. The value chain was the combination of a series of associated valuable activities of the enterprise. The “cost chain” corresponding with the valuable activities exists on the value chain. Starting from the expense devotion for the product R&D, the preparation before the production, and various consumptions in the making process, until to establishing the sales channel, marketing and distribution output and expenses after service, this “cost chain” supports various activities on the value chain to be developed effectively to increase the values of the product and fulfill clients’ demands. As the comprehensive consumption index of the value chain activity, the cost is represented by a sort of form of “negative increment”. The value chain cost management is to manage the “cost chain” on the value chain of the product, eliminate the activities without increments or with low efficiencies, reduce the amount of “negative increment”, minimize the costs on the whole chain, enhance the efficiency of the whole supply chain, and make the enterprises on the chain all win (Mei, Han and Chen, 2009: 17).

Along with the development of information technology, the traditional accounting increasingly doesn’t adapt to economic development, Chinese deceased professor Yan Dawu makes a combination with value chain management theory, accounting theory and information technologies and puts forward the concept of value chain accounting. Value chain accounting by means of information technology, sets financial accounting and management accounting in the integration, the nature of this kind of value chain management activities determines the multi-function of accounting value chain (Wu, Fang and Xie, 2011: 224-225).

The functions of value chain accounting are real-time reflect function, real-time multidimensional control function, prediction function and decision-making.
function. These functions of value chain accounting are discussed below (Wu, Fang and Xie, 2011: 225-227):

1. Real-Time Reflect Function of Value Chain Accounting

The one characteristic of value chain accounting reflect function is real-time, which doesn’t been restricted by the accounting period ruled by accounting system, but will reflect value activities’ information of each node in the value chain alliance on real-time, such as enterprise inflows, creating, outflow and so on. Another characteristic of value chain reflecting accounting functions is the expanded range. In addition to reflecting economic activities of enterprise itself, it still can reflect the economic activity of the value chain’ upstream suppliers and downstream customers.

2. Real-Time Multidimensional Control Function of Value Chain Accounting

Compared with the traditional accounting controlling function, the controlling function of value chain accounting performs comprehensive multi-dimensional controlling based on the real-time evaluation. Namely, the relevant personnel using modern information technology and related information make real-time contrast and real-time analysis of each node enterprise of value chain alliance and the whole business activities process of enterprise itself, and through the link of commanding, coordinating and restricting, etc, to intervene enterprise business to improve its operation efficiency and benefit, so as to achieve the ultimate goal of value maximization.

3. Prediction Function of Value Chain Accounting

Compared with the traditional accounting the prediction function’ range of value chain accounting is broader, on the one hand, it will predict various possible value creation and value realization activities in the value chain, on the other hand, it also needs to predict the value effect of these value activities, namely it will predict which links will appear value-added effects and the possible value appreciation; and which links may appear zero value-added effects and negative value effect and the influential degree on the enterprise total value appreciation, etc.

4. Decision-Making Function of Value Chain Accounting

In the concrete decision-making process, value chain accounting management goal can be decomposed into many objectives, the realization of the total goal relying on realization of these sub-targets, so that the decision-making view changes from abstract total goal to specific objectives. For the value chain
accounting, each objective should be set respectively based on the different value chain of enterprises.

5. VALUE CHAIN COSTING AS A STRATEGIC MANAGEMENT ACCOUNTING TOOL

Strategic management accounting, is an attempt to shift the perceptions of accountants and non-financial managers from an inward-looking to an outward-looking one, recognizing the need to look beyond the business along the value chain to its suppliers and customers and to seek ways of achieving and maintaining competitive advantage (Collier, 2003: 9). The notion of strategic management accounting is linked with business strategy and maintaining or increasing competitive advantage (Collier, 2003: 47). Wilson defined strategic management accounting as an approach to management accounting that explicitly highlights strategic issues and concerns setting management accounting in a broader context in which financial information is used to develop superior strategies as a means of achieving sustainable competitive advantage (Wilson, 1995: 162).

Strategic management accounting is identified with a generic approach of accounting for strategic positioning. The strategic nature of management accounting aims at its external and prospective orientation (Carmen and Corina, 2009: 738). Hogue defined strategic management accounting as "a process of identifying, gathering, choosing and analyzing accounting data for helping the management team to make strategic decisions and to assess organizational effectiveness" (Hogue, 2001: 2).

In the management accounting literature the value chain costing is regarded as a core analytical tool of strategic management accounting (Dekker, 2003: 2). Shank and Govindarajan (1992) developed value chain costing method that represents a management accounting operationalisation of Porter’s (1985) value chain analysis. The focus of this technique is external to the firm as it involves viewing the organization as a link in the chain of all value-creating activities associated with the provision of a product or service. Shank and Govindarajan demonstrate that traditional value added analysis can be seen to be somewhat narrow as it fails to consider any latent cost savings that lie unrealized in the firm’s linkages with its suppliers and customers (Cadez and Guilding, 2007: 10). Value chain costing proposes an approach to accounting that considers all the activities performed from the design to the distribution of the product; the strategic implications regard the exploiting of the economies and efficiencies deriving from the external linkages between the company and both suppliers and customers (Carmen and
Corina, 2009: 739). Value chain costing acts as a useful extension of conventional cost analysis, taking into account benefits and cost savings embedded in the firm’s links with suppliers and customers (Cullen, 2009: 26). Value chain costing has been used as a strategic management accounting tool, where costs are allocated to activities required to design, procure, produce, make, distribute, and service a product or to provide a service.

6. CONTRASTING FEATURES OF VALUE CHAIN COSTING AND TRADITIONAL MANAGEMENT ACCOUNTING SYSTEMS

Traditional management accounting systems have the inability to adequately support a value chain analysis. Traditional management accounting systems are based on the internally oriented concept of value added, which hinders firms in taking advantage of the opportunities to coordinate interdependence in the value chain (Dekker, 2003: 5). Shank argues that a fundamental problem of the value added concept is that it “starts too late and it stops too soon” (Shank and Govindarajan, 1989: 51). By starting cost analysis at the point of purchase, possibilities to exploit linkages with suppliers are missed, and by stopping the cost analysis already at a completed sale, possibilities to exploit linkages with customers are missed. The value added perspective focuses on maximizing the difference between the firm’s purchasing costs and selling price. Thereby it ignores linkages in the wider value chain, such as the causes of this purchasing price, the costs of activities related to the product, and the consequences of the product for the buyer’s activities (Dekker, 2003: 5). Value chain costing assesses competitive advantage by determining the strategic advantages and disadvantages of full range of activities that shape the products which have been supplied to the ultimate user. These activities include not only inside business activities but also outside value activities. Businesses must know about both their own and their competitors' cost of value chain. The achievement of this by using the traditional management accounting systems is not possible. Businesses should use value chain costing that views the costs from strategic perspectives. Traditional management accounting has been “value added-oriented” which is a very narrow approach in today's competitive environment. The value chain costing depends on “value creation”. Moreover, the value chain costing also focuses on the outside of the businesses (Türk, 2004: 231-232). Features of value chain costing and traditional management accounting systems are compared below:
### Table-1: Comparison of Traditional Management Accounting Systems and Value Chain Costing

<table>
<thead>
<tr>
<th></th>
<th>Traditional Management Accounting Systems</th>
<th>Value Chain Costing</th>
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<tbody>
<tr>
<td><strong>Focus</strong></td>
<td>Internal</td>
<td>External</td>
</tr>
<tr>
<td><strong>Perspective</strong></td>
<td>Seeks cost reduction in value added process.</td>
<td>Seeks competitive advantage based on entire set of linked activities from suppliers to end-use customers.</td>
</tr>
<tr>
<td><strong>Cost analysis-way</strong></td>
<td>In term of: product, customer, and function With a strongly internal focus Value added is a key concept</td>
<td>In terms of the various stages of the overall value chain of which the firm is a part With a strongly external focus Value-added is seen as a dangerously narrow concept</td>
</tr>
<tr>
<td><strong>Cost analysis-objective</strong></td>
<td>Three objectives all apply, without regard to the strategic context: Score keeping, attention directing, and problem solving.</td>
<td>Although the three objectives are always present, the design of cost management system changes dramatically depending on the basic strategic positioning of the firm: either under a cost leadership strategy, or under a product differentiation strategy.</td>
</tr>
<tr>
<td><strong>Cost driver concept</strong></td>
<td>A single fundamental cost driver pervades literature - cost is a function of volume. Applied too often only at the overall firm level.</td>
<td>Multiple cost drivers such as: Structural drivers (e.g. scale, scope, experience, technology, complexity) Executorial drivers (e.g. participative management, total quality management) Each value activity has a set of unique cost drivers.</td>
</tr>
<tr>
<td><strong>Cost containment philosophy</strong></td>
<td>Cost reduction approached via responsibility centers or product cost issues</td>
<td>Cost containment is a function of the cost driver(s) regulating each value activity.</td>
</tr>
<tr>
<td><strong>Primary concern</strong></td>
<td>Cost impact</td>
<td>Cost/Value/Revenue relationship</td>
</tr>
<tr>
<td><strong>Nature of data</strong></td>
<td>Internal information</td>
<td>External and internal information</td>
</tr>
<tr>
<td><strong>Primary role</strong></td>
<td>Scorekeeper</td>
<td>Analyst and consultant</td>
</tr>
<tr>
<td><strong>Management responsibility</strong></td>
<td>Follower/reactive Risk-averse</td>
<td>Leader/proactive Comfortable with ambiguity</td>
</tr>
</tbody>
</table>

Source: This table adapted from (Transtutors, 2011), (Fischer, 1993: 129), (Shank and Govindarajan, 1993: 217) and (McNair, 2000: 31).
7. CONCLUSION

Constant and dramatic changes in contemporary competitive environment require the knowledge of a wide focus of cost and performance management of companies. In a changing world, new management accounting practices, or different ways of using some fairly long-standing techniques, are needed. From the value chain costing and the value chain accounting perspectives, a company has to integrate and optimize its internal and external resources to obtain and enhance competitive advantages. Value chain analysis is a way of assessing competitive advantage by determining the strategic advantages and disadvantages of the full range of activities that shape the final offering to the end user. By implementation of value chain costing, the combined costs of all the various activities in a company’s value chain can define the company’s internal cost structure. Value chain accounting sets financial accounting and management accounting in the integration, the nature of this kind of value chain management activities determines the multi-function of accounting value chain. In the management accounting literature the value chain costing is regarded as a core analytical tool of strategic management accounting. The value chain costing depends on “value creation”. On the other hand, traditional management accounting has been “value added-oriented” which is a very narrow approach in today's competitive environment. Today’s cost accountant must understand many functions of a business’s value chain, from manufacturing to marketing to distribution to customer service. The company’s internal accountants have moved beyond the traditional manufacturing cost approach to a more inclusive approach. This newer approach to product costing may take into account the costs of the value-chain activities defined by initial design and engineering, manufacturing, distribution, sales, and service.

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