

**A STUDY ON THE RESPONSIBILITY ACCOUNTING AND  
ECONOMIC VALUE ADDED  
The Case of Korea Tourism Organization**

**By**

**Nam-Chun Kim**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of

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Supervisor Tae-Hee Choi \_\_\_\_\_

## **ABSTRACT**

### **A STUDY ON THE RESPONSIBILITY ACCOUNTING AND ECONOMIC VALUE ADDED**

#### **The Case of Korea Tourism Organization**

This paper examines the issues concerning the responsibility accounting and EVA as a one of the best measures of shareholder economic value and the financial management tool for organizational profitability measurement within the organization. This paper also attempt to present a management accounting model on linking the responsibility accounting to economic value added (EVA) for departmental cost control and performance evaluation of Korea Tourism Organization (KTO). The management accounting model on combining responsibility costs and EVA based on the case of KTO using CAPM and pure-play methodology shows that the responsibility accounting needs to reflect company's balance sheet and hence to account for the full cost of capital employed in business. Including capital charges, the responsibility accounting system provides more accurate information about responsibility costs and hence makes management and managers focus their attention on the real full costs of resources consumed with the most leverage for increasing economic profits.

Key words: responsibility accounting, EVA, responsibility costs, capital charges

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*Dedicated to my parents,  
Jung-Ah Kim  
and So-min Kim*

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# CHAPTER 1

## INTRODUCTION

As many researchers note, companies generally decentralize decision-making authority in order to make better use of local knowledge. Moreover, such firms tend to be organized into divisions to achieve greater accountability and stronger incentives to increase value or to control the free-rider problem (Zimmerman, 1997; Kaplan and Atkinson, 1998; Jensen and Meckling, 1999).

As a result divisional cost control and performance measurement are a hot topic and one of the critical factors determine how divisions and individuals in an organization behave. The conception about divisional cost control and performance evaluation concerns the responsibility accounting compared with the full cost accounting and the widespread practice of evaluating the divisions of decentralized, multi-divisional firms as if the divisions were independent companies. Divisional performance measurement, as Jensen and Meckling (1999) claim, includes subjective as well as objective assessments of the performance of both individuals and subunits of an organization.

Besides the characteristics of the decentralized organizations, the emphasis on

responsibility accounting is reinforced. Benston (1963) describes responsibility accounting as making the smallest areas of responsibility the fundamental building blocks of the accounting system and facilitating effective motivation. With a system of responsibility accounting, top management can afford to widen its span of control and allow operating decisions to be made on a decentralized basis (Benston, 1963).<sup>1</sup> Thus Anthony *et al.* (2005) emphasized responsibility center managers need information about what has taken in their respective areas of responsibility for management control purposes and responsibility accounting identified the amount of costs that each of responsibility center managers is responsible for. Furthermore, if the performance measures are to have the desired effects on the behavior of an organization's members, the reward and punishment system must link rewards with performance in a clear and consistent way. The performance measures should also be consistent with the ways in which decision rights are allocated throughout an organization.<sup>2</sup>

Therefore, as Hubbell (1996) argues, for internal management information systems to serve the best interests of both shareholders and managers, they must identify, collect, and routinely report the information that is critical to making decisions about resource

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<sup>1</sup> George J. Benston. "The role of The Firms Accounting System for Motivation," *The Accounting Review*(April 1963), pp.347-354.

<sup>2</sup> Michael C. Jensen and William H. Meckling. "Special Knowledge and Divisional Performance Measurement," *Journal of Applied Corporate Finance*(Summer 1999), pp.8-17.

allocations. However, as Hubbell (1996) notes, traditional accounting system including responsibility accounting have ignored the balance sheet and failed to account for the full cost of capital. Responsibility costs are therefore underestimated. The advanced perspective, presented by him, suggests that while traditional accounting systems successfully focus management's attention on cost drivers as the means to managing costs, they do not identify critical capital charge drivers as a means of managing capital.<sup>3</sup> As a consequence, if the responsibility accounting system could be modified to include capital costs in a more objective and accurate way, the result will be an improved management system which helps managers focus on all the necessary elements of creating corporate value, including operating costs and capital charges.

With all of these, this paper investigates the topics concerning the responsibility accounting (responsibility centers, cost allocations and transfer prices) and EVA as a one of the best measures of shareholder economic value and also, the financial management tool for organizational profitability measurement within the organization. Also, this study aims to present a management accounting model on linking the responsibility accounting to EVA for departmental cost control and performance measurement of Korea Tourism Organization (KTO).

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<sup>3</sup> William W. Hubbell. "Combining Economic Value Added and Activity-Based Management," *Journal of Cost Management*(Spring 1996), pp.18-29.

The paper is organized as follows: The first section examines antecedent literature on the issues concerning the responsibility accounting studies. The first part will explore the incentives for decentralization in organizations and its advantages and disadvantages. The second part will describe the types and definition of responsibility centers. The third part will explain the issues in the responsibility center accounting: transfer price and cost allocation. Finally, we will review the case of responsibility center approach and its limitations.

The second describes economic value added (EVA) as a performance measure and its usefulness, explaining the measurement method of EVA and the need for combining responsibility accounting and EVA.

The third explains the case of KTO, one of the government-owned corporations and also one of multi-business companies. The first part overviews KTO, explores its business activity and past financial performance by business segment. The second analyzes the responsibility accounting model currently applied in the KTO and suggests the solutions to the problems of KTO's existing management accounting system.

The fourth section is building up responsibility centers in KTO, setting up cost assignment method, reorganizing financial statement and measuring divisional EVA of the company through the methodology that is described in section two and three.

The last section presents the conclusion, limitations and suggestions for future study.



## CHAPTER 2

### LITERATURE REVIEW ON RESPONSIBILITY ACCOUNTING

#### 1. Background of the Responsibility Accounting

The complex environment in which business is conducted today makes it impossible for any individual or central group to possess all the relevant information, experience, time, and computational power to determine the detailed operating plans for the organization. In practice, no central management can possibly know everything about an organization's many activities. Therefore, central management cannot make all the decisions for lower-level managers. Many organizations faced with today's increasing competitive pressures are changing the way they are organized and the way they do business. This is necessary because they must be able to change quickly in a world where technology, customer tastes, and competitors' strategies are constantly changing. Many decisions must be made at the lower or local levels of any organization (Atkinson *et al.*, 2004).

As Atkinson *et al.* (2004) argue, being adaptive generally requires that the organization's senior management delegate or decentralize decision-making responsibility to more people in the organization. Decentralization allows motivated and

well-trained organization members to identify changing customer tastes quickly and gives frontline employees the authority and responsibility to develop plans to react to these changes (Atkinson *et al.*, 2004).<sup>4</sup>

### **1-1. Incentives for Decentralization in Organization**

The first question to be addressed is: Why is a decentralized organizational structure employed?<sup>5</sup> As Zimmerman (1979) argues, generally limited cognitive capacity of the principal and the existence of investment alternatives with positive net present values leads the principal to delegate (or assign) decision-making responsibility to an agent: hence, decentralization.

Centralization and large size make perception of the workers' needs difficult. Communication between the decision makers and those who carry out their decisions becomes complicated and subject to more interference ("noise").<sup>6</sup> Thus Benston (1963) also argued decentralization characterized by the autonomy of action given the department manager by top management serves both to allow the managers the necessary freedom and authority needed for motivation and to encourage them to supervise their workers effectively.

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<sup>4</sup> Anthony A. Atkinson, Robert S. Kaplan, and S. Mark Young. *Management Accounting*. Prentice Hall, 2004, pp.529.

<sup>5</sup> Jerold L. Zimmerman. "The Costs and Benefits of Cost Allocations," *The Accounting Review*(July 1979), pp.504-521.

<sup>6</sup> George J. Benston. "The role of The Firms Accounting System for Motivation," *The Accounting Review*(April 1963), pp.347-354.

And also, Jensen and Meckling (1999) align corporate decision-making authority with valuable “specific knowledge” inside the organization.

They define specific knowledge as knowledge costly to transfer among agents and not easily observable by other agents. General knowledge is information transferable among agents at low cost or easily observable by other agents (Jensen and Meckling, 1999).

Consequently Jensen and Meckling’s (1999) theory describes when the relevant knowledge is specific and when technology is unable to lower the cost of transfer substantially, the appropriate approach to moving the knowledge is to move the decision rights to those agents who possess the relevant specific knowledge.

In addition to the researches mentioned above, Kaplan and Atkinson (1998)<sup>7</sup> presented seven specific incentives for firms to decentralize: 1) the environment of the firm, 2) information specialization, 3) timeliness of response, 4) conservation of the central management time, 5) computational complexity, 6) training for local managers, and 7) motivation for local managers. Kaplan and Atkinson (1998) also argued that different members in the organization have different bodies of knowledge and abilities to act. Thus it is impossible for any individual or central group to possess all the relevant information, experience, time, and computational power to determine the

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<sup>7</sup> Robert S. Kaplan, and Anthony A. Atkinson. *Advanced Management Accounting*. Prentice Hall, 1998, pp.290-293

detailed operating plans for the organization.

## **1-2. Advantages and Disadvantages of Decentralization**

The arguments for decentralization seem compelling (Kaplan and Atkinson, 1998).<sup>8</sup> Garrison and Noreen (2003)<sup>9</sup> holds that although most organizations fall somewhere between two extremes: total decentralization and total centralization, there is a pronounced trend toward more and more decentralization.

How much decentralization is optimal?<sup>10</sup> To answer this question, as Horngren *et al.* (2003) emphasized, the degree of decentralization that maximizes the benefits over costs of should be chosen. Thus the cost-benefit approach helps top management focus on the issues.

Horngren *et al.* (2003)<sup>11</sup> summarize the benefits of decentralization into five components: 1) creates greater responsiveness to local needs, 2) leads to gains from quicker decision making, 3) increases motivation of subunit managers, 4) aids management development and learning, and 5) sharpens the focus of subunit managers. Also, Garrison and Noreen (2003) identify the advantages of decentralization as follows: First, top management s concentration on setting broad strategic direction

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<sup>8</sup> Robert S. Kaplan, and Anthony A. Atkinson. *Advanced Management Accounting*. Prentice Hall, 1998, pp.293.

<sup>9</sup> Ray H. Garrison, and Eric W. Noreen. *Managerial Accounting*. Mc Graw Hill, 2003, pp.526.

<sup>10</sup> Charles T. Horngren, Srikant M. Datar, and George Foster. *Cost Accounting: A Managerial Emphasis*. Prentice Hall, 2003, pp.756.

<sup>11</sup> *Ibid.*

through relieving them of day-to-day operating decisions. Second, providing lower-level managers with vital experience in making decisions. Third, increased job satisfaction with added responsibility and decision-making authority. Forth, lower-level managers' decision-making based on more detailed and up-to-date information.

On the other hand, Horngren *et al.* (2003) point out four costs of decentralizing decision making: 1) leads to suboptimal decision making, 2) focuses manager attention on the subunit rather the organization as a whole, 3) increases costs of gathering information, and 4) results in duplication of activities. According to Garrison and Noreen (2003), decentralization has also four major disadvantages: First, lower-level managers' decision making without fully understanding the company s strategy. Second, lack of coordination among autonomous managers. Third, lower-level managers' objectives different from the objectives of the entire organization. Fourth, more difficulty to effectively spread innovative ideas.

Therefore, as Kaplan and Atkinson (1998)<sup>12</sup> point out, although decentralization seems essential for organizing complex operations, it introduces many problems of its own: problems of goal congruence, problems of externalities, and overconsumption of perquisites. The challenge is to devise the right combination of delegation of effort and

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<sup>12</sup> Robert S. Kaplan, and Anthony A. Atkinson. *Advanced Management Accounting*. Prentice Hall, 1998, pp.300-303.

decision making, observation of effort, and reward or incentive schemes to balance the benefits and costs of decentralization.

### **1-3. Decentralization and Responsibility Accounting**

Benston (1963)<sup>13</sup> argues that decentralization, which is characterized by the autonomy of action given the department manager by top management, serves both to allow the managers the necessary freedom and authority needed for motivation and to encourage them to supervise their workers effectively.

According to Benston (1963), decentralization is aided effectively by responsibility accounting. That is, top management can afford to give authority to the department manager, since it can control the basic activities of the department with the help of accounting reports of performance. Furthermore, he stresses accounting reports may serve as reliable means of communications, wherein top management can inform the manager of the goals of the firm that it expects to fulfill (Benston, 1963).<sup>14</sup>

Anthony *et al.* (2004)<sup>15</sup> defines responsibility accounting as the management accounting construct that deals with both planned and actual accounting information about the inputs and outputs of a responsibility center. Responsibility accounting

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<sup>13</sup> George J. Benston. "The role of The Firms Accounting System for Motivation," *The Accounting Review*(April 1963), pp.347-354.

<sup>14</sup> *Ibid.*

<sup>15</sup> Robert N. Anthony, David F. Hawkins, and Kenneth A. Merchant. *Accounting: Text and Cases*. Mc Graw Hill, 2004, pp.707.

focuses on responsibility centers. It is to be contrasted with full cost accounting, which focuses on goods and services rather than on responsibility centers. This difference in focus is what distinguishes responsibility accounting from full cost accounting (Anthony *et al.*, 2004).

<Table 1> Contrast between Full Costs and Responsibility Costs

<b>Panel A. Full Product Costs</b>			
(Unit : KRW amounts in mil.)	Total	Whisky	Wine
Cost elements:			
Cost of goods sold	20,000	14,000	6,000
Salaries	13,000	8,000	5,000
Rent expense	9,620	5,920	3,700
Selling and administration	5,500	3,645	1,855
Total costs	48,120	31,565	16,555

<b>Panel B. Responsibility Costs</b>				
(Unit : KRW amounts in mil.)	Teams (Responsibility Centers)			
	Total	DF Shop	Purchasing	Promotion
Cost elements:				
Cost of goods sold	20,000	20,000		
Salaries	13,000	10,000	1,500	1,500
Supervision	4,240	2,560	840	840
Other labor costs	6,970	2,670	2,200	2,100
Supplies	1,290	990	100	200
Other costs	2,620	1,320	500	800
Total costs	48,120	37,540	5,140	5,440

Table 1 depicts an international airport duty-free shop in the KTO with only three teams: duty-free shop is the operating team; purchasing team provides goods to sell; and planning & promotion team performs all selling and administrative activities. Panel A

of the Table 1 presents the full costs of the company during the certain period and the cost elements that accounts for these full costs. On the contrary, responsibility accounting identifies the costs that three team managers are held accountable for respectively, as shown in panel B of the Table 1.

As a consequence assigning costs to the team managers who have control over their incurrence is a factor in encouraging these managers to exercise effectively their authority to motivate their supervisees. Also, the managers' performance in this regard is measured by the accounting reports, which are likely to be an incentive for the effective motivation of the managers (Benston, 1963).

## **2. Types and Definition of Responsibility Centers**

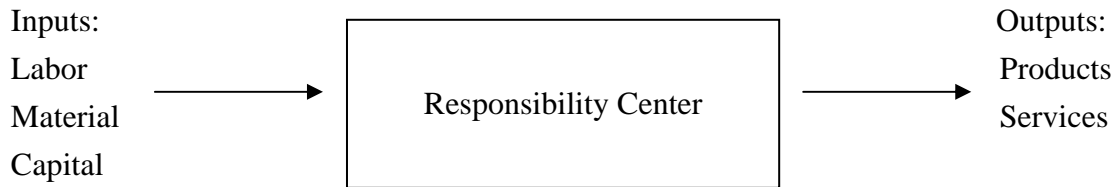
Responsibility center is broadly defined as an organization subunit (division, department, section, and so on) headed by a manager who is held responsible for controlling over cost, revenue, or investment funds (Maciariello and Kirby, 1994; Kaplan and Atkinson, 1998; Garrison and Noreen, 2003; Horngren *et al.*, 2003). Maciarello and Kirby (1994) explain responsibility centers form an organizational hierarchy or a means-end chain in pursuit of organizational goals.

Figure 1 shows a responsibility center is an organizational unit that uses inputs in the form of labor, materials, and capital and converts them into outputs consisting of



products and services (Maciarello and Kirby, 1994).

<Figure 1> Schematic Representation of a Responsibility Center



Most accounting researchers presents five types of decentralized organizational units: 1) standard cost centers, 2) revenue centers, 3) discretionary expense centers, 4) profit centers, and 5) investment centers (Anthony *et al.*, 2004; Jensen and Meckling, 1999; Kaplan and Atkinson, 1998; Maciarello and Kirby, 1994). And these responsibility centers differ depending on the degree of authority and accountability given to the local manager.

As a result, there are five different types of responsibility centers and related financial performance measurement systems to link together decentralized decision making (Jensen and Meckling, 1999). We briefly discuss these types of organization units.

**Standard Cost Centers;** Standard cost centers can be established whenever we can define and measure output well and can specify the amount of inputs required to produce each unit of output. They can be used for any repetitive operation for which we

can measure the physical amount of output and specify a production function relating inputs to outputs. Thus, standard cost centers can be established in both manufacturing and service industries (Kaplan and Atkinson, 1998).

As Jensen and Meckling (1999)<sup>16</sup> argue, standard cost centers are designed to encourage managers to focus on increasing the efficiency of the production process without the distractions caused by changes in demand conditions that would affect them if revenues were included in the performance measure.

**Revenue Centers;** Revenue center acquires finished goods from a manufacturing division and is responsible for selling and distributing those good. However, it is not held accountable for the costs of the goods or services that the center sells (Anthony *et al.*, 2004; Kaplan and Atkinson, 1998).

Kaplan and Atkinson (1998) present when a performance measure is chosen for a revenue center, some notion of the cost of each product should be included so that the center is motivated to maximize gross operating margins rather than just sales revenue.

**Discretionary Expense Centers;** Discretionary expense centers are appropriate for units that produce outputs that are not measurable in financial terms or for units where no strong relation exists between resources expended and results achieved

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<sup>16</sup> Michael C. Jensen and William H. Meckling. "Special Knowledge and Divisional Performance Measurement," *Journal of Applied Corporate Finance*(Summer 1999), pp.8-17.

(Kaplan and Atkinson, 1998). That is, the providers of internal administrative services such as human resources, patent management, and public relations are commonly organized as discretionary expense centers (Jensen and Meckling, 1999).

Because of the weak relationship between inputs and outputs in these responsibility centers, however, it is very difficult to measure output, so neither effectiveness nor efficiency can be determined. Instead, companies use controls on the inputs used by the discretionary expense centers than using results control. And the control of discretionary expense centers requires the informed judgment of knowledgeable professionals on the level an quality of service the centers are producing (Kaplan and Atkinson, 1998).

**Profit Centers;** Units in which the managers have almost complete operational decision-making responsibility and are evaluated on the difference between its revenues and costs as defined by the measurement system (Kaplan and Atkinson, 1998; Jensen and Meckling, 1999).

According to Jensen and Meckling (1999), when the knowledge required to make decisions about the product mix, quantity, and quality is specific to the division and therefore costly or impossible for managers at higher levels in the hierarchy to obtain, the profit center can be an effective performance measurement system.

**Investment Centers;** A subunit is designated an investment center if it has control not only over sales revenues and operating costs but also over the assets employed in producing profit (Maciarello and Kirby, 1994). Investment centers, as Jensen and Meckling (1999) claim, are performance measurement systems that take into account the efficiency of asset utilization.

Investment centers are generalizations of profit centers in which profitability is related to the assets used to generate the profit. Return on investment (ROI) and economic value added which is the best flow measure of performance currently known are typical investment center performance measures (Kaplan and Atkinson, 1998; Jensen and Meckling, 1999).

In addition to investment centers mentioned above, Marc Hodak (2000)<sup>17</sup> introduces EVA center defined as any business unit whose financial results are tracked in terms of economic value added, or EVA.

### **3. Issues in the Responsibility Accounting System Design**

#### **3-1. Proper Cost Allocations in Responsibility Centers**

Despite many accounting researchers view that cost allocations are essentially an arbitrary and serve no useful purpose, cost allocations are popular in practice

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<sup>17</sup> Marc Hodak. "The Viable EVA Center(Or, How TO Slice a Company So It Doesn t Bleed)," *Journal of Applied Corporate Finance*(Fall 2000), pp.71-79.

(Zimmerman, 1979; Blanchard and Chow, 1983). Blanchard and Chow (1983)<sup>18</sup> present the surveys by Imhoff (1978), Chiu and Lee (1981), and Fremgen and Liao (1981) reflecting this practice. They found that absorption costing is commonly used for internal decision making and reporting purposes, allocating corporate indirect costs among their primary responsibility centers.

### **Some Rationales for Cost Allocations**

Why do firms continue to allocate costs for internal reporting purposes?

Zimmerman's examples illustrate that cost allocations can act as a lump-sum tax which reduce the manager's consumption of perquisites and that cost allocations can serve as useful proxy variables for certain difficult-to-observe costs (Zimmerman, 1979). His cases<sup>19</sup> suggest that cost allocations might be useful devices for controlling and motivating managers. Also, Blanchard and Chow (1983) argue cost allocations can be a potent tool in motivating greater goal congruence between a firm and its employee.

### **Costs and Benefits of Cost Allocations**

Zimmerman (1979)<sup>20</sup> examines the reasons why the firms allocate cost. He provides some concrete examples and sufficient conditions which support Horngren's

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<sup>18</sup> Garth A. Blanchard, and Chee W. Chow. "Allocating Indirect Costs for Improved Management Performance," *Management Accounting* (March 1983), pp.38-41.

<sup>19</sup> Jerold L. Zimmerman. "The Costs and Benefits of Cost Allocations," *The Accounting Review* (July 1979), pp.504-521.

<sup>20</sup> *Ibid.*

(1977) and Kaplan's (1977) conjectures: cost allocations are linked to managerial behavior (Zimmerman, 1979). Furthermore, he demonstrates that situations exist in which cost allocations yield positive net benefits to the firm.

According to his analysis, cost allocations appear to proxy for certain hard-to-observe costs that arise when decision-making responsibilities are assigned to and vested in various individuals (*i.e.*, decentralized) within the firm.<sup>21</sup> He discusses, as shown below, two specific situations: 1) controlling the agent's overconsumption of perquisites and 2) proxying the costs of degraded service, delay, and future expansion that arise when a common resource is shared by several decision makers (Zimmerman, 1979). Also, Blanchard and Chow (1983)<sup>22</sup> summarize the possible benefits from cost allocations into two elements: 1) goal congruence in the decentralized firm by reducing slack using the allocation of indirect costs, and 2) more optimal allocation of scarce resources.

### **Controlling the Agent's Overconsumption of Perquisites**

Can cost allocations reduce the overconsumption of perquisites? Zimmerman (1979)<sup>23</sup> describes cost allocations can act as a lump-sum tax which reduces an agent's

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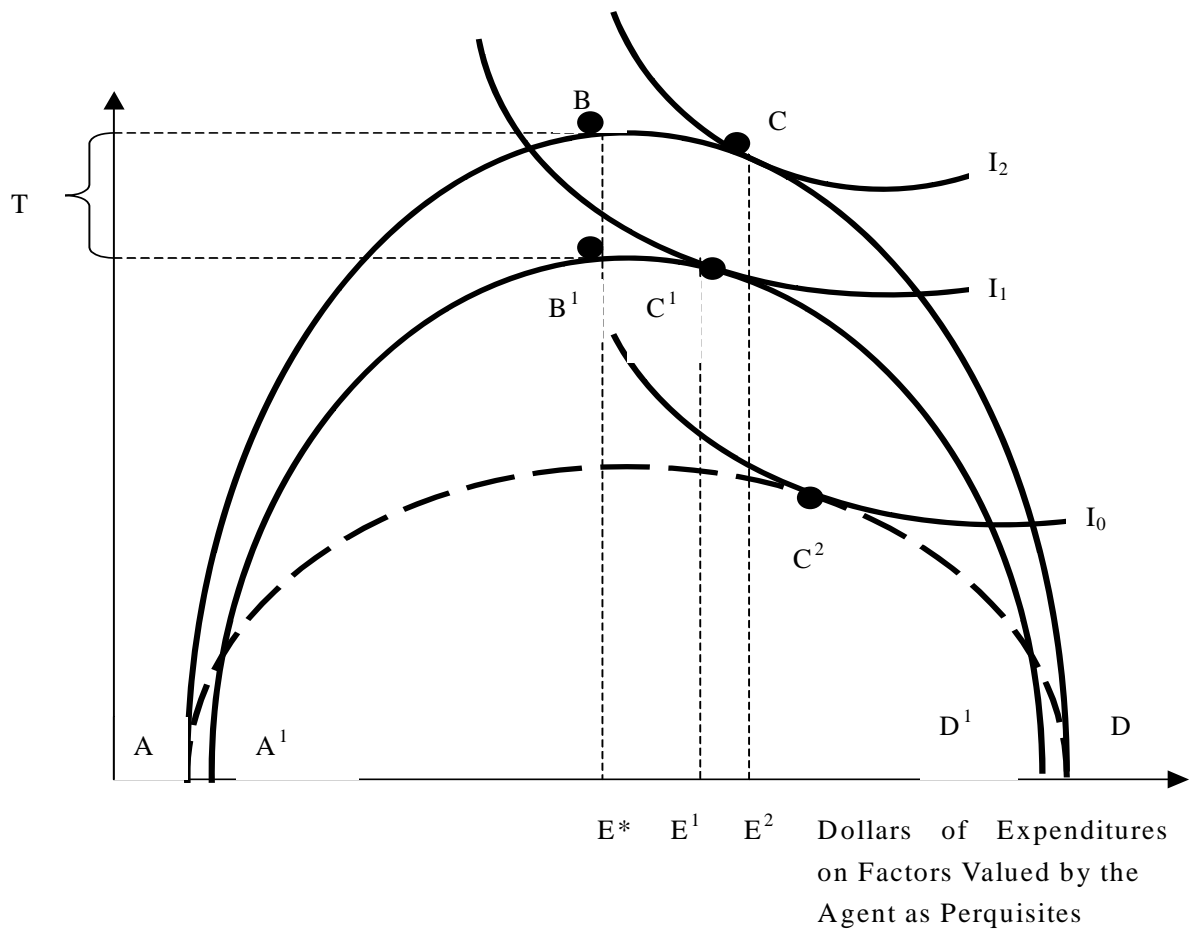
<sup>21</sup> *Op.cit.*, pp.519.

<sup>22</sup> Garth A. Blanchard, and Chee W. Chow. "Allocating Indirect Costs for Improved Management Performance," *Management Accounting* (March 1983), pp.38-41.

<sup>23</sup> Jerold L. Zimmerman. "The Costs and Benefits of Cost Allocations," *The Accounting Review* (July 1979), pp.508-509.

discretionary spending on perquisites in Figure 2. The principal is taxing the responsibility center by allocating  $\$T$  of the principal's overhead to the responsibility

<Figure 2> Overhead as a Lump-Sum Tax to Reduce Discretionary Spending



center. The responsibility center manager faces a new opportunity set,  $A_1B_1C_1D_1$ . ( $A_1B_1C_1D_1$  is a vertical downward shift in  $ABCD$  by  $\$T$ .) As shown in Figure 2, the new optimum level of perquisites after the allocation of  $\$T$  is  $C_1$ , and the level of perquisites is reduced from  $E_2$  to  $E_1$ .

### **More Optimal Allocation of Scarce Resources**

Based on Zimmerman's (1979) argument, Blanchard and Chow (1983)<sup>24</sup> hold increasing use of a corporate service (such as a computer center, a typing pool, or a maintenance shop) by organizational subunits can still entail increasing costs to the firm as a whole. Zimmerman points out this effect is due to increase in opportunity costs, which can arise in numerous ways.<sup>25</sup> These kinds of opportunity costs arise out of use of a service by one unit causing delays for other potential users and degradation of service (Zimmerman, 1979; Blanchard and Chow, 1983). Figure 3 depicts the situation under discussion. Even though the out-of-pocket cost for this service remains constant, total cost for this service to the firm is increasing (Blanchard and Chow, 1983). As described in Figure 3, the difference between the out-of-pocket and total costs is the opportunity costs of delay and service deterioration.

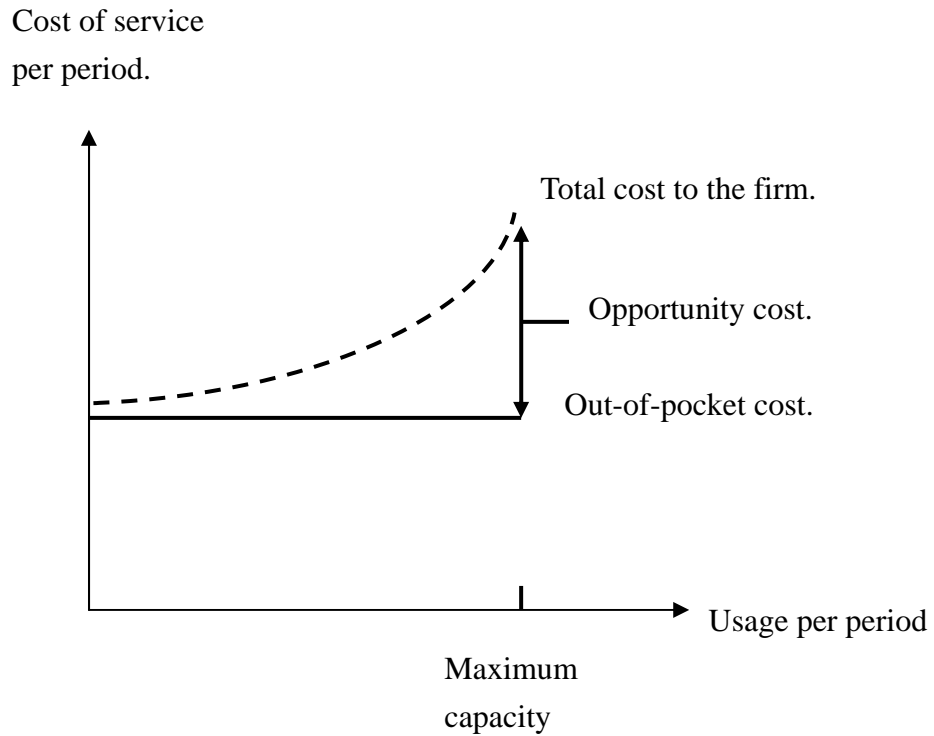
Therefore, if one assumes that the use of a service entails incremental costs to the firm, charging for this service related to usage could lead to more optimal utilization of this resource (Blanchard and Chow, 1983).

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<sup>24</sup> Garth A. Blanchard, and Chee W. Chow. "Allocating Indirect Costs for Improved Management Performance," *Management Accounting* (March 1983), pp.40-41.



<Figure 3> Costs of Using a Fixed Service



### Comparison among Cost Allocation Methods

Based on the benefits of cost allocation described above, this section discusses, as Shank and Govindarajan (1988)<sup>26</sup> present, three different cost allocation approaches: 1) traditional costing approach, 2) modern costing approach, and 3) transaction costing approach.

Shank and Govindarajan (1988)<sup>27</sup> and Cooper and Kaplan (1988)<sup>28</sup> explain that in a

<sup>25</sup> *Op.cit.*, pp.40.

<sup>26</sup> John K. Shank and Vijay Govindarajan. "The Perils of Cost Allocations Based on Production Volumes," *Accounting Horizons*(December 1988), pp.71-79.

<sup>27</sup> John K. Shank and Vijay Govindarajan. "The Perils of Cost Allocations Based on Production Volumes," *Accounting Horizons*(December 1988), pp.71-79.

<sup>28</sup> Robin Cooper and Robert S. Kaplan. "Measure Costs Right: Make the Right Decisions," *Harvard Business Review*(September-October 1988), pp.96-103.

traditional costing system the costs collected by overhead departments (responsibility centers) are assigned to production departments (operating departments) based on some relevant measure of activity (square feet of floor space for janitorial cost, machine value for insurance cost, employee head count for personnel cost, etc.). Then, after all costs have been assigned to production departments, costs are assigned to units of product based on some measure of output volume in the production departments (Shank and Govindarajan, 1988). Then product costs used to consist primarily of direct labor and material.<sup>29</sup> As Cooper and Kaplan (1988)<sup>30</sup> hold, the costs of direct and materials could be traced easily to individual products and distortions from allocating factory and corporate overhead by burden rates on direct labor were minor.

And Shank and Govindarajan (1988)<sup>31</sup> present modern costing system as a new approach to product costing which they incorporate three refinements to the traditional system: break out set-up labor from the overhead pool, break out the overhead that is more related to material cost, and substitute machine hours for labor hours as the measure of production volume. This refinements indicate there is a pool of material handling overhead separate from the pool of production overhead and the best measure

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<sup>29</sup> Norm Raffish. "How Much Does That Product Really Co\$t?," *Management Accounting* (March 1991): 36-39.

<sup>30</sup> Robin Cooper and Robert S. Kaplan. "Measure Costs Right: Make the Right Decisions," *Harvard Business Review*(September-October 1988), pp.96-103.

<sup>31</sup> John K. Shank and Vijay Govindarajan. "The Perils of Cost Allocations Based on Production Volumes," *Accounting Horizons*(December 1988), pp.71-79.

of thruput has lost its salience because factories have become much less labor-paced and much more machines-paced in recent years (Shank and Govindarajan, 1988).

On the other hand, as Cooper and Kaplan (1988) point out, today product lines and market channels have proliferated. Direct labor now represents a small fraction of corporate costs, while expenses covering factory support operations, marketing, distribution, engineering, and other overhead functions have exploded (Cooper and Kaplan, 1988; Raffish, 1991).

Under such environment, volume-based approaches are no longer justifiable because it fails to reflect the true costs of products. Then Shank and Govindarajan (1988) present a much different system for allocating indirect costs—transaction-based overhead allocation. They argue fundamentally each component overhead is caused by some activity and so each product should be charged for a share of the component based on the proportion of that activity which it causes. Also, Cooper and Kaplan (1988) emphasize an activity-based system's more sophisticated approach to attributing factory overhead, corporate overhead, and other organizational resources, first to activities and then to the products that create demand for these indirect resources.

### **3-2. Transfer Pricing**

Whenever multiple business units or divisions, especially in large companies

operating in multiple lines of business, transfer goods or services among themselves , measuring their performance requires that a transfer price be established for the goods and services exchanged (Brickley *et al.* , 1995). As explained in their example<sup>32</sup>, in order to evaluate the performance of responsibility centers, each of these internal transactions requires a transfer price. For each unit of the product transferred, the purchasing division pays the transfer price and the producing division receives the transfer price.

Brickley *et al.* (1995) emphasize the importance of transfer price unit managers' decisions (investment, purchasing, production, and so on) are based on. As shown in the case of Bellcore<sup>33</sup>, because incorrect transfer prices can result in inappropriate decisions, the reduced firm value, and also, inappropriate promotion and retention decisions, getting the transfer price right is important (Brickley *et al.*, 1995; Kovac and Troy, 1989). That is, only through the correct transfer prices will motivating individual business units to maximize profits serve to maximize profits for the firm as a whole (Brickley *et al.*, 1995).

### **Transfer Pricing under Perfect and Asymmetric Information**

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<sup>32</sup> James Brickley, Clifford Smith, and Jerold Zimmerman. "Transfer Pricing and The Control of Internal Corporate Transactions," *Journal of Applied Corporate Finance* (Summer 1995), pp.60-67.

<sup>33</sup> Edward J. Kovac and Henry P. Troy. "Getting Transfer Prices Right: What Bellcore Did," *Harvard Business Review*(September-October), pp.148-154.

In theory, the optimal transfer price for a product or service is its opportunity cost or the value forgone by not using the product or service transferred in its next best alternative use.<sup>34</sup> Brickley *et al.* (1995) claim the transfer price reflecting its opportunity cost accurately maximizes firm value.

However, this simple rule mentioned above is often difficult to implement in reality. In practice, as Zimmerman (1997) and Brickley *et al.* (1995) argue, there can be considerable uncertainty about the factors that determine opportunity costs. Thus, accurate estimates of opportunity cost are generally the private information of only one division and, even then, arriving at such estimates often requires a special study.<sup>35</sup>

That is, senior management's difficulty to verify the accuracy of the information provided by the responsibility centers arises in large part because transfer prices are used in the performance evaluation and compensation systems. Operating managers whose bonuses are tied to their unit's measured profits have strong incentives to distort the information passed up to senior managers so as to influence the transfer price (Brickley *et al.*, 1995).

### **Common Transfer Pricing Methods**

Because determining opportunity costs is expensive, managers resort to various

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<sup>34</sup> Jerold L. Zimmerman. "EVA and Divisional Performance Measurement: Capturing Synergies and Other Issues," *Journal of Applied Corporate Finance*(Summer 1997), pp.99-109.

lower-cost approximations (Brickley *et al.*, 1995). Firms usually adopt at least four different ways that they can estimate the opportunity cost of the units transferred: 1) market price, 2) marginal production cost or variable cost, 3) full cost, and 4) negotiated price (Zimmerman, 1997; Brickley *et al.*, 1995). As noted by Brickley *et al.* (1995), none of these alternatives perfectly represents opportunity cost in all situations and hence each firm must select a policy that best fits its circumstances.

**Market-Based Transfer Prices;** The standard transfer-pricing rule is that given a competitive external market for the good, the product should be transferred at the external market price. That is, the use of market-based transfer prices is often assumed to produce the correct make-versus-buy decisions.

However, if there are important synergies or interdependencies (greater quality control, protection of proprietary information, lower marketing costs, and so on) favoring internal production, the external market price is unlikely to capture them (Brickley *et al.*, 1995). As a result, market price will not provide an accurate reflection of opportunity cost of producing inside in such situations.

**Marginal-Cost Transfer Prices;** Marginal cost represents the value of the resources forgone to produce the last unit. Thus, if there is no external market for the

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<sup>35</sup> *Ibid.*

intermediate good or if large synergies among business units cause the market price to be an inaccurate measure of opportunity cost, marginal production cost may be the most effective alternative transfer price (Brickley *et al.*, 1995).

But as with other transfer-pricing methods, there are problems with marginal cost as a measure of opportunity cost. Marginal cost is expensive to estimate and can lead to influence costs as managers debate whether certain expenditures are marginal or not (Brickley *et al.*, 1995).

**Full-Cost Transfer Prices;** Since full cost is the sum of fixed and marginal cost, full cost cannot be changed simply by reclassifying a fixed cost as a marginal cost. Thus, objective transfer-pricing rules such as those based on full accounting cost are widely used in practice primarily to avoid wasteful disputes over measuring marginal costs.

However, full-cost transfer prices likely suffer from setting the transfer price above opportunity cost. The reason is that full-cost accounting generally overstates the opportunity cost to the firm of producing and transferring one more unit internally (Brickley *et al.*, 1995).

Despite the problem, full-cost transfer pricing is very common because of its important benefits of simplicity and low cost of implementation.

**Negotiated Transfer Prices;** Transfer prices can be set by negotiation between

the purchasing and selling divisions. Both divisions can reach at the transfer prices that approximate opportunity cost through this method because the selling division will not agree to a price that is below its opportunity cost and the buying division will not pay a price that is above what it can buy the product for elsewhere.

But negotiation is time consuming and can produce conflicts among divisions. Divisional performance measurement becomes sensitive to the relative negotiating skills of the two division managers.

#### **4. Framework for the Responsibility Accounting System**

##### **4-1. Review of Case of Responsibility Center Approach**

The change of the athletic environment such as the emphasis on a broad-based athletic program and the pass of Title IX of the Equal Rights Amendment resulted in expanding operating expenses without additional revenues. All universities are concerned with increasing costs that far outpace static revenue flows. The 1980s were spent creating additional revenue streams, and the 1990s would be spent trying to control expenses and allocate revenue fairly.

The responsibility center approach (RCA) was developed at Georgia Tech to enable it to survive the tightening cost environment and to guarantee a future for Tech's sports programs. Prior to the RCA, in many instances coaches and administrators make



important financial decisions using incomplete management information (e.g. Georgia Tech never included employee benefits or overhead costs). Strupeck *et al.* (1993)<sup>36</sup> shows the surplus (deficit) per sport analysis in Table 2. All revenues and expenses of the athletic department are analyzed and allocate to a specific sport. In many cases, assumptions are made and used for allocation purposes. As they point out, many revenue items are easy to allocate but other revenues require a predetermined allocation method. In Table 2, five revenue elements are allocated items.

On the other hand, in order for the RCA to be effective, the costs included in the expense section of the budget must be all-inclusive.<sup>37</sup> Strupeck *et al.* (1993) argue if the system truly is going to reflect a responsibility approach, costs must be assigned to the individual sports on a direct and indirect basis. At Georgia Tech, direct costs are defined as those expenses which are identifiable with a specific sport, such as the operating budget, recruiting, scholarships, and salaries. The above costs are allocated easily. Other direct expenses in Table 2 are not readily traceable and are allocated on a more subjective basis. Table 3 contains the expense category and basis for allocation for these direct costs. The decision to allocate rather than trace these costs was made to

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<sup>36</sup> C. David Strupeck, Ken Milani, and James E. Murphy. "Financial Management at Georgia Tech," *Management Accounting*(February 1993), pp.58-63.

<sup>37</sup> C. David Strupeck, Ken Milani, and James E. Murphy. "Financial Management at Georgia Tech," *Management Accounting*(February 1993), pp.58-63.

<Table 2> Per Sport Analysis

<u>REVENUE</u>	<u>FOOTBALL</u>	<u>BASKETBALL</u>	<u>BASEBALL</u>	<u>TRACK</u>	<u>ALL OTHER</u>	<u>TOTAL</u>
Scholarship Fund	1,181,607	176,106	102,481	108,625	338,408	1,907,227
Gen. Allocation-Contribution	708,883	287,325	77,194	30,596	196,002	1,300,000
Sport Comm. Support			94,798		45,000	139,798
Sinking Fund		450,000				450,000
Conference Revenue Share	500,000	1,671,332				2,171,332
Student Fee Allocation			248,274	114,090	713,326	1,075,690
Ticket Sales	2,004,961	974,777				2,979,738
Post Season Revenue		207,967				207,967
Advertising & Prog. Sales	223,680	136,710				360,390
Radio Rights	151,000	151,000				302,000
Television Rights	100,000					100,000
Facilities Rental	14,537					14,537
Concessions	115,884					115,884
Executive Suites	233,843					233,843
Interest Income	37,752	15,302	4,111	1,629	10,438	69,232
Miscellaneous	6,823					6,823
<b>Total Revenue</b>	<b>5,278,970</b>	<b>4,070,519</b>	<b>526,858</b>	<b>254,940</b>	<b>1,303,174</b>	<b>11,434,461</b>
<b>EXPENSE DIRECT:</b>	<b>FOOTBALL</b>	<b>BASKETBALL</b>	<b>BASEBALL</b>	<b>TRACK</b>	<b>ALL OTHER</b>	<b>TOTAL</b>
Operating Budget	744,305	366,144	109,666	50,395	315,086	1,585,596
Recruiting	568,175	182,357	34,415	9,112	66,126	860,185
Promotions	66,253	10,328	6,057			82,638
Scholarship Cost	1,181,607	176,106	102,481	108,625	338,408	1,907,227
Salaries	627,800	226,200	82,000	47,350	264,517	1,247,867
Payroll Taxes	48,782	17,577	6,372	3,679	20,554	96,964
Band	28,825	28,825				57,650
Cheerleaders	19,800	19,800				39,600
Ticket Office	48,317	48,317				96,634
Employee Benefits	99,096	35,705	12,943	7,474	41,754	196,972
Facility Loans	75,288	65,302	48,228	65,174	52,792	894,505
Capital Improvements	355,258					355,258
Telephone	52,217	13,054	6,527	4,351	32,636	108,785
Postage	34,553	8,638	4,319	2,879	21,597	71,986
Player Development	87,458					87,458
Pension Plan Premiums	27,719	9,987	3,620	2,091	11,679	55,096
Insurance	46,455	4,831	10,034	16,724	56,489	134,533
<b>Total Direct Expenses</b>	<b>4,111,908</b>	<b>1,800,892</b>	<b>426,662</b>	<b>317,854</b>	<b>1,221,638</b>	<b>7,878,954</b>
<b>EXPENSE INDIRECT:</b>	<b>FOOTBALL</b>	<b>BASKETBALL</b>	<b>BASEBALL</b>	<b>TRACK</b>	<b>ALL OTHER</b>	<b>TOTAL</b>
Sports Medicine	147,162	15,305	31,787	52,978	178,949	426,181
Facilities	762,208	308,939	83,001	32,897	210,747	1,397,792
Sports Information	131,353	53,240	14,304	5,669	36,318	240,884
Academic Center	94,412	9,819	20,393	33,988	114,805	273,417
Student-Athlete Program	1,675	174	362	603	2,036	4,850
Office Supplies	22,255	5,564	2,782	1,855	13,908	46,364
Audit & Legal	34,483	13,977	3,755	1,488	9,535	63,238
Accounting Office	49,150	19,921	5,352	2,121	13,590	90,134
Marketing Staff	41,006	16,621	4,465	1,770	11,338	75,200
Administrative Staff:						
Salaries	236,440	95,834	25,747	10,205	65,374	433,600
Travel	49,435	20,037	5,383	2,134	13,669	90,658
Employee Benefits	123,256	49,958	13,422	5,320	34,080	226,036
Payroll Taxes	60,676	24,593	6,607	2,619	16,777	111,272
Pension Plan Premiums	34,476	13,974	3,754	1,488	9,533	63,225
Postage	47,889	19,411	5,215	2,067	13,241	87,823
Telephone	72,370	29,333	7,881	3,124	20,010	132,718
Miscellaneous	67,144	27,215	7,312	2,898	18,564	123,133
<b>Total Indirect Expenses</b>	<b>1,975,390</b>	<b>723,915</b>	<b>241,522</b>	<b>163,224</b>	<b>782,474</b>	<b>3,886,525</b>
<b>TOTAL EXPENSES</b>	<b>6,087,298</b>	<b>2,524,807</b>	<b>668,184</b>	<b>481,078</b>	<b>2,004,112</b>	<b>11,765,479</b>
<b>SURPLUS (DEFICIT)</b>	<b>(808,328)</b>	<b>1,545,712</b>	<b>(141,326)</b>	<b>(226,138)</b>	<b>(700,938)</b>	<b>(331,018)</b>

keep administrative costs reasonable. A sophisticated accounting system would be cost prohibitive, and many athletic program business departments are not equipped to trace items. In these cases, several general assumptions were made to ease the allocation process.

Indirect costs are more difficult to grasp and allocate. They are not specifically identifiable with a sport, and the method of allocation is somewhat subjective and often arguable. A system of allocation and a defensible methodology are essential because many coaches have not had these costs associated with their specific programs. Also, Table 2 lists the indirect costs identified at Georgia Tech. These costs were allocated to each sport using a basis for allocation that was related the particular expense category. Table 3 lists the expenses and their respective bases for allocation.

Once the coach as a decision maker and as manager of the athletic endeavor has been made aware of the total revenues and total costs being allocated to his/her program, he or she can think in terms of how much the program costs and the surplus or deficit generated from operating the program. In effect, the coach must act as an entrepreneur and manage his or her program costs more efficiently.<sup>38</sup> As Strupeck *et al.* (1993) point out, the key to successful implementation of this responsibility center approach is to

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<sup>38</sup> C. David Strupeck, Ken Milani, and James E. Murphy. "Financial Management at Georgia Tech," *Management Accounting*(February 1993), pp.58-63.

<Table 3> Allocated Direct and Indirect Costs at Georgia Tech

<b>DIRECT</b>	
<b>Expense</b>	<b>Basis for Allocation</b>
Payroll taxes	Salaries
Employee benefits	Salaries
Telephone	Size of coaching staff
Postage	Size of coaching staff
Pension plan premiums	Salaries
Insurance	Number of athletes
<b>INDIRECT</b>	
<b>Expense</b>	<b>Basis for Allocation</b>
Sports medicine	Number of student athletes
Facilities	% of operating budget
Sports information	% of operating budget
Academic center	Number of student athletes
Student-athlete program	Number of student athletes
Office supplies	Number of employees
Audit & legal	% of operating budget
Accounting office	% of operating budget
Marketing staff	% of operating budget
Administrative staff	% of operating budget

control expenses. With an effective cost-per-sport analysis, the coach knows his or her total expenses including allocated overhead costs and must be allowed to manage this budget with the help of upper-level administrators.

On the basis of the review of the responsibility center approach at George Tech, Strupeck *et al.* (1993) summarize the benefits of this approach into four components: 1) provides a look at all revenues and costs associated with a specific sports program , 2) provides substantial management information for more effective decision making, 3) provides a measurement technique, and 4) broaden coaches' administrative abilities.

Also, they present the weaknesses in this approach as follows: 1) discontent with allocation of available revenue and the expenses incurred, 2) education process which substantial effort must be made to communicate and to explain the system, 3) continual refinement to be made reasonably over the period of years, and 4) real danger that many nonrevenue sports will continue to consider themselves as having second-class status.

#### **4-2. Limitations of Responsibility Accounting**

Although responsibility accounting system have contributed much to improving the management of operating costs and the measurement technique of divisional performance, it has limitations as follows:

First, as reviewed in the case of Georgia Tech, in responsibility accounting the problem of unequal allocation of revenues and expenses arises and some divisional managers complain about the allocation methods. As Ostrenga (1990)<sup>39</sup> holds, tracing costs directly to cost objects eliminates the need to allocate or assign costs. Thus, costs that cannot be charged directly should be assigned through activity-based costing.<sup>40</sup> In practice, responsibility costs are specifically identified where possible and the remainder is allocated based on an estimate of usage.

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<sup>39</sup> Michael R. Ostrenga. "Activities: The Focal Point of Total Cost Management," *Management Accounting* (February 1990), pp.42-49.

<sup>40</sup> Michael R. Ostrenga. "Activities: The Focal Point of Total Cost Management," *Management Accounting* (February 1990), pp.42-49.

Second, whenever responsibility centers transfer goods or services among themselves or if there are important synergies among divisions, each of these internal transactions requires a transfer price in order to measure the performance of these business units. However, developing an accounting system capable of capturing all the synergic effects or coming up with appropriate transfer prices tends to be either impossible or, at best, a highly complicated and costly undertaking (Brickley *et al.*, 1995; Zimmerman, 1997).

Next, responsibility accounting coupled with incentives to divisional managers to focus on only their division's performance can also lead to behavior that, while increasing divisional profits, reduces the performance and value of the entire company. That is, divisional managers have incentives to pursue sub-optimal gaming strategies.

Fourth, responsibility accounting like cost information systems such as Activity-Based Costing (ABC) fails to account for the full cost of capital employed (Hubbell, 1996a). Hubbell (1996a)<sup>41</sup> proposes cost information system methodologies be modified to include capital costs and capital drivers. The resulting improved cost management system helps managers' focus on all the necessary elements of creating shareholder value, including both the management of costs and the management of

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<sup>41</sup> William W. Hubbell. "Combining Economic Value Added and Activity-Based Management," *Journal of Cost Management* (Spring 1996), pp.18-29.

capital (Hubbell, 1996b). Therefore, this study presents the method of combining responsibility accounting with economic added value (EVA) in order to include the company's most significant costs—the cost of financing the capital employed as responsibility accounting system as a cost management tool and a divisional performance measure fails to include the charge of capital employed.

## CHAPTER 3

# METHOD OF LINKING RESPONSIBILITY ACCOUNTING TO EVA FOR MEASURING DIVISIONAL PERFORMANCE

### 1. Basic Concept and Definition of EVA

#### Residual Income

Residual income and economic profits<sup>42</sup> have been created by economists and managerial accountants. The financial accountant, in contrast, speaks only of accounting profits (Martin and Petty, 2000). According to them<sup>43</sup>, for the financial accountant, profits are measured as revenues less operating expenses less the cost of debt financing in the form of interest expense. The only financing cost is interest expense. Thus, there is no cost for equity capital. However, for economists, true profits come after subtracting all financing costs, both for debt and equity capital, where cost is defined as the opportunity cost of the funds if they were to be invested in another firm of similar risk. Thus,

$$\begin{array}{l} \text{Accounting} \\ \text{Profits} \end{array} = \text{Sales} - \text{Cost of Goods sold} - \text{Operating expenses} - \text{Interest expenses} - \text{Taxes}$$
$$\begin{array}{l} \text{Economic} \\ \text{Profits} \end{array} = \text{Sales} - \text{Cost of Goods sold} - \text{Operating expenses} - \text{Taxes} - \text{Charge for all capital used}$$

<sup>42</sup> John D. Martin and J. William Petty (2000) used the two terms interchangeably.

<sup>43</sup> John D. Martin and J. William Petty. *Value Based Management: The Corporate Response to the Shareholder Revolution*. Harvard Business School Press, 2000, pp.80-81.



On the basis of the formulas above, for the economists, the traditional accounting profits metric does not completely measure a firm's profits.

### **Market Value Added (MVA)**

Basic corporate finance and microeconomic theory tells us that the prime financial directive of any firm ought to be to maximize the wealth of its shareholders (Stewart III, 1994). Stewart III (1994)<sup>44</sup> argued this objective not only serves the interests of the firm's owners; it is also the rule that ensures that scarce resources of all kinds are allocated, managed, and redeployed as efficiently as possible. Also, he holds that shareholders wealth is maximized only by maximizing the difference between the firm's total value and the total capital that investors have committed to it (Stewart III, 1994). This difference is called Market Value Added (MVA), which represents the spread between the cash that the firm's investors have put into the business since the inception of the company and the present value of the cash they could get out of it (Stewart III, 1994; Dierks and Patel, 1997; Epstein and Young, 1999). Therefore,

$$\text{MVA} = \text{Total Value} - \text{Total Capital}$$

Stewart III (1994) holds managers can achieve their goal of maximizing MVA and the wealth of the shareholders through a well-established decision-making rule.

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<sup>44</sup> G. Bennett Stewart III. "EVA™: Fact and Fantasy," *Journal of Applied Corporate Finance*(Summer 1994), pp.71-84.

He portrays that rule as taking those actions and adopting those strategies that are expected to maximize the net present value, or NPV, of future cash flows.

A company's MVA is a cumulative measure of the wealth a firm has created for its investors and communicates the market's present verdict on the NPV of all its current and contemplated capital investments (Stewart III, 1994; Dierks and Patel, 1997). If MVA is positive number, the company has made its shareholder richer. A negative MVA indicates how much shareholder wealth has been destroyed.<sup>45</sup> Thus, as Stewart III argues, MVA is a significant summary assessment of corporate performance-one that shows how successful a company has been in allocating, managing, and redeploying scarce resources to maximize the NPV of the enterprise and, thereby, the wealth of its shareholders.

### **Economic Value Added (EVA)**

Stewart III (1991)<sup>46</sup> defines EVA as the one measure that properly accounts for all the complex trade-offs involved in creating value. As described by Dierks and Patel (1997), EVA is a measure of financial performance that combines the familiar concept of residual income with principles of modern corporate finance.

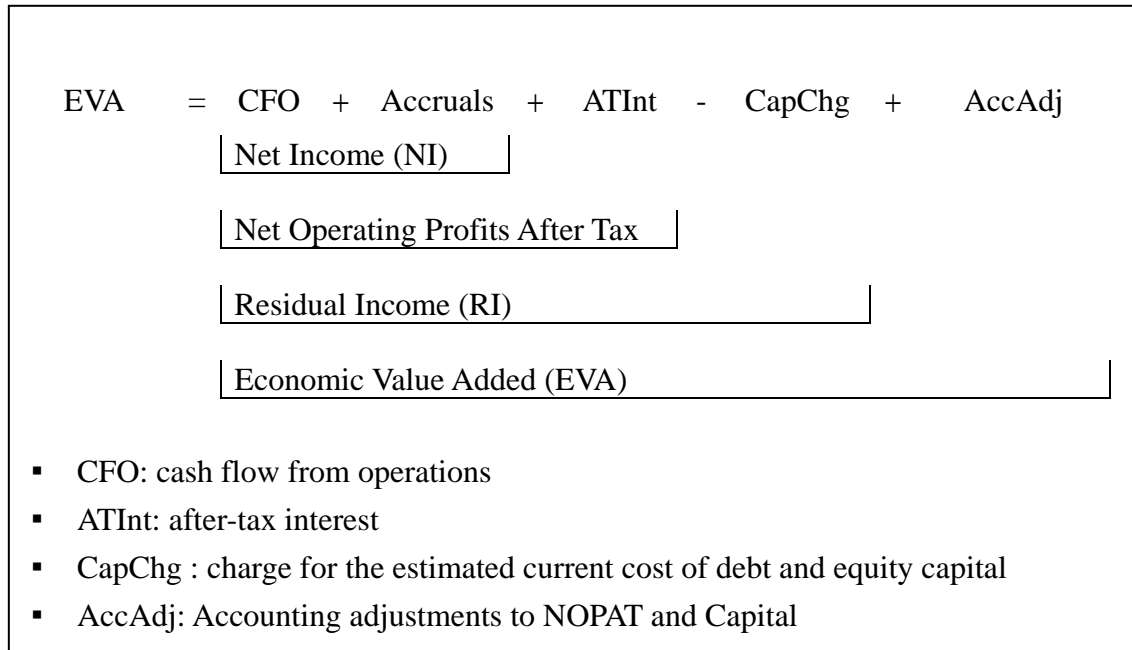
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<sup>45</sup> Paul A. Dierks, and Ajay Patel. "What is EVA, and How Can It Help Your Company?," *Management Accounting* (November 1997), pp.52-58.

<sup>46</sup> G. Bennett Stewart, III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991, pp.136.

Biddle *et al.* (1999)<sup>47</sup> depicts the steps that transform underlying cash flows from operations (CFO) into economic value added (EVA) in Figure 4.

<Figure 4> Relations Between Financial Measures



First introduced in the late 1980s, EVA is computed by taking the spread between the rate of return on capital  $r$  and the cost of capital  $c^*$  and then multiplying by the economic book value of the capital committed to the business (Stewart III, 1991; Dierks and Patel, 1997). In formula form,

$$EVA = (r - c^*) \times \text{Capital};$$

Where  $r$  = rate of return; and

$c^*$  = cost of capital, or the weighted average cost of capital

<sup>47</sup> Garry. C. Biddle, Robert M. Bowen, and James S. Wallace. "Evidence on EVA," *Journal of Applied Corporate Finance*(Summer 1999), pp.69-79.

Then,  $EVA = (r \times \text{Capital}) - (c^* \times \text{Capital})$ ;

$EVA = \text{NOPAT} - c^* \times \text{Capital}$ ; and

$EVA = \text{operating profits} - \text{a capital charge}$

According to Stewart III (1991) and Dierks and Patel (1997), key components of EVA are NOPAT and the capital charge. NOPAT is profits derived from a company's operations after taxes but before financing costs and noncash-bookkeeping entries. It is the total pool of profits available to provide a cash return to those who provided capital to the firm.

The capital charge is the cash flow required to compensate investors for the riskiness of the business given the amount of capital invested and the cost of capital is the minimum rate of return on capital required to compensate debt and equity investors for bearing risk to create value (Stewart III, 1991; Dierks and Patel, 1997).

As we discussed earlier, EVA is not a new technique. However, Zimmerman (1997)<sup>48</sup> points out EVA differs from residual income in three ways:

- First, EVA makes use of principles and methods of modern financial economics to provide a more accurate measure of the weighted average cost of capital (WACC).
- Second, instead of using earnings as computed under Generally Accepted Accounting

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<sup>48</sup> Jerold L. Zimmerman. "EVA and Divisional Performance Measurement: Capturing Synergies and Other Issues," *Journal of Applied Corporate Finance*(Summer 1997), pp.99-109.

Procedures (GAAP), they are encouraged to undo certain GAAP procedures that create incentives to take decisions that reduce value.

- Third, most EVA implementations do not stop at changing the firm's performance measurement scheme but go farther and often recommend wholesale changes in its compensation packages.

## **2. Usefulness of EVA as a Performance Measure**

### **Benefits of EVA**

As Joel Stern is quick to say, "Anyone can compute a firm's EVA, but it's how EVA is used that makes the difference."<sup>49</sup> Based on the arguments of Stewart III (1991) and Ehrbar (1998), Martin and Petty (2000)<sup>50</sup> presents four benefits of EVA as a financial management system within the organization as follows:

- EVA relies on a new and improved measurement of return on invested capital, removing the distorted economic information about the firm and the misleading of management and investors about the financial results.
- EVA provides a new and improved criterion for evaluating a firm's operating and strategic decisions.
- EVA, combined with the right bonus plan, can instill a sense of urgency along with

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<sup>49</sup> John D. Martin and J. William Petty. *Value Based Management: The Corporate Response to the Shareholder Revolution*. Harvard Business School Press, 2000, pp.103-104.

an owner's perspective.

- An EVA system can change a corporate culture by facilitating communications and cooperation among divisions and departments.

As a consequence, as argued by Martin and Petty (2000), EVA is intended to provide the right management incentives to change behavior, including how capital is utilized, rather than just serving as a tool of financial analysis.

### **Evidence on EVA**

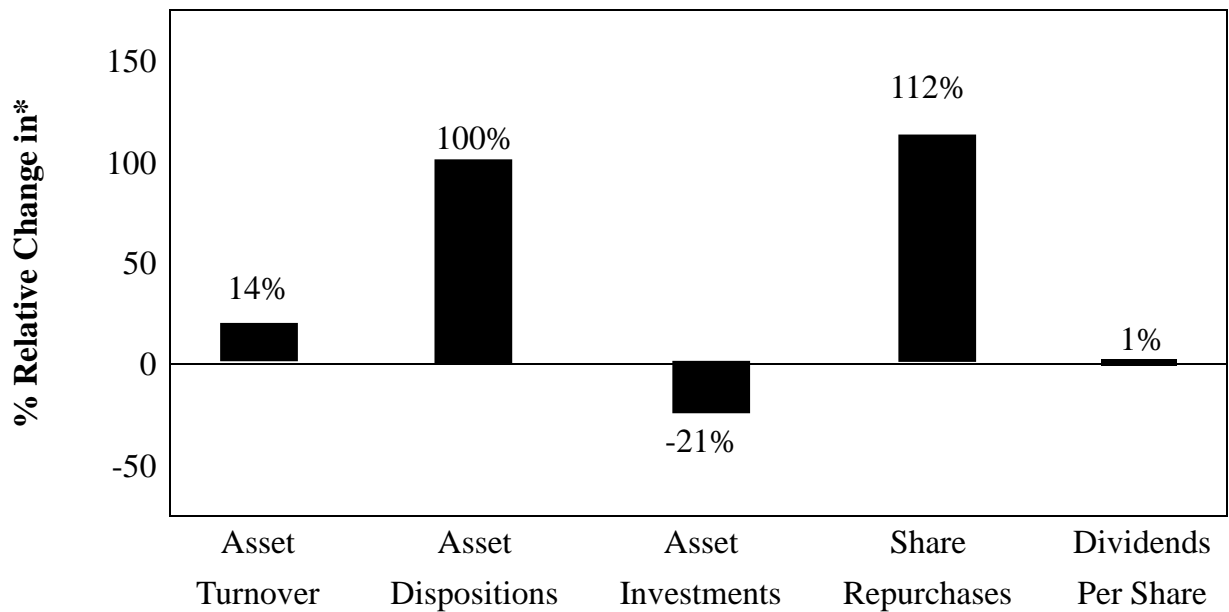
Wallace's (1997)<sup>51</sup> research provides independent evidence on the claim: EVA better motivates managers to increase shareholder wealth. As shown in Figure 5, independent evidence suggests that firms adopting residual income-based incentives tend to (1) improve operating efficiency by increasing asset turnover, (2) dispose of selected assets and reduce new investment, and (3) repurchase more shares. Also, the evidence reveals that firms adopting RI incentive plans exhibit increased residual income (Biddle *et al.*, 1999).

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<sup>50</sup> *Op.cit.*, pp.104.

<sup>51</sup> James S. Wallace. "Adopting Residual-Income-Based Compensation Plans: Do You Get What You Pay

<Figure 5> Incentive Effects Following Adoption of RI Based Compensation Plans



\*Percentage changes in selected actions of firms that adopt residual income based compensation plans relative to a control group of non-adopters.

### 3. Measurement of a Firm's EVA

EVA is a measure of financial performance that combines the familiar concept of residual income with principles of modern corporate finance—specifically, that all capital has a cost and that earning more than the cost of capital creates value for shareholders. In summary, it is a true economic profit consisting of all costs including the cost of capital. Key components of EVA are NOPAT and the capital charge.

#### Calculating NOPAT and Invested Capital

A firm's NOPAT and CAPITAL is calculated after making the necessary

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For?," *Journal of Applied Corporate Finance*(December 1997), pp.275-300.

adjustments of the data reported by a conventional financial accounting system.

According to Stewart III (1991)<sup>52</sup>, a firm's EVA is calculated in two ways: an Operating Approach and a Financing Approach. To understand how these approaches work, we first must understand the concepts of equity equivalent reserves. Equity equivalents are adjustments that a firm's accounting book value into economic book value. In this way, capital-related items are turned into a more accurate measure of invested capital and also, revenue- and expense-related equity equivalent adjustments are included in NOPAT which is a more realistic measure of the actual cash yield from generated from recurring business activities.

According to Martin and Petty (2000)<sup>53</sup>, there are only three reasons for making adjustments: 1) To convert from accrual to cash accounting, 2) To capitalize market-building expenditures that have been expensed in the past, and 3) To remove cumulative unusual losses or gains after taxes.

Stewart III (1994)<sup>54</sup> identifies a total of 164 equity equivalent reserve adjustments; however, only some 20 to 25 have to be addressed in detail, and as few as 5 to 10 key adjustments are actually made in practice. In order to decide when an adjustment should

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<sup>52</sup> G. Bennett Stewart III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991, pp.87-110.

<sup>53</sup> John D. Martin and J. William Petty. *Value Based Management: The Corporate Response to the Shareholder Revolution*. Harvard Business School Press, 2000, pp.90-91.

<sup>54</sup> G. Bennett Stewart III. "EVA™: Fact and Fantasy," *Journal of Applied Corporate Finance*(Summer



be made, he recommends making adjustments only in cases that pass four tests: 1) Is it likely to have a material impact on EVA?, 2) Can the managers influence the outcome? 3) Can the operating people readily grasp it?, and 4) Is the required information relatively easy to track and derive?

As discussed above, there are two equivalent approaches—from a financing perspective and from an operating perspective—for calculating NOPAT and CAPITAL. Martin and Petty (2000) provide a framework for computing NOPAT and CAPITAL and claim that while they cannot include all the possible adjustments to be made, those shown in appendix A represent important ones in most cases (see the table in appendix A).

### **Estimating the Cost of Capital**

As discussed earlier, the cost of capital is the minimum rate of return on capital required to compensate debt and equity investors for bearing risk to create value.<sup>55</sup> EVA makes use of principles and methods of modern financial economics to provide a more accurate measure of the weighted average cost of capital (WACC) (Stewart III, 1991; Zimmerman, 1997). From the financing perspective, WACC is computed by weighting the individual costs of debt and equity by the proportions each financing form

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1994), pp.71-84.

<sup>55</sup> Paul A. Dierks, and Ajay Patel. “What is EVA, and How Can It Help Your Company?,” *Management Accounting* (November 1997), pp.52-58.

represents in the target capital structure:<sup>56</sup>

	<i>(1)</i> <i>After-Tax</i> <i>Cost</i>	<i>(2)</i> <i>Target</i> <i>Percent</i>	<i>(3) = (1) × (2)</i> <i>Weighted</i> <i>Cost</i>
Debt	$(1 - t) b$	Debt / capital	$(1 - t)b \times D/cap$
Equity	$y$	Equity / capital	$y \times E/cap$
Weighted average cost of capital (WACC)	=		Sum of weighted costs

Based on this approach, as argued by Stewart III (1991), the cost of capital is the return that must be earned on total capital employed in order to have funds sufficient to pay interest after taxes on the debt and have enough left over to provide an acceptable return on equity.

In the formula above, the cost of debt, verified more easily, is the rate that a company would have to pay in the current market to obtain new long-term debt capital and its best indication is the prevailing yield to maturity on the firm's own outstanding and publicly traded debt (Stewart III, 1991; Koller *et al.*, 2005). In the absence of a quote for its bonds, a company's borrowing rate could be approximated by the rate of currently being paid by a sample of companies with the same bond rating.<sup>57</sup>

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<sup>56</sup> G. Bennett Stewart III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991, pp.433-434.

<sup>57</sup> *Op.cit.*, pp.434.

On the other hand, a company's cost of equity is more abstract because it is not a readily observable cash-to-cash yield but an opportunity cost to the total return that a company's investors could expect to earn from alternative investments of comparable risk (Stewart III, 1991). The Capital Asset Pricing Model (CAPM) provides a conceptual framework for determining the expected return on common stocks, and it can be used to estimate firms' cost of capital.<sup>58</sup> Thus, the company's cost of capital is expressed as follows:

$$k_E = R_f + \beta_s (R_m - R_f)$$

where

$k_E$  = firm's cost of equity capital

$R_f$  = risk-free rate

$\beta_s$  = beta of the firm's stock

$R_m$  = cost of equity for the market as a whole

Therefore, in order to estimate  $k_E$  we need estimates of  $R_f$ , the risk-free rate;  $R_m$ , the expected return on the market as a whole; and  $\beta_s$ , the level of systematic risk associated with the firm's stock. As Koller *et al.* (2005)<sup>59</sup> describe,  $R_f$  can be estimated

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<sup>58</sup> *Diversification, the Capital Asset Pricing Model, and the Cost of Equity Capital Case*, #9-276-183, Harvard Business School, 1993, pp.9.

<sup>59</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.296-297.

as the average or expected rate of return on Treasury bills in the future and the market risk premium is the difference between the return on the market,  $R_m$ , and the risk-free rate,  $R_f$ . Also, the stock's beta,  $\beta_s$ , can be estimated by linear regression. In practice betas are available from many brokerage firms and investment advisory services.<sup>60</sup>

#### **4. Combining Responsibility Accounting and EVA**

##### **4-1. Need for Linking Responsibility Accounting to EVA**

Creating economic value for shareholders, customers, and employees is the basic purpose of any corporation (Hubbell, 1996b). This requires allocating, managing, and redeploying scarce capital to its most profitable use.<sup>61</sup>

As Hubbell (1996a) holds, for internal management information systems to serve the best interests of both shareholders and managers, they must identify, collect, and routinely report the information that is critical to making decisions about resource allocations. Also, Cooper and Kaplan (1988)<sup>62</sup> emphasize the importance of cost information system, which provides more accurate information about production and support activities and product costs so that management can focus its attention on the products and processes with the most leverage for increasing profits.

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<sup>60</sup> *Diversification, the Capital Asset Pricing Model, and the Cost of Equity Capital Case*, #9-276-183, Harvard Business School, 1993, pp.9.

<sup>61</sup> William W. Hubbell. "Combining Economic Value Added and Activity-Based Management," *Journal of Cost Management* (Spring 1996), pp.18-29.

<sup>62</sup> Robin Cooper and Robert S. Kaplan. "Measure Costs Right : Make the Right Decisions," *Harvard Business Review* (September-October 1988), pp.96-103.

Responsibility accounting system in which controllable costs should be attributed directly, assigned, and allocated to responsibility centers have proved their usefulness in controlling costs, reporting on critical divisional financial performance, and motivating the managers of responsibility centers. Although responsibility accounting have contributed much to improving the management of operating costs, it failed to consider the balance sheet and then to account for the full cost of capital. That is, while cost systems including ABC focus management's attention on cost drivers as the means to managing costs, they do not identify critical capital drivers a means of managing capital (Hubbell, 1996a). Thus, the methodologies of responsibility accounting system need to be modified to include one of the company's most significant costs—the cost of financing the capital employed (Hubbell, 1996a).

On the other hand, as discussed earlier, EVA is one of the best measures of shareholder economic value and also, the financial management tool for organizational profitability measurement within the organization, including the cost of capital employed (Uyemura *et al.*, 1996).

Under such circumstances, companies need to seriously consider integrating their responsibility accounting systems with EVA. In order to link responsibility accounting to EVA, companies must add capital charges to operating expenses. These

capital charges can be traced to responsibility centers by means of cost methodology.

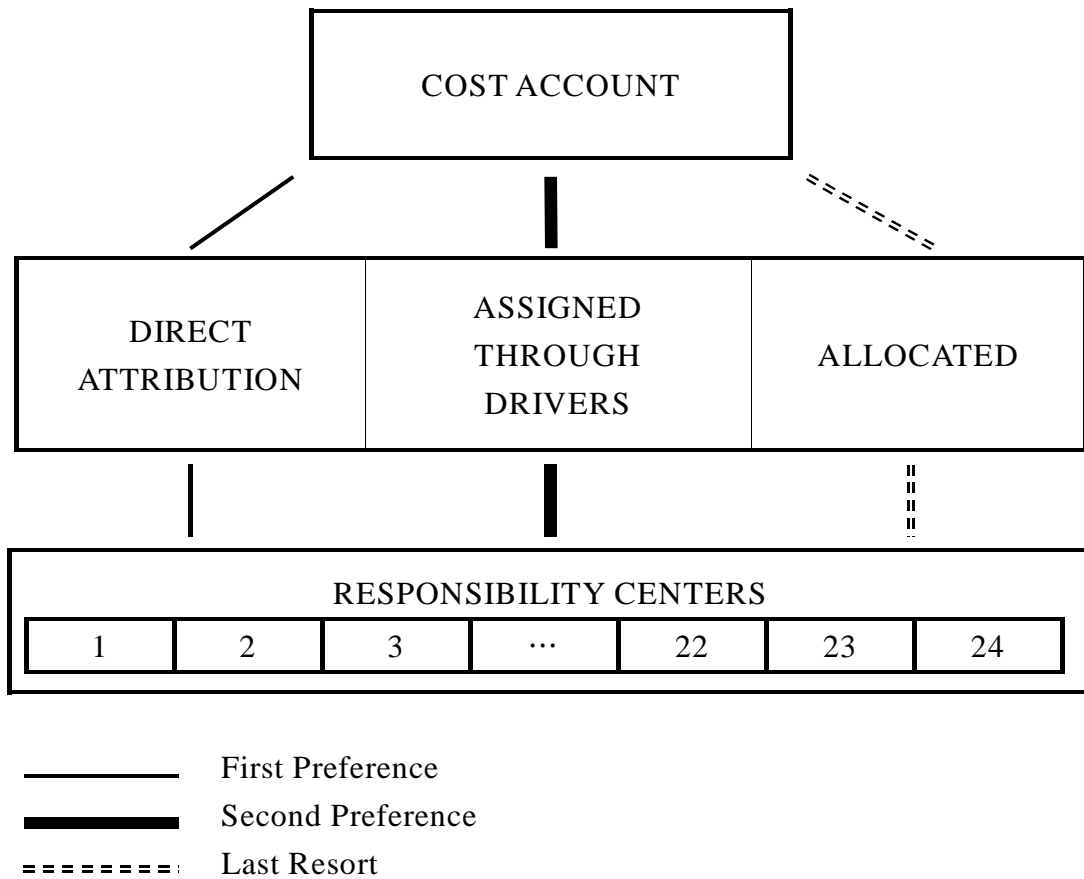
Several benefits to combining responsibility accounting and EVA are summarized as follows: 1) shared costs and assets traced to responsibility centers, 2) asset management improved by focusing on capital drivers, 3) cost information which reflects all costs, including capital charges, 4) operating managers better understanding of how they can help create EVA, 5) setting priorities for investments in new technology and continuous improvement initiatives, and 6) identification of the most appropriate EVA centers (Hubbell, 1996a; Uyemura *et al.*, 1996).

As a result, the resulting integrated cost system provides managers with a total governance system for improving processes, managing both costs and capital, and creating shareholder value.

#### **4-2. Method of Combining Responsibility Accounting and EVA**

Responsibility costs are traced to responsibility centers through cost methodology shown in Figure 6. To establish the integrated cost system mentioned above, as Figure 7 shows from the perspective of Activity-Based Costing (ABC), responsibility costing can be amended to include a capital charge. The capital charges calculated using the balance sheet and the cost of capital must be added to the operating expenses from the general ledger and also, the cost drivers and capital drivers must be used as shown in Figure 7

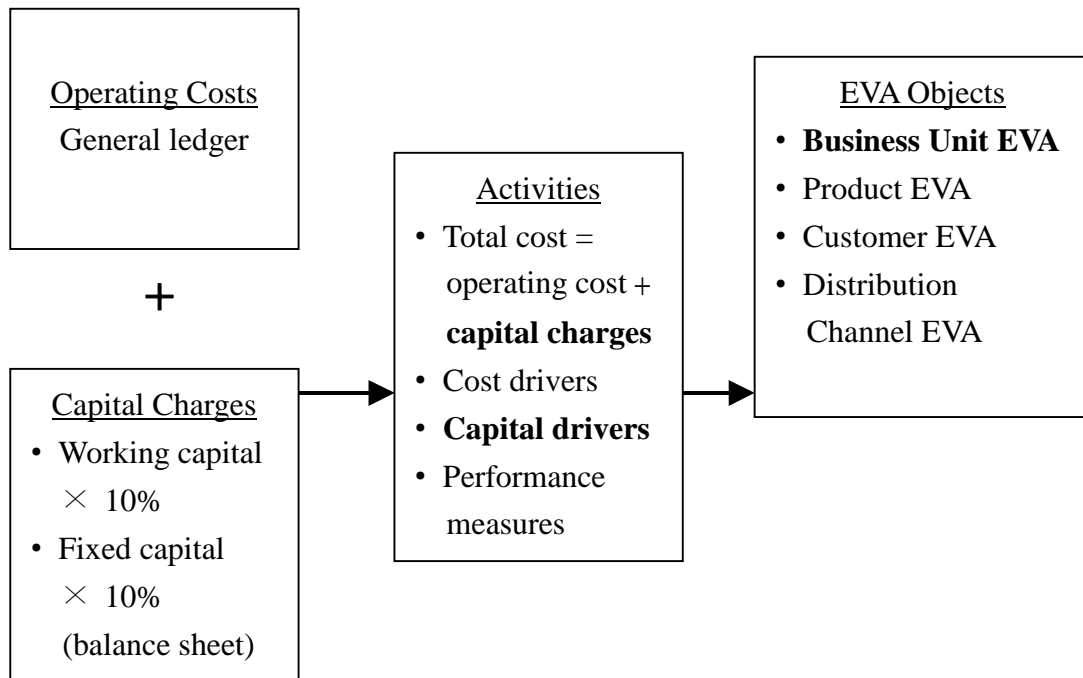
<Figure 6> Cost Methodology and Sequence Preference



Source: Reproduced from Michael R. Ostrenga, Activities: The Focal Point of Total Cost Management, *Management Accounting* (February 1990), pp.42-49.

(Hubbell, 1996a). Then, all the costs including both operating expenses and capital charges must be traced to cost objects. As a consequence, it becomes apparent which business units contribute to EVA, not just operating profit (Hubbell, 1996b).

<Figure 7> Linking EVA to Responsibility Accounting through ABC



Source: Reproduced from William W. Hubbell, Combining Economic Value Added and Activity-Based Management, *Journal of Cost Management* (Spring 1990), pp.18-29.



## **CHAPTER 4**

### **CASE STUDY OF RESPONSIBILITY ACCOUNTING SYSTEM**

In order to approach to the model on linking the responsibility center accounting to EVA in a more objective and accurate way, the various literature research and reports, academic books related to the management accounting and financial management are reviewed above.

KTO (Korea Tourism Organization) is the object of the case study for computation and analysis of divisional financial performance, from 2003 to 2005. In this case study, the introduction method of combining responsibility accounting and EVA was examined. A lot of financial data and business information will be obtained through the KTO and classified by business segment in order to build the advanced model for measuring the results more accurately.

#### **1. Overview of the KTO**

##### **1-1. History and Development**

The Korea Tourism Organization (KTO) began in 1962 as a government-owned corporation responsible for the Korean Tourism industry. The corporation has

concentrated primarily on the promotion of Korea as a tourist destination and has contributed significantly to attracting foreign tourists.

Starting in the 1980s, domestic tourism promotion also came to be an important function of the KTO. Public tourism demand has been going up due to an improved standard of living and increased disposable income, as well as an enhanced transportation network. The KTO continues to help develop tourism within Korea through addressing current trends in the tourism industry.

Inbound visitors amounted to over 6 million in 2005, and the tourism industry is playing a more and more important role in the Korean economy.

In response to such circumstances, the KTO is endeavoring to develop Korean traditional culture into high-quality tourism products and tourism resources, in conjunction with local governments and the tourism industry. To improve tourism transportation, accommodation infrastructure, tourist information systems, and overall service, the company is also working to eliminate undesirable aspects of the tourism atmosphere through various public campaigns. Also, the KTO is endeavoring to make Korea as a worldwide attractive tourism destination, play a pivotal role in the developing in the Korean tourism industry as a national strategic industry, and strengthen Korea's competitiveness through focusing on major strengths and utilizing

expert knowledge.

## **1-2. Business Activity and Financial Results**

The organization's major functions are divided into as follows: 1) Overseas tourism promotion, 2) Korea convention bureau & its activities, 3) Tourist information services, 4) Cooperation with the local government & the tourism industry, 5) Local tourism promotion & improvements in the tourism environment, 6) Tourism exchanges between South & North Korea, 7) Resort development & consulting, and 8) Activities for raising funds for tourism promotion. In Table 4, the company's major business functions and business activities are shown in more detail. KTO reshuffled its organizational structure into 6 divisions in 2005.

Financial history of the KTO for the years 2003 through 2005 is shown in Table 5 through Table 7. Table 5 presents the KTO's income statements for the 3-year period from 2003 to 2005. The KTO posted continuous increases in revenues over the entire period. The KTO's 2005 profits were ₩5,952 million on sales of ₩361.9 billion. Sales and net income have grown at 3-year average annual growth rates of 6.8 % and 79.8 %, respectively. Concurrently, the KTO maintained margins with average gross profit, operating income, and net margins of 38.9 %, -0.9 % and 0.9 %, respectively.

<Table 4> KTO Major Business Functions and Activities

BUSINESS FUNCTIONS	BUSINESS ACTIVITIES
Overseas Tourism Promotion	<ul style="list-style-type: none"> <li>• Devising marketing strategies, Planning inbound tourism products, and Attracting foreign schools &amp; incentive trips</li> <li>• Familiarization tours and Overseas advertising</li> <li>• Performing research, Publishing promotional materials in foreign languages and monthly &amp; yearly reports of tourism statistics, <i>and so on</i></li> </ul>
Korea Convention Bureau & its Activities	<ul style="list-style-type: none"> <li>• Conducting a campaign for holding international conventions and Holding big events</li> <li>• One-stop service for planning and staging intl. Conventions and Cooperative activities with International organizations</li> </ul>
Tourist Information Services	<ul style="list-style-type: none"> <li>• Operating Tourist information center, Providing 24 hr. travel information service (dial 1330)</li> <li>• Promotion thru. internet website (Tour2Korea)</li> </ul>
Cooperation with the Local Govt. & the Tourism Industry	<ul style="list-style-type: none"> <li>• Establishing on-line network between KTO and local govt., Operating educational program for local public servants, <i>and so on</i></li> <li>• Supporting mega-events and festivals in Korea</li> </ul>
Local Tourism Promotion & Improvements in the Tourism Environment	<ul style="list-style-type: none"> <li>• Promoting local tourist attraction, Conducting <i>See Korea First</i> Campaign, Improving tourism environment, and Korea Travel Card</li> </ul>
Tourism Exchanges between South & North Korea	<ul style="list-style-type: none"> <li>• Running tourism businesses in NK, Supporting for inter-Korean exchange events</li> <li>• Collection and analysis of tourism information about North Korea</li> </ul>
Resort Development & Consulting	<ul style="list-style-type: none"> <li>• Development of resort areas by KTO (Jeju, Haenam, Gyeongju, <i>etc.</i>)</li> <li>• Assistance to local govt.s in tourism development</li> </ul>
Activities for Raising Funds For Tourism Promotion	<ul style="list-style-type: none"> <li>• Operating duty free shops (Intl. airports &amp; seaports)</li> </ul>

Annual return on equity averaged 1.0 % and return on assets averaged -0.6 %.

Over this same period, KTO's liquidity situation was comfortable, as indicated by a average current ratio of 229.5 %. And annual debt to equity ratio averaged 41.9 %.

<Table 5> KTO Consolidated Income Statements and Key Financial Ratios

(KRW amounts in millions)	Year Ended December 31			
	2005	2004	2003	
<b>Revenues</b>	<b>361,924</b>	<b>340,303</b>	<b>280,206</b>	
Net sales	269,430	261,833	222,019	
Other income	92,494	78,470	58,187	
<b>Cost of goods sold</b>	<b>221,702</b>	<b>210,245</b>	<b>168,996</b>	
<b>Gross margin</b>	<b>140,222</b>	<b>130,058</b>	<b>111,210</b>	
<b>Operating expenses:</b>				
Wages, salaries and benefits	31,581	29,552	28,117	
Depreciation and amortization	9,689	8,529	9,059	
Rentals	71,878	65,831	57,726	
Selling expenses	8,290	8,084	5,985	
Other operating expenses	16,705	20,041	18,275	
<b>Total Operating Expenses</b>	<b>138,143</b>	<b>132,037</b>	<b>119,162</b>	
<b>Operating Income</b>	<b>2,079</b>	<b>(1,979)</b>	<b>(7,952)</b>	
<b>Income before taxes and extraordinary loss</b>	<b>1,289</b>	<b>2,289</b>	<b>3,318</b>	
Provision for income taxes	(4,663)	1,064	1,255	
<b>Net Income</b>	<b>5,952</b>	<b>1,225</b>	<b>2,063</b>	
	2005	2004	2003	<b>3-Yr Avg</b>
<b>Selected Growth Rate and Ratios</b>				
Sales Growth	6.4%	21.4%	-7.3%	6.8%
Net Income Growth	281.8%	-24.4%	-18.0%	79.8%
Growth Profit Margin	38.7%	38.2%	39.7%	38.9%
Operating Margin	0.6%	-0.6%	-2.8%	-0.9%
Net Margin	1.6%	0.4%	0.7%	0.9%
Return on Assets	0.4%	-0.4%	-1.8%	-0.6%
Return on Equity	1.9%	0.4%	0.7%	1.0%
Current Ratio	222.4%	189.5%	276.7%	229.5%
Debt to Equity	55.0%	39.4%	31.4%	41.9%

<Table 6> KTO Consolidated Balance Sheets

(KRW amounts in millions)	Year Ended December 31		
	2005	2004	2003
<b>ASSETS</b>			
<b>Current Assets</b>			
Cash and cash equivalents	11,309	6,557	3,080
Short-term investments	10,743	10,971	5,338
Accounts receivable	5,136	5,230	3,252
Prepaid expenses	3,473	4,012	4,470
Inventories	86,391	86,675	95,527
Other current assets	6,128	6,225	5,557
<b>Total current assets</b>	<b>123,180</b>	<b>119,670</b>	<b>117,224</b>
Investments	161,871	138,597	116,855
Property, plant and equipment, net	222,175	194,084	174,804
Intangible assets, net	53,869	57,077	59,272
<b>Total assets</b>	<b>561,095</b>	<b>509,428</b>	<b>468,155</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>			
<b>Current Liabilities</b>			
Accounts payable	8,459	8,020	8,323
Short-term borrowings	22,000	26,000	15,000
Accrued liabilities	14,392	18,478	13,339
Accrued interest	1,344	24	24
Advance	3,935	3,995	1,646
Other current liabilities	5,252	6,637	4,036
<b>Total current liabilities</b>	<b>55,382</b>	<b>63,154</b>	<b>42,368</b>
Long-term debt	154,000	99,000	84,400
Retirement allowance	8,575	5,150	3,222
Rental deposit	20,457	20,629	19,530
Other liabilities	-	4,051	2,104
<b>Shareholders' Equity</b>			
Common stock	32,391	32,391	32,391
Additional paid in capital	1,835	1,835	1,835
Retained earnings	288,677	283,211	282,299
Recapitalization	(222)	7	6
<b>Total shareholders' equity</b>	<b>322,681</b>	<b>317,444</b>	<b>316,531</b>
<b>Total liabilities and shareholders' equity</b>	<b>561,095</b>	<b>509,428</b>	<b>468,155</b>

### 1-3. KTO's Past Financial Performance by Business Segment

<Table 7> Financial Summary by Business Segment, 2003-2005 (millions of KRW)

	2005	2004	2003
<b><i>Tourism Promotion</i></b>			
Sales	71,941	58,428	42,147
Cost of sales	67,222	54,726	39,823
Gross profit	4,719	3,702	2,324
Operating expenses	32,852	36,455	32,732
Operating profit	(28,133)	(32,753)	(30,408)
Total assets	546,384	487,008	447,923
<b><i>Duty-free Shops</i></b>			
Sales	275,619	249,198	212,164
Cost of sales	150,703	143,247	124,427
Gross profit	124,916	105,951	87,737
Operating expenses	94,489	85,218	77,180
Operating profit	30,427	20,733	10,557
Total assets	60,480	72,364	72,450
<b><i>Jeju Office</i></b>			
<b>Golf Club</b>			
Sales	9,737	9,475	9,304
Cost of sales	1,235	1,880	1,316
Gross profit	8,502	7,595	7,988
Operating expenses	6,429	6,019	5,361
Operating profit	2,073	1,576	2,627
<b>Resort Development</b>			
Sales	4,579	23,202	16,591
Cost of sales	2,492	10,391	3,430
Gross profit	2,087	12,811	13,161
Operating expenses	4,172	4,111	3,889
Operating profit	(2,085)	8,700	9,272
Total assets	112,423	115,748	121,072
<b><i>Seonam Office</i></b>			
<b>Resort Development</b>			
Sales	49	0	0
Cost of sales	51	0	0
Gross profit	(2)	0	0
Operating expenses	200	233	0
Operating profit	(202)	(233)	0
Total assets	111,779	84,316	69,142

The KTO has four major lines of business: tourism promotion, resort development, duty-free shops, and golf club. Table 7 summarizes its line-of-business data.

Tourism promotion includes 21 divisions(departments and teams), with 23 overseas offices and 5 regional promotion offices. Tourism generated 19.9% of 2005 sales and 23.8% of operating expenses.

Duty-free shops are operated at 3 international airports and 6 seaports throughout the country. Duty-free shops produced 76.2% of 2005 sales and 68.4% of operating expenses.

Operating duty-free shops has been a oligopolistic business with intense competition from other private companies such as Lotte, AK, and DFS since the demonopolization of Korean government in 2001.

Resort development encompasses resort areas developed by KTO: Jungmun resort in Jeju and Hwawon resort in Haenam. Resort development provided 1.3% of 2005 sales and 3.2% of operating expenses.

## **2. Responsibility Accounting Model Currently Applied in the KTO**

Inasmuch as the backbone of any responsibility accounting is the organization chart of the company, the organization chart of the KTO is presented first to describe its current responsibility accounting in Figure 8. This organization chart shows a chief



executive officer (CEO) and six vice presidents to head up the basic divisions of the KTO: management, marketing, investment & development, tourism technology, e-tourism, and business development. Each vice president in charge of divisions has many responsibility centers (*e.g.*, department, team, bureau, center, and so on) whose managers has control over cost, revenue, and investments in operating assets. Also indicated are the business units above responsible directly or indirectly to each vice president in charge of them.

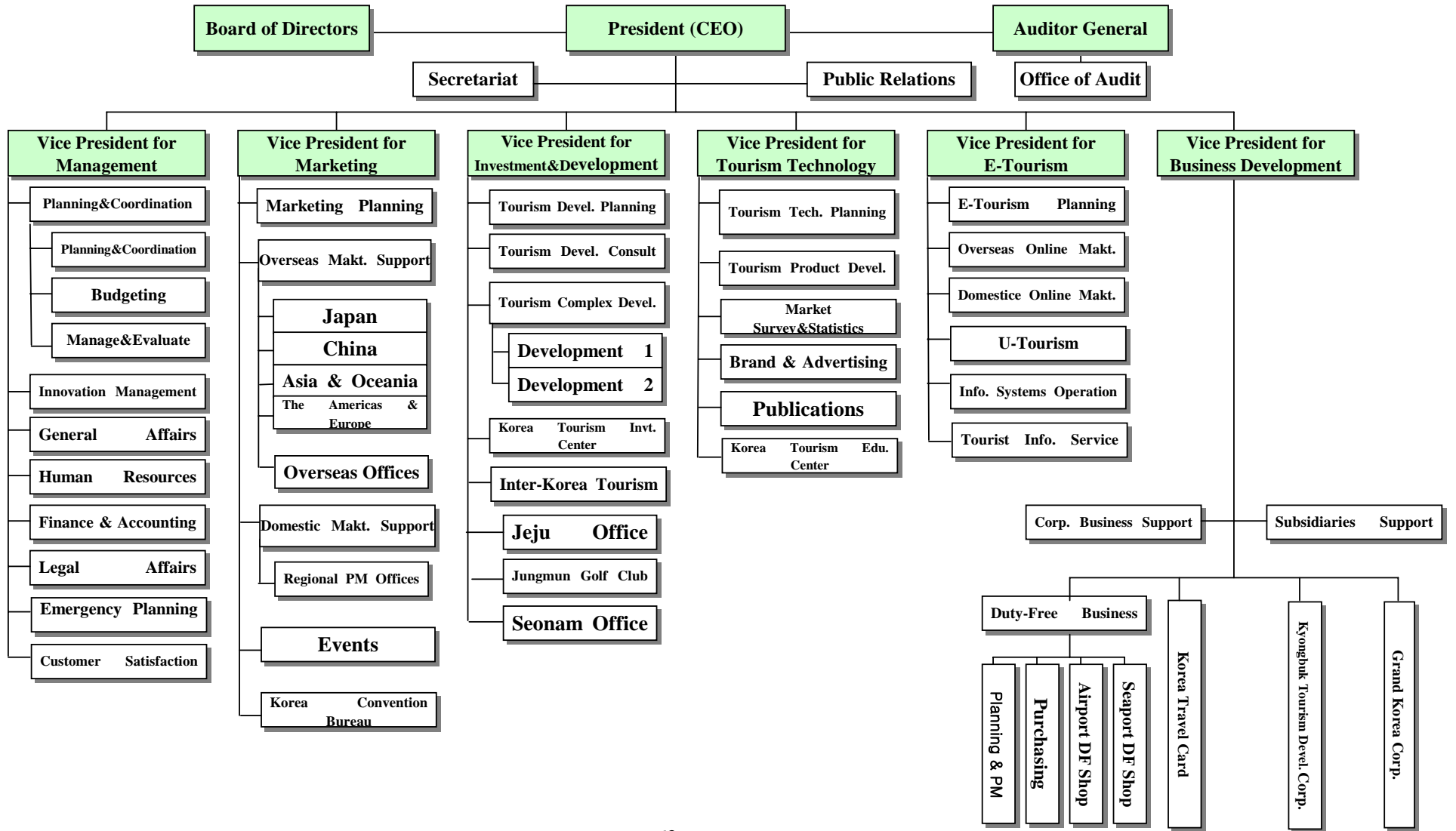
## **2-1. Introduction of the KTO's Responsibility Accounting Method**

### **Establishing of Responsibility Centers**

As shown in Table 8, Korea Tourism Organization (KTO) categorizes its six divisions and one department into cost centers, profit centers, and investment centers depending on the responsibilities of the managers of the segments. In addition, the KTO builds the business units of which divisions are composed as responsibility centers on the basis of its levels of responsibility.

A partial organization chart for vice president investment & development appears in Figure 9. This partial organization chart indicates how the various business units of the company are classified in terms of responsibility.

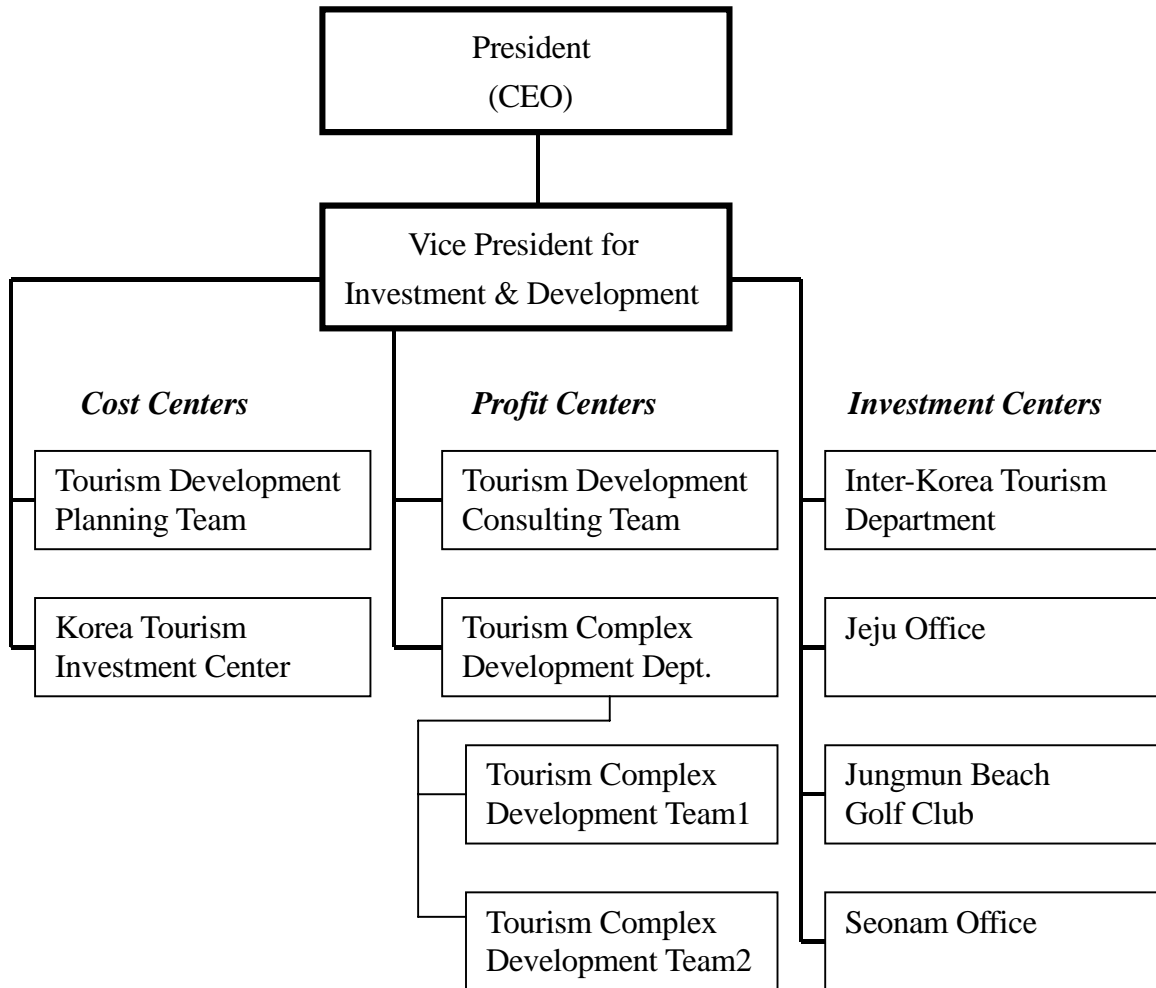
<Figure 8> Organization Chart



<Table 8> Divisions Classified as Cost, Profit, and Investment Centers

Divisions	Related Business Functions	Responsibility Centers
Vice President for Management	<ul style="list-style-type: none"> <li>• Support to the company's operating units</li> </ul>	Cost center
Vice President for Marketing	<ul style="list-style-type: none"> <li>• Overseas tourism promotion</li> <li>• Local tourism promotion</li> <li>• Korea convention bureau &amp; its activities</li> </ul>	Profit center
Vice President for Investment & Development	<ul style="list-style-type: none"> <li>• Cooperation with the local govt. &amp; tourism industry</li> <li>• Tourism exchanges between South &amp; North Korea</li> <li>• Resort development &amp; consulting</li> </ul>	Investment center
Vice President for Tourism Technology	<ul style="list-style-type: none"> <li>• Research and survey for tourism promotion</li> </ul>	Profit center
Vice President for E-Tourism	<ul style="list-style-type: none"> <li>• Information technology planning, development, and operation</li> </ul>	Profit center
Vice President for Business Development	<ul style="list-style-type: none"> <li>• Operating duty-free shops &amp; Korea travel card (KTC)</li> </ul>	Investment center
Public Relations Department	<ul style="list-style-type: none"> <li>• Performing public relations for enhancing corporate image</li> </ul>	Cost center

<Figure 9> Business Units Classified as Cost, Profit, and Investment Centers



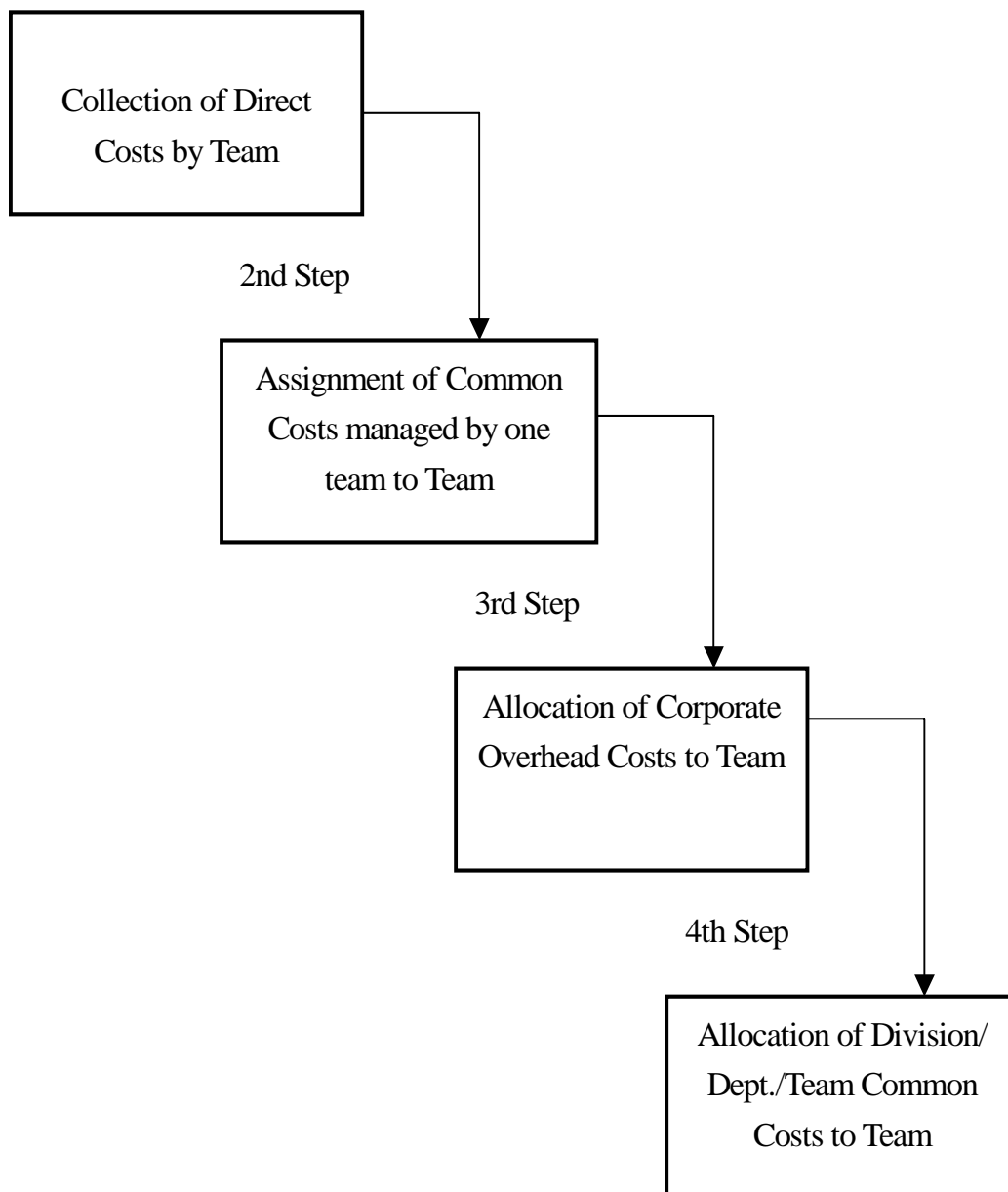
**Responsibility Costing**

As discussed earlier, responsibility accounting system in which costs should be attributed directly, assigned, and allocated to responsibility centers have proved their usefulness in controlling costs, reporting on critical divisional financial performance, and motivating the managers of responsibility centers. Therefore, in order to more

accurately measure the performance of responsibility centers and control their costs for enhancing the KTO corporate value, it requires more appropriate responsibility costing system which segregates costs attributable to the responsibility centers from costs that are not.

The KTO like most modern large organizations has both operating departments and support departments (service departments). The central purposes of the KTO are carried out in the operating departments: marketing planning team, Korea convention bureau, Korea tourism investment center, Korea travel card, and so on. In contrast, support departments provide services or assistance to the operating departments. Examples of support departments include finance & accounting team, human resources team, budgeting team, and general affairs team. The costs incurred by its' support departments are usually allocated to its, operating departments through the cost allocation method selected. The costs allocation method selected by the KTO is illustrated in Figure 10. As the first step in Figure 10 indicates, only the traceable costs are charged to the teams which consume corporate resources. If a cost is not traceable to a team, then it is not assigned to the team. In the second step, the corporate overhead costs are assigned through more than one driver by account which should drive those costs.

<Figure 10> Cost Allocation Method for Responsibility Costs



For example, the number of employees is used as the driver for employee social insurance expenses because the costs incurred in the human resources team are driven to

a large extent by the number of beneficiaries.

<Table 9> Cost Allocation Bases

Panel A. Cost Allocation Bases for Corporate Overhead Costs managed by one team

<b>Example of Costs</b>	<b>Basis for Allocation</b>	<b>Related Team</b>
Medical checkup	Percentage of salaries	Human Resources
Athletic meeting	Number of employees	Human Resources
Social insurance expenses	Percentage of salaries	Human Resources
Telephone charges	Number of employees	General Affairs
Electric charges	Square footage occupied	General Affairs
Water rates	Number of employees	General Affairs
Natural gas charges	Square footage occupied	General Affairs
Office and IT supplies	Number of employees	General Affairs
Uniform	Number of salespersons	Planning & Promotion
Information systems	Number of employees	Information Systems
maintenance & repair		Operation
Training	Number of employees (excluding temp. employees)	Human Resources

Panel B. Cost Allocation Bases for Support Departments

<b>Support Department</b>	<b>Basis for Allocation</b>	<b>Cost Object</b>
Office of Audit	Number of employees	Each team in six divisions
Secretariat	Number of employees	
Planning and Coordination	Number of employees	
Budgeting	Number of employees	
General Affairs	Number of employees	
Human Resources	Number of employees	
Finance & Accounting	Number of employees	
Legal Affairs	Number of employees	
Overseas Marketing Support	Number of employees	
Tourism Complex Development	Number of employees	
Duty-Free Business	Revenues	
Planning and Promotion	Revenues	
Purchasing	Revenues	

Then allocation of corporate overhead costs and division/department/team common costs to operating teams is illustrated in the third step and the fourth step in Figure 9.

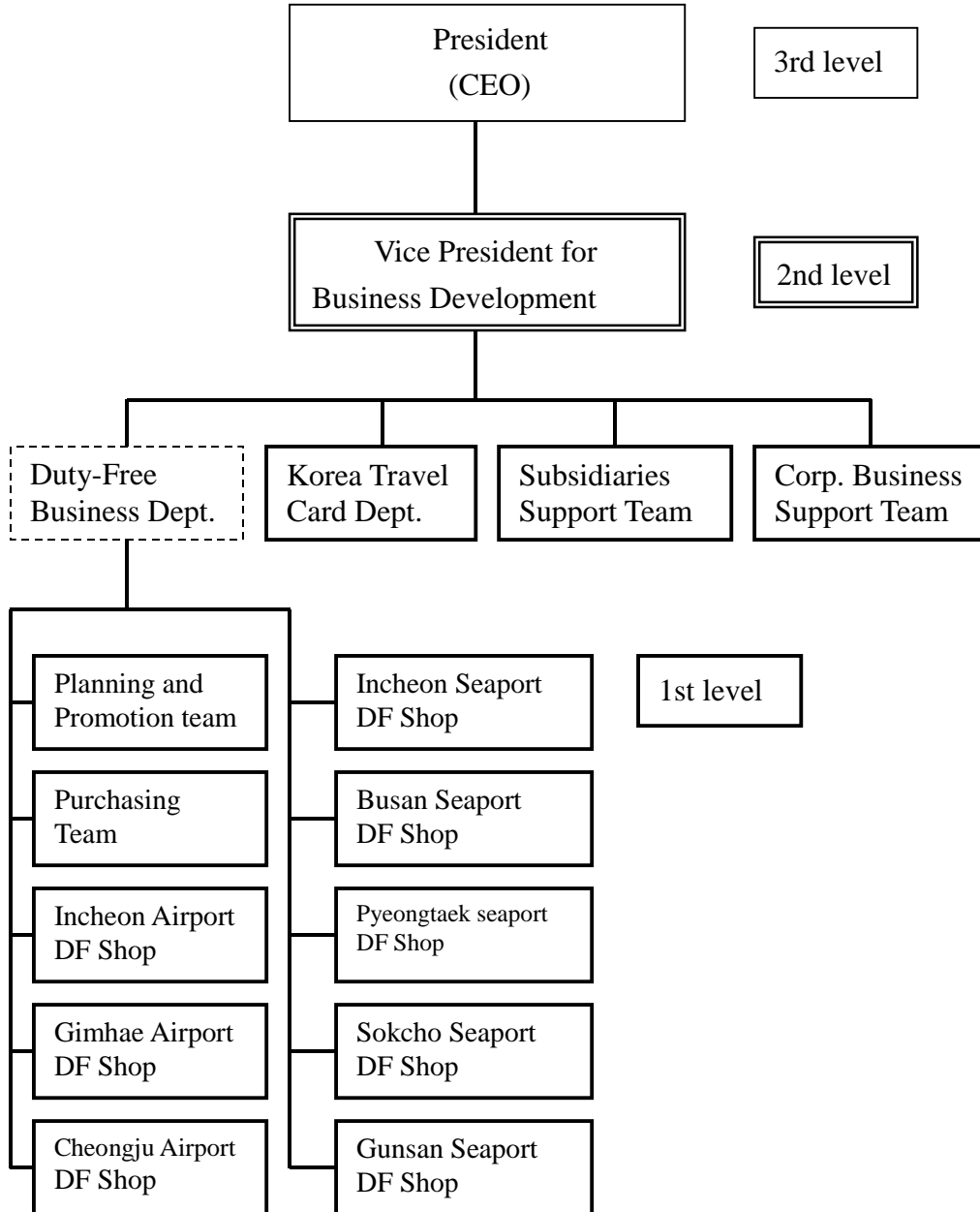
These costs are allocated to teams using allocation bases selected. In Table 9, Panel A presents the cost-allocation bases of common costs managed by a specific team for its efficient control. Examples of allocation bases for some support departments are listed in Panel B.

### **Responsibility Reporting**

A different kind of financial statement is required for evaluating the performance of a responsibility center that emphasizes segments rather than the performance of the company as a whole. In Figure 11, the three levels of responsibility reporting in the partial organization have been indicated and numbered. These levels are applicable to other divisions in the organization. That is, these constructs tend to emphasize the parallel relationship of the levels of responsibility and the reports which are directed at each of the levels and serve as an anchor chart in that it will enable one to refer back to this as individual responsibility centers, reporting is discussed through the various levels of responsibility. Under the responsibility accounting system, the KTO focuses attention on the first level of responsibility reporting to more appropriately evaluate the performance of the responsibility centers in the division.



<Figure 11> Levels of Responsibility Reporting



**Segmented Financial Statements**

A portion of the segmented report by responsibility centers in the division is shown in Table 10. Immediately to the right the column listing accounts are four

columns — one for each of the four responsibility centers. In order to prepare an income statement for a particular responsibility center, as illustrated in Table 10, the segment margin is obtained by deducting the operating expenses of a responsibility center from the responsibility center's gross profit. The operating expenses are directly traced to individual responsibility centers. In the next step, support costs in the division are allocated through allocation bases to yield the contribution margin 1.

<Table 10> Segmented Income Statements by Responsibility Centers

	<b>Responsibility Centers</b>			
	<b>Events Team</b>	<b>Incheon Airport Duty-Free Shop</b>	<b>Jungmun Beach Golf Club</b>	<b>Jeju Office</b>
(KRW amounts in millions)				
<b>Revenues</b>	-	<b>114,462</b>	<b>9,304</b>	<b>16,591</b>
Net sales	-	109,710	-	15,880
Other income	-	4,752	9,304	711
<b>Cost of goods sold</b>	<b>570</b>	<b>62,817</b>	<b>1,318</b>	<b>3,428</b>
<b>Gross profit</b>	<b>(570)</b>	<b>51,645</b>	<b>7,986</b>	<b>13,163</b>
<b>Operating expenses:</b>				
Salaries	412	3,897	2,488	865
Rent expense	-	29,064	2	12
Depreciation	-	556	298	487
Selling expenses	-	2,760	303	-
Other operating expenses	35	1,120	2,270	2,525
<b>Total Operating Expenses</b>	<b>447</b>	<b>37,397</b>	<b>5,361</b>	<b>3,889</b>
<b>Segment Margin</b>	<b>(1,017)</b>	<b>14,248</b>	<b>2,625</b>	<b>9,274</b>
Allocated Support Dept. Costs	-	1,078	161	-
<b>Contribution Margin 1</b>	<b>(1,017)</b>	<b>13,170</b>	<b>2,464</b>	<b>9,435</b>
Allocated Corp. Overhead Costs	430	383	385	202
<b>Contribution Margin 2</b>	<b>(1,447)</b>	<b>12,787</b>	<b>2,079</b>	<b>9,233</b>

Finally, some corporate overhead costs such as medical checkup and athletic meeting are directly assigned to individual centers and others are allocated to them using allocation bases. These procedures generate the contribution margin 2.

## **2-2. Problems of Existing Responsibility Accounting System in KTO**

As discussed above, the KTO establishes three types of responsibility center and measures the responsibility costs consumed by responsibility center. However, the current responsibility accounting system in the KTO has problems to be solved so as to measure the responsibility costs more accurately and objectively. They are as follows:

First, for the accurate classification of responsibility centers, the KTO needs to set up discretionary expense centers in its current responsibility accounting system. While production departments controlling over costs and directly engaging in operating activities are organized as cost centers, support departments controlling over costs and providing services or assistance to the operating departments are established as discretionary expense centers.

Next, whenever business units transfer goods or services among themselves, measuring their revenues and costs requires that a transfer price be established for the goods and services exchanged. In order to measure the revenues and costs of responsibility centers, each of these internal transactions requires a transfer price. That

is, for each unit of the goods and services transferred, the purchasing responsibility center pays the transfer price and the providing responsibility center (accounting & finance, human resources etc.) receives the transfer price. That is, charge-back system should be set up in order to price the goods and services which discretionary expense centers (accounting & finance, human resources etc.) provide to other responsibility centers. However, as Zimmerman (1997) and Brickley *etc.* (1995) emphasize, the transfer price should be the forgone profits, or opportunity costs, of the resource in its next best use. But though the theory seems simple, measuring opportunity costs can be quite difficult in practice. Thus, it can be very time-consuming and costly to develop a menu of transfer prices that incorporates most realities without relying on privately-held information held by one division.

Lastly, the current responsibility accounting system could result in cost distortion because it fails to include capital costs into the full responsibility costs. Thus, management and responsibility managers do not consider important capital drivers as a means of managing capital for creating economic value.

### **2-3. Suggestions**

Chapter 4 introduces responsibility accounting's merits, which controls costs, reports critical divisional financial performance and motivates the managers of

responsibility centers. As mentioned earlier, responsibility accounting have contributed much to improving the management of operating costs, it failed to reflect company's balance sheet and hence to account for the full cost of capital employed in business.

Under such accounting system, management and responsibility center managers focus their attention on cost drivers as the tool for managing costs and evaluating divisional financial performance. Thus, they do not consider critical capital drivers as a means of managing capital for creating economic value.

Therefore, as discussed earlier, in order to include one of the company's most significant costs—capital charge, the current KTO's responsibility accounting needs to be modified. Then the revised responsibility accounting system, as Cooper and Kaplan (1988)<sup>63</sup> emphasize, provides more accurate information about product costs and support activities and hence makes management and the managers focus their attention on the real full costs of resources consumed with the most leverage for increasing economic profits.

Furthermore, in order to establish more useful and appropriate internal management information systems, the KTO needs to combine its current responsibility accounting and EVA which is one of the best measures of shareholder economic value,

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<sup>63</sup> Robin Cooper and Robert S. Kaplan. "Measure Costs Right : Make the Right Decisions," *Harvard Business Review* (September-October 1988), pp.96-103.

and the financial management tool for organizational profitability measurement within the organization. That is, the KTO should add capital charges to operating expenses to produce its economic profits. These capital charges are traced and allocated to individual responsibility centers.

In more detail, the related methods and steps involved in developing a model on linking KTO's current responsibility accounting to EVA are briefly summarized as follows: 1) categorize business units (teams and divisions) into responsibility centers on the basis of their authority and responsibility over costs, revenues, profits, and investments, 2) attribute directly, assign through drivers, and allocate costs consumed to individual responsibility centers, 3) make accounting adjustments to produce net operating profit after taxes (NOPAT) and invested capital (IC), 4) estimate the weighted average cost of capital (WACC) reflecting the business and financial risk by responsibility center of the KTO as a multibusiness company, and 5) measure the divisional EVA.

## CHAPTER 5

### THE KTO'S RESPONSIBILITY ACCOUNTING SYSTEM AND EVA

#### 1. Building up Responsibility Centers in the KTO

Companies' structures fall somewhere in between strong decentralization and high centralization because there are both benefits and costs of decentralization, which are discussed earlier. In order to choose an organization structure that will implement a company's strategy, top management should compare the benefits and costs of decentralization.

As Hodak (2000)<sup>64</sup> holds, companies are generally split into divisions to improve managerial decision-making by allowing for specialization and decentralization. That is, decentralization is generally a more popular form of organizational design than centralization when companies face uncertainties in their environments, require detailed local knowledge for performing various jobs, and have few interdependencies among divisions (Hansen and Mowen, 1992; Horngren *et al.*, 2003).

Decentralization is usually achieved by creating decentralized units. One way in which decentralized units are differentiated is by the type of responsibility given to the

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<sup>64</sup> Marc Hodak. "The Viable EVA Center(Or, How TO Slice a Company So It Doesn t Bleed)," *Journal of*

divisional manager.

Organizing divisions as responsibility centers not only differentiates them on the degree of decentralization but also creates the opportunity for control of the divisions through the use of responsibility accounting. Thus, responsibility accounting should fit a decentralized organizational structure and motivate managers and employees to give effort to achieve the organization's goals to become an effective management control system, which is a means of gathering and using information to aid and coordinate the planning and control decisions throughout the organization, and to guide the behavior of managers and employees.

As a consequence, to measure the full cost and evaluate the performance of subunits in decentralized companies, the management control system uses one or a mix of the five types of responsibility centers presented in Chapter 2. The five types of responsibility centers are as follows: cost centers, revenue centers, discretionary expense centers, profit centers, and investment centers. And these responsibility centers differ depending on the degree of authority and accountability given to the local manager. Then, as Vancil (1980)<sup>65</sup> and Maciariello and Kirby (1994)<sup>66</sup> contend,

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*Applied Corporate Finance*(Fall 2000), pp.72.

<sup>65</sup> Alfred Ra Ppaport. *Information for Decision Making : Readings in Cost and Managerial Accounting*. 3<sup>rd</sup> ed. Prentice Hall, 1982, pp.299-309. Reprinted from *Financial Executive*, March 1980.

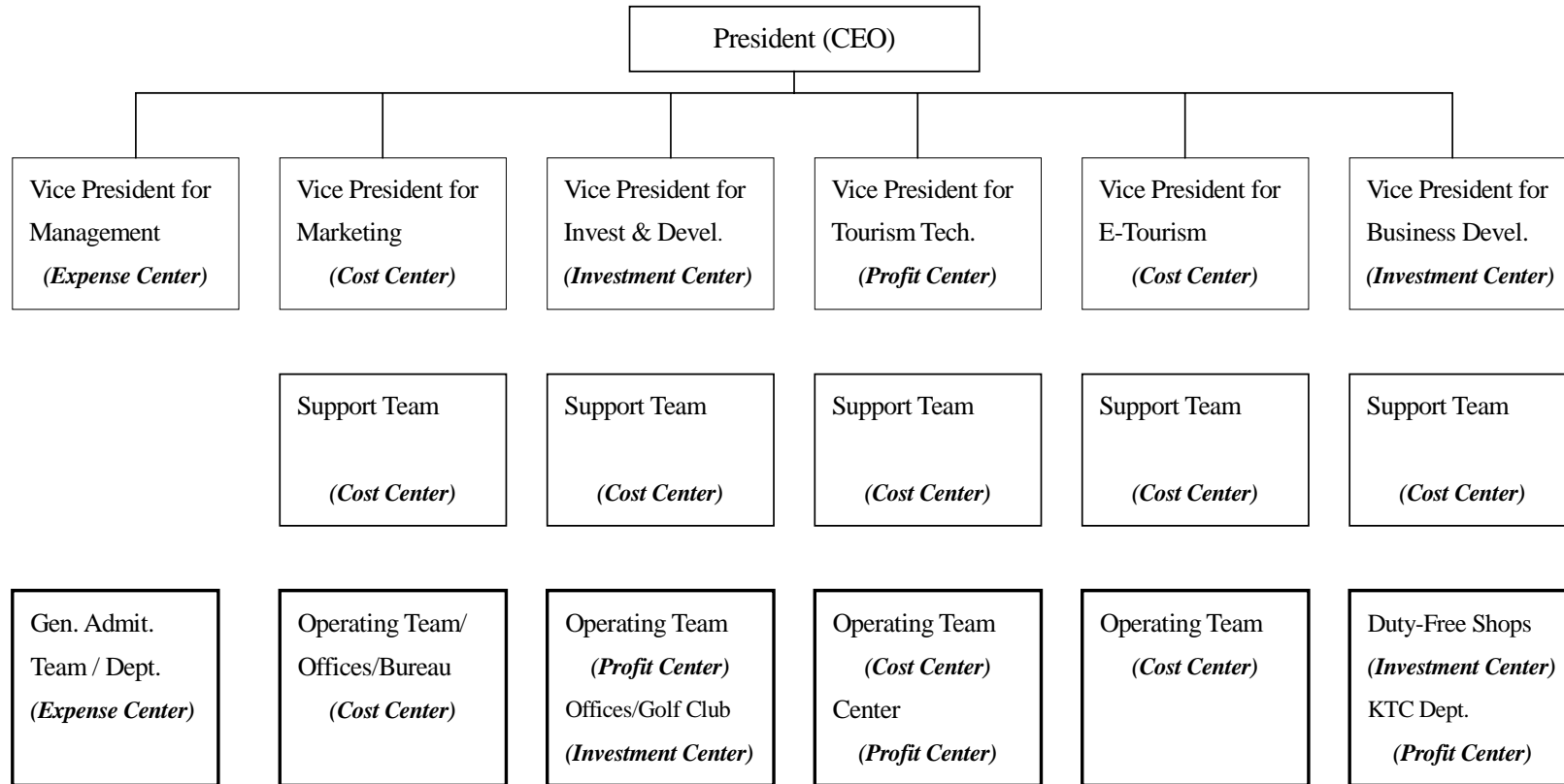
<sup>66</sup> Joseph A. Maciariello and Calvin J. Kirby. *Management Control Systems : Using Adaptive Systems to Attain Control*. 2<sup>nd</sup> ed. Prentice Hall, 1994, pp.185-197.



autonomy is influenced by the eight separate variables: corporate managers: philosophy and style, management process: policies and procedures, diversification strategy, business strategy, responsibility structure: custody of physical resources, cost and asset assignment, measurement methods: for assigned costs and assets, and rewards: physical and tangible.

With these definitions of five types of responsibility centers and their autonomy mentioned above, the business units in the KTO require to be rebuilt up as a responsibility center as follows: discretionary expense center (*e.g.*, human resources team, finance & accounting team), cost center (*e.g.*, events team, publications team), profit center (*e.g.*, tourism development consulting team, Korea tourism education center), and investment center (*e.g.*, duty-free shops, golf club).

<Figure 12> Responsibility Centers Classified as Expense, Cost, Profit, and Investment Centers



\*Complete name of expense center shown above: Discretionary Expense Center

## **2. Setting up Cost and Capital Allocation Method**

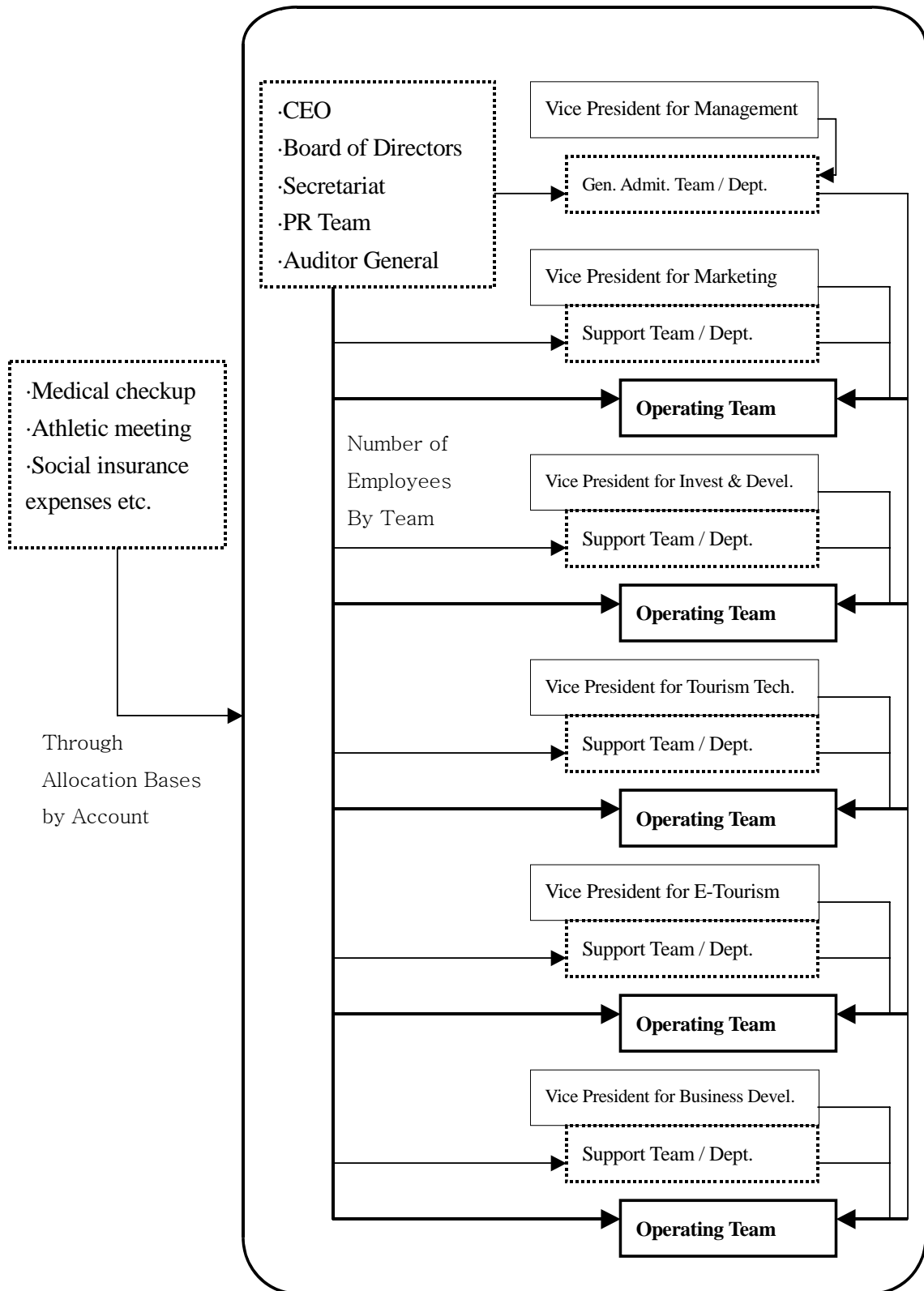
In order to provide more accurate cost information including capital costs and hence to help managers focus on the real full costs of resources consumed for creating economic profits, the KTO first requires to segregate costs attributable to the responsibility centers from costs that are not. And also, to trace capital charges to responsibility centers, each account balance from the balance sheet first should be segmented by responsibility center where the management of the asset takes place and then multiplied by the weighted average cost of capital (WACC). Finally, the capital charges are assigned to responsibility centers employing the invested capital .

As cost methodology (direct attribution, assigned through drivers, allocated) in Figure 6 presents, in the first step, only the traceable costs and capital are charged to the responsibility centers which consume or employ corporate resources. That is, if a cost and capital are not traceable to a responsibility center, then they are not assigned to the center. Next, the corporate overhead costs and common assets shared by two or more users are assigned through more than one driver by account. Then division/department/support team overhead costs and common assets are allocated using the allocation bases. Figure 13 summarizes the cost allocation method for responsibility costs, presenting the cost-allocation bases of common costs managed by a specific

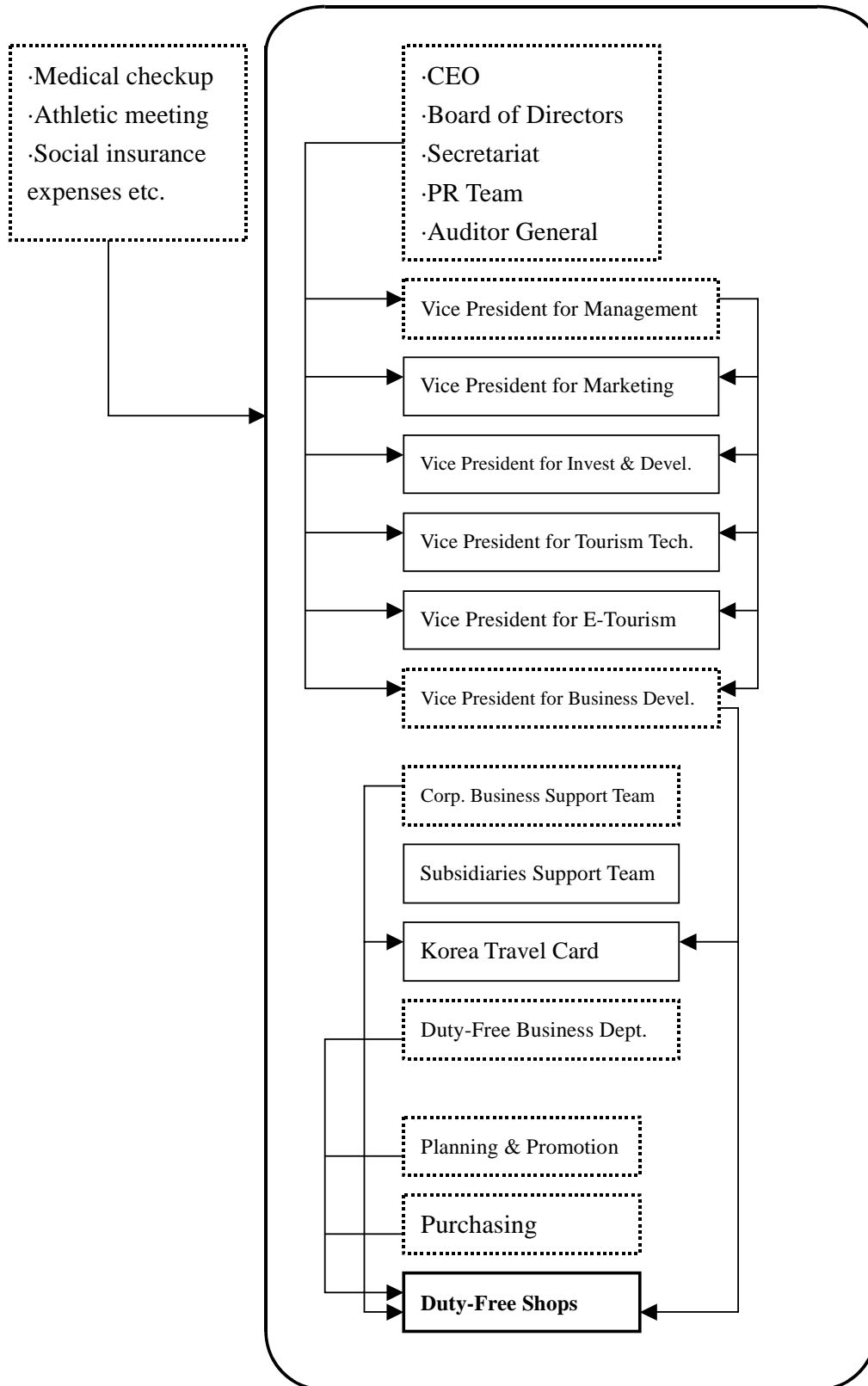
support team such as human resources team and general affairs team. And then allocation of corporate headquarters overhead costs (*e.g.*, secretariat, promotion team, and so on), corporate service departments overhead costs (*e.g.*, finance & accounting team, human resources, etc.), and division/department/support team overhead costs to operating teams is illustrated in Figure 13. The cost-allocation bases mentioned above are shown in appendix B (see the table in appendix B). And also, Figure 14 depicts the processes of assigning and allocating shared costs to each operating team as a responsibility center, focusing on the duty-free shops which are investment centers and EVA centers.

In a similar manner, common assets could be assigned and allocated by responsibility center through their capital drivers and allocation bases.

<Figure 13> Cost Allocation Method for Responsibility Costs



<Figure 14> Cost Allocation Method for Responsibility Costs of Duty-Free Shops



### **3. Calculation of NOPAT and Capital for the KTO**

The net operating profit after taxes (NOPAT) and the amount used for capital are not readily available because they don't come directly off the financial statements.

In order to compute NOPAT and capital, the amount of equity equivalent reserves for certain accounts must be determined first, and the footnotes to the financial statements are the primary source for this information (Stewart III, 1991; Dierks and Patel, 1997). And also, Stewart (1991) calculates NOPAT and capital in two ways: an Operating Approach and a Financing Approach.

In this study, from an operating perspective, the calculations of NOPAT and capital for the KTO is made.

#### **Calculating Net Operating Profit After Taxes (NOPAT)**

The net operating profits after taxes (NOPAT) is the profits derived from the company's operations after taxes but before financing costs and non-cash-bookkeeping entries.<sup>67</sup> With operating approach, we start with sales as a proxy for operating cash receipts and then deduct recurring cash economic operating expenses including depreciation, but other noncash-bookkeeping entries are ignored. Next, equity equivalent (EE) reserve adjustments are made. Interest expense is ignored, but other

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<sup>67</sup> G. Bennett Stewart, III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991, pp.86.

income is added to get Net Operating Profit Before Taxes (NOPBT). Finally, an estimate of the taxes payable in cash on these operating profits is subtracted leaving NOPAT. The following Figure 15 provides a framework for computing the KTO's NOPAT by responsibility center.

<Figure 15> Framework for Computing NOPAT by Responsibility Center

<p><b>Net operating profits before taxes (NOPBT)</b></p> <p><b>Less: Cash taxes</b></p> <p>Income tax provision minus yearly increase in the deferred income tax reserve</p> <p><b>Plus: Changes in equity equivalents</b></p> <p>Goodwill amortization</p> <p>Increase in Bad debt reserve</p> <p>Unusual loss after taxes</p>
<p><b>NOPAT</b></p>

### Calculating CAPITAL

As mentioned earlier, from an operating perspective, capital can be defined as net working capital (NWC) plus net fixed assets (NFA). In turn, NWC is current assets net of non-interest-bearing current liabilities (NIBCLS), and NFA consist of net property, plant and equipment, goodwill, and other long-term capital necessary to run the business (Stewart, 1991).

According to Stewart (1991)<sup>68</sup>, capital employed is estimated by taking the

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<sup>68</sup> G. Bennett Stewart, III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991,



standard accounting book value for a company's net assets and then grossing it up three ways: first, to convert from accrual to cash accounting, next, to convert from the liquidating perspective of lenders to the going-concern perspective of shareholders, and in the final way, to convert from successful-efforts to full-cost accounting. As a result, these adjustments produce a more accurate measure of the capital base than is represented by conventional accounting book value (Stewart, 1991).

From the operating approach, mentioned above, we begin with the firm's total assets as reported on the balance sheet and get the NIBCLS (*e.g.*, accounts payable, accrued expenses, and income taxes payable) that are netted from current assets to compute net working capital. And finally the major adjustments to net assets are to add the equity equivalents (EEs) related to the company's asset accounts, such as goodwill amortization and cumulative unusual gains.

Based on the approach mentioned above, the framework for computing the KTO's capital by responsibility center is presented in the Figure 16.

<Figure 16> Framework for Computing CAPITAL by Responsibility Center

<p><b>Operating Current Assets</b></p> <p>Trade Receivables Other Receivables Advance Payments Prepaid Expenses Deposits Inventories</p>	-	<p><b>Non-interest-bearing Current Liabilities</b></p> <p>Trade Payables Other Accounts Payable Advance from Customers Withholdings Accrued Expenses Unearned Income L/T Trade Payables Deferred Income Tax Credits L/T Other Accounts Payable Guarantee Deposits</p>	+	<p><b>Net Fixed Assets</b></p> <p>L/T Trade Receivables Other Investments Tangible Assets Intangible Assets</p>
+				
<p><b>Equity Equivalents Reserves</b></p> <p>Deferred tax reserve Cumulative goodwill amortization Bad debt reserve Cumulative unusual loss after taxes</p>				
=				
<p><b>CAPITAL</b></p>				

#### 4. Estimating the Cost of Capital

In order to integrate responsibility accounting with EVA, as discussed in chapter 3, the KTO should add capital charges to operating expenses. These capital charges can be traced to responsibility centers by means of capital drivers. That is, each responsibility center adds the capital charges to the responsibility costs so that the responsibility costs

would reflect all costs, including the cost of capital.

As Dierks and Patel (1997)<sup>69</sup> describe in the formula presented, the capital charge is the cash flow required to compensate investors for the riskiness of the business given the amount of capital invested and the cost of capital or the weighted average cost of capital (WACC) is the minimum rate of return on capital required to compensate debt and equity investors for bearing risk to create value. That is, the weighted average cost of capital represents the opportunity cost that investors face for investing their funds in one particular business instead of others with similar risk and hence includes the opportunity costs from all sources of capital: equity, debt, and so on.<sup>70</sup>

To determine the weighted average cost of capital (WACC), it is necessary to calculate the KTO's three components: the cost of equity, the after-tax cost of debt, and the company's target capital structure.

Furthermore, the KTO, as reviewed earlier, is in multiple businesses: tourism promotion, resort development, duty-free shops, golf club. Some business units' financial characteristics are significantly different and thus their systematic risk (beta) of operating cash flows and their implied capital structure differ by line of business.

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<sup>69</sup> Paul A. Dierks, and Ajay Patel. "What is EVA, and How Can It Help Your Company?," *Management Accounting* (November 1997), pp.52-58.

<sup>70</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.291-292.

Therefore, as Koller *et al.* (2005)<sup>71</sup> and Ruback (1998)<sup>72</sup> present, the KTO requires three inputs (target capital structure, cost of equity, and debt cost) to determine the opportunity cost of capital by line of business. The cost of capital varies across the lines of business because all three of the cost-of-capital inputs could differ for each line of business.

### **Estimating the Target Capital Structure**

To estimate some business units' target capital structure in the KTO as a multibusiness company, the mean capital structure of several companies in the same line of business (*e.g.*, AK, DFS Seoul in the duty-free shop business) is used based on Koller *et al.*'s (2005) recommendation.

In this method, the resulting divisional debt percentages in capital by line of business are as follows:

<Table 11> KTO: Estimating Target Capital Structure for Each Line of Business

<b>Source of Capital</b>	<b>Tourism Promotion</b>	<b>Duty-Free Shops</b>	<b>Resort Development</b>	<b>Golf Club</b>	<b>Comments</b>
Debt to Equity	1.0	0.7	0.4	0.3	Mean of peers
Debt to Capital	0.5	0.4	0.3	0.2	

<sup>71</sup> *Op.cit.*, pp.538-540.

<sup>72</sup> Richard Ruback. *Marriott Corporation: The Cost of Capital Case*, #9-298-101, Harvard Business School, 1998, pp.3-6.

## **Estimating the Cost of Equity**

As described earlier, the Capital Asset Pricing Model (CAPM) is used to estimate the cost of equity to establish the weighted average cost of capital.

However, the appropriate cost of equity capital for each line of business in the KTO as a multibusiness company should reflect the risk associated with the industry in which that business unit operates, because the systematic risk inherent in its basic business operations differs by business unit.

Furthermore, the systematic risk inherent in the firm's basic business operations is amplified by financial leverage.<sup>73</sup> Therefore, with financial leverage, application of the cost of capital by line of business to the individual units would result in good explanations about the real full costs including capital charges.

**Determining the risk free rate;** as Koller *et al.* (2005)<sup>74</sup> describe, the risk-free rate is defined as the return on a portfolio that has no covariance with the market represented by a CAPM beta of 0. However, given the cost and complexity of designing a zero-beta portfolio, they recommend focusing on long-term government default-free bonds.

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<sup>73</sup> Leveraged Betas and the Cost of Equity Case, #9-288-036, Harvard Business School, 1993, pp2.

<sup>74</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.296-297.

In addition, as Copeland *et al.* (2000)<sup>75</sup> point out, there are three reasonable alternatives that use government securities for estimating the risk-free rate: the rate for Treasury bills, the rate for 10-year Treasury bonds, and the rate for 30-year Treasury bonds.

They recommend using a 10-year Treasury bond rate as a proxy to estimate the risk-free rate, because the short-term bond rate fails to recognize a bondholder's reinvestment at higher rates and the 30-year Treasury can cause stale prices and yield premiums.

As a consequence, the risk-free rate could be derived from the 10-year treasury bonds (the State Treasury of Korea). The 10-year treasury bond rate is 4.95% as of year 2005.

**Determining the market risk premium;** the market risk premium, as presented in chapter 3, is the difference between the expected return on the market portfolio and the risk-free rate. The expected risk premium in the future is difficult to estimate. In addition, as Koller *et al.* (2005) hold, no single model for estimating the market risk premium has gained universal acceptance.

However, a common approach is to assume investors expect returns in the future

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<sup>75</sup> Tom Copeland, Tim Koller, and Jack Murrin. *Valuation : Measuring and Managing The Value of Companies*. 3<sup>rd</sup> ed. John Wiley & Sons, 2000, pp.215-216.

to be about the same as returns in the past.<sup>76</sup> The market risk premium is estimated by measuring and extrapolating historical excess returns as a reasonable proxy for future premium (Koller *et al.*, 2005). To best measure the risk premium using historical data, Koller *et al.* (2005)<sup>77</sup> present the following guidelines: calculate the premium relative to long-term government bonds, use the longest period possible, use an arithmetic average of longer-dated intervals, and adjust the result for econometric issues such as survivorship bias.

Based on the guidelines mentioned above, the market risk premium is produced as follows using spread between the arithmetic average Korea Composite Stock Price Index (KOSPI) returns for the years 1980 through 2005 and long-term government bond returns:

$$\begin{aligned}\text{Risk premium} &= \text{expected rate of return} - \text{risk free rate} \\ &= \text{arithmetic average KOSPI returns} - \text{10-year treasury bond rate} \\ &= 14.18\% - 4.95\% \\ &= 9.23\%\end{aligned}$$

**Determining the beta;** According to the CAPM, an asset's risk is not measured

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<sup>76</sup> *Diversification, the Capital Asset Pricing Model, and the Cost of Equity Capital Case*, #9-276-183, Harvard Business School, 1993, pp.9.

<sup>77</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.298-303.

as an individual risk, but the asset's contribution to the risk of a market portfolio. This risk, usually called systematic risk, is measured by the beta coefficient ( $\beta$ ).<sup>78</sup>

As Koller *et al.* (2005) describe, the most common regression used to estimate a company's raw beta is the market model:  $R_i = \alpha + \beta R_m + \varepsilon$ . In the market model, the stock's return ( $R_i$ ) is regressed against the market's return ( $R_m$ ).

Fuller and Kerr (1981)<sup>79</sup> and Copeland *et al.* (2000)<sup>80</sup> recommend using published estimates of beta for listed companies, which is the easiest approach and also employing industry averages for unlisted companies such as the KTO or business units. That is, for estimating betas for unlisted companies or business units, the pure play method is used. According to Brigham and Ehrhardt (2005)<sup>81</sup>, in the pure play method, the company finds several comparable companies in the same line of business as the unlisted company or the division, and it averages those companies' betas to determine its own cost of capital.

In addition, if the pure play firms employ different capital structures than that of an unlisted company or business unit, this fact should be dealt with by adjusting the

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<sup>78</sup> Richard Ruback. *Marriott Corporation: The Cost of Capital Case*, #9-298-101, Harvard Business School, 1998, pp.5.

<sup>79</sup> Russell J. Fuller, and Halbert S. Kerr. "Estimating the Divisional Cost of Capital: An Analysis of the Pure-Play Technique," *The Journal of Finance* (December 1981), pp.997-1001.

<sup>80</sup> Tom Copeland, Tim Koller, and Jack Murrin. *Valuation : Measuring and Managing The Value of Companies*. 3<sup>rd</sup> ed. John Wiley & Sons, 2000, pp.223-224.

<sup>81</sup> Eugene F. Brigham and Michael C. Ehrhardt. *Financial Management*. 11<sup>th</sup> ed. Thomson South-Western, 2005, pp.327.



betas. That is, as Fuller and Kerr (1981) recognize, in estimating the cost of capital from the pure-play cost of capital, the firm's division and the pure-play are unlikely to have the same capital structure.<sup>82</sup> In order to derive the cost of capital from the cost of capital of the pure-play, Fuller and Kerr (1981) utilize the following Hamada equation:

$$\beta_U = \beta_L / [ 1 + (1 - T) D / S ]$$

Then, the unlevered beta is relevered according to

$$\beta_L = \beta_U [ 1 + (1 - T) D / S ]$$

where

$\beta_U$  ,  $\beta_L$  : the unlevered beta, levered beta

S, D: the market values of stock and debt

T: the corporate tax rate

Their approach has two steps: 1) unlever the pure-play beta, and 2) relever the unlevered beta according to the appropriate capital structure and tax rate of the multidivision firm (Conine and Tamarkin, 1985). Moreover, Koller *et al.* (2005)<sup>83</sup> recommend using industry, rather than company-specific, betas to improve the precision of beta estimation.

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<sup>82</sup> Thomas E. Conine, and Maury Tamarkin. "Divisional Cost of Capital Estimation: Adjusting for Leverage," *Financial Management* (Spring 1985), pp.54-58.

<sup>83</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.311-313.

In sum, to estimate an industry-adjusted divisional beta in the KTO, the following five-step process is used: 1) find pure-play firms to determine raw beta, 2) calculate each company's debt-to-equity ratio, 3) unlever each beta using the Hamada equation, 4) determine the industry unlevered beta by calculating the average, and 5) relever the industry unlevered beta employing each company's target debt-to-equity ratio.

Table 12 summarizes the estimation of cost of equity and beta for multiple businesses in the KTO (for more detailed information, see the table in the appendix C).

<Table 12> KTO: Estimating Beta and Cost of Equity for Multiple Businesses

	<b>Tourism Promotion</b>	<b>Duty-Free Shops</b>	<b>Resort Development</b>	<b>Golf Club</b>	<b>Comments</b>
Unlevered beta	0.44	0.44	0.47	0.32	Mean of peers
Corp. tax rate	0.28	0.28	0.28	0.28	Whole firm
Target debt to equity	1.0	0.7	0.4	0.3	Mean of peers
Relevered beta	0.76	0.65	0.61	0.39	At target cap. structure
Cost of equity	11.94%	10.98%	10.59%	8.52%	

### **Estimating the After-Tax Cost of Debt**

In order to estimate the cost of debt, Stewart (1991)<sup>84</sup> and Koller *et al.* (2005)<sup>85</sup> recommend to use the prevailing yield to maturity (YTM) of the firm's own long-term,

<sup>84</sup> G. Bennett Stewart III. *The Quest for Value : The EVA Management Guide*. Harper Business, 1991, pp.434-444.

<sup>85</sup> Tim Koller, Marc Goedhart, and David Wessels. *Valuation : Measuring and Managing The Value of Companies*. 4<sup>th</sup> ed. John Wiley & Sons, 2005, pp.318-322.

option-free bonds. According to them, for estimating the cost of debt for a company with investment-grade debt, yield to maturity is a suitable proxy.<sup>86</sup>

In the absence of a quote for its bonds, a company's borrowing rate could be approximated by the rate currently being paid by a sample of companies with the same bond rating (Stewart III, 1991).

The KTO does not have publicly traded debt whose yield would indicate the company's marginal cost of debt financing. However, the Korea Investors Service (KIS)'s bond rating scoring system positions the KTO as an AAA-rated credit.

Therefore, the KTO's borrowing rate is estimated by the yield to maturity prevailing on publicly traded bonds issued by a large sample of AAA-rated companies. The average long-term bond yields an even 5.57% as of year 2005. As shown in the company report, the corporate marginal tax rate is 27.5%. The KTO's after-tax cost of debt thus is produced as follows:

$$\begin{aligned}\text{After-tax cost of debt} &= \text{Cost of debt} \times (1 - \text{Marginal tax rate}) \\ &= 5.57\% \times (1 - 0.275) = 4.04\%\end{aligned}$$

### **Estimating the Weighted Average Cost of Capital by line of business**

Estimating the costs of debt and equity and the target capital structure in earlier

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<sup>86</sup> *Ibid.*

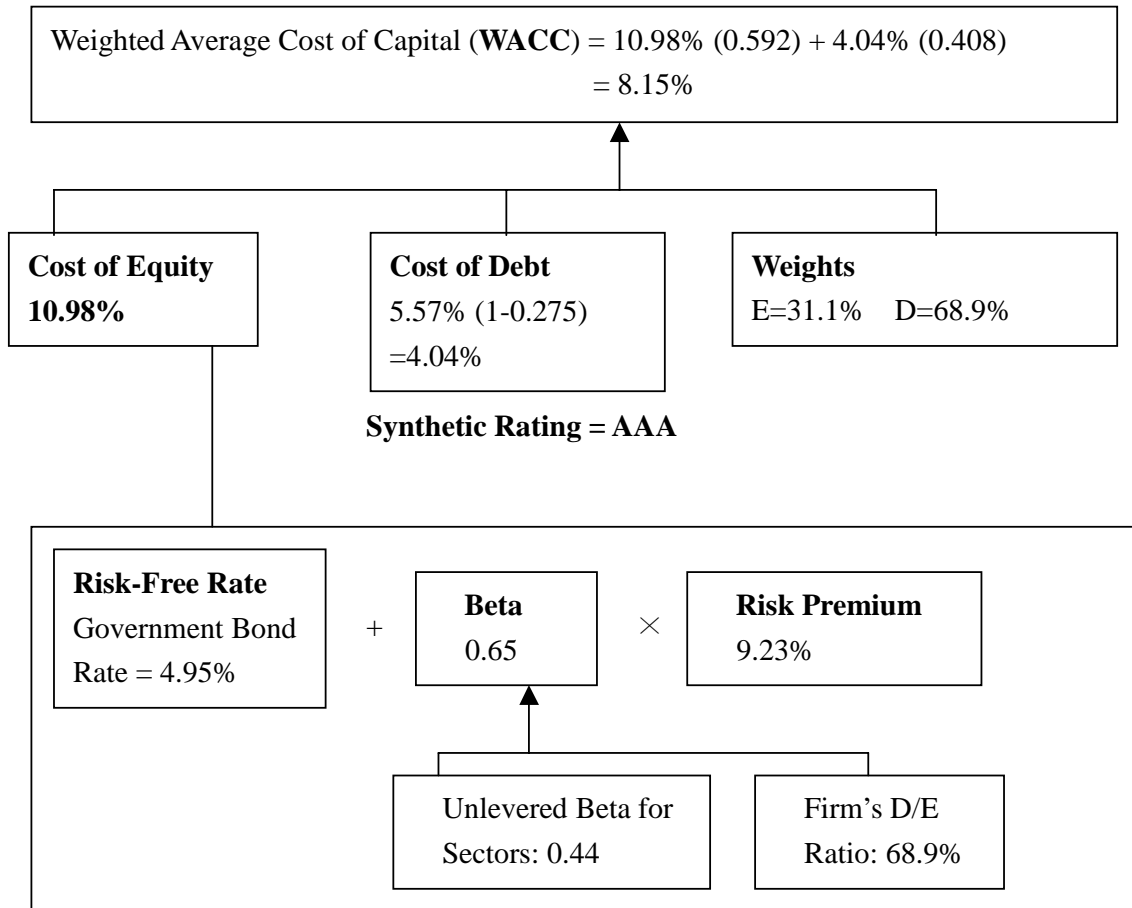
discussion, we can put them together to arrive at a cost of capital for each line of business. This method, as shown in Figure 17, generates the weighted average cost of capital for multiple businesses in the KTO. First, to make an estimate of duty-free shop business' beta in the KTO, we use an unlevered beta of 0.44 and its debt-to-equity ratio of 68.9%: Levered beta =  $0.44[1 + (1 - 0.28)(0.689)] = 0.65$ . Next, to estimate the cost of equity, we use a riskless rate of 4.95% and a market risk premium of 9.23%: Cost of equity =  $4.95\% + 0.65(9.23\%) = 10.98\%$ . Then, we use a AAA-rated credit for the KTO positioned by the Korea Investors Service (KIS) to come up with a pretax cost of borrowing of 5.57%. With a marginal tax rate of 27.5% and a debt to capital of 40.8%, the cost of capital of the duty-free shop business is: Cost of capital =  $10.98\%(0.592) + 0.0557(1 - 0.275)(0.408) = 8.15\%$ .

Using these procedures, the cost of capital by line of business in the KTO is presented in the following Table 13.

<Table 13> Weighted Average Cost of Capital (WACC) by Line of Business

	<b>Tourism Promotion</b>	<b>Duty-Free Shops</b>	<b>Resort Development</b>	<b>Golf Club</b>
WACC	7.99%	8.15%	8.62%	7.42%

<Figure 17> Weighted Average Cost of Capital (WACC) for Duty-free shop Business



### 5. Measuring Capital Charges and EVA

Although the KTO's responsibility accounting system has contributed much to improving the measurement of operating costs consumed by responsibility centers and the evaluation of their performance, it fails to account for the full cost of capital. Responsibility costs are therefore understated.

Consequently, as suggested in Chapter 4, the KTO's responsibility accounting

system should be combined with EVA to provide more accurate cost information including capital costs and hence to help managers focus on the real full costs of resources consumed for creating economic profits. As Hubbell (1996)<sup>87</sup> presents, economic value added (EVA) is simply operating profits after tax less a charge for the capital used in creating the profits.

<Table 14> Applying Responsibility Accounting to EVA Analysis

(KRW amounts in millions)	Responsibility Centers			
	Events Team	Incheon Airport Duty-Free Shop	Jungmun Beach Golf Club	Jeju Office
<b>Revenues</b>	-	<b>114,462</b>	<b>9,304</b>	<b>16,591</b>
Net sales	-	109,710	-	15,880
Other income	-	4,752	9,304	711
<b>Cost of goods sold</b>	<b>570</b>	<b>62,817</b>	<b>1,318</b>	<b>3,428</b>
<b>Gross profit</b>	<b>(570)</b>	<b>51,645</b>	<b>7,986</b>	<b>13,163</b>
<b>Operating expenses:</b>				
Salaries	412	3,897	2,488	865
Rent expense	-	29,064	2	12
Depreciation	-	556	298	487
Selling expenses	-	2,760	303	-
Other operating expenses	35	1,120	2,270	2,525
<b>Total Operating Expenses</b>	<b>447</b>	<b>37,397</b>	<b>5,361</b>	<b>3,889</b>
<b>Segment Margin</b>	<b>(1,017)</b>	<b>14,248</b>	<b>2,625</b>	<b>9,274</b>
Allocated Support Dept. Costs	-	1,078	161	161
<b>Contribution Margin 1</b>	<b>(1,017)</b>	<b>13,170</b>	<b>2,464</b>	<b>9,435</b>
Allocated Corp. Overhead Costs	430	383	385	202
<b>Contribution Margin 2</b>	<b>(1,447)</b>	<b>12,787</b>	<b>2,079</b>	<b>9,233</b>
Invested capital	315	24,773	11,402	103,683
<b>Capital charge</b>	<b>25</b>	<b>2,018</b>	<b>846</b>	<b>8,934</b>
<b>Economic Value Added</b>	<b>(1,472)</b>	<b>10,769</b>	<b>1,233</b>	<b>299</b>

<sup>87</sup> William W. Hubbell. "A Case Study in Economic Value Added and Activity-Based Management," *Journal of Cost Management* (Summer 1996), pp.21-29.

The capital charge by responsibility center then is calculated by multiplying its cost of capital times the capital employed (defined as net working capital plus net fixed assets) by responsibility center. Table 14 illustrates the impact of including capital charges on responsibility costs for the KTO's responsibility centers.

## **CHAPTER 6**

### **CONCLUSION**

#### **1. Summary of Results**

As examined in the literature review, method of linking responsibility accounting to EVA and the case study of this study, there are some findings to be summarized as follows:

- In the first place, as Benston (1963) argues, decentralization serves both to allow the managers the necessary freedom and authority needed for motivation and to encourage them to supervise their workers effectively. And decentralization is aided effectively by responsibility accounting.

- Next, examined in Chapter 2 of this study, there are five different types of responsibility centers (discretionary expense center, cost center, revenue center, profit center, and investment center or EVA center) and related financial performance measurement systems to link together decentralized decision-making.

- Thirdly, cost allocations could be useful devices for controlling and motivating managers and a potent tool in motivating greater goal congruence between a firm and its employee based on Zimmerman's cases and Blanchard and Chow's argument.



- In the fourth step, whenever responsibility centers transfer goods or services among themselves, correct transfer prices need to be established for the goods and services exchanged to measure their performance. Getting the transfer price right is very important because incorrect transfer prices can result in inappropriate decisions, the reduced firm value, and inappropriate promotion and retention decisions.

- The responsibility accounting needs to reflect company's balance sheet and hence to account for the full cost of capital employed in business. Including one of the company's most significant costs—capital charge, the responsibility accounting system provides more accurate information about responsibility costs and hence makes management and the managers focus their attention on the real full costs of resources consumed with the most leverage for increasing economic profits.

- As we examined in Chapter 3 and Chapter 5 of this research, the responsibility accounting could be linked to EVA which is one of the best measures of shareholder economic value and the financial management tool for organizational profitability measurement in order to build up more useful and appropriate internal management information system.

## **2. Limitations and Suggestions for Future Research**

### **Limitations**

In the study, by and large, there might be four kinds of the limitations of this study. The first limit belongs to the absence of information concerning transfer prices which each of internal transactions requires. Because developing an accounting system capable of capturing all the synergic effects or coming up with appropriate transfer prices tends to be either impossible or a highly complicated and costly undertaking, the KTO has not designed and implemented a transfer pricing system that captures these transactions. Next, there remains basic limitation inherent in the pure-play approach. Since the beta for a division of a company or a nonpublic company is unobservable in the marketplace, a proxy beta derived from a publicly traded company whose operations are most similar to the division or the company in question is used as the measure of its systematic risk. As a result, if we have difficulty selecting a pure play engaged in line of business that is as similar as possible to the firm's division (*e.g.*, tourism promotion), the resulting beta may not be a reasonable proxy for the division. In addition, the third restriction stems from measuring the full responsibility costs including capital costs. Tracing costs directly to cost objects eliminates the need to allocate or assign costs. Under KTO's responsibility accounting system, costs that cannot be charged directly are be assigned through allocation bases. For this approach to be valid, the allocation bases should be highly correlated with cost drivers and capital drivers. In practice, every allocation base

used in the KTO does not assign costs and capital to responsibility centers on a cause-and-effect basis. When costs including capital charges are improperly assigned among responsibility centers in the KTO, cost distortion can occur. Lastly, the fourth limitation comes from the characteristic inherent in financial measures. As Kaplan and Atkinson (1998) point out, EVA also is one of the traditional methods to measure and monitor the performance of decentralized units solely by financial measures. Increasingly, many people are now questioning the appropriateness of assessing performance using a highly aggregate number such as net income and EVA.

### **Suggestions for Future Research**

This research does not provide any guideline for establishing correct transfer pricing system capturing intercompany transactions. As discussed earlier, it can become very time-consuming and costly to develop a menu of transfer prices that incorporates most realities without relying on privately-held information held by one responsibility center. However, in order to provide incentives for the responsibility center managers to take into account the consequences of their actions on the other responsibility centers' performance, In the future, additional research into designing and implementing an appropriate transfer price system would be needed

An increased and coordinated approach to selecting appropriate allocation bases

for costs and capital not to result in cost distortion will represent a significant opportunity for responsibility accounting and product costing. Therefore more detailed research into building up costs (including capital charges) allocation method on a cause-and-effect basis is strongly needed in the future.

In addition to these, to gain a better understanding of why managers are moving beyond single, financial performance measures for decentralized units, a broad set of financial and nonfinancial measures need to be reviewed to motivate and evaluate the performance of the responsibility center.

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## APPENDIX A

<Table 1> Measuring a Firm's NOPAT and CAPITAL

<b>Computing NOPAT</b>	
Financing Perspective	Operating Perspective
<p>Income available for common Stockholders</p> <p>+ Interest expense after taxes</p> <p>+ Implied interest expense on non-capitalized leases after taxes</p> <p>- Interest and other passive investment income after taxes</p> <p>+ Preferred dividend</p> <p>+ Minority interest provision</p> <p>+ Changes in equity equivalents</p> <p style="padding-left: 20px;">Increase in deferred tax reserve</p> <p style="padding-left: 20px;">Increase in LIFO reserve</p> <p style="padding-left: 20px;">Goodwill amortization</p> <p style="padding-left: 20px;">Increase in bad debt reserve</p> <p style="padding-left: 20px;">Increase in (net) cumulative expensed intangibles, e.g., R&amp;D and product development</p> <p style="padding-left: 20px;">Unusual loss (gain) after taxes</p> <p style="padding-left: 20px;">Increase other reserves, such as for inventory obsolescence, warranties, deferred income</p> <p>= NOPAT</p>	<p>Net operating profits before taxes (NOPBT), excluding unusual losses or gains</p> <p>+ Implied interest on noncapitalized leases</p> <p>- Cash taxes</p> <p style="padding-left: 20px;">Provision for income taxes</p> <p style="padding-left: 20px;">- Increase in deferred tax reserve</p> <p style="padding-left: 20px;">+ Marginal taxes saved (paid) on unusual losses (gains)</p> <p style="padding-left: 20px;">+ Marginal taxes saved on interest expense on debt and implied interest on noncapitalized leases</p> <p style="padding-left: 20px;">- Marginal taxes paid on interest and other passive investment income</p> <p>+ Changes in equity equivalents</p> <p style="padding-left: 20px;">Increase in LIFO reserve</p> <p style="padding-left: 20px;">Increase in bad debt reserve</p> <p style="padding-left: 20px;">Goodwill amortization</p> <p style="padding-left: 20px;">Increase in (net) cumulative expensed intangibles, e.g., R&amp;D and product development</p> <p style="padding-left: 20px;">Increase other reserves, such as for inventory obsolescence, warranties, deferred income</p> <p>= NOPAT</p>

<Table 1> (continued)

<b>Computing CAPITAL</b>	
Financing Perspective	Operating Perspective
<p>Common equity</p> <p>+ Interest-bearing debt</p> <p>+ Present value of noncapitalized leases</p> <p>+ Capitalized leases</p> <p>- Marketable securities and construction in progress</p> <p>+ Preferred stock</p> <p>+ Minority interest</p> <p>+ Equity equivalents</p> <p style="padding-left: 20px;">Deferred tax reserve</p> <p style="padding-left: 20px;">LIFO reserve</p> <p style="padding-left: 20px;">Bad debt reserve</p> <p style="padding-left: 20px;">Cumulative goodwill amortization</p> <p style="padding-left: 20px;">Unrecorded goodwill</p> <p style="padding-left: 20px;">Increase in (net) cumulative (Net) cumulative expensed intangibles, e.g., R&amp;D and product development</p> <p style="padding-left: 20px;">Cumulative unusual loss (gain) after taxes</p> <p style="padding-left: 20px;">Other reserves, such as for inventory obsolescence, warranties, deferred incom</p> <p>= CAPITAL</p>	<p>Total assets</p> <p>- Marketable securities and construction in progress</p> <p>+ Non-interest-bearing current liabilities</p> <p>+ Present value of noncapitalized leases</p> <p>+ Equity equivalents</p> <p style="padding-left: 20px;">LIFO reserve</p> <p style="padding-left: 20px;">Bad debt reserve</p> <p style="padding-left: 20px;">Cumulative goodwill amortization</p> <p style="padding-left: 20px;">Unrecorded goodwill</p> <p style="padding-left: 20px;">Increase in (net) cumulative (Net) cumulative expensed intangibles, e.g., R&amp;D and product development</p> <p style="padding-left: 20px;">Cumulative unusual loss (gain) after taxes</p> <p style="padding-left: 20px;">Other asset-contra reserves, such as for inventory obsolescence, warranties</p> <p>= CAPITAL</p>

## APPENDIX B

<Table 1> Cost Allocation Bases

<b>Common Costs</b>	<b>Basis for Allocation</b>	<b>Related Team</b>
Medical checkup	Percentage of salaries	Human Resources
Athletic meeting	Number of employees	Human Resources
Social insurance expenses	Percentage of salaries	Human Resources
Telephone charges	Number of employees	General Affairs
Electric charges	Square footage occupied	General Affairs
Water rates	Number of employees	General Affairs
Natural gas charges	Square footage occupied	General Affairs
Office and IT supplies	Number of employees	General Affairs
Uniform	Number of salespersons	Planning & Promotion
Information systems maintenance & repair	Number of employees	Information Systems Operation
Training	Number of employees (excluding temp. employees)	Human Resources

<b>Corporate Headquartes</b>	<b>Basis for Allocation</b>	<b>Cost Object</b>
CEO	Number of employees	Each team in six divisions
Board of Directors	Number of employees	
Office of Audit	Number of employees	
Secretariat	Number of employees	

<Table 1> (continued)

<b>Service Departments/Teams</b>	<b>Basis for Allocation</b>	<b>Cost Object</b>
Planning and Coordination Dept.	Number of employees	Operating team in five divisions excluding division for management
Innovation Management Team	Number of employees	
General Affairs Team	Number of employees	
Human Resources Team	Number of employees	
Finance & Accounting Team	Number of employees	
Legal Affairs Team	Number of employees	
Emergency Planning Dept.	Number of employees	
Customer Satisfaction Center	Number of employees	
Overseas Marketing Support Dept.	Number of employees	Operating team in a specific business unit involved
Tourism Complex Develop. Dept.	Number of employees	
Duty-free Business Dept.	Revenues	
Corp. Business Support Team	Revenues	
Planning and Promotion Team	Revenues	
Purchasing Team	Revenues	

## APPENDIX C

<Table 1> Calculation of the Weighted Average Cost of Capital

### 1. Target Capital Structure

Source of Capital	KTO	Duty-Free Shops	Resort Development	Golf Club
		<b>AK</b>	<b>HANHWA LAND</b>	<b>ORA</b>
Debt		27,032,231,024	143,670,519,655	6,221,350,000
Short-term debt		27,032,231,024	86,340,000,000	588,630,000
Long-term debt		-	57,330,519,655	5,632,720,000
Equity		31,378,096,210	363,218,031,728	117,396,310,895
Capital		58,410,327,234	506,888,551,383	123,617,660,895
Debt to Equity	1.0	0.9	0.4	0.1
Debt to Capital	0.5	0.5	0.3	0.1
		<b>DFS SEOUL</b>	<b>DAEMYUNG</b>	<b>JEJU</b>
Debt		3,000,000,000	53,722,137,899	32,740,487,137
Short-term debt		3,000,000,000	13,055,387,899	32,740,487,137
Long-term debt		-	40,666,750,000	-
Equity		12,233,040,424	95,621,914,561	2,574,005,121
Capital		15,233,040,424	149,344,052,460	35,314,492,258
Debt to Equity		0.2	0.6	12.7
Debt to Capital		0.2	0.4	0.9
		<b>Mean</b>	<b>Mean</b>	<b>Mean</b>
<b>Debt to Equity</b>		<b>0.7</b>	<b>0.4</b>	<b>0.3</b>
Debt to Capital		0.4	0.3	0.2

### 2. Systematic Risk (Beta)

	Tourism Promotion	Duty-Free Shops	Resort Development	Golf Club
Levered beta	0.93	1.02	1.18	1.1
Corp. marginal tax rate	0.26	0.23	0.27	0.3
Debt to equity	1.27	1.39	1.31	2.80
Industry beta	0.85	0.9	0.91	0.95
Estimated unlevered beta	0.48	0.49	0.60	0.37
Estimated unlevered beta*	0.44	0.44	0.47	0.32
Corp. marginal tax rate	0.28	0.28	0.28	0.28
Target debt to equity	1.00	0.7	0.4	0.3
Relevered beta	0.83	0.74	0.79	0.45
Relevered beta*	0.76	0.65	0.61	0.39

source: [www.kisinfo.com](http://www.kisinfo.com)

<Table 1> (continued)

3. Market Risk Premium

\* Risk-free rate

	2005 yr	2004 yr	2003 yr	2002 yr	2001 yr	2000 yr
10-year Treasury Bond (State Treasury of Korea)	4.95%	4.73%	5.05%	6.59%	6.86%	7.76%

source: Money & Banking Statistics (2006. 1), The Bank of Korea

\* Expected rate of return

Composite Stock Price

Index Returns

**Arithmetic  
Avg. Return**

1980-2005	<b>14.18%</b>
1994-2005	<b>6.13%</b>
1999-2005	<b>7.02%</b>

	Composite Stock Price Index (Average)	Composite Stock Price Index Returns
1980 yr	108.91	-
1981 yr	126.63	16.27%
1982 yr	122.17	-3.52%
1983 yr	121.73	-0.36%
1984 yr	131.81	8.28%
1985 yr	138.71	5.23%
1986 yr	227.80	64.23%
1987 yr	416.70	82.92%
1988 yr	692.44	66.17%
1989 yr	918.73	32.68%
1990 yr	746.00	-18.80%
1991 yr	657.98	-11.80%
1992 yr	585.73	-10.98%
1993 yr	728.37	24.35%
1994 yr	965.28	32.53%

<Table 1> (continued)

	Composite Stock Price Index (Average)	Composite Stock Price Index Returns
1995 yr	934.92	-3.15%
1996 yr	833.4	-10.86%
1997 yr	654.48	-21.47%
1998 yr	406.07	-37.96%
1999 yr	806.83	98.69%
2000 yr	734.22	-9.00%
2001 yr	572.83	-21.98%
2002 yr	756.98	32.15%
2003 yr	679.83	-10.19%
2004 yr	832.92	22.52%
2005 yr	1071.36	28.63%

*source: KOREA EXCHANGE*

**\* Risk premium**

Spread between Composite Returns  
and L/T Govt. Bond Returns

1980-2005	<b>9.23%</b>
1994-2005	<b>1.18%</b>
1999-2005	<b>2.07%</b>

**4. Cost of Equity**

	Tourism Promotion	Duty-Free Shops	Resort Development	Golf Club
<b>Cost of Equity</b>	12.59%	11.78%	12.26%	9.08%
<b>Cost of Equity*</b>	11.94%	10.98%	10.59%	8.52%

**5. Cost of Debt**

<b>After-tax cost of debt</b>	Marginal tax rate*
<b>4.04%</b>	27.5%

*\*source: Company report*



<Table 1> (continued)

**6. Weighted Average Cost of Capital (WACC)**

	Tourism Promotion	Duty-Free Shops	Resort Development	Golf Club
<b>WACC</b>	8.32%	8.62%	9.79%	7.84%
<b>WACC*</b>	7.99%	8.15%	8.62%	7.42%