

## Costing Management on Activity Based Costing (ABC) and Economic Value Added (EVA) in Manufacturing Companies in Iran

<sup>1</sup>Safdari Mehdi, <sup>2</sup>Motiee Reza

<sup>1</sup>Ph.D in Economics, Associate Professor, University of Qom, Iran

<sup>2</sup>Department of Economics, Payame Noor University, Iran

Safdari Mehdi and Motiee Reza: Costing Management Based on Activity Based on Costing (ABC) and Economic Value Added (EVA) in Manufacturing Companies in Iran

### ABSTRACT

Activity Based Costing ABC is a new method of costing methods so on the one hand, providing accurate cost information and identify the value of the work activity has no value in the process of effective cost management. In this paper, the theory can explain the ABC including the specification, processes, models and other related principles. This article estimates the major determinants of Cost training of Activity Based on Costing (ABC). This study uses annual data of 2009 year and analyze them using Activity Based Costing (ABC) model by Garison (2006). This co-integration technique accommodates potential structural breaks that could undermine the existence of a long-run relationship and its main determinants.

**Ke ywords:** Activity Based Costing (ABC), Economic Value Added (EVA), Allocation of indirect overhead

### Introduction

Due to the drastically changed that was created in the field technology and presentation methods and new perspectives of early eighties, organizations concluded that for continue their life and provide superior service to customers should improve their practices and processes and for survive in the market also continuous increase quality, costs Get down acceptable manner, of course the rapid growth of technology in different dimensions this may partly provide for them, but in addition, these organizations should be appeals to the accounting methods and their management. Because reliance on methods and traditional techniques others could not to fulfill their current needs, and these organizations were inevitably up to review at accounting systems and their cost. The urgent need on the one hand and develop new perspectives in the field of management accounting on the other hand, make the transformation to provide new methods calculation price finished. Thinking creation relationship between costs and activities in the late 1960s and early 1970s were presented in the works of some authors. But given the scientific and academic centers about its importance and how organizations were raised more in the 1980s. The note mainly was due to appearance Tuesday's main structures: The first structure the new changes had occurred in the world for introduction modern technology, intelligent information systems and new operational mechanisms. The second structure, was philosophy

changes, managers of large organizations in the 1980s, in addition to profitability, other factors had stressed among global competition, increase customer satisfaction and high quality services.

The third factor was effort academic circles and authors of management accounting, which is widely and seriously, did to describe the new space created, the role of various technologies and new perspectives of managers. The Cooper & Kaplan than others had a significant impact in reflection failure management accounting system. The authors believed that using the traditional system not only is not meeting the needs of managers, but use of their information is cause misdirection and the correct decision. The failure of and increasing global competition, that great importance has to the fast access and timely, led to appearance new way for costing called "Costing Based activities". Words activity based costing, that later evolved to system ABC, the first time was used by Cooper and Kaplan [1], for allocation cost of production activities. The two authors along with Johnson [2], had a significant impact in reflection financial accounting system failure provide accurate information about costs and price finished. Technology development and industry in different dimensions and typically it the complexity of a company's activities calls for a proper system of costing be designed that be ability to identify activities and measurement impact of the activities on costs the company. Based on method traditional costing overhead costs are multiplexed only based on volume production or the machines

### Corresponding Author

Safdari Mehdi, Ph.D in Economics, Associate Professor, University of Qom, Iran.

work and it cannot be an appropriate basis for multiplexing overhead costs. But the method of activity based costing beginning with the major activities identification overhead costs proportion to the resources that in each activity consumed after allocation of overhead construction activities, cost drivers (allocation bases) associated with each activity been identified and cost of each activity dispensation covered by the stimulus spending in each of the products, be allocated to these products.

Activity based costing and economic value are counted modern tools are used in order to management and performance measurement and many companies at across Europe use it. Do are incompatible activity based costing frameworks and economic value added together or can apply to them at an organization together? Activity based costing provides the information management need. It direction decided that the final decisions made leads to value creation. Economic value added provides decision framework, performance criteria and stimulants that can raise management to create value. To understand more concepts of activity based costing and economic value added can trade likened football. Coach a football team several factors need to for success. For example to acquire the station, to obtain a corner, providing a strong defense and having a good goalkeeper. But at the end of the race the only thing that matters this is we've won or lost the competition not during the game we have gained a corner or a blow to the station. Business also manager many criteria Is necessary for success. Activity based costing measures that are helping, manager in decision making and achieve success but is the use of these criteria merely because the success? This subject that management to achieve success needs to these criteria is granted but determinant is win or lose the company's economic value; with using the economic value managers the use of information are excited in order to value creation and owners asked.

Organizations need to compatibility today's dynamic and complex business environment for survival that is the result of development of competitive markets on the one hand and the investor community administrators determine and explain the value of accurate and transparent criteria, caused traditional organizational reward systems and measuring performance that there had in the decade before revised to and again test them, do have been the correct and the reinsurance decision or not? Current measurement techniques that are more based on accounting frameworks have built the economic theory. But what companies really need to use a framework? When running a new framework this means that you should ignore the company of other frameworks? This article will be discussed Tuesday activity based costing framework and economic value industries that use them are rising widely. Although in this paper in summary is described the

three framework but we are tackling with answer this question that How to apply this framework will simultaneously or they incommensurable together? This article argues that indeed the framework are complementary to each other and when be used together can be effective much. Do there are an appropriate benchmark assessment of company performance That investors help in identifying suitable investment opportunities and managers interested in making to making final decisions made that to create value for the business unit? Economic value added is a measure is used for overall supervision, in value creation, the company. No economic value strategy way that to measure results. As regards measure of economic value refers to the ability of enterprise create efficiencies in excess the expected return to investors based on certain risk can to measure effectiveness of company operations. The result is a positive measure such judgments can be the management of ongoing operations, firm value increases if the negative is performance management is reduces the value of the business unit. The criteria that are correlated the purpose of the organization in increase shareholder wealth provided by Stern Stewart and the operating profits minus the cost of capital that has been used to for it and in fact be considered as one of the profitability indicators.

Fortune magazine in October 1996 economic value Introduced as the most attractive financial ideas and noted that American institute predicted an economic value added will alternative earnings profit per share. Among company Coca-Cola using this criterion could increase return on his investment About 200 percent Years 1993-1987. Manager Coca-Cola is believed the economic value of his are forced to find Subtle ways to continue with less capital; in other words Ways to increase motivation provides Efficiency of capital and finally causes the Performance is superior company. Stewart recommends that of economic value be used as basis for capital allocation, performance evaluation, the reward and Communicate with experts in capital markets. The more effective decision increases communications and rewards are higher with the increase in economic value added.

### Materials and Methods

Also with diversified production and an organization's customers, allocations of overhead costs are somewhat misleading and distort the cost of production or special services. As we know, activity based costing system and traditional costing systems with different in terms of how to allocate overhead costs. This means that in traditional costing systems, overhead costs are multiplexed only based a stimulus cost which can be production volume, direct labor hours, machine hours or direct average wages and this cannot be created based correct for Share of overhead costs, because for example, product that it

is short-cycle production operations may be amount of disproportionate take advantage of the cost of storage or weekly. So industrial accounting the traditional gives the wrong message to administrators. But activity-based costing system, share of overhead costs is consists of two stages that in the first stage are identified the major activities and overhead costs proportion to the resources that is used in each activity allocation is to those activities. Overhead allocation to each activity is called accumulated cost of the activity 4. After allocation of overhead construction activities in the first stage are identified stimulus spending five appropriate and related to the each of the activities. Then in the second stage accumulated cost each activity proportion to the amount of stimulus spending in each product line is allocated to these lines. The costing system can provide better information for strategic management decisions and help to diagnosis costs without adding value. So activity based costing, improves production quality and costing them.

#### *Method of costing based on activity:*

One of the management tools the ability to create in determining the actual costs production techniques in connection with a product or service is "Activity-Based Costing" that occurred by Cooper

$$TC_i = B_i PB + OE_i + \sum_{i=1}^m E_{ij} PE_{ij} + \sum_{j=1}^m L_{ij} W_{ij} + \sum_{i=1}^m C_{ij} PC_{ij} + U_i PU \quad (1)$$

Where,

$TC_i$  = The total cost of the activity center

$B_i$  = Total space occupied by the center of activity  $i$

$PB$  = Cost of depreciation of building space

$OE_i$  = Share of depreciation expense Top-secret equipment, allocated to the activity center  $i$

$E_{ij}$  = Number of equipment units in group  $j$  at center of activity  $i$

$PE_{ij}$  = Cost of depreciation equipment unit  $j$  at  $i$  activity center  $i$

$L_{ij}$  = Number of personnel at  $j$  activity center  $i$

$W_{ij}$  = Wages and benefits personnel in Group  $j$  in Activity Center  $i$

$C_{ij}$  = Number of consumer units at  $j$  Activity Center  $i$

$PC_{ij}$  = Price per unit of material  $i$

$U_i$  = Number of units, utilities (water, electricity, gas, telephone and etc) consumption by  $i$  activity Center

$PU$  = Unit price of municipal services and facilities

#### *Traditional costing systems and its failures:*

In the late 80s, a number of experts in accounting and management, managers of organizations large errors were due to the use and application of traditional accounting systems. Problem and the main criticism was that experts costs that are offered by traditional costing systems, accurate information about the cost of services and products to provide decision makers does not provide

and Kaplan [3] and a new approach accounting and budgeting created entitled Activity Based Budgeting. Also activity based costing call briefly costing activities or activities for ABC. [4 and 5] owners of these techniques work and process leads identify and track direct and indirect costs and their precise allocation to activities that involved the production process a product or service [4]. General principles calculation and sharing costs algebraic approach the first action in a method of costing is identify the organizational structure of the unit and the activity centers [6]. The usual division is defined three centers of activity [7]. Top-secret operations center namely units are as administrative units and support the cost of the activity centers is overhead and other units. The units are not served in direct contact with the receiver. Activity centers are intermediate units that may be with client service or as an intermediate service delivery to the units are served in direct contact with the receiver. The final activities centers are defined as to the units directly are dealing with client service. This center of activity that offers the final service, the two series of high activity center and the basics receives costs as overhead [7]. How to calculate costs are taken in centers activity is obtained of the relationship [7].

false information to mislead or cause to be managers in making decisions. To examine how traditional costing systems Foster (1991) research among financial executives of several large organizations was perform in America. The result showed that the traditional system capable of providing adequate information for decision making is not managers. The results of this study, they were 45% as the information provided by the system, the information is accurate and true and in making appropriate decisions and did not know. 34% was noted that traditional systems due to performance measurement is causing dissatisfaction among them, 27% of managers believed that information provided is not adequate for the analysis of competition and 11% also believed that these systems do not comply with organizational strategy [8].

#### *Economic Value Added Method:*

Economic Value Added, criteria that is applied direction general supervision in the field value creation, at Company. Economic value added not a strategy, but is a way that can be measured results. Economic Value Added is difference between net operating incomes after taxes (NOPAT) costs capital. Economic Value Added is evolved version of RI that be deducted of it all capital costs among opportunity cost. So EVA is different from the traditional tools

measurement of accounting earnings such as EBIT, EPS and etc because EVA considers the total cost of funding.

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

$$EVA = \text{NOPAT} - (c \times \text{Capital})$$

R = rate of return on investment

C = Capital cost rate = Investment Capital

NOPAT = net operating profit after tax

EVA = Value Added Economic

Based on economic value creating value in a company depends on to two factors:

\* What returns gets company of capital employed?

\* What is the cost deal for the capital employed?

So what matters in this benchmark this is company can be achieved efficiency more finance its capital expenditures. Economic value added stock price makes earnings per share more than 11 and roe, 12. Recently companies are going the way of revenue management which leads the value management. Economic value added the model can be applied helps managers in this process. One of the main benefits of economic value is presented in the same language. When economic value is placed on the focus of performance management process will be efficient because economic value added gives us

accountability and can only be a measure they are summarized success.

## Results and Discussion

Administrative procedures method activity based costing in manufacturing companies is as follows:

*The first stage:* Committee system design: The costing system need to information companies from various sectors of financial, process engineering, and so you can use the different expertise in this committee .

*Second stage:* Determine the company's activities: activities in manufacturing companies are classified as following three groups:

1. Activities that are in direct contact with product and services .
2. Activities that directly are not the track products and services such as factory overhead activities such as storage, logistics, and supervision, utility.

*Third stage:* Allocation cost of activities the products based on appropriate cost drivers after clarify the activities, the cost of each activity based on fundamental principles of cost allocation or stimulus we allocate to products.

**Table 1:** An example of the allocation basis.

Basis Allocation	Activity
Number of purchase order	Procurement - Purchasing
Supervision time to hours	Supervision
hours work machinery	Electricity costs
Average stored products	Warehousing
Time used for sales per unit	Cost of sales

The steps listed above expressed with a simple numerical example:

**Table 2:** Cost finished for  $\alpha$ ,  $\beta$  and  $\gamma$  based on to traditional accounting cost.

Product	$\alpha$	$\beta$	$\gamma$	Sum
Number of Sales	2000	1000	500	3500
Price selling per unit	15	30	20	65
Amount of sales	30000	30000	10000	70000
<b>Cost</b>				
Direct materials	8000	6400	2400	16800
Direct wage	2000	1300	1800	5100
<b>Actual overhead</b>				
Supervision	Supplies	Electricity	Warehousing	Sum
3000	9000	3000	3000	18000

Overload absorbed based on direct wages is absorbent products. Cost of sales is 2% of total sales  $1400 = 2\% \times 70000$

**Table 3:** Results of Cost finished based on to traditional cost.

Product	$\alpha$	$\beta$	$\gamma$	Sum
Cost of materials one unit	$8000/2000=4$	$6400/1000=6.4$	$2400/500=4.8$	15.2
Costs wage one unit	$1=2000/2000$	$1300/1000=1.3$	$1800/500=3.6$	5.9
Cost overload one unit: Total overhead / total wages = Rate of overhead absorption, $18000/5100=3.53$				
Total production Overhead cost per unit	$2000 \times 3.53/2000 = 2000$	$1300 \times 3.53/1000 = 4.58$	$1800 \times 3.53/500 = 12.7$	20.81

*Calculations Activity Based Costing (ABC):*

Material costs and direct wage similar to the above method is transmitted as direct but overhead costs are multiplexed as follows:

*Supervision Activity costs:***Table 4:** The results of Supervision Activity costs.

Product	$\alpha$	$\beta$	$\gamma$	Sum
Number of hours of supervision	15	40	45	100
Cost one hour supervision $30=100/3000$	30	30	30	900
Total cost activity supervision	450	1200	1350	3000
Divided total production	500	1000	2000	3500

*Cost activity - procurement:***Table 5:** The results of Cost activity - procurement

Product	$\alpha$	$\beta$	$\gamma$	Sum
Number of order purchase	100	120	20	240
Cost every time order	37.5	37.5	37.5	$37.5=240/9000$
Total cost activity purchase	3750	4500	750	9000
Division on total production	2000	1000	500	
Cost supplies one unit product	1.87	4.5	1.5	

*Activity costs – electricity:***Table 6:** The results of Activity costs – electricity

Product	$\alpha$	$\beta$	$\gamma$	Sum
hours function machinery	90	100	10	200
each hours function machinery	15	15	15	$15=200/3000$
Sum electrical activity	1350	1500	150	3000
Divided total production	2000	1000	500	
Cost electricity one unit product	0.67	1.5	0.3	

**Table 7:** The results of Cost Activity - storage

Product	$\alpha$	$\beta$	$\gamma$	Sum
Average stored goods	50	45	5	100
Cost maintenance one unit	30	30	30	$30=100/3000$
Sum activity warehousing	1500	1350	150	3000
Division on total production	2000	1000	500	-
Cost maintenance one unit product	0.75	1.35	0.3	-

**Table 8:** The results of Cost Activity - Selling

Product	$\alpha$	$\beta$	$\gamma$	Sum
Time spent for selling (hours)	25	10	5	40
Cost one hour time spent	$75=40/3000$	75	75	75
Sum selling activity	1875	750	375	3000
Division on total production	2000	1000	500	
Cost selling one unit product	0.94	0.75	0.75	

**Table 9:** Comparison cost finished one unit product calculated to methods traditional and ABC

Description	Traditional Method			ABC Method		
	$\alpha$	$\beta$	$\gamma$	$\alpha$	$\beta$	$\gamma$
Product						
Direct Materials	4	6.4	4.8	4	6.4	4.8
Direct Wage	1	1.3	3.6	1	1.3	3.6
<b>Overhead</b>						
Absorbed	3.53	4.58	12.7			
Supervision	-	-	-	0.67	1.2	0.9
Purchase supplies	-	-	-	1.87	4.5	1.5
Electricity	-	-	-	0.67	1.5	0.3
Storage	-	-	-	0.57	1.35	0.3
Total Marginal Cost	8.53	12.28	21.1	8.96	16.25	11.4
Selling	15	30	20	15	30	20
Profit (loss) margin	6.47	17.72	(1.1)	6.04	13.75	8.6
Cost of sales	(0.3)	(0.6)	(0.4)	(0.94)	(0.75)	(0.75)
Profit (loss) special	6.17	17.12	(1.5)	5.1	13	7.85

Due to the above example and comparison of two methods we see that product gamma in the traditional method due to inadequate allocation overhead costs is with losses and the same product with costing methods activity based is with profit rate of 8.6 riyals and also profits the traditional method equal to 21.79 in the ABC method is 25.95

times. Finally the conclusion application activity based costing method in the manufacturing and service companies that are have high overhead costs and complex activities leads to get the following benefits:

1. Improving the system, costing the company
2. The price of finished products a reasonable and

accurate

3. Evaluate the performance of managers
4. Cost reduction activities that have high costs
5. Removal products no value

Of course in implementing this method has a limitation as follows:

1. The culture of the ABC method
2. Culture Managers
3. To ABC
4. How control the company
5. Executive costs high

EVA, is defined based how its relationship with market Value Added (MVA). In this way, MVA (or NPV) is equivalent to present value the EVA future expected company. On the other hand, MVA consists of difference between firm value and economic book value capital been used in company.

Book value shareholders Equities (Capital used)  
- Market Value Equity = MVA present value of future EVA = MVA

$$MVA = \frac{EVA_1}{(1+C)^1} + \frac{EVA_2}{(1+C)^2} + \dots + \frac{EVA_n}{(1+C)^n}$$

Where, Characteristics market value as follows:

1. MVA represents the subject is that how a company as successfully its capital used and has predicted opportunities benefit of orate.
2. The basic purpose of each unit profit should be maximizing MVA.
3. EVA is the cause of MVA, because EVA is present value of future that is based assessment and Valuation Company in the market.

The relationship between EVA & MVA is as follows:

1. EVA and MVA performance criteria used to measure external and internal criteria.
2. MVA assessed the effects of management measures since the company established and EVA assesses specific year.
3. MVA represents the investor community is evaluated of activities and is not affected by the one-year performance EVA is the single year.
4. EVA is the creation of the MVA.
5. If you are EVA positive future, the company's shares will be sold in the market to spend and vice versa.

*Conclusion:*

Activity based costing; balanced scorecard and economic value added appropriate tools are can help company in achieving success in the business environment, competitive today. Economic Value Added shows the relationship between the decisions and focuses reward system based on performance criteria in order to create value. The EVA is different

from the traditional tools measurement accounting earnings Such as EBIT, EPS and etc EVA because the Intends the total cost of funding. Considering that the measure EVA refers to the ability enterprise creates efficiencies in excess of expected return to investors the specific risk can to measure rate effectiveness operations of the company. EVA is a measure of multi-purpose one of performance evaluation, other determination shareholder value, budgeting especially capital budgeting and help to determination remuneration of directors that it had merit and considered a motivational factor. ABC, BSC and EVA are appropriate tools can help companies in access to success in business environment, competitive nowadays. All three frameworks begin with new measurement techniques. The high volume of information does not necessarily to effective decision. Indeed add a new benchmark to existing standards will be more complex issues. One of the fundamental factors is having a balance between simplicity and accuracy. As they may a model for understanding complex for management is very difficult also a very simple model leads to incorrect decisions. Costing based activity, balanced scorecard and economic value added are appropriate tools can help companies the breakthrough in the business environment, competitive and modern. Activity based costing can make managers help understanding effectiveness of their decisions. Balanced scorecard the functional perspective is extensive in order to inclusion of financial indicators and nonfinancial. Economic Value Added shows the relationship between the decisions and focuses on performance criteria reward system in order to value creation. When managers, decision frameworks, have performance criteria and reward that they unite of having equity position, will have best performance. Having the right strategy it is important but also have managers who are enforcement strategy and its results it is important the same size.

## References

1. Kaplan, R.S., 1984. Yesterday's accounting undermines Production, Harvard Business Review, July-August: 95-101.
2. Johnson, K., A. Foley, G. Suengas, L. Raye, 1988. Phenomenal characteristics of memories for perceived and imagined autobiographical events, Journal of experimental psychology, 117(4): 371-376.
3. Cooper, R., R. Kaplan, 1991. The Design of Cost Management System, Prentice-Hall International, London.
4. Sarraf, A.R., 2002. Calculation price finished activity based costing, Tehran.
5. Cooper, R., 1988. "The Rise of Activity-Based Costing-Part One: What is an Activity-Based Cost System?" Journal of Cost Management.

6. Namazi, M., Review System Activity Based Costing in accounting management and the behavioral observations, review of accounting and audit, seventh year, number 26 and 27.
7. Zaman, S., 1993. Cost Analysis For Hospital Care The Case Of EMBARA Hospital, Cario, Egypt.
8. Adler, R., 1998. Engendering Judaism: An Inclusive Theology and Ethics, Jewish Publication Society, Philadelphia, PA.
9. Garrison, M., 2006. Activity-Based Costing: A Tool to Aid Decision Making, Managerial Accounting, Eleventh Edition.
10. Garrison, M., 2006. Activity-Based Costing: A Tool to Aid Decision Making, Managerial Accounting, Eleventh Edition.
11. Gharun, M., 2007. Application of Activity Based Costing for Estimation of Per student Cost in Iran, Research and Planning Institute for Higher Education, No 44.
12. Hassanabadi, M., A. Saraf, 2007. Comprehensive model of the operational budget, Publications and Research Center of Iran, first publication: Tehran.
13. Robinson, M, B. Jim, 2005. Does performance Budgeting Work? An analytical review of the empirical literature, International Monetary Fund Robinson Marc and Jim Brumby (2005), Does performance Budgeting Work? An analytical review of the empirical literature, International Monetary Fund.
14. Talae, Z., 2010. The establishment of the operational budget using Activity Based Costing in Research and Educational Planning Organization Ministry of Education.