Provide a cost management model: with an efficiency approach

Raheleh Shahsvarzehi
Ph.D. Student, Department of Accounting, UAE Branch, Islamic Azad University, Dubai, United Arab Emirates
taranom2313@yahoo.com

Fereydoun Rahnamay Rudposhti
Professor, Department of Accounting UAE Branch, Islamic Azad University, Dubai, United Arab Emirates
roodposhti.rahnama@gmail.com

Zahra Pour Zamani
Professor, Department of Accounting, Central Tehran Branch, Islamic Azad University, Tehran, Tehran
Zahra.poorzamani@yahoo.com

ABSTRACT

Given that cost management and expanding its various dimensions have an important effect on the efficiency and operational effectiveness of companies and institutions, the main purpose of creating cost management is to reduce the cost of services (fixed and variable costs) to help To increase profitability. In this study, the positive relationship between organizational capital and the sticky behavior of sales, public and administrative costs has been investigated. The statistical population of the study includes companies listed on the Tehran Stock Exchange that 75 companies in the period 2007 to 2013 have been selected from the statistical population by a systematic elimination method. In terms of purpose, the present study is a descriptive-correlational study in which, with a deductive-inductive approach, the primary data is collected through experiment and observation and analyzed using statistical methods. Finally, these lead to the production of theory. The result of the research is to provide a cost management model with an efficiency approach that can help managers in effective designing and implementing goods and services cost management system. As a result, managers and owners of companies, considering the above reason, learn the strategies related to adjusting this cost model in order to achieving methods to improve cost efficiency through handeling performance of firm.

Keywords:

cost management, cost efficiency, efficiency improvement.

1. Introduction

In today's world, the Survival of many industries depends on their ability to increase the accuracy of the cost management system, which reduces costs, or more generally, cost items as important components of the triangle of survival throughout the Production process, and value chain are centralized. Changes in the business environment such as globalization (formation of various trade unions and economic alliances including NAFTA, WTO, and EU, production technology, use of information technology, Internet and e-commerce), increasing competition, customer focus and social, political, and cultural Environments make management practices in new and changing environments different from static ones. In this regard, the emergence of new ideas such as strategic management, which requires the design and application of production management, marketing, etc., is completely different from the past and increases the strategic focus on cost management (rahnamaye roudposhti, 2009). A competitive business environment requires efficient financial management, which emphasizes the importance of adopting cost management practices to increase cost control and reduce costs (Erasmus, 2021). Cost management has a much broader focus than traditional costing systems. This issue is highly dependent on cost management and reducing unnecessary costs and increasing the value of goods along the production value chain (Hansen, Maun and Heitger, 2021).

Therefore, cost management and consequently improving cost efficiency, by reducing the cost of sales or reducing the share of sales, distribution and administrative costs, can have a positive effect on the profit margin of the firm and strengthen the company's profitability. Another positive effect of cost management is the improvement of the cost identification process and the establishment of cost systems. Existence of cost systems can help increase the level of efficiency of cost management in companies. Changes in cost systems in order to improve cost management help managers make important and fundamental decisions and enable them to more efficiently allocate limited resources to unlimited options. Changes in the cost accounting system may cause a change in the price of the product, given that the use of advanced cost accounting systems will improve the pricing system of firms; reducing cost accounting system errors can guide managers in formulating the right sales, sales amounts, and advertising costs strategies. Therefore, improving cost accounting systems and product pricing as part of improving cost management efficiency can have a significant impact on firm planning for how it is produced, distributed, sold and advertised, and ultimately Strengthen the performance and financial and profitability of the enterprise. In this study a cost management model with an efficiency approach has been provided. This issue will be explained below.Alabi, Adbisi, and Fatimin (2020) recommend that the board should ensure that good business management is their focus by exercising effective control over administrative costs to improve the performance of the organization (Alabi et al., 2020). Increasing production costs, limited resources in many industries, changing the combination of costs with a general tendency towards automation and the use of computers in the production process, which leads to a sharp reduction in wage costs and its replacement by technology and machinery costs, makes the issue more important. On the other hand, new issues in the field of cost accounting, costs control and management, increasing demand for quality, competition, etc., considering the limitations of the traditional costing system that can not meet the needs of managers, the importance of new systems and cost management systems is very clear. Cost management is known as an important part of accounting management that seeks to reduce its volume and extent by identifying behavioral patterns of cost. Given that the task of management accounting is to prepare and provide relevant and useful information to assist management in planning activities, exercising managerial control and making rational decisions in order to achieve the goals of the organization is formed and exploited, cost management is considered one of the most important management accounting tools. Management accounting information systems were also created with the aim of assisting managers in making decisions and have grown and expanded with the expansion and complexity of the production system and the provision of services. It is obvious that integrating the accounting information system with the goals and methods of cost management will lead to reduce costs and help increase profitability.

Many managerial decisions are influenced by the science of how to change costs as a function of activity level. In this regard, Garrison and Van (2007) believe

that trying to make decisions without full knowledge of the associated costs and how to change them according to the level of activity may lead to adverse consequences.

Since that the variable cost changes with a fixed ratio commensurate with changes in the level of production and its graph is a straight line, the variable costs by nature is called linear (Liner). In high-volume domains, the variable cost may change in different proportions with changes in production level, but not in a fixed ratio.

Neokichin, Englehard, Krauss et al., Et al. (2021) showed that highly efficient firms outperform inefficient firms in terms of accumulated returns (Neokichin et al., 2021).The rapid and amazing advancement of technology along with the increasing competition in the competitive markets in the world market, has made the managers of for-profit units inevitably produce high quality products, provide good customer service and at the same time at the lowest possible cost. In strategic cost analysis, the activities that produce valuable products or services of the for-profit unit are called the value chain. Then, in this analysis, the cost incentives that determine the cost of each activity are determined. Finally, in the strategic cost analysis, the possibilities of increasing the competitiveness of the for-profit unit are examined. These expectations create more requirements in terms of providing the information needed for management accounting. Many for-profit entities are gradually moving away from traditional cost accounting perspectives and tending to create a cost management system. The competitiveness of the for-profit unit can be increased by choosing a combination of pricing decisions, controlling of cost incentives, and reconsidering product mixes. Cost measurement analyzes the resources used to carry out the core activities of the organization and warns management to identify and eliminate items of cost that do not create added value. These items are related to activities that can be removed without compromising product quality, performance or expected value. By determining the efficiency and effectiveness of the main activities performed in the organization, can be identifeid and evaluated new activities that can improve the future performance of the organization (Darabi, 2008).

The importance of the study is the emphasis on creating a system that is used to determine the cost of producing goods and services. In this system, costs are formed based on related activities. An activity-based costing system helps managers understand the relationship between activities and cost. Using an activity-based costing system to improve an organization's operations is called activity-based management. Cost accounting focuses on historical perspectives and focuses on cost reporting, while the cost management system plays an important role in planning as well as cost management and reduction. This is done through cost management tools.

The necessity of the research is to explain the cost management model by establishing a modern and efficient system. Cost management and its behaviors are related to various factors inside and outside the organization that can explain how changes in cost management change with respect to changes in the volume of activities of the organization. In fact, accurate identification of cost can lead to cost savings and quality improvement and increase efficiency in the organization, and ultimately, by reducing the cost of goods sold, will increase the company's profit margin. Moreover, explaining the cost management model will be correct management of resources in the company through which the cost management system will perform better and identify the factors affecting the effectiveness of the organization. Factors that save costs and Strengthen improving cost quality. Therefore, identifying cost management models is an important part of managing effectiveness and improving efficiency in the organization, so the development and success of the cost management system extremely depends on it.

The main issue of the study is to explain and present the cost management model with an efficiency approach. Accordingly, the researcher seeks to provide a cost management model with an efficiency approach.

2. Literature Review

Management is the optimal and efficient use of organizational resources in order to create value for customers. The central point if this definition emphasizes that the profitability and growth of the firm is achieved through the creation of value for customers. The source of wealth creation of enterprises and organizations are customers and only satisfied and happy customers remain loyal and sustainably continue to create wealth in organizations. Customer satisfaction also depends on the extent to which we

offer valuable and qualify products and services at a reasonable price and at the right time compared to competitors.

"Cost management" is a concept that largely fulfills the above goal. Cost management is a philosophy of improvement because it seeks to find appropriate ways to make decisions that involve value creation for customers, while reducing costs. Cost management is based on the view that costs are not created by themselves but by all of Production or service costs is the result of management decisions that focus primarily on how to use the organization's limited resources. In summary, the different cost categories and some of their applications are described in Table (1):

Cost classification	Applications
Product cost, period cost	inventory valuation, preparation of financial statements and profit measurement and budget preparation
Conversion cost and initial price	Product pricing, inventory valuation, budgeting
Differential cost	Decisions in areas such as: expanding operations, continuing or stopping the production of some products, accepting or rejecting special orders, pricing internal transfers, building a part inside or buying it from outside, evaluating capital projects and implementing plans reduction in costs.
Direct cost and indirect costs	Compare the direct costs of a product with its revenue to determine the profitability of the product and implement cost reduction plans.
Expired and unexpired expenses	Measure profits and prepare financial statements at the end of each financial period.
Fixed and variable costs	Analysis of cost trends, product pricing, calculation of break-even point sales, long-term decisions, budgeting and decisions based on the relationship between cost-activity volume and profit, implementation of cost reduction programs.
opportunity cost	Various decisions such as accepting or rejecting a special order, building a part inside or buying it from outside, pricing internal transfers between different parts of a company and ...
lost Cost or lost	Such costs are considered irrelevant information in decisions, such as machine replacement decisions, and only their tax effect on various decisions, including machine replacement decisions, should be considered.

Many economic units are gradually moving away from the traditional cost accounting perspective and tending to create a "cost management system". The main purpose of creating cost management is to reduce the cost of services (fixed and variable costs) to help increase profitability. Important goals in for-profit institutions such as profitability, market share growth, financial self-sufficiency, minimizing cost, variety of products and services, increasing the quality of products and services, etc. that are repeatedly emphasized by managers and financial professionals Are somehow related to cost management.

One of the new tools to achieve of the above goals system is to calculate the cost of goods and services based on "activity-based costing", this system by reviewing the financial information (balance sheet and profit and loss) of the institution, identifying key activities, determining operating costs related to each activities, selecting cost factors and calculating operating costs related to each cost item, provides information to managers. As strategic issues become increasingly important to managers, cost management has also moved beyond a traditional role (product costing and operations control) to emphasis on strategic cost management. Therefore, strategic cost management is the preparation of cost management information in order to facilitate the performance of the first and main task of the manager, namely strategic cost management (Dianti et al., 2011). Cost management is based on the view that costs are not incurred by themselves but all the production costs or performing services costs and the result of management decisions are that focus primarily on how to use the organization's limited resources. The cost management approach plays an important role in handling managers' decisions towards creating value for all stakeholders (shareholders, customers, employees and the society) and tries to create a suitable and creative combination between the interests of different stakeholders. The philosophy and attitude of "cost management" consists of a set of tools and techniques that can comprehensively analyze and support management decisions in each case. A set of tools and techniques of "cost management" that helps advance goals and programs are called "cost management systems".

Many for-profit units are replacing their traditional costing systems with "cost management systems". In the cost management system, the cost of each activity

is measured and costs without added-value is specified, reduce and eliminate. Emphasis on cost management system causes to be produced and offered high quality and lowest cost products and services. In this case, the competitiveness of for-profit units will increase.

2.1. Performance and measurement criteria

Hauser and Bertel, who have examined the relationship between firm performance metrics, consider market value of firms, cash flows, and profitability as performance metrics, and believe that each firm measures cash flows and profitability as three performance metrics. They believe that each of these metrics represents a dimension of company performance. On the other hand, they believe that each of the criteria somehow reflects the company's wealth for shareholders.

They believe that in addition to the interdependence between these three criteria, there is also an interaction between them.
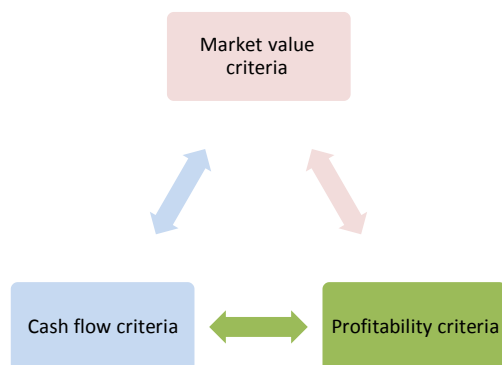

Figure 1.Performance measurement criteria

The two researchers believe that companies with higher profitability will have more cash flows and therefore can distribute more cash dividends as dividends among their investors, which will increase the company's stock price in the market. (Dependency relationship)

On the other hand, they say that companies with high profitability and cash flow may not pay cash dividends to their shareholders and reinvest the funds in the company, but this will necessarily lead to company's stock lower prices in the market (interaction effect). Hauser and Bertel do not consider

the two factors of profitability and cash flows as the only factors affecting the market price (company value) but also mentioned the existence of other factors that affect the value of the company. These factors are: (Hauser and Bertel, 2006):

1) organization size;
2) Company growth rate;
3) Capital structure;
4) Cash conversion cycle;
5) The amount of research and development expenses;
6) Expenditures intended for advertising;
7) Capital expenditures incurred;
8) Type of auditor's comment;
9) Appropriate financial criteria;
10) Percentage of sales changes;
11) Degrees and rankings announced on listed companies by regulatory agents.

Tishwarlo and Tiwari categorize performance metrics into three categories: profitability metrics, cash flows, and growth rates. They summarize all the financial ratios used to measure a firm's performance in these three categories (Yasukata K, Kajiwara T. 2011):

Table 2: Performance criteria

Growth rate criteria	Cash flow metrics	Profitability
1- Profit growth rate	1- Cash flow per share	1- Earnings per share
2- Sales growth rate	2- Cash return per share	2- Return on capital
	3- Current ratios	3- Return on investment
	4- Instant ratios	4- Return on assets
		5- Sales returns

2.2. Cost management objectives

A cost management system is a type of planning and control system that pursues the following goals:

1) Measuring the cost of resources that are used to carry out the main activities of the economic unit.
2) Identify and eliminate items of cost that do not create added value.
3) Determining the efficiency and effectiveness of the main activities performed in economic units.

4) Identify and evaluate new activities that can improve the future performance of the organization.

Because the task of management is to ensure the achievement of the set goals, in the efforts made to achieve the above goals, managers are usually involved in four main types of activities. 1- Decision making 2- Planning 3- Leading operational activities 4- Control.

To perform each of the four activities, management needs information; this information can be obtained from various sources such as economists, financial professionals, sales, marketing, production, services staff and accountants

2.3. Necessity of cost-effectiveness:

Cost efficiency can improve the financial performance of companies by reducing costs, efficient use of resources and the like. In most cases, because changes in cost management cause changes in the price of the product, it plays a key role in changing the selling prices of products, so cost management, which seeks to improve cost efficiency, by reducing cost of sales or reducing the share of sales, distribution and administrative costs can have a positive effect on the firm's profit margin and enhance the company's profitability. Another positive effect of cost management is the improvement of the cost identification process and the establishment of cost systems. Existence of cost systems can reduce the efficiency of cost management in companies. Changes in cost systems to improve cost management help managers make important and fundamental decisions and enable them to more efficiently allocate limited resources to unlimited options. Change in cost accounting system may lead to a change in the price of the product, given that the use of advanced cost accounting systems will improve the pricing system of firms; Reducing cost accounting system errors can help managers in developing the right sales, sales amounts, and advertising costs strategies. Therefore, improving cost accounting systems and product pricing as part of improving cost management efficiency can have a significant impact on firm planning for production, distribution, sales and advertising, and ultimately strengthen the firm's financial performance and profitability. (Maiga and Jacques, 2008).

2.4. Cost management methods and tools

Cost management has used various approaches and tools over time to continuously improve and differentiate the organization, which has improved performance and brought resource effectiveness closer to its nominal level. These approaches have been developed over time and space, and each has focused on one aspect of costs for improvement, followed by new cost management tools.

2.5. Target costing

Target costing has several definitions, but all of them emphasize cost reduction. Horwath defines target costing in terms of the entire Product longevity. target Costing is set of managerial methods and tools for handling costs, setting activity's goals, designing and planning a new product, providing initial controls for the next stages of operations, and ensuring that these products meet their profitability goals that determined during Product longevity (Horwath, 1993).

Customer advantage is the difference between what each customer receives and what they lose (cost at a lower than competitor's offer). With an emphasis on cost, quality, and performance perspectives, Cooper and Slagmolder define target costing as follows: target costing is a structured approach to determining cost over Product longevity So as to determine what performance and quality indicators should the product be produced with, in order to during its life at the time of sale at the predicted price, achieve the desired amount of profit (Ansari and shafiei, 2009).

The target costing process is divided into three main stages: the first part introduces the allowable cost of each product; a new product must be built at this cost so that its target profit margin can be earned by selling the product at the target selling price. The second part introduces the target cost of the product level, which is only achievable if the product designers use a lot of creativity and innovations. The third part of the target costs is the level of the parts. Manufacturers and suppliers of enterprises are expected to find solutions to transfer parts to their target costs by obtaining their appropriate returns (Ansari and shafiei, 2009)

2.6. Activity-based Costing (ABC)

One of the management tools for creating the ability to determine the actual costs associated with producing

product or service is the "activity-based costing" technique developed by Cooper, Kaplan, and colleague Johnson. Activity-based costing leads employers and process owners to identify and track direct and indirect costs and accurately allocate them to activities involved in the production of a product or service. This technique was formed when managers realized that traditional accounting information provided as a general ledger was no longer useful for evaluating the effectiveness of resource allocation decisions, but only were satisfactory for auditors and others outside the organization seeking financial accountability. In 1988, Cooper and Kaplan stated that one of the serious problems of organizations in the traditional method is the allocation of indirect costs (overhead). As we approach the 21st century, due to the more complex process of producing products and services, most of the costs are borne by overhead costs. Therefore, it was no longer possible to as in the past, overhead costs were uniformly and sometimes optionally distributed over all products or services (azizi, 2013, 23).

3. Research background

Neokichin et al. (2021) in a study entitled Corporate efficiency and stock returns during the COVID-19 epidemic based on financial and accounting data of 884 American companies and using data envelopment analysis and regression analysis techniques, showed that firms Highly efficient experienced at least 44.9% higher cumulative returns during the market downturn. A long-term portfolio of efficient and inefficient companies will also yield an average positive return of 53.3% per week. Overall, the results of their research showed that the performance of the company has significant explanatory power for stock returns during the crisis period.

Chang Myung (2021) in a study entitled Factors affecting the validity of performance measurement in non-profit organizations stated that while many resources are dedicated to performance measurement in the non-profit sector, concerns about the validity of measurement have hindered measurement efforts. In this study, the author used path analysis to examine the direct and indirect effects of six predictors on the validity of performance measurements in nonprofits. Findings showed that stakeholder engagement, growth culture, level of acceptance of performance measurement, professionalism and financial stability

significantly affect the quality of performance measurement.

Alabi, Adbisi, and Fatimin (2020) in a study entitled "The Impact of Cost Efficiency on the Performance of Deposit Money Banks Listed in Nigeria" using secondary data from the annual financial statements of selected banks consisting of 13 Nigerian banks from 2010 to 2019 and Using regression analysis method, they showed that cost efficiency has a significant effect on the financial performance of Nigerian deposit money banks. Su et al. (2019) also showed in a study on cost management and performance evaluation of public hospitals in China public hospitals that not using modern cost management systems will force public hospitals to spend more energy. In the control of medical expenses and the use of cost management methods, provides a scientific and accurate basis for decision-making in public hospitals.

In their study, Chiung et al. (2018) examined the relationship between asymmetric cost behavior and external competitive factors. The results of their research showed that the general, administrative and sales costs for companies in a competitive environment, which is indicated by product differentiation, higher entry costs and larger market size, are more sticky. In general, their research findings showed that asymmetric cost behavior is influenced by external and internal factors.

Xu and Hong (2016) examined the motivations of profit management, corporate governance and stickiness in a study. They stated that by considering low positive earnings or low increases in earnings as earnings management, we observed significant cost stickiness under the unmanaged earnings sample compared to the managed earnings sub-sample. By dividing costs into research and development, advertising, and other public spending, we found that managers control costs primarily by reducing public spending. We also examined the impact of corporate governance on cost stickiness. Using factor analysis, we extracted eight key factors and concluded that good corporate governance reduces cost stickiness. Finally, we examine the reciprocal effects of profit management and corporate governance on cost stickiness. Experimental results have shown that good corporate governance can reduce cost stickiness, although its effect is not as strong as profit management.

Anderson and Lee (2016) in a study entitled Asymmetric Cost Behavior: Life Cycle Analysis examined the effect of different stages of corporate life cycle on the labeling of administrative and public costs. In their research, they concluded that cost adhesion behavior increases in the production and development stages. Also, the stickiness of costs in these stages is more than the maturity stage. Hassan and Habib (2017) examined the effect of corporate social responsibility on cost stickiness behavior. The results of their research showed that the costs related to corporate social responsibility increase the asymmetry of cost behavior when sales decline. Therefore, they confirmed the existence of a positive and significant relationship between corporate social responsibility and cost stickiness.

Jun and Hong (2015) in a study entitled earnings management, corporate governance and cost stickiness examined the effect of corporate governance and earnings management as well as their mutual ether on cost stickiness. The results of their research suggest that good corporate governance can reduce cost stickiness, which, of course, is not as effective as profit management.

Francis et al. (2015), in a study entitled "Investigating the Impact of Corporate Governance on Cost Changes" examined the relationship between corporate governance and cost stickiness on data from 14 countries. The research results are as follows: Better corporate governance reduces companies' dependence on cost reduction and reduces stickiness

Bunker et al. (2014) examined the relationship between demand uncertainty and cost behavior, showed that if the conditions of uncertainty increase, the cost of goods sold, sales costs, general and administrative, and wages will increase.

4. Research methodology

The main hypothesis: Cost-effectiveness management has a significant relationship with company performance.

Sub-hypotheses of the first main hypothesis:
1) By increasing the efficiency of cost management, the return on assets, which is a factor in improving performance, increases significantly.
2) By increasing the cost-effectiveness of cost management, the return on equity, which is a factor in improving performance, increases significantly.
3) By increasing the cost-effectiveness of cost management, the company's sales return, which improves performance, increases significantly.

This study is descriptive and correlational and post-event research. Descriptive research is a kind of fundamental research and is based on library studies. In the correlation research method, the researcher turns to the correlation method when examining the relationship between the variables. Because this research uses past information, the research methodology is post-event. Regarding to the applications that have in investors' decisions, the nature of this study is applied research.

In the above research, information about 129 companies in an 11-year period from 2007 to 2013 was analyzed to examine the relationship between variables. To analyze the data, first descriptive statistical methods were used and then data envelopment analysis (DEA) technique was used, moreover the normality of the dependent variable was tested in order to prepare the data for correlation tests. In the analysis of hypotheses, regression was used and its statistical results were identified, which will be discussed below

5. The conceptual model

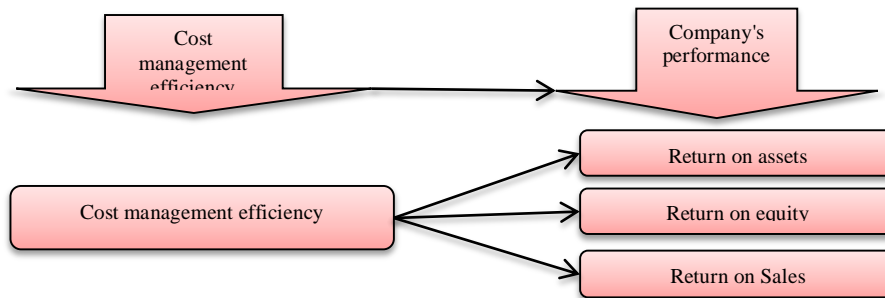According to the hypothesis, the conceptual model of the research is presented as follows:

Figure 2: Conceptual model of research

6. Model analysis

Considering the above model and for each of the hypotheses and fitting the models, we tested the hypotheses as follows:

1-Maneuver test of variables that Fisher test (ADF) is used. The results of this test in Table 3 showed that all research variables are meaningful.

Table 3: Generalized Dickey-Fuller test result

variable	ADF test statistic	error level	Mana
Return on Assets (ROA)	-37.1482	0.0000	meaningful
Return on Stocks (RET)	-41.1072	0.0000	meaningful
return on sales (SALE)	-23.4033	0.0000	meaningful
Company size (SIZE)	-21.7896	0.0000	meaningful
Debt Ratio (LEV)	-44.7253	0.0000	meaningful
Sales Growth (GROW)	-41.8229	0.0000	meaningful
Institutional Ownership (INST)	-79.3116	0.0000	meaningful
Gross Profit Margin (NON)	-233.523	0.0000	meaningful
Operating Cash Flow (CFO)	-57.0188	0.0000	meaningful
Market value to book value ratio (MB)	-172.937	0.0000	meaningful
Company life efficiency (E-COST)	-62.3223	0.0000	meaningful

7. Estimation of research model

To determine the estimation method of each of the research models, and in order to choose between panel and integrated data methods, F-Limer test was used. Brush-Pagan test was used to investigate the heterogeneity of variance. The regression results were analyzed using z and χ^2 statistics and its probability. In the following, the test results of each of the hypotheses are described separately.

Due to the use of composite data to test the hypothesis, in order to choose between panel and integrated data methods, first the F-Limer test must be performed. According to the results of this test, if the probability of F statistic is more than 0.05, the integrated data method should be used; otherwise the panel data method should be used. The results of F-

Limer test for this regression model show that the probability value of F statistic is 0.0000 and because this value is less than 0.05, the H_0 hypothesis (the use of integrated data method) is rejected. Therefore, the panel data method is used to estimate model (1). A summary of the results of the F-Limer test for the model is shown in Table (4).

In the next step, after determining the panel data method, using the Hausman test, we estimate the random and fixed effects and obtain the sum of its squares, the results of which are shown in Table 5.

After selecting the estimation method, the hypothesis of variance heterogeneity is examined. In order to investigate the heterogeneity of variance, the Brush-Pagan test was used; the results are summarized in Table (6). Result shows that the probability value

obtained is equal to 0.193680 and therefore the H_0 hypothesis of variance homogeneity is not rejected and there is no problem of variance heterogeneity.

Table 4: Summary of the results of F-Limer test to evaluate

the estimation method of regression model (1)

Test	Test statistics	$p-value$	result
F-limer	3.351469	0.0000	Panel data method

Table 5: Summary of Hausman test results to investigate the method of fixed or random effects

Test	Test statistics	$p-value$	result
Hausman	173.641237	0.0000	Fixed effects method

Table 6: Summary of Brush-Pagan test results to investigate the variance homogeneity of the regression model (1-4)

Test	Test statistics	$p-value$	result
Brush-Pagan	١/٧٧٦٢	٠/١٩٣٦٨٠	Matching variance

Table (7) shows the results of regression model estimation (1):

ROAit=$\beta_0 + \beta_1 E - cost_{it} + \beta_2 E - DSA_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 GROW_{it} + \beta_6 INST_{it} + \beta_7 NON_{it} + \beta_8 CFO_{it} + \beta_9 MB_{it} + \beta_{10} AGE_{it} + \varepsilon_{it}$				
variable	Coefficient	standard deviation	t-statistic	significance level
C	0.086457	0.055841	1.548269	0.1224
E-COST	0.587569	0.025981	19.31380	0.0000
E-DSA	0.288071	0.045168	6.377815	0.0000
SIZE	-0.161811	0.037273	-4.341204	0.0000
LEV	0.012502	0.006812	1.835245	0.0673
GROW	0,02141	0,01509	2,26673	0,02413
INST	-0,10470	0,01802	-0,17897	0,85967
NON	0,12602	0,07838	-2,69900	0,00789
CFO	0,48502	0,08303	-0,92895	0,04560
MB	0.007680	0.003453	2.224178	0.0267
AGE	0.039821	0.013690	2.908753	0.0038
Dourbin-Watson Statistics	1.972179	R^2		0.799633
F- Statistics	249.4278	Adjusted coefficient of determination(Adj. R^2)		0.796427
F- significance Statistics	0.000000			

Since the value of the Dourbin-Watson statistic is approximately close to the 2 (best possible cases), it indicates a lack of autocorrelation between the components of the disturbance. Also, the F statistic indicates the high validity of the model.

As shown in Table (7), the value of the coefficient of determination(R^2) in Equation (1) is equal to 0.80 and indicates that about 80% of the behavior of the dependent variable is explained by independent variables. This is indicates high explanation of independent and control variables.

As shown in Table (7), the probability of rejecting the estimated coefficient for the variables of cost management efficiency (E-COST) and distribution, general and sales costs efficiency (E-DSA) in the sample companies is equal to 0.0000. Since this value is less than 0.01, so the coefficient is significant at the error level of one percent. In fact, according to the obtained results, cost-effectiveness management efficiency (E-COST) and efficiency of distribution, public and sales costs (E-DSA) have a direct and significant relationship with return on assets (ROA). The results show that this efficiency, ie the accuracy of cost management, increases the return on assets, which includes the ratio of the use of assets, both current and non-current assets. The efficiency of the resources used in cost management has increased and this significantly increases the return on assets through the optimal use of company's resources.

8. Data collection method

Data analysis is a multi-step process in which the data collected through the use of data gathering tools from sample are summarized, coded and categorized and finally processed to analyze and communicate between this data to test hypotheses. In examining the relationship between a dependent variable and one or more independent variables, using three types of data, the parameters of the dependent variable can be estimated and predicted by presenting a model (Gujarati, 2002, p. 28). In this research, combined data are used, so we use a new method of econometrics, namely data panel. Often, time-series and cross-sectional models have a problem called the alignment of explanatory variables, which causes the correct values of β to not be estimated and the inference to be difficult. It is clear that the number of observations of

a variable such as price has multiplied, ie from T (time) or N (sections) in time series data or cross-sectional data to T × N in panel data. Data panel analysis is one of the new and practical topics in econometrics, because the data panel provides a very rich information environment for the development of estimation techniques and theoretical results.

9. Data analysis Method
9.1. Descriptive Statistics

In this section, only the sample is described and the purpose is to calculate the sample statistics. Table (8) shows an overview of the descriptive statistics of the companies. These statistics are related to 129 companies during the period from April 2007 to March 2013.

Table (8): Results of descriptive statistics of variables

Indicator	mean	Median	Maximum	Minimum	Deviation	Skewness	Elasticity	Number
Return on Assets (ROA)	0.112071	0.101493	0.626784	-1.06325	0.13734	-0.46959	6.870335	1548
Return on Stocks (RET)	0.28489	0.078066	4.729684	-0.61572	0.740512	3.31725	2.83491	1548
return on sales (SALE)	0.875672	0.77834	3.472638	0.053893	0.455484	1.706097	4.380402	1548
Company size (SIZE)	6.00668	5.944328	8.414156	4.291191	0.663129	0.827913	1.334469	1548
Debt Ratio (LEV)	0.608637	0.612318	4.002704	0.090164	0.228955	3.194126	38.52841	1548
Sales Growth (GROW)	729.2128	55390	1.02E+08	-3.1E+08	11652264	-14.7044	374.2788	1548
Institutional Ownership (INST)	70.97348	79.31	99.2	0	25.84376	-1.38535	0.983418	1548
Gross Profit Margin (NON)	0.845308	0.879903	0.994986	-3.05699	0.183484	-10.3832	172.7829	1548
Operating Cash Flow (CFO)	736801.7	86822	35189214	-2.5E+07	2976563	5.746824	54.02551	1548
Market value to book value ratio (MB)	0.1433	0.0892	1.00	0,00	0.34	2,20	5,83	1548
Company life(AGE)	41.75969	44	67	16	13.26637	-0.09113	-1.26103	1548

As mentioned, the study period is 12 years and the number of companies is 129 companies, so in total we have the product of 1548 years of company or observation to conduct research.

9.2. Inferential statistics

Calculating cost efficiency and cost behavior using data envelopment analysis (DEA): Measure the efficiency of decision units with multiple inputs and outputs by giving them weights as the ratio of the sum of outputs weight to inputs Weight is achieved (Cooper et al., 2011).

Suppose there is a set of DMUs. Each DMUj has m distinct input x_{ij} (i = 1, .., m) and s distinct output y_{rj} (r = 1,…, s). The self-assessment performance of DMUd using the CCR model (Charens et al., 1978) in DEA will be demonstrated as follows:

$$max\ \overline{E}_d = \frac{\sum_{r=1}^{s} u_r y_{rd}}{\sum_{i=1}^{m} v_i x_{id}}$$

$$S.t$$

$$\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1 \quad j = 1, …, n$$

(١)

$$v_i \geq 0 \qquad i = 1, .., m$$
$$u_r \geq 0 \qquad r = 1, … s$$

Where u_{rd} and v_{id} respectively are the r output weights and i input weights of DMU_d. Model (1) is a fractional programming model that can be transformed linearly using Charness and Cooper (1962) transformations. The linear programming form of this model is:

$$max\ \overline{E}_d = \sum_{r=1}^{s} u_r y_{rd}$$

$$S.t$$

$$\sum_{r=1}^{s} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} \leq 0 \quad j = 1, \dots, n$$
$$(\text{۲})$$
$$\sum_{i=1}^{m} v_i x_{id} = 1$$
$$v_i \geq 0 \qquad i = 1, \dots, m$$
$$u_r \geq 0 \qquad r = 1, \dots s$$

Models (1) and (2) are constructed on the assumption of returns to a fixed variable scale. But Bunker et al. (2011) constructed the following model assuming returns on a variable scale.

$$max \, \overline{E}_d = \sum_{r=1}^{s} u_r y_{rd} + w$$
$$S.t$$
$$\sum_{r=1}^{s} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} + w \leq 0 \quad j = 1, \dots, n$$
$$(\text{۳})$$
$$\sum_{i=1}^{m} v_i x_{id} = 1$$
$$v_i \geq 0 \qquad i = 1, \dots, m$$
$$u_r \geq 0 \qquad r = 1, \dots s$$

The difference between model (3) and model (2) is that in model (3) due to the assumption of return to the scale of the variable, the variable w is added to the model. Model (3) is stable to data transfer, ie by adding a fixed value to the input and output data, the efficiency value does not change. This model is suitable for financial data in which some inputs and outputs may be negative, so that by adding a fixed value to the inputs and outputs (containing negative data); make all of them positive and the possibility of using the model (3) are provided. In DEA models, especially the models given here, it is necessary to assume that the input and output are negative. In this study, because some of the outputs (eg profits) of companies may be negative, the model (3-4) is used to evaluate effcency.

10. Evaluate the effcency of cost management (E-cost)

In this section, we calculate the effcency of cost management. To do this, first identify the inputs and outputs as following:
Input variables:
1) Wage cost;
2) Material cost;
3) Overhead cost;
Output variables:
1) Gross profit;

2) Sales

To calculate the efficiency, we use model (3) (ie the BCC model). It is noteworthy that the gross profit variable is negative for some companies. To negate the gross profit data, we add all the gross profit in a fixed number.

2- Research hypothesis test

Considering the proposed model for each of the hypotheses and fitting the models using the relevant detailed methods, the desired result is obtained. As a result of model estimation that was showed in table (9), it was found that research hypothes was accepted

Table 9: Hypothesis test results

number	Hypothesis title	result
۱	As the effcency of cost management increases, the return on assets increases significantly.	accepted

11. Conclusion

Explaining the cost management model using efficiency management system through data envelopment analysis method is one of the researched fields through which management accounting can guide industrial and production managers. On the other hand, increasing production costs, limited resources in many industries, changing the nature and combination of costs with trend towards automation and the use of computers in the production process, which leads to a sharp reduction in wage costs and its replacement. Accordingly, evaluating and explaining the impact of - cost management effcence on the performance and efficiency of firms, both in terms of managerial and macroeconomic perspectives, can guide the economy and governments.

The results of variable statistical data analysis and testing of research hypotheses show that the presentation of descriptive statistics in relation to the research variables, Hadri unit root test was performed on all variables and it was found that all variables in Research periods are meaningful. In the inferential statistics section, the assumptions of the linear regression model were examined, then the research model was generalized to the hypothesis in a least squares method and the panel data method with constant effects was estimated. As a result, estimating of the research model was determined that the main hypothesis of the research was accepted.

According to the results, we conclude that in order for companies to continue their activities, the efficiency of resources used in the production of goods and services as well as the cost, general cost must increase efficiency and thus In this way, it is possible to increase the return on assets, (ie to make better use of the total assets for the company). The aim of hypothesis is to determine whether the efficiency of cost management has a significant relationship with the performance of the company or not? To evaluate the company's performance, three indicators return on assets, return on equity and return on sales were used. Table (9) shows the results of regression model estimation (1)

Table 9: Results of partial adjustment model estimation

$ROA_{it}=\beta_0 + \beta_1 E - cost_{it} + \beta_2 E - DSA_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 GROW_{it} + \beta_6 INST_{it}+\beta_7 NON_{it} + \beta_8 CFO_{it} + \beta_9 MB_{it} + \beta_{10}AGE_{it} + \varepsilon_{it}$				
variable	Coefficient	standard deviation	t-statistic	significance level
C	0.086457	0.055841	1.548269	0.1224
E-COST	0.587569	0.025981	19.31380	0.0000
E-DSA	0.288071	0.045168	6.377815	0.0000
SIZE	-0.161811	0.037273	-4.341204	0.0000
LEV	0.012502	0.006812	1.835245	0.0673
GROW	0,02141	0,01509	2,26673	0,02413
INST	-0,10470	0,01802	-0,17897	0,85967
NON	0,12602	0,07838	-2,69900	0,00789
CFO	0,48502	0,08303	-0,92895	0,04560
MB	0.007680	0.003453	2.224178	0.0267
AGE	0.039821	0.013690	2.908753	0.0038
Dourbin-Watson Statistics	1.972179	R^2		0.799633
F- Statistics	249.4278	Adjusted coefficient of determination(Adj. R^2)		0.796427
F- significance Statistics	0.000000			

Therefore, according to the fitted test, it was found that there is a probability of rejecting the estimated coefficient for the variables of cost management efficiency (E-COST) and efficiency of distribution, general and sales costs (E-DSA), so the coefficient is 0.0. In fact, according to the results, cost management efficiency (E-COST) and distribution, general and sales costs efficiency (E-DSA) have a direct and significant relationship with return on assets (ROA).

The value of the estimated determination coefficient ($R^2 = 0.799$) indicates that about 80% of the behavior of the dependent variable is explained by independent variables. This indicates high explanation of independent and control variables.

The coefficient of the variable used to analyze the hypothesis is β1. The significance of the above coefficient in this model indicates the significance of the independent variable and the effect of cost management efficiency on the company's performance. Also, the direction of coefficient in the model shows how the cost management efficiency affects the return on assets Performance. As regards, the coefficient is positive in the model, increasing the efficiency of cost management leads to increasing the return on assets. As a result, considering that the cost management efficiency affects one aspect of asset-liability management. The claim made in the hypothesis is confirmed and accepted. Therefore, in this study, suggestions based on the results of the hypothesis test are necessary that the companies under study increase the efficiency and management of sales and general administrative costs and increase stock returns and equity value and earnings per share as much as possible. Provide. It is also suggested that in order to increase the sales efficiency of companies, increase the efficiency and management of sales, general and administrative costs. The results of the study are in line with the results of previous research such as: Bunker and Chen (2006), Mohammadian(2016), Hadavand, Ahmadi and Ehtesham Rasin(2014), Alinejad, Saroei Kalay et al.,(2013), Pakmaram et al.,(2019), Khashei Varnakh and Ronakh Vasti,(2016).

Moreover, the results are not in line with some researches such as Xuo and Hank (2016), Anderson and Lee (2016), Khajavi et al., (2019), Kurdistani and Mortazavi, (2011).

In this regard, it is recommended for future researchers to use other performance measurement models. To evaluate and explain the impact of cost

management efficiency on firm performance investigate a macroeconomic perspective.

References

1) Alabi, A. W., Adebisi, A. J., & Fatimehin, K. (2020). Influence of Cost Efficiency on Performance of Nigerian Listed Deposit Money Banks. Journal of Economics, Finance and Management Studies. 3(12), 276-289.

2) Ansari, Abdolhamdi and Shafiei, Hossein, (2009), The effect of internal audit variables on the audit program, Quarterly Journal of Accounting and Auditing Reviews, No. 58, Winter, pp. 21-34.

3) Ali Nejad Saroklai, Mehdi; Biorani, Hossein and Forouzan, gentleman. (2013), "Study of factors affecting cost management including goal costing and value engineering in Iran Khodro Tabriz Industrial Group", Productivity Management (Farsavi Management), Volume 7, Number 24, Spring, pp. 159-168.

4) Anderson, M., & Lee, J. (2016). Asymmetric Cost Behavior: A Life Cycle Analysis.http://aaahq.org/Meetings/2016/M anagement-Accounting/Program.

5) Azizi, Shirin, Mirghafouri, Seyed Habibollah; Shafiee Roudposhti, Meysam (2013), "Cost Management in the Automotive Industry with the Tanaka Technique Approach (Case Study: Pride Car Engine)", Management Accounting, Volume 6, No. 18, pp. 13-30.

6) Banker, R. D.; and Byzalov, D. (2014). Asymmetric Cost Behavior. Journal of Management Accounting Research, 26 (2), 43-79.

7) Banker, R., and Chen, L. (2006). Predicting Earnings Using a Model Based on Cost Variability and Cost Stickiness. The Accounting Review 81(2), 285-307.

8) Banker, R., Ciftci, M., and Mashruwala, R. (2011). Managerial Optimism and Cost Behavior. Working paper, Temple University.

9) Cheung, J., Kim, H., Kim, S., Huang, R. (2018). Is the asymmetric cost behavior affected by competition factors? Asia-Pacific Journal of Accounting & Economics. 25(1-2).

10) Chongmyoung Lee., (2021). Factors influencing the credibility of performance measurement of nonprofit, International Review of public Administration, Vol. 12 no 2.

11) Cooper, William & Seiford, Lawrence & Zhu, Joe. (2011). Data Envelopment Analysis: History, Models, and Interpretations. 10.1007/978-1-4419-6151-8_1.

12) Darabi, Roya. (2008), "An Approach to Cost Management systems", Accounting Knowledge and Research, No. 15, pp. 12-17.

13) Dianti Deylami, Zahra, Hassas Yeganeh, Yahya and Nowruzbegi, Ebrahim (2011), "Investigating the management accounting situation in companies listed on the Tehran Stock Exchange", Journal of Management Accounting.

14) Erasmus, E. G. (2021). Cost Management Practice and Financial Performance of Listed Deposit Money Banks in Nigeria. Journal of Accounting and Financial Managemen.7(22021),1-15.

15) Francis, B., Hasan, I., & Wu, Q. (2015). Professors in the boardroom and their impact on corporate governance and firm performance. Financial management, 44(3), 547-581.

16) Hadavand Ahmadi, Rozita and Ehtesham Rathi, Reza. (2014), "Study and identification of effective factors in quality cost management in the automotive industry (Case study of Iran Khodro Company)", Management Accounting and Auditing Knowledge, Volume 3, Number 12, Winter, 33-44.

17) Hansen, D. R., Mowen, M. M., & Heitger, D. L. (2021). Cost management. Cengage Learning.

18) Hasan, M.M. and Habib, A. (2017), "Corporate life cycle, organizational financial resources and corporate social responsibility", Journal of Contemporary Accounting & Economics, Vol. 13 No. 1, pp. 20-36.

19) Horvath P., (1993), Target Costing: A State-of-the Art Review, A CAM-I Research Project, IFS International Ltd., Bedford (UK)

20) Khajavi, thanksgiving; Sadeghzadeh Maharloui, Mohammad; Jokar, Mohammad and Reza, Taghizadeh. (2019), "Cost Adhesion and Cost Inertia: A Model of Two Cost Drivers from Asymmetric Cost Behavior", Management Accounting and Auditing Knowledge, Volume 8, Number 29, Spring, pp. 135-148.

21) Khashei Varnakhastavi, Vahid (2006), "Designing a Cost Management Algorithm for an Enterprise (Case Study: Iran Khodro Industrial Group)" Andisheh Sadegh Quarterly, No. 24, Imam Sadegh

University Research Center, Fall Season, pp. 109-134.

22) Kostyukova, E. I., Vakhrushina, M. A., Shirobokov, V. G. E., Feskova, M. V., & Neshchadimova, T. A. (2018). Improvement cost management system for management accounting. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 9(2), 775-779.

23) Kurdistani, Gholamreza and Mortazavi, Seyed Morteza. (2012), "Study of the effect of managers' measured decisions on cost stickiness", Accounting and Auditing Reviews, Volume 19, Number 67, Spring, pp. 73-90.

24) Maiga, I. H., Lecoq, M., and Kooyman, C.,(2008), Ecology and management of the Senegalese grasshopper control, In. J. Pest Manag, 55, 113-120.

25) Namazi Mohammad, Fereydoni Marzieh and Mohammad Javad Ghaffari. (2012), Fundamental Analysis of Sticky Behavior of Costs and Sold Cost with Emphasis on the Range of Changes in Tehran Stock Exchange, Accounting Advances, Volume 4, No. 2.

26) Neukirchen, D., Engelhardt, N., Krause, M., & Posch, P. N. (2022). Firm efficiency and stock returns during the COVID-19 crisis. Finance Research Letters, 44, 102037.

27) Pak Maram, Asgar; Mohammadi, Bijan and Jafar Beykzadeh. (2010), "Factors affecting the application of cost management systems in the Iranian petrochemical industry", Journal of Management Beyond, Fourth Year, No. 14, Fall, pp. 131-156.

28) Roudposhti Rahnama, Fereydoun (2008), "Strategic Management Accounting", Islamic Azad University, Science and Research Branch, Tehran, First Edition, pp. 61-63.

29) Roudposhti Rahnama, Fereydoun and Gholami Jamkarani, Reza. (2011), "Inter-organizational Cost Management: Concepts, Procedures and Requirements", Management Accounting, Volume 4, No. 9, pp. 99-115.

30) Su, B., Feng, S. Q., & Tao, H. J. (2019). Public Hospital Cost Management and Performance Evaluation from the Perspective of DRGs. DEStech Transactions on Economics, Business and Management, (icem).

31) Xue, S. and Hong, Y, (2016), "Earnings Management. Corporate Governance and Expense stickiness", China Journal of Accounting Research. 9, PP. 41-58.

32) Xue, Shuang & Hong, Yun. (2015). Earnings management, corporate governance and expense stickiness. China Journal of Accounting Research. 41. 10.1016/j.cjar.2015.02.001.

33) Yasukata K, Kajiwara T.(2011), Are "Sticky Costs" the Result of Deliberate Decision of Managers? Online: http://www.ssrn.com; 2011.