



## Evaluating the Actual Cost of Various Bank Deposits Using Activity-Based Costing Case Study: Bank Hekmat Iranian

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**Abstract.** In this study, the actual cost of bank deposits was estimated in 15 branches of Bank Hekmat Iranian in the North West in 2013 using activity-based costing and the obtained results were compared with actual cost applying the traditional method of banking system in Iran. In order to apply the methods and the obtained statistical data, correspondence was carried out. Data normality test was run using a paired comparison of the selected samples. The results revealed that using activity-based costing method, the actual cost of each Rial of deposits had a significant difference with the traditional method. Therefore, it is recommended that this bank replace the traditional approach to activity-based costing method.

**Keywords:** Activity-Based Costing, Bank Hekmat Iranian, Bank Deposits

### 1. INTRODUCTION

Given the importance of accessibility to precise information in decision-making by managers and developing advanced technologies in various aspects along with increasing complexity and diversity of activities, understanding these changes and measuring their impacts on organizational costs are highly important. Considering that the degree of changes and variety in service units, especially banks is more in production activities, the importance of this issue is doubled for these units. Obviously, recognition of these activities and evaluation of their impacts on the actual cost of services require designing an appropriate and effective system of costing so that it will be able to recognize the diversity and complexity of activities and consider it in the costs of providing services. So far, in the country's banking system, no practical measures or even theoretical studies have been done on identifying costs and calculating actual cost of bank services and activities. Based on the importance that financial information and actual cost will have on decision-makings of management in various aspects, in this field, examining and providing practical techniques are very tangible. Despite other economic sectors such as industry sector or some service sectors, in this section, the traditional system has not even been used for costing and estimating the actual cost. Therefore, studying and investigating various systems in this field and using modern systems of costing which are common in the world is an essential necessity and should take a special attention. One of the new systems of costing whose different applications are increasingly expanding in service activities of banks is the system of "activity-based costing" so-called ABC system. Through applying appropriate methods, this system involves effects from changes in activities, complexity, diversity and special attributes of each activity in calculating the actual cost. One attribute which distinguishes this system from other systems is the ability to exactly detect the costs and present non-financial information for improving performance and increasing the efficiency of activities so that these effects can quantitatively attract the estimation of actual cost of products and services using appropriate methods.

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Similarly, in the present study, the actual cost of bank deposits is investigated in some branches of Bank Hekmat Iranian using activity-based costing and comparing it with traditional methods.

### **2. THE REVIEW OF THEORETICAL FOUNDATIONS AND STUDY BACKGROUND**

#### **2.1. Activity-Based Costing (ABC)**

ABC to costing relies primarily on activities including an event, task, or doing a work with a specific objective. ABC considers cost of these activities as the basis for apportionment of costs into other cost objectives such as products, services, and recipients of services.

Cooper and Kaplan suggested Activity-Based Costing (ABC) as a way to support new applications (such as comprehensive quality management), particularly to address the overhead effects of correct information on actual cost. In ABC, all activities are analyzed to identify what factors cause costs; in the other words, what result in raising the costs. These causes are commonly named Cost Drivers [1]. In a research study entitled "Investigation into Activity-Based Costing System in Management Accounting and its Behavioral Considerations" by Namazi [2], the main objective was to investigate the important roles of ABC system in management accounting. In this study, the system mechanism along with numerical examples has first been described to determine its main differences with the traditional framework of cost allocation. Then, its practical applications have been evaluated in industrial units, services, and in different countries with necessary behavioral considerations. It was concluded that ABC system is revolutionary in costing systems and can be used as a powerful tool to solve different managerial problems; however, accessibility to these benefits does not seem possible regardless to behavioral considerations. The most important and effective behavioral structures to be considered include: international culture, society and organization, culture of managers, methods of assessing managers, way of creating control, and factors affecting apportionment of costs [2].

#### **2.2. ABC model in a bank**

What is practically observed in the collection of the World Banks is to classify banking activities into two major sections; however; the most perfect type of classification can be found in the study by Smith and Harper (2001). The first section is done in the strategic and upper levels of management of banks and more sensitive decisions such as determining bank's policies, how to offer services, and if possible, determining and pricing facilities and received deposits are on the agenda of senior managers. Resources related to the acquiring required resources for banks are purchased or acquired through customers, other banks, and central bank. In this context, all activities leading to the acquisition of bank resources including opening accounts, borrowing other sources, and paying wage and bank profit are considered. Selling or granting facilities is the third section of banking services whose subject is the assignment of resources received from various sources to customers. Granting facilities are done in this section in the form of Islamic contracts such as installment sales, speculation, reward, buying debt, etc. The fourth section of banking service includes other services. Receiving deposits such as bills, counseling and assessing, monitoring and assurance, sales agency of securities etc. can be considered as other services of banks.

With regard to the allocation of indirect costs in Activity-Based Costing system, it is assumed that all costs are indirect and important. To find the appropriate driver for allocating non-operational costs, a repeatable and manageable driver must be used. The general scheme of the levels of bank activity for doing the four above-mentioned services has been provided in Diagram (1). As it can be seen in Diagram (1), banking costs including costs of staff, office, and technology should be allocated to the four activities and in the next stage, they should be

prorated to the cost issues including customers, channels of communication, and productions/ services. In practice, the most important section of this process is to select drivers of resources and activities so that costing can be carefully and accurately carried out.

After determining the four activities, a list of sub- activities of each section should be provided. Also, we should look for necessary derives in order to do the activities. For example, planning section in senior banking levels may be segregated into other activities such as determining policies, how to grant facilities, and pricing banking products and services. In this case, it is necessary to report sub-activities for each one.

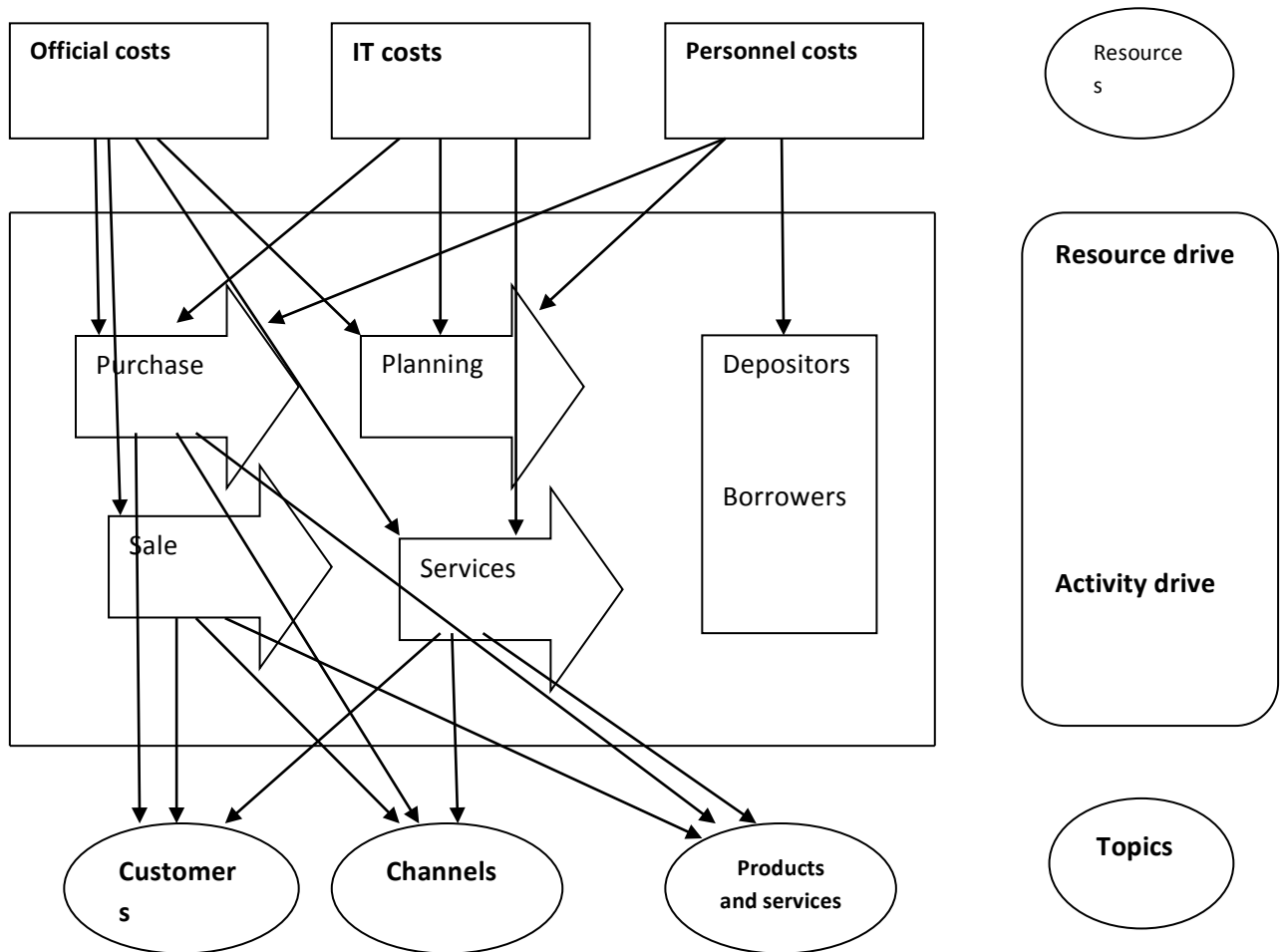


Figure 1. The view of allocating costs in ABC system.

### 3. Review of the Related Literature

#### 3.1. Foreign studies

Caplan applied ABC in US banks to introduce and implement it and stated that the objective of establishing such system was to meet the demand for banking services according to resources. He showed that ABC system led to more appropriate pricing of the existing services and providing the possibility of evaluating new products and services.

Publishing a series entitled “Time-Oriented Activity-Based Costing”, Caplan and Anderson indicated that recent ABC system can be used in banks and institutions of financial and insurance services and provide better results than the first generation of ABC.

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Fuster [3] showed that 96.2% of sample banks in Spain were familiar with the concept of activity-based costing and 31% of them used this system, 34% were examining it, and 27% of them did not apply it.

**Carenys and Sales** [4] investigated the role of management accounting techniques in Japanese banks. The results of his study revealed that management accounting techniques such as ABM played an important role in measuring the performance of Japanese banks and that non-financial performance measures were less important than financial performance measures. ABM played a better role as a suitable method in understanding the nature of costs, reducing them and as a result, in decision-making. Among from the studied banks, two ones benefited from this technique.

Using activity-based costing system, Franklin and Kocakulah [5] studied one of the banking services in the United States entitled “Managed Asset Program”. The results of their study indicated that contrary to the previous thoughts on applying this system in which the cost of wages is considered as a major cost, other factors should be considered as factors of main cost. Consequently, the cost of providing services in activity-based costing system should be allocated on the basis of other factors.

**Rezaee** [6] evaluated the development of management information systems in Portuguese banks with focusing on activity-based costing approach. In this study, they presented a model that provided the possibility of investigating the effect of accounting policies on structural changes, exposure surfaces, and the effect of both on the process of power relations in the perspective of Foucault.

Through examining Portuguese banks, Carenys and Sales [4] showed that using the activity-based costing method is limited among this country’s banks so that banks prefer to use variable costing method about customers and absorption costing method in branches.

### 3.2. Domestic studies

Pointing out that banks have moved from the stage of attention to profitability to the profitability of customers, Rezaee [6] indicated the importance of information in decision making. He believes that if an intra-organizational costing system cannot be matched with extra organizational financial reporting system; there would be no basis for assessing the performance and reliability of the data.

Examining the current system of costing of services in the national commercial banks, Arab Mazaryazdi and Naseri [7] designed a model for calculating the actual cost of bank deposits using activity-based costing in Refah Bank. They showed that the results based on ABC had a significant difference between the actual cost of evaluated services and calculated and expected numbers of bank managers.

Malakouti [8] showed that the allocation of indirect costs of Export Bank and principles of allocation of mentioned costs to the operational units have no compliance with the theoretical criteria of accounting literature. He also suggested that to eliminate the limitation in the generalization of results of the best bases for apportionment of costs of the administrative offices via applying activity-based costing method, the amount of each main activity of every office be determined and cost behavior be assessed with cost factor.

Rahnamaye et al [9] estimated and compared the actual cost of banking facilities under two traditional costing and ABC systems using the model of American AMIFS Research Committee for granting facilities in branches of Export Development Bank in 2004. Results of their study

indicated that the actual cost of loans granted in the form of contracts such as installment sales, civic participation, and interest-free loan in two costing systems had a significant difference. More detailed numerical calculations indicated that the actual cost of interest-free loan in traditional costing method is less than civil participation and installment sales while civil participation and installment sales have had the same actual cost.

Meanwhile evaluation of the operational and financial information of Mehr Institute and Export Bank in West Azarbaija, Rahnamaye Roodposhty et al [9] showed that the method of estimating the actual cost of country's banking systems are not appropriate both scientifically and in terms of the rules of Islamic banking. They also indicated that there was a significant difference between the actual cost and traditional method of calculated activity- based ABC.

Namazi and Nazemi [10] estimated and compared the actual cost of e-banking services in Keshavarzi Bank based on two traditional and ABC systems. Results indicated that the actual cost of e-banking services is lower than that of both services. Also, the results confirmed the significant difference between traditional and ABC systems. In this study, in addition to investigating 470 branches of Keshavarzi Bank during 2008, it has been shown that the actual cost in 364 according to ABC system was less than that according to the traditional system. In the remaining branches, the actual cost according to ABC system has been more than that according to the traditional system. These findings were tested in the level of bank evaluators and using questionnaire and similar results were obtained.

### 3.3. Methodology

Since the results from this study solve a specific problem or issue and this type of studies can be used by banking system and financial and credit institutions, financial analysts, financial managers, universities and institutes of higher education, researchers, and financial organizations, the study is applied; however, these studies are descriptive – analytical in terms of inference method and research in terms of type of project.

### 3.4. Formulating the study hypotheses

According to the theoretical foundations of the study, the study hypotheses are raised as follows:

The main hypothesis: There is a significant difference between mean actual cost of types of bank deposits in the traditional method and their actual cost in activity-based costing.

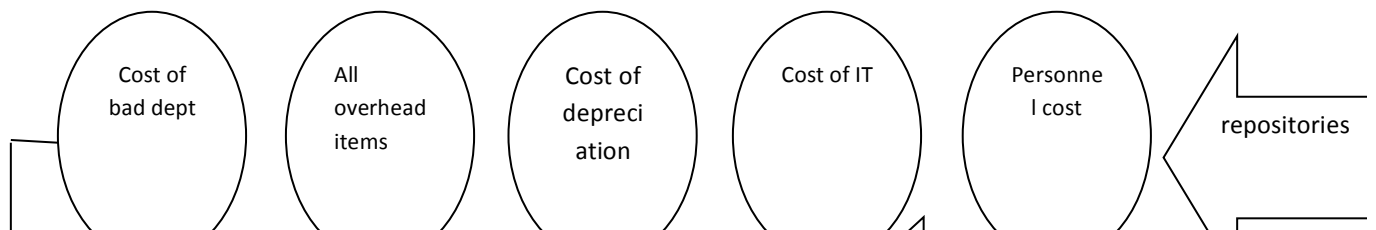
The first sub-hypothesis: There is a significant difference between mean actual cost of bank deposits in the traditional method and their actual cost in activity-based costing.

The second sub-hypothesis: There is a significant difference between mean actual cost of interest-free loan services in the traditional method and its actual cost in activity-based costing.

The third sub-hypothesis: There is a significant difference between actual cost of short-term deposits in the traditional method and its actual cost in activity-based costing.

### 3.5. Data processing method

In this study, according to the analysis of the costs of selected branches and the general pattern of services in the following diagram, the actual cost of services related to bank deposits has been used similar to the method suggested by Anvari Rostami and Rezaiaf [11].



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**Figure 2.** Diagram of ABC model.

As it can be seen, at the first stage, overhead costs have been assigned to two cost repositories. The first repository involves costs that directly or indirectly depend on activities of employees. The major costs include personnel costs. Some other costs such as materials and supplies, fuel and light, rental, repair, telecommunications, etc. are also classified in this repository. The second repository consists of costs depending on the volume of deposits and other part of administrative costs such as fund insurance, bill transportation, protection costs, etc. which were classified in this repository in the previous studies. In the second stage, some drivers should be used to allocate costs of repositories. One way for the allocation of costs is to determine how many documents are issued associated with each classification of deposits. Thus, based on the previous studies, one of the allocation bases of the first repository is the number of documents. On the second repository, one of the allocation bases is the mean ratio of residue of deposits to each deposit. Hence, the way of allocating bank costs to each type of deposits can be subject to the following function.

In addition, the actual cost of deposits and payment facilities of bank should be calculated which is possible using the following formula:

$$R_{DD} = \frac{\left( (C_a \times r_{DD}) + \left( C_v \times \frac{\bar{V}_{DD}}{\bar{V}_t} \right) \right) - (\bar{V}_{DD} \times S_{DD} \times r_s)}{\bar{V}_{DD}(1 - (S_{DD} + L_{DD}))}$$

Where  $R_{DD}$ ,  $C_a$ , and  $C_v$  are operational costs rate to the current deposits, overhead operational costs of bank, and overhead non- operational costs depending on the volume of deposits, respectively

$r_{DD}$  is the allocation rate of  $C_a$  to the deposits.  $\bar{V}_{DD}$ ,  $\bar{V}_t$ ,  $S_{DD}$ ,  $r_s$ , and  $L_{DD}$  are the average volume of demand deposits, average total deposits, *legal* deposits rate, profit rate of *legal* deposits, and the ratio of current deposits reserved for liquidity.

$$R_{SD} = \frac{\left( (C_a \times r_{SD}) + \left( C_v \times \frac{\bar{V}_{SD}}{\bar{V}_t} \right) \right) - (\bar{V}_{SD} \times S_{SD} \times r_s)}{\bar{V}_{SD}(1 - (S_{SD} + L_{SD}))}$$

Where  $R_{SD}$ ,  $C_a$ , and  $C_v$  are operational costs rate to free-interest deposits, overhead operational costs of bank, and overhead non-operational costs depending on the volume of deposits, respectively

$r_{DD}$  is the allocation rate of  $C_a$  to the deposits.  $\bar{V}_{SD}$ ,  $\bar{V}_t$ ,  $S_{SD}$ ,  $r_s$ , and  $L_{SD}$  are the average volume of free-interest deposits, average total deposits, *legal* deposits rate for free-interest deposits, profit rate of *legal* deposits and the ratio of free-interest deposits reserved for liquidity.

$$R_{SHD} = \frac{\left( (C_a \times r_{SHD}) + \left( C_v \times \frac{\bar{V}_{SHD}}{\bar{V}_t} \right) \right) - (\bar{V}_{SHD} \times S_{SHD} \times r_s)}{\bar{V}_{SD}(1 - (S_{SHD} + L_{SHD}))}$$

Where  $R_{SHD}$ ,  $C_a$ , and  $C_v$  are the rate of operational costs of short-term deposits; overhead operational costs of bank; and overhead non-operational costs dependent on the volume of deposits, respectively

$r_{SHD}$  is the allocation rate of  $C_a$  to the deposits.  $\bar{V}_{SHD}$ ,  $\bar{V}_t$ ,  $S_{SHD}$ ,  $r_s$ , and  $L_{SHD}$  are the average volume of short-term deposits, average total deposits, *legal* deposits rate for short-term deposits, profit rate of *legal* deposits and the ratio of short-term deposits reserved for liquidity.

**3.6. Statistical Population and sample**

Statistical Population of the study includes Bank Hekmat Iranian and its statistical sample involves the bank branches of North-West of the country consisting of 15 branches in 2013.

**4. RESULTS**

**4.1. Explaining actual cost of services in Bank Hekmat Iranian in the traditional method**

In this study, regarding the analysis of costs of selected branches, general information of services on financial statements of Bank Hekmat Iranian during the fiscal year of 2013 have been given in Table (1).

**Table 1.** Total value of reported services.

Types of services	Amount in millions of dollars
Current deposit	995424
Free-interest deposit	495018
Short-term investment deposit	5141246

In traditional costing method, operational and non-operational costs are allocated to each type of services in terms of the volume of services done. Accordingly, in accordance with information obtained from employees' costs, administrative costs, bad debts and wage payment cost which have been reported in the financial statements of Bank Hekmat Iranian for 2013, the actual cost was obtained as 10000000 Rials for each type of deposits in the traditional method shown in Table (2).

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**Table 2.** Actual cost of 10000000 Rial for each type of deposits in2013.

Types of deposits	Actual cost in the traditional method
Current deposit	5109648
Free-interest deposit	5109643
Short-term investment deposit	5109648

### 4.2. ESTIMATING ACTUAL COST OF TYPES OF SERVICES OF BANK HEKMAT IRANIAN IN ABC METHOD

First, the overhead costs have been allocated to three repositories. The first repository includes costs directly or indirectly depending on the work activities of employees. The most important costs include personnel costs. Some other costs such as materials and supplies, fuel and lighting, rent, maintenance, communications are also classified into this repository. The second repository consists of costs depending on the volume of deposits and other administrative costs such as fund insurance, bill transportation, and protection costs classified in the previous studies. Also, the third repository includes depreciation costs.

In the second stage, some drives should be used to allocate the costs of repositories One way for the allocation of costs is to determine how many documents are issued associated with each classification of deposits. Thus, based on the previous studies, one of the allocation bases of the first repository is the number of documents. About the second repository, one of the allocation bases is the mean ratio of residue of deposits to each deposit. Also, driver of the third repository is the number of the documents issued.

Given that the amount of necessary activity for regulation and issuing various documents is different, by allocating some amounts to the documents issued in connection with types of deposits and facilities, the number of documents is adjusted. In 2010, through studies by a group of experts, Bank Hekmat Iranian assigned amounts to the rate of complexity and time-consuming services to measure the efficiency of branches' services. These amounts are used as user factor to measure the amount of work in the branches. Therefore, these amounts were extracted according to the report of the mentioned experts and to adjust driver, some documents were collected based on Table 3.

**Table 3.** Calculating the rate of the allocation of overhead costs based on driver of the number of issued documents

Type of activities and services	Current deposit	Free-interest deposit	Short-term deposit	Installment sales	Reward	Speculation	Civil participation	Free-interest loan	Total documents
1 Number of issued documents	288192	85065	41290	1562	1851	1233	845	2261	422299
2 User factor	9.14	6.85	10.61	17.22	15.35	12.41	18.12	14.25	-
3 $1 \times 2$	2634074.8	582695.25	438086.9	26897.6	24812.85	15301.5	15311.4	32219.25	3772999

Table (4) shows the Rial value of repositories for 2013

**Table 4.** Rial value of repositories in terms of Million Rials.

Repository 1	Repository 2	Repository 3
376043	206792	78933



The actual cost of services of Bank Hekmat Iranian including types of deposits and types of facilities was estimated in terms of determined drivers. The results are given in Table (5).

**Table 5.** Allocating actual cost of services in Bank Hekmat Iranian via ABC Method (millions Rial).

		Current deposit	Free-interest deposit	Short-term deposit	Installment sales	Reward	Speculation	Civil participation	Free-interest loan
Repository 1	Driver: number of documents	0.60	0.15	0.11	0.01	0.01	0.004	0.004	0.02
	share	259469.67	56406.45	41364.73	3760.43	3760.43	1504.17	1504.17	7520.86
Repository 2	Driver: rate of mean	0.08	0.04	0.43	0.17	0.038	0.19	0.025	0.027
	share	16543.36	8271.68	88920.56	53154.64	7858.1	39290.48	5169.8	5583.4
Repository 3	Driver: number of documents	0.60	0.15	0.11	0.01	0.01	0.004	0.004	0.02
	share	54463.77	11840	8682.63	789.33	789.33	315.7	315.7	1578.66
Rate of ABC cost in terms of percentage		0.5	0.11	0.21	0.06	0.018	0.062	0.01	0.022

Now, based on these rates, actual cost of 10000000 Rials of each type of services can be stated according to the above ABC costing rate in Table (6).

**Table 6.** Actual cost of 10000000 Rials of types of deposits in 2013 based on ABC.

Types of deposits	Actual cost in ABC
Current deposit	5001483
Free-interest deposit	1156523
Short-term deposit	2103160

### 4.3. Testing The Hypothesis

In following, two methods and testing hypothesis are compared that in this regard, paired test is used.

**Table 7.** Results of paired T-test for the main hypothesis and its sub- hypotheses.

First pair: Actual cost according in ABC Actual cost in traditional method	Mean		SD		
	2087143		2.88		
	5109646		9.225		
First pair: ABC- Traditional method	Mean	SD	Number of T-test	P-Value	Degree of freedom
	3022573	9.226	5.675	0.030	2

As it can be observed, the null hypothesis of paired t-test is rejected. Therefore, there is a significant difference between the actual cost of types of bank deposits (including current, free-interest, and short-term investment deposits) in the traditional method and their actual cost in ABC method. Thus, it can be said that, according to the results of paired t-test, the study hypotheses are confirmed at the confidence level of 95%.

## 5. CONCLUSION

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Costing is based on the activity of costing method in which costs are first allocated to activities and then, the collected costs are allocated to product according to the use of any product, as a result, the real cost of activities is obtained. Costing seeks to find and track (ABC) based on activity of costs to services and products through activities. According to the first hypothesis of this study, there is a significant difference between actual cost of types of bank deposits in the traditional method and their actual cost in ABC method. The first to third sub- hypotheses revealed the difference between the actual cost of current deposit, free-interest deposit, and short-term deposit in the traditional method and their actual cost in ABC method, respectively. Finally, it was obtained that P-value of paired t-test is 0.30 for the main hypothesis and its sub-hypotheses which implies to reject the null hypothesis of test based on the absence of significant difference between actual cost in the traditional method and actual cost of types of deposits in ABC method at level of significance of 5% and the mentioned hypotheses are confirmed. Therefore, it can be said that it is better for the bank to replace activity-based costing to using the actual cost of traditional method for types of deposits so that the role of activities based on the number of documents issued in branches be considered.

It is suggested that in future studies, considering the mentioned costs, calculations related to the actual cost be done and the results be repeated. These findings are consistent with the argument by Rahmani and Mohtadi [12] based on non-recovery of actual cost of banking services from granted facilities in the form of Islamic contracts.

In order to establish new (time-oriented) generation-based costing system, accessibility to ABC information related to bank processes along with standard time for each bank process is necessary. In future studies, precise results can be estimated using collecting such information.

Despite the fact that in many economic enterprises, establishment of systems of actual cost has been accepted as a necessity, it seems that the usefulness of information is not obvious in the services units of bank for managers. Hence, in the future studies, it should be focused on the issue that what factors will prevent to accept and do investment in banks for establishing such systems.

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