The Effect of Banking on Value Added for Services Sector in Iran

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Abstract- One of the most important sectors of economic activity in the countries is service sector that as the other economic sectors has major and determinant role for production and value-added of economy. In today's world the importance of the service sector and related markets is reached so extent that the developed countries have been allocated increasingly volume of business activities to this sector. With regard to the expansion of the service sector in the economy and establish a close relationship between the manufacturing and service sectors the importance of the service sector as a productive sector is more crucial than ever. Given to the variation of different services, the survey and study of the impact of the value added of banking system on value-added of services group is very importance and its study also seem necessary. The aim of this paper was to study the effect of banking services on the value-added of services sector during the period 1338-1392 in Iran. The vector error correction model (VECM) and Eviews software are used to test the hypotheses. The results show significant effect of transportation added value, value-added of personalized services, banks value-added, value-added of real estate and specialized services on the value added of service group in the related period. Also, according to the obtained results, it was clear that the added value of public services and value-added for hotel and restaurants has no significant effect on value-added of services.

Keywords- *value added for various services, value-added services group, vector error correction model, banking services*

I. INTRODUCTION

The service sector, which has long been ignored by some economists, recently becomes one of the essential pillars of economic activities. It is shaped by the rise of urbanization and finds coverage with wider urbanization. The first signs of the development of service activities in Iran coincided with the era's grants and now much of the value of the total allocated to the economy. In the economies this sector over time has changed a lot in quality and quantity. Its contribution to creating added value and the allocation of resources and their activities and its share in GDP, employment and development increased continuously and significantly so that now the business whether inside and outside the borders of any country has developed and has become more important (Hakimian, 1377). Of course, the banking system's contribution plays a major role to the development of this sector.

II. THEORETICAL STUDIES AND LITERATURE

A value that added to the value of intermediate goods in the manufacturing process is called the value added. This concept is related to the production process and not to specific goods. The purpose of the value-added is increasing in the monetary value of a good based on done work or service on it; that caused to change the application, improvement of quality or facilitating of its use (Rahmani, 1384). It can be said that the added value is additional wealth that is created through the production process or service and obtained by deducting of intermediate inputs (including costs) from incomes. The service sector is a sector which accounts for the wide range of activities, and the activities related to transportation, real estate, financial intermediation, banks, insurance, hotels and restaurants, tourism, wholesale and retail sales are in this subgroup. Due to the dominant presence of the government in the banking, insurance and transport, especially rail transport, it can be say that major of the value added of services sector is made by public state. Samsami et al. (1390), in the article in titled "The effect of banking facilities on the value added for mining industry" proceed to this important. Using time series data during 1356-1386 and the estimation of simultaneous equations shown that the banking facilities was affected the value added in the mining industry and on average, a stretch of fixed facilities and working capital to add value was 0.05 and 0.14 respectively. Emadzadeh et al. (1388), in the article appearing under the title "*Interaction and dynamic of value-added between of economic sectors in Iran during the 1980-2004*" studied the interrelationships between economic sectors (services, agriculture and industry) Using vector autoregressive models (VAR) during the mentioned period. The results show that in the considered periods, the economic sectors in Iran have been complementing each other perfectly and each other's growth is required to development of another. Also, the results were assessed the interrelationship between industry and Agriculture so strongly, so that the growth in the agricultural

sector in future periods will be caused to growth in the industry and services. This fact is to other sectors. These results also appear the necessity using of balanced growth strategies between economic sectors in Iran, so that economic growth in each of the sectors required in another sector. Moormann and Wilkerling (2006), in an article appearing " *creating value-added services for bank customers using intelligent documents* proceeds to test a new approach for the development of value-added services based on customer processes and intelligent documents. Their findings show the intelligent documents and e-banking and internet-banking has improved the business processes in the banks extensively.

- **Research hypotheses:**

The research effort will be analyzed following hypotheses:

- **Main hypothesis**
  - Banks added value has significant impact on value added of services.
- **Sub hypothesis**
  - Public services added value has significant effects on the services added value
  - Personal and household have significant effects on the services added value Real estate and professional services value-added have significant effects on the services added value
  - Transportation value added has significant effects on the services added value.

Restaurant and hotel value-added has significant effects on the services added value

III. METHODOLOGY

Introduction of model:

In this study, the model used is as follows:

$$LSERV_t = \beta_0 + \beta_1 LPERS_t + \beta_2 LGEN_t$$
$$+\beta_3 LHOTEL_t + \beta_4 LTRAN_t + \beta_5 LBANK_t \quad (1)$$
$$+\beta_6 LESTATE_t + \varepsilon_t$$

Where

LSERV: logarithm of value-added services,

LPERS: logarithm of personal and domestic value-added services,

LGEN: logarithm of value added public services,

LHOTEL: logarithm of hotel and restaurant value-added services,

LTRAN: logarithm of transportation value added services,

LBANK: logarithm of value-added commercial banks,

LESTATE: logarithm of real estate and professional value-added services,

e: disturb components of model.

The above equation estimates using vector error correction model (VECM) and co-integration test Johansson over the period from 1338 to 1392 in the Iranian economy.

IV. THE VECTOR ERROR CORRECTION MODEL (VECM)

A vector self-explained pattern with endogenous variable k and interrupted p for each variable shown in the matrix form as following:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + U_t, U_t \sim 1N(0, \textstyle\sum) \quad (2)$$

Where, Y_t and its interrupts K×1 vectors are related to the pattern variables. A_i for 1,…,p of coefficient matrix are patterns and U_t vector K×1 is related to disturbing pattern.

Now, to link short-term behavior Y_t to the long-term equilibrium values, This relationship can be in the form of vector error correction model (VECM) as follows:

$$\Delta Y_t = B_1 \Delta Y_{t-1} + B_2 \Delta Y_{t-2} + \cdots$$
$$+B_{p-1} \Delta Y_{t-p} + \textstyle\prod Y_{t-p} + U_t \quad (3)$$

where

R_i= - (I - A₁ - A₂ - … - A_i)

Π= - (I - A₁ - A₂ - … - A_p)

The Π matrix contains information about long-term equilibrium relations and β is the long-run equilibrium coefficients matrix. To estimate of coefficients of VECM it is enough that each of the equations of the model are estimated by OLS method, since the set of descriping variable (with interruption) of the model equations is the same, thus OLS estimators are efficient. At the same time, because all the variables in the model are I (0), performing of hypothesis tests using t statistical and f statistical is valid.

A. Evaluation of stationary of variables

In this study, before that the regression model estimated, the static test was used for the entire time series. A large number of economic time series have been non-stationary and the regressions between them generally are dummy regression. Therefore, it is necessary that unit root tests be used to determine the degree of integration variables. There is used unit root test for the stationary test. If the studied time series are not stationary, because of the problem of false regression, there is the possibility to use regression models. Among the different tests the Augmented Dickey Fuller (ADF) unit root tests is more common and widely used. This test is used for all the variables in the model. If the calculated ADF statistics is larger than critical values of the table, the null hypothesis based on the existence of unit root is rejected and so the desired series is stationary. The results of test for the variables of model are listed in below table. The results show that the studied log variables were non-stationary and their first difference is stationary.

TABLE I. THE RESULTS FOR AUGMENTED DICKEY FULLER (ADF) UNIT ROOT TESTS

Variable	ADF statistical	MacKinnon Critical values	Result
LSERV	-1.57	-2.91	Non-stationary
D(LSERV)	-4.18	-2.91	Stationary
LTRAN	-0.82	-2.91	Non-stationary
D(LTRAN)	-5.11	-2.91	Stationary
LPERS	-2.47	-2.91	Non-stationary
D(LPERS)	-4.40	-2.91	Stationary
LGEN	-1.90	-2.91	Non-stationary
D(LGEN)	-3.49	-2.91	Stationary
LBANK	-1.81	-2.91	Non-stationary
D(LBANK)	-5.17	-2.91	Stationary
LHOTEL	-2.37	-2.91	Non-stationary
D(LHOTEL)	-4.86	-2.91	Stationary
LESTATE	-1.86	-2.91	Non-stationary
D(LESTATE)	-4.75	-2.91	Stationary

Calculation: research

LSERV: logarithm of value-added services; LPERS: logarithm of personal and domestic value-added services; LGEN: logarithm of value added public services; LHOTEL: logarithm of hotel and restaurant value-added services; LTRAN: logarithm of transportation value added services; LBANK: logarithm of value-added commercial banks; LESTATE: logarithm of real estate and professional value-added services. D: shows the first order difference of variables.

B. Johansson co-integration test

The first step to estimate the model is determination of the optimal lag length; so that according to Schwartz test, the optimal lag length is 1. Then in the next step the possibility of long-term co-integration vectors is testing. For this purpose, the method of Johansson co-integration with 1 optimal lag length is used. Results of co-integration vectors (based on tests for maximum specific value and effect) are summarized in the following tables; so that according to the effect test, the presence of two co-integration vectors and based on maximum specific value test the presence of three vectors are confirmed.

TABLE II. DETERMINATION OF THE NUMBER OF CO-INTEGRATION VECTORS BASED ON THE EFFECT TEST

Null hypothesis	Opposite hypothesis	Effects statistics	Critical value 95%	Possibility
R=0	r=1	165.66	125.62	0.00
r≤1	r=2	110.07	95.75	0.00
r≤2	r=3	69.57	69.82	0.05
r≤3	r=4	32.55	47.86	0.58
r≤4	r=5	16.68	29.80	0.66
r≤5	r=6	5.94	15.49	0.70
r≤6	r=7	0.00	3.84	0.99

Calculation: research

TABLE III. DETERMINATION OF THE NUMBER OF CO-INTEGRATION VECTORS BASED ON THE MAXIMUM SPECIFIC VALUE TEST

Null hypothesis	Opposite hypothesis	Effects statistics	Critical value 95%	Possibility
R=0	r=1	55.59	46.23	0.00
r≤1	r=2	40.50	40.08	0.04
r≤2	r=3	37.01	33.88	0.02
r≤3	r=4	15.87	27.58	0.68
r≤4	r=5	10.75	21.13	0.67
r≤5	r=6	5.94	14.26	0.62
r≤6	r=7	0.00	3.84	0.99

Calculation: research

It is necessity that notes which in practice the obtained results of both effect and maximum specific value test may be not the same. But according to Monte Carlo studies, the effect test sometimes is stronger than the maximum specific value tests. It is worth noting that the convergence vectors obtained from the effect and maximum specific value tests are purely statistical relationships, thus we should be select a vector that has economic argument and justified and in addition has factor significant statistically. The related vector can be obtained in different modes depending on the estimated values that can be written as follows in the below table:

TABLE IV. SUMMARIZES THE RESULTS OF JOHANSSON CO-INTEGRATION LONG-TERM VECTORS

variable	Normalized vectors	Standard deviation	t statistic
LSERV	-1	-	-
LTRAN	0.11	0.05	** 2.06
LPERS	0.80	0.08	** 9.86
LGEN	-0.04	0.04	-1.002
LBANK	0.05	0.02	** 2.21
LHOTEL	-0.07	0.06	-1.15
LESTATE	0.33	0.04	** 6.81
static	-2.10	-	-
R^2		0.70	

Calculation: research   ** significant with 95%

LSERV: logarithm of value-added services; LPERS: logarithm of personal and domestic value-added services; LGEN: logarithm of value added public services; LHOTEL: logarithm of hotel and restaurant value-added services; LTRAN: logarithm of transportation value added services; LBANK: logarithm of value-added commercial banks; LESTATE: logarithm of real estate and professional value-added services.

The results of the above table show that the transportation value added services (LTRAN) has positive and significant effect on the value added of service. The elasticity of this variable is equal to 0.11 percent, so that an increase of one percent in the transportation value added services caused to

increase 0.11 percent in value-added services. The elasticity of variable of personal and domestic value-added services (LPERS) is equal to 0.80 with t=9.80. This variable has a significant impact and has the highest coefficient and effect. The value-added commercial banks (LBANK) is equal to 0.05 with t = 2.20 and is significant. Thus increasing the added value of banks has positive and significant impact on the services sector. The elasticity of real estate and professional value-added services is equal to 0.33 with the t=6.81 and is significant.

C. Vector Error Correction Model (VECM)

When variables have a unit root and at least one relationship balance (a vector of co-integration) exists between them, in this case, the VECM model should be used instead of VAR model. (Soori, 1390). Therefore, in this study, because of all the variables were non-stationary and have a co-integration relationship, thus the VECM model used in this study.

D. The error correction coefficient

In this section, the short and long term relationship between the components of value-added services and total value added services with the vector error correction model (VECM) is investigated. The results of the model are listed in appendix. The number within parentheses in front of variables symbol indicates the number of variable log.

The error correction model for variables can be written as follows:

$$\Delta LSERV_t = \sum_{i=1}^{p-1} a_{11}^i \Delta LSERV_{t-i} + \sum_{i=1}^{p-1} a_{12}^i \Delta X_{t-i} + a_1 ecm_{t-1} + \varepsilon_{1t} \quad (4)$$

$$\Delta LX_t = \sum_{i=1}^{p-1} a_{21}^i \Delta LX_{t-i} + \sum_{i=1}^{p-1} a_{22}^i \Delta LSERV_{t-i} + a_2 ecm_{t-1} + \varepsilon_{2t} \quad (5)$$

Where

X: the independent variables of the model include components of the service sector; SERV: total value added of the service.

The error correction model enables us that test the short-term and long-term causality, so that the rejection of the $a_1 = 0$ hypotheses in error correction model (1) means that the long term causal relationship from LX to LSERV is confirmed and the rejection of $a_{12}^i = 0$ hypotheses per all of the is means that the confirmation of short term causal relationship from the LX to LSERV. Also, the rejection of the $a_2 = 0$ hypotheses in error correction model (2) means that the long term causal relationship from LSERV to LX is confirmed and the rejection of $a_{22}^i = 0$ hypotheses per all of the is means that the confirmation of short term causal relationship from the LSERV to LX (Andres, 2004). It is expected that the error correction coefficient to be negative, between zero and one, and significant. Vector error correction coefficient shows the conditioning rate. The error correction coefficient of value added services is equal to -0.51 and t=-5.15 is obtained that the significance of the t statistic indicates long-term causality relationship from components of the service sector (independent variables) to the total value-added services, shows that any deviation from the equilibrium in the long term will move back to the long-term equilibrium. In other words, this means that in each period, -0.51 value will be conditioned from short-term non- equilibrium to achieve long-term equilibrium and represents a long-term relationship between the independent variables with value-added services is established.

TABLE V.   ESTIMATION OF ERROR CORRECTION MODEL FOR THE VALUE ADDED SERVICES

item	coefficient	standard deviation	t statistic	R²
Error correction coefficient	-0.51	0.10	** -5.15	0.70

Calculation: research   ** significant with 95% probability

E. Analysis of variance table

In this section, the analysis of variance for variables of model is done according to the estimated model. The identifying of affecting factors on the value-added services is very important. In other words, the explanation and analysis of this concept is one of the most important aspects in policy-making: when a shock occurs, how much role of each of the effecting factors in the increasing of value-added services? The below table shows the analysis of variance value added services. The first column that specified by the S.E indicates the prediction error of related variables during the different periods. Because this error is calculated each year based on the error of the previous year, it is increased during the time period. The source of this error is the change in the current values and the future impulses. The next columns show the percentage of variance due to sudden change or given impulse. The second column of the table shows that the One hundred percent of changes of value-added services in the first period is due to the variable. In the second period, the 67 percent of the value added changes is related to the variable, 12% is related to personal and domestic services, 10% is related to real estate and professional services, and 4% is related to banks and the rest is related to the other variables. The rest of periods are interpreted so on. In general it can be said that in the short term (first period) the personal services, real estate services and then banks has more impact than other variables on value added services. In the medium-term and long-term, the role of banks has the largest contribution among the components of the service sector compared to other components on the value-added services.

TABLE VI. THE ANALYSIS OF VARIANCE FOR VALUE ADDED SERVICE SECTOR

LESTATE	LHOTEL	LBANK	LGEN	LPERS	LTRAN	LSERV	S.E.	duration
0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.05	1
10.40	1.52	4.90	1.82	12.48	1.09	67.78	0.09	2
10.67	1.80	8.73	3.08	19.83	1.45	54.45	0.14	3
10.58	2.33	11.04	3.12	25.37	1.81	45.74	0.19	4
10.48	2.57	12.59	3.04	28.27	1.96	41.10	0.24	5
10.32	2.74	13.70	2.90	30.22	2.03	38.08	0.29	6
10.22	2.85	14.51	2.76	31.55	2.07	36.03	0.33	7
10.14	2.93	15.12	2.65	32.50	2.09	34.57	0.37	8
10.08	2.98	15.58	2.57	33.21	2.10	33.48	0.41	9
10.03	3.02	15.94	2.50	33.76	2.11	32.65	0.45	10

V. RESULTS AND DISCUSSION

In this study, the effect of value-added of banking on the value-added of services sector during the period 1338-1392 were studied through the vector error correction model (VECM) and Johansson co-integration test. The results of Johansson co-integration model showed that the banks added value coefficient, the added value of personalized service, professional services and value-added of real states and the transportation value added were obtained positive and significant statistically. Based on the obtained results, the elasticity of the transportation variable is equal to 0.11 percent, so that an increase of one percent in the transportation value added services caused to increase 0.11 percent in value-added services. The elasticity of variable of personal and domestic value-added services is equal to 0.80 with t=9.80. This variable has a significant impact and has the highest coefficient and effect. The elasticity of variable of value-added banks is equal to 0.05 with t = 2.20 and is significant. Thus increasing the added value of banks has positive and significant impact on the services sector. The elasticity of real estate and professional value-added services is equal to 0.33 with the t=6.81 (the main hypothesis and the second, third, fourth sub-hypothesis are confirmed). The results of analysis of variance showed that in the short term (first period) the personal services, real estate services and then banks has more impact than other variables on value added services. In the medium-term and long-term, the role of banks has the largest contribution among the components of the service sector compared to other components on the value-added services. The error correction coefficient of value added services is equal to -0.51 and t= -5.15 is obtained that the significance of the t statistic indicates long-term causality relationship from components of the service sector (independent variables) to the total value-added services, shows that any deviation from the equilibrium in the long term will move back to the long-term equilibrium. In other words, this means that in each period, -0.51 value will be conditioned from short-term non- equilibrium to achieve long-term equilibrium and represents a long-term relationship between the independent variables with value-added services is established. According to the medium-term and long-term the banks have largest contribution among the components of services sector on the total value-added services, it is recommended that the banks found a new ways trough investment in research and development (R&D) to finance its activities even in critical situations (e.g. sanctions). Also it is recommended that the banks through the efficient allocation of resources and public savings in various sectors including agriculture, business, housing, services can be create more added value so that taken an essential step towards sustainable development. In this study, the effect of value added services of various sectors on the value-added services group was discussed. It is suggested that future researchers through auto-regressive with distributed lag being determination the performance of various sectors on the value-added services so enable to increase the value added through strategic planning.

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