

Investigating the effects of financial intermediates on economic growth in Iran

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Abstract: The aim of this study was to investigate the effects of financial intermediates on economic growth in Iran. For this purpose, time series data were collected from 1340 to 1389. The effects of financial intermediation on economic growth were examined using Vector Error Correction Model (VECM), Johansen method, Co-integration test, Impulse Response Function (IRF), and Variance Decomposition (VD). Generally, the obtained results of estimated model indicated that financial intermediations had positive and significant long term effect on Iran's economic growth, and a shock made positive and continuing changes on economic growth equally as one standard deviation in financial intermediation index. In addition, financial intermediations explained about 24% of economic growth changes which indicates the impact of financial intermediation on Iran's economic growth and it can be concluded that there is a close interaction between financial intermediations and economic growth. The capital stock also has direct and significant impacts on economic growth.

Key words: *Financial intermediates; Economic growth; Vector error correction model; Impulse response function; Variance decomposition function*

1. Introduction

The relationship between savings and investments is provided by either financial markets or financial intermediates such as commercial banks. The efficiency and positive performance of markets and financial intermediates along with impacting the quantity and quality of investment as one of the main basis of economic growth and development have great importance in economy. Financial markets and specifically financial intermediates play an important role in economic prosperity. In fact, the main functioning of financial markets and intermediates is establishing communication between savers and investors. Possibly there might be some people who might have additional financial resources and might not have a special program for them, and yet there might be others who have a lot of ideas which might not be able to achieve them due to financial resources problems. Establishing relationship between these two groups of individuals can totally increase economic efficiency by affecting the production and economic supply side and creating financial context for entrepreneurs. In this case and despite the financial markets and financial intermediates such as commercial banks and pension funds, a win-win game will be formed between savers and borrowers. Therefore the presence of financial markets and financial intermediates, and their proper functioning will have an important role in the economy. Generally

individuals, government, and corporations are faced with two options to meet their lack of financial resources: Financing directly through financial markets, financing indirectly through financial intermediates such as commercial banks. Most savers in economic are families which save their earning surplus in the form of deposits at banks or purchasing shares or bonds. Borrowers are also a combination of households, corporations, and government which are mainly the corporations that are in need of loan for financing their investment projects. Borrowers provide their lack of financial resources directly through financial markets or indirectly through financial intermediates. Economic growth creates demand for financial intermediates, and then creating new financial institutions and services because of the demands from investors and providers react in economy. Banks are considered as the most important financial intermediates between enormous resources of savers and investors. On the other hand, changes in global financial markets and the development of organized financial markets including the stock exchange and new financial innovations that led to the creation of new financial intermediates such as invested companies result in different kinds of financial intermediates' activities and also the combination of their resources and expenses are subject to changes. The financial system experience in Iran suggests the special role and importance of these intermediates in attracting the resources surplus of savers and financing investors.

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Nowadays what considered highly essential in related studies in the field of economy in Iran is investigating the effects of financial intermediations on economic growth. Understanding the interactions between financial intermediates and economic growth, capital supply on economic growth, explaining economic growth reactions to financial intermediation changes, identifying the effective variables on the structure of financial intermediation, economic growth and capital supply, and their behavior and function in terms of econometric models are a small part of the obtained results of this research. From this perspective, understanding this relationship can guide Iranian economic policymakers in different sectors of the economy to codify and provide legal and regulatory policy packages in order to exploit the available potentials in economy and specially support this field. In order to achieve the above goals, the aim of the current study was to assess the effects of financial intermediates on economic growth in Iran.

To this end, this paper is organized in five sections as follows: Section two reviews the related literature including theoretical foundations and empirical research. In the third section, methodology of the study is presented in which the model used in this research and the method of analysis are investigated. Section fourth discusses the empirical results of the study and the final section is devoted to the conclusions and recommendations.

2. Literature review

2.1. Theoretical background of the research

Financial intermediates are corporations which establish savings and loans based on people's deposits, make long-term loans, and thereby increase liquidity and through the integration of a large number of loans reduce the risk of depositors' loan (Khataee, 1378). It should be noted that financial intermediates receive interest or dividends for doing this and pay off some gains to the depositors as well which are usually less than the amount of the profit that they pay over. Financial intermediates can be divided into two categories of depositor and non-depositor. Financial intermediates depositor both pay direct loans to many economic units and invest in securities by using funds from deposits and other financial resources. Some of the most important types of financial intermediates depositors are commercial banks, savings and loan associations, savings banks, and credit unions (Fabozzi, et al., 1948, p. 27).

Non-depositor financial intermediates provide financial services with respect to the financial resources that are at their disposal, but do not act as funds intermediary. The main types of non-deposit financial intermediates are exchange brokers, investment companies, pension funds, insurance companies, money market investment companies, and finance companies (Khataee, 1378, p. 8). Iran's

financial system and its financial intermediates can be introduced mainly by banking system.

Financial intermediates would play an important role in the economic development of the surveyed countries and of course the prerequisite for this is an innovative and private entrepreneur sector which is able to convert the collected savings to effective investments in goods' production and services. The impact of the financial sector can be also effective through increasing the investment's productivity on actual economic sectors (Kelman, 2012, p. 21).

Financial intermediation leads to higher economic growth by affecting the investment level and enhancing investment productivity. The crucial achievements of intermediates are conducting the constant and relatively low flow of funds from savers to the ultimate consumer or investor. Any advanced economy has financial intermediates that are responsible for main financial functions of individuals, households, companies, small firms and new governments (Rosea & Vatypadadvern, 2009, p. 19-17). Financial intermediates integrate traditional assets like mortgage loans and similar issues and sell securities supported by these collected loans in capital markets. Actually they get money through their right for distributing finance and supply them to the participants in the capital markets, and then they invest these funds. These intermediates actions refer to financial functions such as mediating in maturities' adaptation, reducing risk through diversification, reducing transaction and information processing costs, and creating payment mechanisms. The nature of financial intermediation in the field of economy can be defined as an action which guarantees the closeness of involved parties with the aim of making a profit. The benefit and economic role of the intermediation is to reduce exchange and transaction costs between economic units, encourage work, and produce and trade whatever is related to it (Venimiglya & Andres, 2007).

The basis of economic intermediates activities arises from this fact that individuals' recognition of the investment opportunities, financing, capital resources, and also skills in increasing possessions and its management is incomplete and imperfect. Hence, individuals need some people to resolve some of these defects while receive salary in return and as a result satisfy all parties' interest (Pantyr, 2010). The role and importance of the financial system in the process of economic development of the countries is in a way that one can investigate the economic differences of developed and underdeveloped countries regarding the degree of effectiveness and efficiency of their financial system and particularly the role of financial intermediates (Coleman & Davis, 2012, p. 11).

To determine the nature of financial intermediation, it should be noted that financial intermediates mediate between the two parties which have surplus units and deficit units, and are responsible for pushing the surplus wealth of former group to those of later group who are most in need

of help, and make profit from these activities and eventually the aim of financial intermediations is to manage surplus properties not possessing them. Schumpeter (1912) states that the good banks could reinforce technological innovations by identifying and financing program of entrepreneurs who are best prepare to produce new products or perform innovative projects. John Robinson (1952) believes in this theory that the financial system tracks the economy real sector which means that each time the economy real sector develops; the financial sector will develop as well. Generally two different views and theories are stated regarding the role of financial markets on economic growth: based on the first view, financial intermediates are completely passive conduit for conducting households' savings towards investments activities. Followers of this school who are inspired by Robinson's view believe that capital stock and investment rate should be considered as the main development factors and public policies should primarily focus on physical capital accumulation (Khutae, 1378). Jappelli and Pagani (1994), Gertler and Rose (1994), Rasti (1378), and Nazifi (1383)'s studies on Iran's economy can be considered to belong to this category. The second point of view is inspired from Schumpeter (1912)'s views. The followers of this viewpoint believe that markets and financial intermediates have a key role on development and economic growth. They believe that the difference in the quantity and quality of services provided by financial institutions can explain an important part of the different growth rate among countries (King & Levin, 1993, p. 20). Financial intermediations are crucial for growth, as economists like Goldsmith (1969), McKinnon (1973), and Shoaw (1973) demonstrated that financial development and economic growth are positively related among countries. Schumpeter (1912) has stated that financial intermediates promote by identifying and redirecting budget towards innovative projects.

2.2. Research background

In recent years investigating financial intermediation effects on macroeconomic variables such as growth, inflation, and investment has been taken into consideration. Various studies have been done inside and outside of Iran regarding financial intermediates subject which are as follows:

Franckline and Antonios (2012) studied the influence of gradual changes on basic financial intermediates activities on America's economy. Ordinary least squares (OLS) was used in this study to identify the long-run relationship between financial intermediates and America's economy. The results indicated that the position of financial intermediation on America's economy has positive effect due to the financial markets release, the optimal management of coherent financial system, and benefit from the laws and regulations.

Lee (2010) investigated the relationship between financial intermediations and economic growth

function on Canada's economy from 1987 to 2009, using econometric time interval assess and vector auto regression model (VAR). The obtained results demonstrated that financial intermediation had significant effects on economic growth.

Piontkivisky (2010) examined the effects of financial intermediations' development and economic growth, and by considering the new experiences of panel data to countries classifications, and their geographic areas came to the conclusion that there is a reciprocal relationship between economic growth and the development of financial intermediations, but in some parts that the per capita income is low, this relationship is from the development of financial intermediates to economic growth.

In a survey conducted by Solymen and Howels (2011), about four countries Chile, Korea, Malaysia, Philippines, the relationship between economic growth, development of financial markets, and financial intermediates were examined. This study sought to determine the impact of the development of financial markets and intermediates channels on economic growth in the long run. Accordingly, this hypothesis that in endogenous growth models, financial developments cause higher economic growth by influencing the level of investment and enhancing investments productivity was tested. To investigate the causality of this research, the VAR model was employed. The results indicated that the development of financial markets and intermediates increased economic growth through promoting efficiency and investment productivity in these four countries.

Valuable research on the relationship between economic growth and financial intermediates has also been conducted in Iran which some of their results are noted here.

Hosseini, Ashrafi, and Siami (1390) investigated the relationship between financial intermediations and economic growth in Iran with introducing and using new variables such as: Credit provided by the banking sector, the credit granted to the private sector, broad definition of money, Gross domestic savings and also governmentspending variables and trade rate as the real economy sector and inflation in Iran from 1338 to 1388. At first the long term relationship between economic growth and financial development were tested. The results indicated a negative relationship between financial development and economic growth. In addition, the short-term relationship between financial development variables and economic growth were performed using Granger causality test block. The obtained results demonstrated that the provided credit by the banking sector and economic growth are not causality for each other's. Furthermore, the bidirectional causality relationships between economic growth, credit granted to the private sector, and the broad definition of money have been confirmed.

Ehsani (1387) studied the role of financial intermediates in Iran's economy in an interference

generations pattern which its aim was to analyze the effect of removing the factors of making financial repression, creating flexibility in financial system, improving its performance, explaining the effects of the elimination of financial repression on economic growth and per capita income in the long run in terms of the interference generations model. According to the research hypotheses, increasing financial intermediations had positive impact on intermediation investments volume and also on the productivity of investment. Based on the obtained results from the investigation, financial development could increase economic growth, and therefore the presence of financial intermediation and its activity on its own potential was associated with higher growth.

Vali zadeh and Lali (1388) examined the role of financial intermediations to invest in the stock market where the role of financial intermediates to attract savings and provide necessary resources for investment, decrease investment risk and securities management which can have a significant effect on investment have been pointed out. And after explaining the relationship between investment and financial intermediation using the ARDL technique the intended models had been estimated and analyzed and its ultimate result in Iran economy was that agent variables of financial intermediations had significant effect on the investment.

Baimani (1388) investigated the effects of the financial intermediates and Iran's economic growth in which the role of financial intermediates in the endogenous economic growth of Iran was explored. For this purpose, a model of endogenous growth including households, corporations, and financial sector was employed. The analysis was done by VECM (vector error correction model) using Johansen method since 1338 to 1384. The obtained results of the estimated model indicated that the relationship between financial intermediates and economic growth in Iran is negative and amount of its impact on Iran economic growth is minimal, so that it would not even be possible to conclude a close relationship between financial intermediations and Iran economic growth.

3. Model and research methodology

Based on the theories of the different schools, there is a relationship between economic growth and financial intermediates. In this case using simultaneous equations system and investigating long-term relationship between these factors by the Vector auto response (VAR), or vector error correction models (VECM), and evaluating impulse response effects in each one of them on other elements in the form of Impulse response functions, and determining the long-term co-integration relationships between these elements are issues which are being evaluated in new experimental econometric studies. In simultaneous equations system, variables are: endogenous, exogenous or predetermined. According to Sims (1980) if there is

a real synchronization between a set of variables, then this synchronization must be considered identical for all variables and there should not be any predetermined discrimination or prejudice between endogenous and exogenous variables (Noferesti, 1378, p. 109). Since there is synchronization between financial intermediation, capital stock, and economic growth variables, all variables are considered equal and it is not correct to prejudice that whether one variable is exogenous or endogenous. In practice, when there is k variable in a model, the number of k-1 linear independent co-integration vectors can utmost be between the variables of the model. In this case, the long-term relationship between financial intermediates, economic growth, and capital stock can be examined using VAR or VECM models. In this study time series data of the central bank of Iran were collected from 1340 to 1389 in order to evaluate the interaction between financial intermediates and economic growth. It is done in the following model:

$$\begin{bmatrix} GYP \\ PRIVATE \\ KMS \end{bmatrix} = \sum B_p \begin{bmatrix} GYP_{t,p} \\ PRIVATE_{t,p} \\ KMS_{t,p} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \end{bmatrix} \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} \\ \beta_{21} & \beta_{22} & \beta_{23} \end{bmatrix} = \begin{bmatrix} GYP_{t,p} \\ PRIVATE_{t,p} \\ KMS_{t,p} \end{bmatrix} + \begin{bmatrix} u_{GYP,t} \\ u_{PRIVATE,t} \\ u_{KMS,t} \end{bmatrix}$$

In first phase, the stationary or non-stationary of the data of the research was investigated according to constant data using unit root test. Also the augmented Dickey-Fuller test was used in this study. In second phase, Johansen test was used to examine the long-term relationship between variables, after determining the degree of non-stationary of variable. And finally in the third phase, the vector error correction model was used to evaluate the short-term behavior towards the long-term error.

3.1. Introducing the variables of the model

The variables examined in this study include per capita gross domestic production (GDP) growth index to actual prices (GYP) which is the only growth index that is used to reflect the developments of real sector of economy and is an appropriate measure to demonstrate economic growth.

To measure financial intermediations various indexes should be investigated. In this study, the ratio index of the paid credits of commercial and specialized banks to the private sector to total granted credit by the banking system and the central bank is used (PRIVATE). This index is designed to provide a picture that how credits are distributed and directed to private sector by financial intermediates.

The capital stock index (KMS) was used and when it is high indicate both high levels of domestic investment, and the development of a country's

financial systems. K is used as a substitute for the physical and human combined capital as well.

3.2. Hypothesis testing

Financial intermediation has a positive effect on economic growth in Iran.

This means that since the roles and effectiveness of the financial intermediaries activities have been examined over years, economic growth has increased in Iran and this is simply due to the positive effects of financial intermediaries functions as one of the basic components of the financial markets in developing financial sector and useful interface between savers and borrowers and by this function, flexibility and diversity in financial markets can be shaped which in turn could lead to developing economic growth.

4. Analysis of the model

In order to find a long-run relationship between the under-studied variables like financial intermediaries and economic growth in this study, time-series data method was used which its data has been extracted from the economic report of statistics set from 1340 to 1389. Johansen's co-integration model was used to identify long-run relationship between the model variables, and then after determining the long-term relationships between variables, in order to examine the short-term relationship between the variables, the vector error correction model (VECM) was used. Co-integration means that between two variables which both are individually non-stationary; there is a long-term equilibrium relationship. In addition, co-integrated variables have also an error correction model that represents the short-term relationship between them. It is also practically possible to use co-integration technique from various techniques like Engle-Granger, Engle-Yoo. But Johansen method as the most preferred method can identify and determine long-term relationships if there are two or more variables (Enders, 1995). This method is based on a vector auto regressive model (VAR) in which determining the number of co-integration vectors is done by maximum likelihood. The number of co-integration vectors can be identified by determining the matrix rank. Johansen maximum likelihood method determines special relation or long term equilibrium relationships between variables of the model by using the maximum Eigen Value Test and Trace Test statistic. Firstly, the effects of financial intermediaries on economic growth were analyzed using vector error correction method, the Impulse Response Function (IRF), Variance Decomposition (VD), and Johansen technique.

4.1. Estimating the model and analysis of the data

Econometric modeling is based on the assumption of time series static variables by using

time series traditional and conventional methods. Accordingly, it is generally assumed that the mean and variance of the variables are constant over time and the covariance between the two values of time series variables depends only on the time interval between them. But macroeconomic variables often contain a random process (unit root) which could be eliminated by getting the differences of mentioned process. Since the presence of this trend might invalidate statistical estimations and inferences, therefore the first step for econometric analysis is to make the variables static. The random trend of variables (unit root) would be specified by unit root tests. Different tests could be done to check that variables are static such as Augmented Dickey-Fuller Unit Root Test for the desired static variables. In time series data before analyzing and estimating model equations, unit root test should be done to determine stationary of the time series variables. The main assumption in traditional econometric techniques is that all time series are stationary over time or are in the range of Median value. However, several other studies have shown that most of the macroeconomic time series are non-stationary. In this way and in order to determine the appropriate series conversion to achieve stability, it is required to test all variables; in other words, it is necessary to know a variable degree of integration. It can be said that time series X_t is integrated in terms of rank d if after d getting difference rank become static (Nofresti, 2010).

Augmented Dickey-Fuller test was used to determine the degree of stagnation in this study. This test is used to identify stationary or non stationary time series from estimation relationship.

$H_0 =$ unit root

$H_1 =$ no unit root

In this test, t is time process, Δ is first rank difference, and p is the number of delays. Null hypothesis in augmented Dickey-Fuller test is that 0 $H_0: \delta = 0$ which its acceptance means that the desired time series is non-stationary. In table (1-4) this test was performed once with the process variable ($0\beta \neq$) and once without the process variable ($\beta = 0$). The results of augmented Dickey-Fuller test indicated that all the variables are not in stationary level, because the absolute values of all statistics of Dickey Fuller are less than the absolute values of critical values. But after getting a difference, all the variables became stationary, so all variables are I.

4.2. Estimating the optimal interval

Johansen co-integration analysis involves determining the optimal delay length of the vector auto response model (VAR). In order to do the co-integration test, the model must firstly be estimated by vector auto regressive method (VRA) and to estimate the models usually estimated the model with the largest delay, and then after first estimation of the model, the optimal number of delays are selected by using the criteria, and again based on these obtained delays, the model will be estimated

(Abrishami, 1388). After estimating this model co-integration test was performed.

Table 1: Unit root test with under-studied process variable and without process variable

Statistic value (ADF) in the first-order difference				Statistic value (ADF) in level				Variable
Possibility	Constant value and trend (process)	Possibility	Constant value	Possibility	Constant value and trend (process)	Possibility	Constant value	
0/10	3/15	0/14	2/39	0/25	2/66	0/51	1/52	GYP
0	6/60	0	6/07	0/98	0/26	0/67	1/17	PRIVATE
0/08	3/27	0/292	1/98	1/00	2/20	1/00	3/40	KMS

Source: Research Calculations

There are various and different criteria to determine the optimal delay length. Akaike (AIC), Schwarz and Beizien (SC), and Hannan-Quinn (HQ) criteria were used in this study. The desired model of this study was estimation of intervals between 0 and 4, and their AIC, SC, and HQ was calculated. Results

of the table (2-4) showed that delay 1 minimized the AIC, SC, and HQ criteria. Since Schwarz-Beizien criterion follows the parsimony principle and is more suitable for the low number, the optimal delay model one would be selected.

Table 2: Test for determining the optimal delay number of the Vector auto response model (VAR)

HQ	SC	AIC	FPE	LR	LogL	statistic The number of delays
52/24776	52/32234	52/20308	9/42e+18	NA	1197/671	0
42/24544*	42/54378*	42/06674*	3/74e+14*	442/1612	955/5350	1
42/61187	43/13396	42/29915	4/74e+14	6/197013	951/8804	2
42/58991	43/33575	42/14316	4/11e+14	19/70267*	939/2926	3
42/90979	43/87938	42/32901	5/09e+14	6/779697	934/5673	4

Source: Research Calculations

4.3. Co-integration test based on the statistic of trace test

In this section using Johansen method, the estimation of long-run coefficients of the model is discussed. To this end, firstly the number of co-

integrated vectors should be identified using the statistic of Trace test (λ trace). The results of this test are presented in table 3. According to the results of Trace test, the presence of (1) co-integrated vector at 5% level is confirmed.

Table 3: Co-integration test based on the Trace test (λ Trace)

The number of vectors of Hypothesis H0	Specified root Eigen value	Statistic Trace	Possibility level 0.05	Prob
None	0/320213	33/21706	29/79707	0/0194
At most 1	0/236763	14/69021	15/49471	0/0658
At most 2	0/035224	1/721234	3/841466	0/1895

Source: Research Calculations

4.4. Estimating co-integration equation of vector error correction model (VECM)

Since the variables of the model were not stable, but were co-integrated, it was more appropriate to used (VECM) model than (VAR) model. The obtained results of estimating the vector error correction model are presented in table (4) which was used to examine the role of long-term and equilibrium relationships of variables in damping the short-term modulation and investigating short-term dynamic behavior of the under studied variables. Vector error

correction model is a kind of partial equilibrium models in which short-term influential forces and the speed to approach to long-term equilibrium value is measured by entering the stable residue from a long-term relationship. In these models, if the error correction coefficient appears with negative sign, it will be the indicator of the error correction rate and tendency to long-term equilibrium. This index indicated that how many percentage of imbalance dependent variable was damped and approached to long term relationship.

4.5. Estimating Johansen co-integration model

This phase is devoted to determine the long-term relationship between the estimated model variables to the desired endogenous variable. It should be noted that while selecting the long-term vector among model variables, the normalized vector to endogenous variables should be consistent with

economic theories in terms of the signs of the coefficients and the vector coefficients should be statistically significant as well.

Table 4: The results of estimating the vector error correction model (VECM) model variables

Variable	GYP	PRIVATE	KMS
C(Intercept)	D(GYP)	D(PRIVATE)	D(KMS)
CointEq1	0/006545 (0/79257)	1/95E 08 (1/71467)	0/027372 (4/27123)
D(GYP(1))	0/158478 (1/05642)	3/60E 08 (0/17481)	0/021598 (0/18551)
D(PRIVATE(1))	41703/81 (0.36549)	0/006413 (0.04090)	100321/5 (1.13290)
D(KMS(1))	0/150094 (0.71263)	2/03E 07 (0.70271)	0/227657 (1.39278)
C	1720/897 (0.21546)	0/006919 (0.63042)	27498/41 (4.43635)

Source: Research calculations; numbers in parentheses indicate the t-statistic at the 5% level

Table 5: vector of convergence

Variable	GYP	PRIVATE	KMS	C (Intercept)
VECM	1/000000	3085303/0 (1/98297)	2/561515 (5/04007)	3387475

Source: Research calculations; numbers in parentheses indicate the t-statistic at the 5% level

Since Johansen method only determines unique co-integrated vectors in integration space, on the other hand, each linear combination of the stable vectors results in other invariant vectors, therefore the provided estimations are not necessarily unique for each specific column of coefficient β . So it is necessary to imposed constraints based on economic theories or any previous information out of model and exogenous on co-integration vectors coefficients to identify long-term relationships. In this case the constraint $\beta (1, 1) = 1$ was imposed on model coefficients and again its coefficients have been estimated, so the co-integration vector shows the relationship of financial intermediates on economic growth in Iran in which the related coefficients are statistically significant.

Based on the obtained results of the co-integrated vector in table 5, 1 unit increase in the variable GYP (Gross Domestic Product), make changes in PRIVATE variables (index of financial intermediation) and KMS (capital stock). These changes are such that 1 unit increase in economic growth rate leads to an increase in the amount of financial intermediates (3085303) and also 1 unit increase in economic growth rate increases the capital stock value to (2/561515).

The amount of granted credit by commercial and specialized banks which explains financial intermediation role in Iran provided the economic growth and in fact the impact of financial intermediation of commercial and specialized banks in the form of money bank has led to this growth. Moreover, increase in capital stock increases the real

economy sector share, and the service sector share especially subsectors of banking money services in general have increasingly positive effect on gross domestic production (GDP).

4.6. Impulse response function (IRF)

Instant impulse response functions are used as an appropriate tool for obtaining information about the interaction between the variables in dynamic models. These functions indicate the dynamic system path in response to imposed shocks as one standard deviation. In other words, these functions represent stability direction and the responses that endogenous variable gives to shocks resulting from errors. These functions separate the related components of the endogenous variables from shocks, and then specify the impact of changes in the mutation in the size of one standard deviation of shocks on the current and future values of the endogenous variables. Based on VECM model, and Fig. 1 which represents impulse response function in research appendix, the effect of one unit momentum to variable (GYP), its response to its growth variable (GYP) has a positive and significant effect while indicate growing and progressive condition over time. Because of a one unit momentum to (GYP) variable, its response to growth variable (PRIVATE) has a significant positive effect which indicates that the gross domestic production growth explains all its own variables and a share of changes which was explained by financial intermediation index has increasingly growing trend in the next periods. Because of a one unit momentum to (GYP) variable, its response to the growth variable (KMS), at the beginning of period has a negative and descending trend, but it indicates a constant trend and then a positive and progressive mode after passing a certain period of time.

Because of a one unit momentum to (PRIVATE) variable, its response to the growth variable (GYP),

typically has a stable and durable state and has been growing over time. Because of a one unit momentum to (PRIVATE) variable, its response to the growth variable (PRIVATE), expresses a positive effect and increasing growing trend. Because of a one unit momentum to (PRIVATE) variable, its response to

the growth variable (KMS) has a positive effect and growing trend over time. Because of a one unit momentum to (KMS) variable, its response to the growth variable (GYP) typically has a stable and durable effect while after passing several successive periods has growing state.

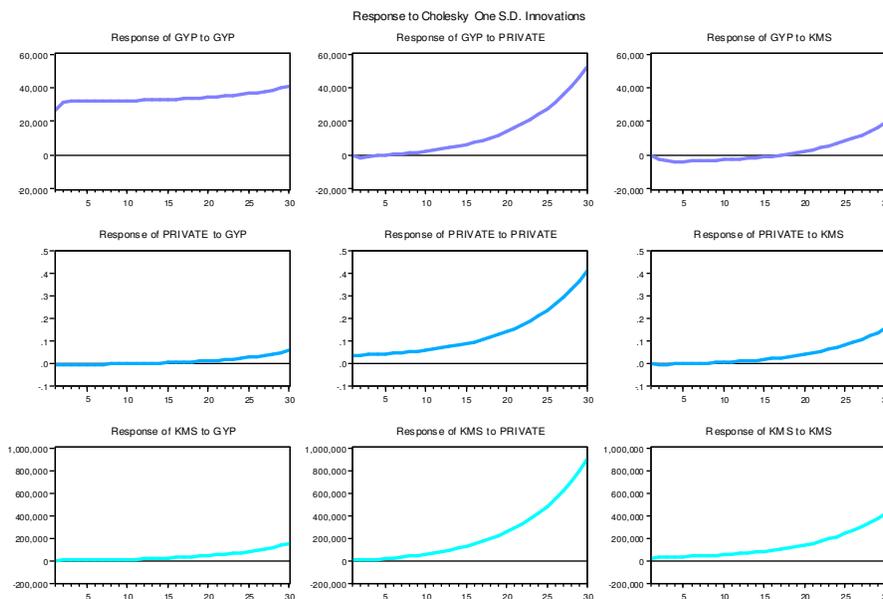


Fig. 1: Variables response

Because of a one unit momentum to (KMS) variable, its response to the growth variable (PRIVATE) has a positive effect and exponential growth. Because of a one unit momentum to (KMS) variable, its response to the growth of the variable (KMS) expresses a significant and positive effect and growing states.

4.7. Variance Decomposition Function (VD)

It is a method that is used for describing the dynamics of a model and is the indicator of the explanatory percentage of each variable of the dependent variable changes over time. In other words it suggests that the some percentages of dependent variable changes are explained by each of the available variables in model over time. In the method of analysis of variance, the power of each of the variables was separately studied and was used as the fluctuation index. How many percentages of the financial intermediation variance is explained by changes of its own variable, gross domestic production growth variables, and capital stock variables will be indicated using variance analysis.

Among the model variables in short-term (uninterrupted ten periods) and long-term (uninterrupted 30th period) its shock of gross domestic production growth has the most explanatory; it means that more than 98 percent and 72 percent in gross domestic production change. Financial intermediation level is in the second place so that in the short term its value does not even approach to 1%, but has a good performance in long-

term, and its value is 24% and shows the financial intermediates changes rate to gross domestic production growth variable. The relative contribution of ineffectiveness of capital stock to gross domestic production growth get to nearly 1% in the short term and to 3% in the long-term. So, gross domestic production growth has greatest contribution to explaining the changes of other variables than other variables in long-term.

Among the model variables in short-term (ten uninterrupted period), and long-term (30th uninterrupted period), financial intermediation shock has the most explanatory on financial intermediation changes, it means more than 99 % and 88 %. Gross domestic production growth level is in the second place, so that its value does not even get to 1% in the short-term and its performance is 1.2% in long-term, and shows change rate of the gross domestic production growth variable to financial intermediates. The relative contribution of ineffectiveness of capital stock to financial intermediates gets to 0.3% in short-term, and has optimum and appropriate performance in long-term and gets almost to 10 %. So in the long-term financial intermediates variable has the greatest contribution variable in explaining changes in other variables than other variables.

Among the model variables in short-term (ten uninterrupted period), and long-term (30th uninterrupted period), capital shock has the most explanatory on capital stock changes, it means more than 61% and 19%. Gross domestic production growth level is in the second place, so that its value

does not even get to 1.3% in the short-term and its performance is 2.1% in long-term, and it shows change rate of the gross domestic production growth variable to capital stock variable. The relative contribution of ineffectiveness of financial intermediate to capital stock gets to 37% in short-term, and has optimum and appropriate performance in long-term and gets to 78 %. So in the long-term financial intermediates variable has the greatest contribution in explaining changes in other variables than other variables.

These results are presented in tables 1 to 3 in the Appendix of the study.

5. Conclusions and recommendations

In sum, the obtained results of the effects of financial intermediates on economic growth in the Iran indicated that a one unit momentum to financial intermediates has appropriate and considerable performance so that for gross domestic production growth variable and its national intermediation and capital stock express a progressive and growing trend both in short and long-term. According to the theory of financial intermediates impact on economic growth in Iran, the short-term and long-term significant tests coefficients demonstrated that the role and activities of financial intermediates impact on gross domestic production growth and capital stock and has a significant positive effect. Finally, based on the findings, the following recommendations regarding the role and activities of financial intermediates are stated:

1. Regarding the current economic situation of Iran which has a stagflation, increasing financial intermediation activities and roles could change Iran economic situation from recession to growth and due to the positive impact of financial intermediation on economic growth, increasing their activities and functions could pave the way for economic growth in the future.

2. To increase the efficient functionality of banks, orient banking facilities in the regulation framework, specialized investigations towards effective economic sector, and create value-added and productive activities and/ or knowledge-based and entrepreneurs projects.

3. Financial intermediation could lead to economic growth if it could provide appropriate field for optimal allocation of resources and increase capital efficiency. In other words, the main channel of influencing and transferring positive effect of financial intermediation on economic growth is through increasing the capital.

4. The role of saving is very important in determining investment and economic growth. It can maintain and reinforce high savings ratio to gross domestic production and a high tendency to save among different classes of society by providing incentive policies and can facilitate entering direct and indirect foreign investment to country through providing necessary mechanisms to use all sources

in order to achieve a dynamic and developing economy in long term horizon.

5. It is necessary to pay serious attention to remove barriers to economic activist in order to supply financial resources, developing financial markets can be done through investment volume and performance, this factor can affect the activities of financial intermediates development.

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