IJBPAS, March, 2015, 4(3): 1326-1334

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

THE INVESTIGATION OF RELATIONSHIP BETWEEN FINANCIAL DEPTH AND SAVING ON ECONOMIC GROWTH IN IRAN (1991-2012)

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ABSTRACT

Among the objectives of the economies in all time is achieving an efficient economic system and High and sustained economic growth. Economies are required to have real and strong financial sectors. On the other words, varieties of factors are effective on economic growth that financial sector development and saving are the most important of them. The objective of this research is to study the relationship between financial depth and saving on economic growth in Iran during the year 1991 to 2012. For approaching to this aim, this research has used from vector error correction model and Granger dynamic causality test. The main results of this study indicate that savings and financial depth variables has significant and positive effect on economic growth in a way that with one percent increase in each of these two variables, economic growth will increase in order of 1.47 and 0.44 percent. Also, there is bidirectional causality between variables saving and economic growth and also between variables saving and financial depth and there is directional causality between variables financial depth and economic growth from financial depth to economic growth.

Key words: Financial Depth, Saving, Investment, Granger Dynamic Causality

INTRODUCTION

The relationship between financial development and economic growth has been tested widely in many developing countries; much of the researches have focused mainly in Europe and Latin America and especial studies which has considered the casual

relationship between financial development and economic growth in Middle Eastern Countries, are low. In addition, mainly, the studies use from bivariate framework for testing the causality relationship between financial development and economic growth. Now, it is clear that the results of bivariate causality test between financial development and economic growth might be invalid because of deleting important variable which is effective on financial development and economic growth in causality model. In the other words, identifying the third variable in causality framework might not change only the direction of causality, but also change the estimated amount. In addition, some of these studies have used temporal pattern that generalize the causality relationship between financial development and economic growth among countries. Therefore, the objective of the present research is to study the causality relationship between financial development and saving on economic growth in Iran with using of three variables pattern. For this purpose, the simultaneous effect of financial development and saving on economic growth has been evaluated with inserting gross domestic saving variable in model.

Review the literature of topic

The relationship between financial development and economic growth always has been investigated since 19 century. Most studies have been presented for the benefit of supply view, where it is expected development of financial sector is further than development of reality sector. It has been presented three views in literature about the relationship between financial development and economic growth. First view argues that financial development is important and it leads to further economic growth. Recently, this view has been supported widely by **Makinon (1973) and Shau (1973)**. But the second view emphasis that economic growth leads to develop the financial sector. Whereas, the third view claims that the financial development and economic growth are causal for each other. Therefore, there is bidirectional causality between financial development and economic growth.

Supply advanced view is supported strongly by Shoompiter. He argues that investment leads to economic growth and financial institutions are minimum requirement for creating economic development in capitalist's countries. Based on his idea, a well-functioning banking system identifies innovation of technology, the budget and sources are allocated to entrepreneurs who have best chance in performing successful in innovative production process. In the year 1952, Robinson tried to bring this issue to

challenge. His argue was developing real sector leads to economic growth and where there is an economic growth, developing financial sector will come follow which is bidirectional relationship. Patrik in the year of 1966 adapted two paradoxical theories with the reason that the direction of causality will change between financial development and economic growth during the developmental period. From his point of view, financial development is able to induce real innovation investment and by creating sustainable economic growth prepare the possibility that economic growth causes developed in financial market.

The features of experimental model and estimation technique

In this research, the simultaneous effects of financial development and saving on economic growth have been evaluated. The considered variables in this research are defined as below.

- In this study, Y is Gross Domestic Production and N is population. The ratio of Y to N is defined as Gross Domestic Production per capita.
- Financial depth will estimate as the ratio of liquidity to Gross Domestic Production which is the ratio of M2 to GDP in this research that expressed the financial depth.
- Savings is an increase in net wealth during the one accounting period.

Investigation method

In this research, the Ganger dynamic causality test has been used for estimation of the relationship between financial development and saving on economic growth in Iran. The Granger causality test which is based on error correction model between financial development and economic growth, it can be defined based on equations (1) and (2). In these equations, the ratio of M2 to GDP is financial depth variable and the ratio of Y to N is the indicated economic growth variable or per capita income. 1- ECT is the condition for correcting the co integration regression error and μ and $\varepsilon$is residuals of the model.

$$\Delta y/N_t = a_0 + \sum_{i=1}^{n} a_{1i}\Delta y/N_{t-i} + \sum_{i=1}^{n} a_{2i}\Delta M_2/\mathrm{GDP}_{t-i} + a_3\mathrm{EC}_{t-1} + u_t \quad (1)$$

$$\Delta M_2/\mathrm{GDP}_t = b_0 + \sum_{i=1}^{n} b_{1i}\Delta y/N_{t-i} + \sum_{i=1}^{n} b_{2i}\Delta M_2/\mathrm{GDP}_{t-i} + b_3\mathrm{EC}_{t-1} + \varepsilon_t \quad (2)$$

$$y/N_t = \lambda_0 + \sum_{i=1}^{m} \lambda_{1i} y/N_{t-i} + \sum_{i=1}^{n} \lambda_{2i} M_2/\mathrm{GDP}_{t-i} + \sum_{i=1}^{n} \lambda_{3i} S_{t-i} + \lambda_4 \mathrm{ECT}_{t-1} + \mu_t \quad (3)$$

$$M_2/\mathrm{GDP}_t = \varphi_0 + \sum_{i=1}^{m} \varphi_{1i} y/N_{t-i} + \sum_{i=1}^{n} \varphi_{2i} M_2/\mathrm{GDP}_{t-i} + \sum_{i=1}^{n} \varphi_{3i} S_{t-i} + \varphi_4 \mathrm{ECT}_{t-1} + \varepsilon_t \quad (4)$$

$$S_t = \delta_0 + \sum_{i=1}^{m} \delta_{1i} y/N_{t-i} + \sum_{i=1}^{n} \delta_{2i} M_2/\mathrm{GDP}_{t-i} + \sum_{i=1}^{n} \delta_{3i} S_{t-i} + \delta_4 \mathrm{ECT}_{t-1} + v_t \quad (5)$$

The society has been studied in this research is Iran. The required data has been collected from the financial statistics of International Money Fund (IMF) and World Bank Website.

The unit root test results

In this research, in order to avoid spurious regression, it has been dealt with the study of stationary of variables with using of Dickey Fuller Generalized Test.

Variables are stationary in level but they have been stationary in level of 95 percent with one differential. One of the important issues in estimating vector error correction model is determining the number of appropriate lags. In this study in order to determine the appropriate lags, it is used from Akaike criteria, Schwarz, Hannan- Quinn, last prediction error and statistic LR and based on all criteria; the optimal lag length was selected. The results of this test have been shown in **Table (2)**.

Co integration test is used in this level. For this purpose, it is used from Johanson model. Co integration test has shown in **Tables (3) and (4)** based on the tests of the effect and Eigen values.

The results of **Table (3) and (4)** show that inexistence long term relationship hypothesis in model is rejected, because the statistic of effect test is 29.68 which is bigger than its critical amount and the maximum statistic of Eigen value is 18.9 which is bigger than its critical amount and the H_0 hypothesis which is indicated on inexistence of long term relationship, is rejected. The results indicate that there is a long term relationship in model. Therefore, long term equilibrium relationship is shown as below:

G(-1) =-6.17+ 1.47 GS(-1) + 0.44 M2(-1)

(5.02) (2.14)

In the above equation, the number inside the bracket shows the statistic of t. This equation implies that Gross Domestic Saving variable has positive and significant effect on economic growth in long term, in a way that with one percent increase in Gross Domestic Saving, economic growth will increase in amount of 1.47 percent. Also, financial depth variable in long term has significant and positive effect on economic growth, in a way that one percent increase in financial depth index causes 0.44 percent increase in

economic growth. In order to connect long term equilibrium relationship among variables with short term swing, vector error correction model has estimated for economic growth variable that the results has shown in **Table (5)**.

Dependent variable in this estimation is economic growth which is the only government expenditure coefficient in terms of significant statistic. So that one percent increase in variable is caused 0.18 percent decrease in economic growth. Due to the significance of the error coefficient, it is clear that ten percent of imbalance is resolved in each period which indicates that speed of adjustment is partly low and it is moderated in less than ten periods. The results of vector error correction model related to Gross Domestic Saving have been shown in **Table (6)**.

Only financial depth variables with one lag and human capital variable are significant for dependent Gross Domestic Saving variable and the rest of the variables are not significant in terms of statistic. The significance of error correction coefficient means that in each period based on the amount of this coefficient which is 98 percent, it has been moderated 98 percent in each period which is quiet high amount. The results of vector error correction model related to financial depth have been shown in **Table (7)**.

According to the presented results, only financial depth variable with two lags is significant in terms of statistic in a way that with one percent increase in this variable, financial depth is decreased in amount of 0.45 percent which means decrease in financial development. In continue, it has been dealt with the study of Granger causality relationship between saving and economic growth based on **Table (8)**.

Based on **Table (8)** there is a bidirectional causality relationship between saving and economic growth. The results have shown the Granger causality relationship between financial depth and economic growth in **Table (9)**.

In the study of Granger causality relationship between economic growth and financial depth this results have been obtained that financial depth is the causality of economic growth and this is one directional and the results have shown in **Table (9)**. The Granger causality relationship between financial depth and saving has shown in **Table (10)**.

Table 1: the unit root test based on Dickey Fuller Generalized Test for variables first difference

Variable	Statistic ADF	Critical amount1%	Critical amount5%	Critical amount10%	probability	Results
Gross Domestic Production logarithm	-4.20	-4.23	-3.54	-3.20	0.001	Stationary
Saving Gross Domestic logarithm	-7.51	-4.23	-3.54	-3.20	0.001	Stationary
Financial depth logarithm	-4.90	-4.23	-3.54	-3.20	0.002	Stationary
Final private consumption logarithm	-6.17	-4.23	-3.54	-3.20	0.001	Stationary
The costs of final government consumption	-6.31	-4.23	-3.54	-3.20	0.001	Stationary
Investment logarithm	-5.82	-4.23	-3.54	-3.20	0.001	Stationary
Net export logarithm	-9.18	-4.23	-3.54	-3.20	0.001	Stationary
Human capital logarithm	-4.30	-4.23	-3.54	-3.20	0.008	Stationary

Table 2: determining the number of optimal lag

Lag	LogL	LR	FPE	AIC	SC	HQ
0	109.0526	---	1.68e-0.06	-4.79	-4.01	-4.51
1	172.7189	91.17	9.63e-0.08	-7.66	-6.50	-7.25

Table 3: co integration test based on effect test

Zero hypothesis	Statistics of the effect test	Critical value	p-value
Inexistence of co integration relationship	29.68	27.06	0.0515
Existence of one co integration relationship	10.76	13.42	0.2261
Existence of two co integrations relationship	0.93	2.70	0.3344

Table 4: co integration test based on Eigen values test

Zero hypothesis	Statistics of Eigen value test	Critical value	p-valu
Inexistence of co integration relationship	18.91	18.89	0.0944
Existence of one co integration relationship	9.83	12.29	0.2228
Existence of two co integrations relationship	0.93	2.70	0.3344

Table 5: the vector error correction model with dependent economic growth variable

DG (dependent)	independent
-0.23 (-0.97)	C
0.28 (1.34)	(-1) DG
-0.21 (-1.13)	(-2) DG
0.06 (1.25)	(-1) DGS
0.03 (1.08)	(-2) DGS
0.02 (0.66)	(-1) DM2
0.01 (0.38)	(-2) DM2
-0.01 (-0.11)	CP
0.09 (1.93)	NX
-0.18 (-2.03)	GOV
0.04 (0.62)	INV
0.14 (1.59)	EDU
-0.10 (-2.25)	(-1) ECM
0.62	R^2

Table 6: Vector error correction model with dependent Gross Domestic Saving variable

DG(dependent)	Independent
-1.49 (-1.25)	C
-0.19 (0.17)	(-1) DG
-0.40 (0.42)	(-2) DG
-0.03 (0.15)	(-1) DGS
-0.05 (-0.33)	(-2) DGS
0.38 (2.11)	(-1) DM2
-0.15 (-0.73)	(-2) DM2
-0.82 (-1.36)	CP
0.31 (1.29)	NX
-0.28 (-0.62)	GOV
0.29 (0.83)	INV
1.29 (2.83)	EDU
-0.98 (-4.11)	(-1) ECM
80	R^2

Table 7: vector error correction model with dependent financial depth variable

DG (Dependent)	Independent
0.17 (0.13)	C
-0.39 (0.29)	(-1) DG
-0.55 (0.52)	(-2) DG
0.24 (0.83)	(-1) DGS
0.14 (0.82)	(-2) DGS
-0.11 (-0.05)	(-1) DM2
-0.45 (-1.94)	(-2) DM2
-0.61 (-0.90)	CP
0.09 (0.33)	NX
0.66 (1.32)	GOV
-0.48 (-1.23)	INV
0.35 (0.69)	EDU
-0.17 (-0.65)	(-1) ECM
0.31	R^2

Table 8: Granger causality relationship between saving and economic growth

Zero hypothesis	F-statistic	Probability
Saving is not the causality of economic growth	1.16	0.32
Economic growth is not the causality of saving	1.96	0.15

Table 9: Granger causality relationship between financial depth and economic growth

Zero hypothesis	F-statistic	Probability
Financial depth is not the causality of economic growth	1.31	0.28
Economic growth is not the causality of financial depth	4.88	0.01

Table 10: Granger causality relationship between financial depth and saving

Zero hypothesis	F-statistic	Probability
Financial depth is not the causality of saving	1.65	0.20
Saving is not the causality of financial depth	0.13	0.87

CONCLUSION

In present research, due to the circumstances of macro economy in Iran, the factors which were effective on financial depth relationship, saving and economic growth have been identified and they are inserted to the model as control variables. These variables and factors are such as: private final consumption, government final consumption, investment, net exports and human capital index. According to the obtained results in this research, the hypothesis is confirmed which in amount of the development of financial sector, the economic growth will increase. Its reason is that in the case of developing financial sector, economic ability in mobilization and optimal allocation sources toward the investment activities will increase and in follow we will see the economic growth which is confirmed the ideas of economists like Shoompiter, Hiks and so on. On the other hands, saving has also positive relationship with economic growth which means those with increase in saving, require sources for investment and as follow increase in occupation and production will be prepared. The obtained results from Granger causality relationship also express the existence of bidirectional causality relationship between saving and economic growth. Also, there is one directional relationship between financial depth and economic growth from financial depth to economic growth which indicates that with increase in developing finance because of increase in ability of this sector in allocating optimal sources for investment, the field for growing occupation and production will increase. The causality relationship between financial depth and saving is also bidirectional because with increase in saving, the power of financial sector for allocating sources will be more and with increase in developing financial sector, the willingness of savers for saving and allocating their savings to financial agents will be increased and in follow that the power of financial sector for optimal allocation will also increase and finally it caused to increase in economic growth.

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