Impacts of Rising Interest Rate on Household Welfare, Saving and Investment: A Financial CGE Analysis

Davood Manzoor and Mohammad Abed
Imam Sadiq University, Iran

Submitted: Oct 19, 2013; Accepted: Nov 24, 2013; Published: Dec 4, 2013

Abstract: The interest rate in Iran is artificially fixed under market rate. This paper evaluates the impact of increase in interest rate on real sectors of Iranian economy. We develop a dynamic Computable General Equilibrium (CGE) model including both real and financial sectors. The model contains financial assets, goods and services, labor and capital, saving and foreign exchange markets. The CGE model is calibrated based on Financial Social Accounting Matrix for Iran. We found that households’ welfare would increase substantially (about 7.2%) by duplicating interest rate of credits in banking system. Furthermore, despite the increase in saving by 11.1% in first year, total capital formation of the economy reduces by 10.7 because of the higher costs for loans and credits. In a word, we expect this policy to improve households’ welfare and to intensify labor’s share in production technology.

Key words: Financial Computable General Equilibrium Model - Interest rate - Welfare - Investment

INTRODUCTION

The purpose of this article is to analyze the impacts of changes in interest rate on level of bank deposits, capital formation, households’ welfare and the combination of assets in their portfolios. Analyzing sectoral effects of this economic policy needs to deploy a multi sector model. So, in this paper we use a multi sector and dynamic general equilibrium model that explains interactions between interest rate and real sector of economy.

Interest rate is under control of central banks and is controlled in several ways. However, there is a particular way of controlling interest rate in Iran. In this way, banking interest rate differs in various contracts. Therefore, banking loans are offered based on different rates in economic sectors. In addition, allocating banking resources to different sectors is determined by Central Bank.

Loan’s interest rate affects economy in several ways: in one way, interest cost is one of the costs of production that changes by variation of interest rate. On the other hand, changing interest rate would change people tendency to make deposit in banks. For instance, there are two ways in which decreasing banking interest rate would affect real sectors and households’ welfare. First, reduction in costs of production would causes improvement in production, price reduction and rise in welfare. Second, it would decline saving and depositor’s income which makes a negative impact on welfare. As a whole, the overall effect on welfare is unknown.

From the above discussion, it is cleared that when we decide to choose a higher interest rate, we need more careful attention to consequences of this decision. As changing in interest rate changes resource allocation in economy, households’ welfare and production level in sectors, forecasting these impacts could be helpful to economic decision making system. In this regard, our main question in this paper is: what are the impacts of changes in banking interest rate on real sector’s variable? Who are losers and who are winners? To answer the question of this paper, we utilize a Financial Computable General Equilibrium (FCGE) model. CGE models are used to analyze interactions between production activities and economic agents. As Figure 1 indicates, these interactions are mainly linkages between production, consumption, foreign trade and public sector. Interaction of demand and supply determines production level. Theoretically, the supply of each product is a function of activity level, input prices, output price and foreign prices. The demand is also a function of income, own price, price of substitute goods and foreign prices. Since changing in interest rate
would influence cost of production and households’ income, we expect that demand and supply of markets change. In a real-financial general equilibrium model, the financial sector affects producers and household directly. In other words, changes in financial sectors would change income and costs of households and also cost of production and activity levels. Then, these changes influence demand for goods and services by households and producers. They also affect supply of goods and services. Price signals in markets beside change in households demand and producers’ supply affect import and export indirectly.

Export is a function of exchange rate, activity level, domestic and foreign price of product. If change in interest rate influences these factors, then export will change, too. Import is also a function of income, exchange rate, domestic price and the price of product in foreign world. Thus, changes in interest rate influence export and import indirectly. For more detail on CGE models see Devarajan and Go 1998.

The organization of the paper is as follows. The next section reviews some related literature. Section three describes data; and section four presents the FCGE model. Sections five and six then provide empirical results and conclusions, respectively.

**Literature Review:** Traditional general equilibrium models are based on equilibrium of flow variables. In the case of financial general equilibrium models, some of them have considered flow equilibrium and others have studied stock adjustment. FCGE modeling started two decades ago and its complexity increased gradually. In first versions of Robinson model, one static model was repeated at several periods and growth of stock variables has been defined in every period. They usually were repeated in 5-10 periods (Robinson, 1991). More complicated models have employed rational expectation models in which households maximize their utility during the given period (Devarajan and Go, 1998). At the end of 1980s, researchers tried to revise in the way of modeling financial variables due to the weakness of previous models. With the extension of the microeconomics general equilibrium and aggregated nominal flows, the way of incorporating asset markets into CGE models changed (Robinson, 1989). In most of CGE models after 1990, flow equilibrium takes place according to new flows (Bourguinon, et al 1992). In this method, in some markets –e.g. goods market- still some flows exist. But saving flow in this period is being considered in wealth stock of next period and influence the pattern of capital portfolio allocation between different sectors. Tobin admitted in his Nobel lecture that households make only a portion of stock adjustment in short run and the gap between introducing new information in asset market and households’ reaction may be due to interaction costs and making decision. Moreover, system of simultaneous equations in economic models only represents interactions and interdependencies between economic agents and does not necessarily reflect the coincidence of adjustment, while the economy in the real world needs to pass a time consuming process to adjust (Tobin, 2000). These problems were considered in following models.

Two applied studies have been done in Iran using financial computable general equilibrium modeling. In the first study, Haqiqi (2011) describes how to model the financial variables in computable general equilibrium models with different approaches. In his study various approaches of modeling a financial CGE is introduced. Then, three financial models have been made and compared base on three different approaches. These approaches have been contrasted using a baseline
policy scenario. One scenario is setting a 50% subsidy on saving deposits profit. Results of this scenario indicate that this policy reduces consumption but increases saving. In addition, they show that the structure of households’ portfolio may change because of the increase in attractiveness of investment. In other words, depositing in banks and foreign exchange purchase may diminish but capital formation rises instead. In the other case, the results of flow equilibrium CGE model are similar to static model’s results. But this model cannot explain the impacts on fixed capital formation due to inattention to stocks adjustment. Finally, despite the similar results of the financial model, this scenario admits that production path is moved to a higher path. Overall, comparing the results of mentioned scenarios suggest that static financial CGE and stock adjustment models give more realistic results than flow equilibrium models.

The other study is done by Salami and Javanbakht (2011). They present a real-financial CGE model for the economy of Iran and use it to examine the effects of reducing interest rate of credits on investment and growth. In their study, they simulate a 4% reduction in interest rate of credits in all economic sectors. Results reveal that, following this policy the real GDP and total fixed capital formation face a growth rate of 1.2% and 1.86%, respectively. Employment rises by 0.71% and overall export experiences 2.84% growth rate which leads to the 0.1% improvement of balance of trade. Following a reduction in interest rate of credits, the prices of commodities and services decline which results in reduction of inflation rate by 0.53%. In addition, households’ income and savings increased by 0.54% and 7.83%, respectively.

The current study has some innovations. In Haqiqi’s study fund market has not modeled and Salami and Javanbakht’s study is actually a real general equilibrium model which does not include financial markets. Also, it seems that modeling of funds market with fixed rate has not been done in the world.

To evaluating the impacts of raising interest rate, we introduce the concept of implicit subsidy for interest rate. Then, by removing this implicit subsidy, the amount of changes in variables of economy’ real sector has been calculated.

**Data Description:** General equilibrium modeling requires data on the interactions between sectors and economic agents. Input-output (IO) table and Social Accounting Matrix (SAM) are two appropriate data sets for these models. The SAM is a square matrix which contains all the interactions and monetary flows between economic agents and sectors. Table 1 is a simple example of this matrix that includes almost all relationships existing in Figure 1.

Available data in the SAM is not enough for modeling financial variables. For modeling a financial CGE the information about interactions of the financial agents and also financial variables must be available. The Financial Accounting Matrix (FAM) provides a suitable structure for financial modeling, because it represents agents’ assets and liabilities with respect to each other. Since in this matrix a flow of money goes from an agent to another agent, a financial asset is a liability of one agent to another. So, these assets and liabilities can be shown in a square table such as Table 2.

In the FAM, liabilities of agents are arranged in columns and assets in rows. Thus for instance, the intersection of “Household” row and “Institutions” column is an asset of household and a liability of institutions (shares); likewise, the intersection of “Banks” row and “Household” column is an asset of banks and a liability of household (loans). In this table, the main diagonal is empty, because its cells represent agents’ liabilities towards themselves and it is meaningless.

While using the FAM, three points are important. First, it is probable that each study analyzes only a portion of these assets, so other sectors may be considered as aggregate. Second, this matrix does not include all needed data for financial CGE modeling. For example, one of characteristics of each asset is its return, but return rate on assets cannot be determined by this matrix. Also, increase or decrease in value of assets is indistinctive in the FAM. For considering these variations we use “Revaluation account”. Third, if money base is defined based on total non-state agents’ claims, then available data in “Central Bank” column can represent money base.
The Model: Our model is an extension of Shamoradi et al. (2010) study. Producers’ behavior is modeled through Nested Constant Elasticity of Substitution (NCES) functions. Producers combine labor and capital with the other intermediate inputs in order to produce products. Output of each sector is produced using capital (K), labor (L) and intermediate goods (M). Intermediate goods and services are divided into tradable and non-tradable goods. Produced goods are also divided into domestic supply and imports using a Constant Elasticity of Transformation (CET) function. The nested form of production sector is shown in Figure 2.

The model is formulated in the form of a Mixed Complementary Problem (MCP). The endogenous variables in this model are divided into activity level (AL) and price index (P) variables. The model’s parameters include elasticity of substitution in different nests (shown by $\gamma, \sigma, \pi, \beta, \tau$ symbols) and technical coefficients or shares parameter (shown by $\theta, \omega, \phi$ symbols).

The general form of each agent’s production structure can be written as follows:

$$AL_k \left[ \left( \omega_{K,L,s}P_{K,L,s}^{1-\sigma_{K,L,s}} + \omega_{M,s}P_{M,s}^{1-\sigma_{M,s}} \right) \frac{1}{1-\sigma_{K,L,s}} - \sum_i \omega_i \frac{1}{1-\tau_i} \right] = 0,$$

$$AL_k \geq 0, \left( \omega_{K,L,s}P_{K,L,s}^{1-\sigma_{K,L,s}} + \omega_{M,s}P_{M,s}^{1-\sigma_{M,s}} \right) \frac{1}{1-\sigma_{K,L,s}} \geq \sum_i \omega_i \frac{1}{1-\tau_i}$$

**CES unit cost function**

**CET unit revenue function**
In the above relation, \( s \) and \( i \) point to sectors and products. As can be seen, MCP problem consists of two inequalities and one equation which is similar to Kuhn-Tucker problem. Value-added and intermediate goods price indices are represented by \( \text{PKL} \) and \( \text{PM} \), respectively. In this relation, \( \Delta L_s \), \( \omega_{kl,s} \), \( \omega_{im,s} \), \( \omega_c \), and \( \tau \) depict activity level of sector \( s \), labor and capital shares of total production cost, intermediate goods and services share of total production cost, elasticity of substitution in first nest, product \( i \)'s share of total income of sector \( s \) and elasticity of transformation between one sector's product, respectively.

As equation 2 shows, labor and capital combine together in a CES function in the nest of value added:

$$ P_{kl,s} = \left( \theta_{s,kl} \left( 1 - \sigma_{kl,s} \right) + \theta_{s,w} \left( 1 - \sigma_{kl,s} \right) \right)^{-1} $$ \hspace{1cm} (2)

In this equation, \( P_{kl,s} \), \( w \) and \( r \), are labor and capital price indices in sector \( s \), wage index and return on capital, respectively. Share of capital and labor in value added nest is shown by \( \theta \). \( \sigma_{kl,s} \) is also the elasticity of substitution between labor and capital in sector \( s \). Similarly, the composition of intermediate goods and services can be written as follows:

$$ P_{m,s} = \left( \sum_g \omega_{g,m,s} \left( 1 - \sigma_{g,s} \right) \right)^{-1} $$ \hspace{1cm} (3)

in which, \( \theta_{s,} \), \( \sigma_{s,} \), \( P_s \) are good \( g \)'s share in intermediate good's cost, elasticity of substitution in intermediate nest and price index of good \( g \), respectively.

Intermediate goods can be either domestic or imported. It is assumed that imported and domestic goods are imperfect substitutive. If \( P_d \), \( P_m \), \( \sigma \) and \( \theta \) represent domestic price index, imported price index, elasticity of substitution and share parameter, then composition of imported and domestic is as below:

$$ P_g = \left( \theta_{d,g} P_{d}^{1-\sigma_{d,g}} + \theta_{im,g} P_{im}^{1-\sigma_{im,g}} \right)^{1/(1-\sigma_{d,g})} $$ \hspace{1cm} (4)

**Household Expenditure Structure:** Households devote their income to consumption and investment goods. Investment goods are mainly construction, machinery and equipment and jewelry. Thus, they can be tradable or non-tradable similar to consumption goods. Figure 3 exhibits the nest form of households’ expenditure.

According to the nested structure, household expenditure can be explained as a MCP problem in which one price index (PW) has been defined based on Hicksian Welfare index. So, the following relation can be written for the nest of consumption goods and services:

$$ C_{h,t} \left[ \sum_g \omega_{g,h} P_{g}^{1-\gamma_g} \right]^{1/(1-\gamma_h) - PC_{h,t}} = 0 $$ \hspace{1cm} (5)

in which, \( C_h \) is households consumption index and \( \omega_{g,h} \) is good \( g \)'s share in the household expenditure basket. \( \gamma_g \) and \( P_g \) are, respectively, elasticity of substitution between consumption goods of households and good \( g \)'s price index.

Here every intermediate good can be imported or domestic like production. It is assumed that imported and domestic goods are imperfect substitutive. If \( P_d \), \( P_m \), \( \sigma \) and \( \theta \) represent domestic price index, imported price index, elasticity of substitution and share parameter, then composition of imported and domestic is as below:
Households earn income by supplying labor and capital, as well as transfer payment.

\[
Y_H = \sum_{t=1}^{T} \left( w_t L_{H,t} + i_t Z_{H,t} + TR_{H,t} - SUB_{H,t} \right)
\]

where, \( Y, L, Z, i, TR \) and \( SUB \) are, respectively, household income in its total lifetime, labor stock in time \( t \), household’s portfolio and its return, transfer payment and sum of the implicit subsidies.

**Dynamics of the Model:** In this model, households should solve their lifetime maximization problem to determine consumption in each period. This problem is formulated as a Ramsey Problem.

\[
\max \sum (1 + \rho)^{-t} U_h(C_{h,t})
\]

\[
U_h(C_{h,t}) = \frac{C_{h,t}^{1-\theta_h} - 1}{1 - \theta_h}
\]

where, \( t \)- time periods, \( \rho \)- individual time-preference parameter, \( U_c \)- utility function of households, \( C_{h,t} \)- household consumption in period \( t \) and \( \theta \)- relative risk aversion parameter.

By solving household’s problem due to lifetime total budget, the following relation is obtained:

\[
\frac{C}{\theta} = r + \rho
\]

in which, \( r \) is capital interest rate. This relation depicts the optimal consumption path of households during their lifetime.

**Financial Behavior of Households:** It is assumed that institutions save part of their income. In this model saving level of institutions is determined based on income level and saving rate. Institutions investment is performed in three ways: financial portfolio, inventory and fixed capital formation. So, a CES harmonic mean for allocation of resources to these three shapes of investment is:

\[
Z_H = \left( \frac{1}{\sigma_{H,KF}} + \frac{1}{\alpha_{H,QA}} + \frac{1}{\alpha_{H,NV}} \right)^{-1} \left( \frac{\sigma_{H,-1}^k KF_{H}}{\sigma_{H}^k} + \frac{\sigma_{H,-1}^{\sigma_{H}}^a QA_{H}}{\sigma_{H}^a} + \frac{\sigma_{H,-1}^{\sigma_{H}}^n NV_{H}}{\sigma_{H}^n} \right)
\]

where \( Z \) is total portfolio, \( QA \) is financial portfolio, \( NV \) is inventory, \( KF \) is fixed capital formation. \( \alpha \) and \( \alpha \) are share and substitution between portfolio assets parameters, respectively.

For financial portfolio a CES harmonic mean has been considered which is composed of the composition of shares, deposit and bonds.

\[
Q_{HA} = \left( \frac{1}{\alpha_{HA}^D} + \frac{1}{\alpha_{HA}^{SLT}} + \frac{1}{\alpha_{HA}^{NIO}} \right)^{-1} \left( \frac{\alpha_{HA}^D H_{EQT}}{\alpha_{H}^D} + \frac{\alpha_{HA}^{SLT}}{\alpha_{H}^{SLT}} H_{BND} + \frac{\alpha_{HA}^{NIO}}{\alpha_{H}^{NIO}} H_{BLN} \right)
\]
where, BND, BLN and EQT are, respectively, bond, deposit and shares. \( \alpha \) and \( \lambda \) are also substitution and share parameter in financial portfolio. Interest rate of deposits is considered endogenously in this relation, but in the model it is considered exogenously for estimating the impacts of change in profits.

**Demand for Financial Assets:** Using the harmonic mean of institutions’ portfolio, share of each asset is determined in portfolio basket and therefore, demand and supply of financial assets will be defined. By solving the optimization problem of institutions, households’ demand for bonds will be as bellow:

\[
D_{BND,H} = \delta_{FA,H} \lambda_{BND,H} s H Y_H \left( \frac{i_{FA,H}}{i_{FA,H}} \right)^{\alpha_H} \left( \frac{i_{FA,H}}{i_{z,H}} \right)^{\sigma_H}
\]  

in which, \( D_{\text{eq}} \) is demand for bond, \( Y \) – household income, \( \bar{a} \) – share of financial portfolio in total portfolio of household, \( \alpha \) and \( \alpha \) – elasticities of substitution, \( \lambda_{\text{BND}} \) share of bonds in financial portfolio, \( s \) – saving rate, \( i_{\text{eq}} \) – index of return rate on bonds, \( i_{z,H} \) – index of return rate on financial portfolio, \( i_{z} \) – index of return rate on total portfolio, \( \bar{a} \) – subscript of total portfolio, \( FA \) – subscript of financial portfolio, \( A \) – subscript of financial assets.

Household demand for bonds is also as follows:

\[
D_{EQT,H} = \delta_{FA,H} \lambda_{EQT,H} s H Y_H \left( \frac{i_{EQT}}{i_{FA,H}} \right)^{\alpha_H} \left( \frac{i_{FA,H}}{i_{z,H}} \right)^{\sigma_H}
\]  

in which, \( D_{\text{eq}} \) is demands for shares, \( \lambda_{\text{EQT}} \) is share of shares in financial portfolio, \( i_{\text{eq}} \) is index of return rate on shares and other symbols are as previous equation’s.

Correspondingly, it can be shown that household depositing function is:

\[
D_{DEP,H} = \delta_{FA,H} \lambda_{DEP,H} s H Y_H \left( \frac{i_{DEP}}{i_{FA,H}} \right)^{\alpha_H} \left( \frac{i_{FA,H}}{i_{z,H}} \right)^{\sigma_H}
\]  

in which, \( D_{\text{eq}} \) is demand for depositing, \( \lambda_{\text{DEP}} \) are demand of deposits in financial portfolio and index of deposit rate and other symbols are as previous equation’s.

Therefore, depositing in banks has a direct relationship with relative rate of deposit and an adverse relationship with rate of substitutive assets. Saving rate, households’ income and elasticities of substitution are also affecting on depositing in banks.

**Supply of Financial Assets:** Supply of financial assets is done by investors based on production signals. In sum, supply function of financial assets of total economy is as below:

\[
QS_{\text{eq}} = \beta_{\text{eq}} \left( \frac{r}{i_{\text{eq}}} \right) \sum S \omega_{k,s} \theta_{k,s} ALS \bar{Q}_{s} \left( \frac{P_{\text{KL,S}}}{P_{\text{KL,S}}} \right) \sigma_{\text{eq}} \sigma_{\text{eq}}
\]  

\[
QS_{\text{BND}} = \beta_{\text{BND}} \left( \frac{r}{i_{\text{BND}}} \right) \sum S \omega_{k,s} \theta_{k,s} ALS \bar{Q}_{s} \left( \frac{P_{\text{KL,S}}}{P_{\text{KL,S}}} \right) \sigma_{\text{BND}} \sigma_{\text{BND}}
\]  

\[
QS_{\text{BLN}} = \beta_{\text{BLN}} \left( \frac{r}{i_{\text{BLN}} (1-\text{sub})} \right) \sum S \omega_{k,s} \theta_{k,s} ALS \bar{Q}_{s} \left( \frac{P_{\text{KL,S}}}{P_{\text{KL,S}}} \right) \sigma_{\text{BLN}} \sigma_{\text{BLN}}
\]  

1623
In these equations, \( QS \) indicates supply of financial assets or demand for finance through financial asset \( j \) (The symbol \( j \) is used for BND, BLN, EQT). In other words, first and second equations reveal supply of shares and bonds and third equation displays demand function of facilities. The symbols used in these equations are as follow: \( \dot{a} \) –share of each financial asset in finance, \( r \) – return rate of economy, \( i \) – return rate on each financial asset, \( \gamma \) – way of substitution between ways of financing in economy, \( s \) – subscript for economic sectors, \( \varphi \) – share of labor and capital in cost of production in each sector, \( \theta \) – capital share in value added nest in each sector, \( AL \) – index of activity level in each sector, \( Q \) – production level in each sector, \( \sigma \) – elasticity of substitution in production, \( P_u \) – index of labor and capital’s share in each sector, \( P_g \) – index of produced goods in each sector, \( sub \) – rate of implicit subsidy on facilities.

Third relation represents demand for facilities. According to this relation, demand for facilities has an adverse relationship with facilities rate. In other words, a reduction in facilities rate leads to an increase in demand for facilities. However, share of capital in production technology, sectors’ activity level and relative price of products have direct relationship with demand for facilities.

**RESULTS**

In this paper, we have estimated the impacts of increasing interest rate for 10 periods. Rising interest rate might raise households’ income and so their welfare. On the other hand, it might reduce activity level of some production sector.

Evaluating the implicit subsidy rate is a very complicated and time-consuming work. For computing the implicit subsidy rate of loans, we require to have the amount of loans subject to this rate, percentage of allocation to investment and also the average of their rate. We also need to know the interest rate of loans in their free market. Inasmuch as we have access to none of these numbers, it is impossible for us to estimate this rate actually. On the other hand, since our approach in this study is evaluating the impacts of a counterfactual scenario of increase in interest rate, calculating the accurate amount of this rate is not necessary. Therefore, it is assumed that banking loans are subject to a 50% implicit subsidy.

**Model Calibration:** The model of this paper is calibrated based on a Financial Accounting Matrix which is extracted from 2001 Social Accounting Matrix for Iran. For calibrating a dynamic model some specific assumption about the parameters of the model (e.g. depreciation rate and growth rate of population) is required. In this paper, the growth rate of population and the depreciation rate are set at 2% and 5%, respectively. It is also assumed that the economy is on the long-run steady state growth path in the base year, so, the return rate on capital for the Iranian economy is calibrated at 11.6% on its long-run growth path.

Results of simulations reveal that removal of implicit subsidy of loans will increase interest rate, households’ welfare and saving in banks, but it will reduce capital formation in economy, during the time. Results also suggest that households’ welfare will increase by 3.41% in the total 10-year period.

**Change in Household Welfare:** Figure 4 shows the path of households’ welfare index in both base case and after liberalization of interest rate of loans. The welfare index is set at 1 for the base year. Results disclose that in the first

Fig. 4: Path of household’s welfare index before and after rising in interest rate
year, this policy will raise households’ welfare by 7.2%. The amount of change in second to fifth year is, respectively, 5.42%, 4.14%, 2.23% and 2.57%.

The increase in household welfare is mainly due to this fact that removal of implicit subsidies is a distortion in the economy and causes welfare loses. After solving this problem net welfare benefits will create for the economy. Indeed, the increase in households’ income due to the increase interest rate, will compensate the negative impacts of this policy.

Another cause of rising in welfare is rising in wages due to technological changes and substitution between labor and capital. This is because that after rising in capital rent, production technology will be more labor-intensive and less capital-intensive. In his condition, demand for labor will increase and therefore employment will improve. Then, rising in labor’s income will affect households’ welfare positively. As Figure 6 depicts, the amount of increase in labor wage is about 12.5% in the first period and will increase further in future periods.
Change in Total Investment: Results indicate that rising interest rate of loans will bring a reduction in total capital formation in the economy. This amount of reduction is about 10.7% in the first year and 9.2%, 7.9%, 6.8% and 6.1% in the second to fifth year, respectively. It seems that the decline in investment is because of this fact that there is no economic justification for some activities after rising in loans’ rate.

Change in Amount of Banking Depositing: Simulations show that rising interest rate will increase banking depositing. The amount of increase in first year is 11.1%. This change is 9.8%, 8.9%, 8.2% and 7.7% in the second to fifth year.

The increase in the amount of investment despite the decrease in capital formation shows that a structural change has happened in the ways of production
financing. Indeed, people have used depositing more than other instruments and so using other instruments (bonds and shares) will reduce.

**CONCLUSION**

This study simulated the impacts of an increase in interest rate on real sector’s variable of the Iranian economy. The simulation was carried out within a financial Computable General Equilibrium framework using a 2001 FAM for Iran.

The results show that rising the interest rate and liberalization of loans rate have net welfare gains for the economy. So, keeping down of this rate has no economic rationale. In sum, increasing the interest rate leads to allocative changes in the economy. Moreover, those economic activities and firms that have not any economic rationale diminish, but activities with higher return expand. These changes will increase the competitiveness of domestic products.

On the other hand, production technology changes due to increase in interest rate. Considering the increase in average cost of capital, capital-intensive technologies are less attractive and therefore, a substitution toward labor-intensive technologies happens. This substitution brings net welfare gain for labor force. As a whole, simulations of this study indicate that despite the reduction of activity level in some sectors, interest rate liberalization is a good policy and we recommend it.

**REFERENCES**