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Exploring the Economic Effects of Risk Spillovers of Foreign Exchange Rate on Money Market and Macroeconomic Variables in the Economy of Iran via DCGE Model

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Abstract

Risk spillovers are generally occurred simultaneous with business transactions and capital mobility. They can be effective on different economic sectors that one of the most important of these sectors is the money market. In this study, channel of the international risk spillover has been considered given certain circumstances governing the foreign exchange market in Iran, exchange rate and its behavior. Thus, the main questions are as follows: Do risk spillovers of the foreign exchange market influence the money market in Iran? And do risk spillovers of the foreign exchange market influence macro-economic variables in Iran? To respond to these questions, the dynamic computable general equilibrium (DCGE) model has been employed considering the effect that international risk spillovers can have on macroeconomic variables through structural equations. The results revealed that the international risk index from the channel of foreign exchange market influences the money market and macroeconomic variables that the most important of them are inflation, investment and welfare in the current and future situation of the economy of Iran.

Keywords: Risk spillovers; Money market; Business transactions; Capital mobility; DCGE

Introduction

When economy of one country is influenced by situation and direction of other countries, the effect of spillovers is proposed by emphasizing the role of trade and economic cooperation. Economic cooperation can increase business and trans-regional transactions of countries, economies of scale and technology transfer. Therefore, an important element in technology transfer is special emphasis on scientific and helpful use of research and development or in other words, technology commercialization. Likewise, technology transfer depends on factors such as high volume of infrastructures of the existing technology, sources such as technical knowledge, potential for research and development, progress of industrial production, financing system of technology transfer and so on. As there are spillovers in transactions between two countries like technology spillover and investment spillover which can have favourable effects for a country, they may be led to risk spillover that can have unfavorable effects on the economic structure of a country. In general, considering that technology and investment spillovers are from big economic countries to small countries, risk spillovers move in the same direction and the path which determines risk spillovers is through oil and foreign exchange markets. Foreign exchange risk is one kind of financial risk that is created as a result of buying securities that have been published with a different exchange rate. Possibility of this risk is increased when an investor buys properties in different countries. Foreign exchange risk is one of the subset risks of market risk that is occurred due to exchange rate changes. Importance of this risk is increased when a considerable portion of a firm's portfolio is made up of one foreign exchange or several foreign exchanges based on the market status (currency basket). Another situation that is led to foreign exchange risk occurs when a bank has remarkable foreign currency transactions or the banks receive foreign currency deposits and also pay foreign exchange facilities. Foreign exchange risk is created due to exchange rate change. All firms which have transactions with countries having different currency unit outside political borders are exposed to foreign exchange risk. It can influence the firm's capability to repay foreign loans and it also can lead the firm not to act to its commitments toward forward buying of goods from foreign markets.

Hence, the main questions in this study are as follows: Do risk spillovers of the foreign exchange market influence the money market in Iran? And do risk spillovers of the foreign exchange market influence macroeconomic variables in Iran? In order to respond to these questions, this study is organized as below. The research literature is addressed in the next section. Theoretical principles are presented in the third section. Model estimation is proposed in the fourth section and conclusion will be represented in the final section.

Research Literature

Keshavarzian et al. [1] explored the effect of risk spillover of the US dollar rate on crude oil price. The results showed that the causality relationship in the US dollar market and crude oil price in long-term has been one way and from the foreign exchange market to the oil market. Moreover, its reverse is not true. Also, about the volatility spillovers or risk transfer, it can be observed that there is no spillover from the oil market to the foreign exchange market while there are volatility spillovers from the foreign exchange market to the oil market.

Jalaei et al. [2] investigated the effect of exchange rate impulses on investment and employment in Iran through CGE approach by means of GTAP.8 software and annual data of the year 2007. The results indicated that total investment is in line with exchange rate changes

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in all regions under study. Also, positive impulses of foreign exchange rate can totally increase employment.

Fouladi [3] explored the effect of exchange rate changes on price levels, production, export and import in various economic sectors using a general equilibrium model. The results disclosed that applying the exchange rate policy is more effective on goods of service sector and agricultural goods and the lowest effect can be observed in prices of the construction sector.

Jensen and Tarr [4] studied business policies, exchange rate increase and energy policies in Iran in a computable general equilibrium model and concluded that the combined reforms have had great advantages in three cases. In addition, these advantages have increased consumers' revenue up to 50% that 7% of it is obtained due to commercial reforms, 7% due to exchange rate reform and 36% due to the reform of energy carriers' price. Thus, exchange rate changes can have strong and important spillover effects.

Employed a dynamic general equilibrium model in his survey and concluded that the global price shocks play an important role in economic volatilities of developing countries. Moreover, they explain about 80% of production volatilities and 90% of volatilities of investment in such countries.

Liu [5] investigated extreme downside risk spillover from the United States and Japan to Asia-Pacific stock markets. The results had shown that the majority of Asia Pacific markets become more sensitive to Japan's extreme downside risk when the Japanese market switches into high volatility periods, whereas the U.S. spillover effect is intensified only on Taiwan during high volatility periods in the U.S. Mainland China is the least sensitive to extreme downside risk in the U.S. and Japan, Australia is the most sensitive to the U.S., and Singapore is the most sensitive to Japan.

Mattoo et al. [6] estimated the impact of China's exchange rate changes on exports of competitor countries in third markets, which they call the "spillover effect". Their estimates suggest that a 10 percent appreciation of China's real exchange rate boosts on average a developing country's exports of a typical 4-digit HS product category to third markets by about 1.5-2 percent.

Bozovik et al. [7] analysed how the exchange-rate risk of foreign-currency loans spills over into default risk. They show that in an economy where foreign-currency loans are a dominant source of financing economic activity, depreciation of the local currency establishes a negative feedback mechanism that leads to higher default probabilities, reduced credit supply, and reduced growth. This finding has some important implications that may be of special interest for regulators and market participants in emerging economies.

Schmidbauer and Rosch [8] investigated volatility spillovers between crude oil prices and US dollar to Euro exchange rates. They applied a novel bivariate asymmetric quadratic GARCH model and found even though crude oil prices and US dollar exchange rates are somehow linked, the correlation of price changes is almost zero. This is because the link between them is in terms of volatility spillovers rather than in terms of co-movements of returns [9,10].

Theoretical Principles and Model Specification

Modelling risk

We assume that the global bank equalizes expected risk-adjusted rates of return, so that risk-adjusted rates for all regions are equal to some global average.

$$RORE(r)/RISK(r)=RORG \quad (1)$$

Where, in accordance with GTAP notation convention, these capitalized variables represent levels, while lower-case variables represent percentage rates of change from initial levels.

RORE(r) is a non-risk-adjusted expected rate of return, i.e. it is the expected rate of return in the absence of any default by the borrower.

RISK(r) represents the ratio of equilibrium returns in region r to the global average rate of return. For relatively high-risk countries, this ratio will be above 1, and for relatively safe countries below 1. It is important to note that this variable represents a ratio rather than a certain number of basis points – it is better called a 'risk ratio' than a 'risk premium'.

RORG does not represent a risk-free return but a weighted average of returns around the world. This formulation differs from the more familiar representation of required rate of return in a country being equal to the risk-free return plus some risk margin.

If we rewrite this as

$$RORE(r)=RORG*RISK(r) \quad (2)$$

Then by total differentiation and division through by RORE(r) we can obtain

$$rore(r)=rorg+risk(r) \quad (3)$$

where these variables are percentage changes in their levels equivalents. This is

the analogue of eqn. (11') in the standard GTAP model in the case where RORDELTA=1:

$$rore(r)=rorg+cgdslack(r) \quad (4)$$

This equation states that the percentage change in the rate of return on investment in region r is equal to the percentage change in the global rate of return plus a disequilibrium factor which is generally exogenous and set at zero in a general equilibrium closure. Normally, the cgdslack variable is only non-zero when we allow disequilibrium to exist in the market for capital goods. The main proposition of this paper is that cgdslack can be interpreted to represent a risk premium as defined above, although it was not originally designed for this purpose. In a general equilibrium closure, cgdslack is unused for any other purpose (being exogenous and unshocked), and therefore we do not disturb any other components of the model by using it in this way.

In the general equilibrium model that can be calculated for the implementation and application of each scenario, a change is required in the model standard closure. In other words, the combination of the endogenous and exogenous variables of the model must be changed. In addition, the number of functions must be equal to the number of unknowns so that the system can be solved. Therefore, the classification of variables in the closing of each model depends on the economic problem, in a way that is in line with the purpose and policy. The first new function that is considered in the table and shows the effect of internal equilibrium on product changes is the function of the initial factors.

$$qo(i,r)=qocom(i)+qoreg(r)+qoall(i,r) \quad (5)$$

In eqn. (5), qo(i, r) is the change percentage in the amount of product related to the initial commodity i in the region r and are determined by three primary factors that are normally exogenous in the standard GTAP. Adding this new function and primary shifter makes it easier to isolate the internal and external balance. These three primary factors in the regions r and quall are the change percentage in the amount of the product related to the primary factor in the region r.

The second new function introduces another closure variable, which is the total actual per capita consumption (uc) as the sum of

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government and private sector spending. It should be noted that for the separation of curves FE and BP, the variable uc is used. Adding a function to define this variable expresses its endogenousity in the GTAP standard closure.

$$AGGEXPAND(r).uc(r)=PRIVEXP(r).up(r)+GOVEXP(r).ug(r) \quad (6)$$

In function (6), uc(r), is the per capita consumption utility of the government and private sector in the region r. This endogenous variable is divided into up(r) and ug(r), which are the per capita consumption of the private sector and the government, respectively.

The two remaining variables that are effective in the closure are dpsave and pfactor(r). dpsave represents the growth rate of a part of the income that affects the savings distribution based on the savings function in the region r. Also, the change in dpsave affects the balance of investment-savings.

$$Psave(r)+qsave(r)-y(r)=uelas(r)+dpsave(r) \quad (7)$$

In eqn. (7), psave is the change percentage in the savings price in the region r, qsave (r) is the change percentage in regional demand for net savings, y(r) is the change percentage in the regional household income in the region r, uelas is the elasticity of the cost relative to the changes in desirability. dpsave (r) is the savings distribution parameter.

The intended shock is applied by the variable pfactor which is the weighted average of the relative price of the production factors. This variable, which is an appropriate index to show the real exchange rate, is considered by the eqns. (8-10) in the standard closure.

$$VENDWWLD \cdot pfactor(r) = \sum_{i \in END-COM} (VOM(i,r) \cdot pm(i,r)) \quad (8)$$

Eqn. (8) calculates the percentage of changes in the primary price index in each region. In this function, pfactor(r) is the primary market price index in the region r (average weight of the variety of production factors receivables), VENDWWLD(r) is the global value of the primary factors, VOM (i,r) is the value of the product i in the market price in the region r, pm(i,r) is the market price of the commodity i in the region r.

Equation (9) specifies the actual return rate of the primary factor i in the region r.

$$pfactoreal(i,r)=pm(i,s)-ppriv(s) \quad (9)$$

In eqn. (9), pfactorreal(i, r) is the difference between the rate of return of the primary factor i from the growth rate CPI (Consumer Price Index), pm(i,s) is the market price of the factor i in the region s, pprive(s) is the price index for the private sector's consumption expenditure.

The eqn. (10) calculates the percentage of change in the global price index of the primary factors.

$$VENDWWLD.pfactwld = \sum_{r \in REG} (VENDWrEG(r).pfactor(r)) \quad (10)$$

In eqn. (10), pfactwld is the percentage of change in the global price index of the primary factors.

$$VENDWWLD = \sum_{i \in END-COMM} (VENDWrEG(r) \quad (11)$$

In eqn. (11), VENDWREG(r), the value of the primary factors for the market price in each region, is obtained endogenously through eqn. (12).

$$VENDWrEG = \sum_{i \in ENDw-COMM} VOM(i,r) \quad (12)$$

In the standard closure of the global trade analysis project model, qoreg and dpsave are exogenous; while pfactor and uc(r) are defined endogenously. On the other hand, the curve FE and BP are analyzed through the relationship between consumption and real exchange rate. Hence, the exogeneity of consumption and the real exchange rate in the model are essential. To apply these modifications, you also need to change the model closure; so that the transition parameters are endogenous. So, using the replacement functions, consider uc exogenous and dpsave endogenous; so that these functions enable the model to change the total savings. It also makes pfactor exogenous and qoreg endogenous so that makes it possible to change at the level of the primary factors.

Given the role of production in the structure of computable general equilibrium models, structure of the production model is explained in this section. Naturally, other sectors have structural equations in this model that help solve the problem but they are not mentioned here.

Production structure

Manufacturing activities are shown by index j, jj € J and regions by z, zj € Z. There is a one to one correspondence among the activities and goods in PEP-w-t-fin. It is assumed that firms are active in a complete competitive environment. Thus, the representative firm of each industry in each region maximizes its profit given the manufacturing technology and considers the price of goods, services and factors specifically (price taking behavior). Figure 1 shows the nested structure of production.

These nested structures are common in CGE models. At lower levels of hierarchy, more elasticity of substitution is expected. There are other possible specifications that the modeler considers the best specification at last.

At high levels (eqns. (13) and (14)), industrial production of any manufacturing activity j in each region z combines the value added and total intermediate consumption in certain shares. In other words, two sets of inputs are conceived absolutely supplementary following Leontief production function without the possibility of substitution.

$$VA_{j,z,t}=v_{j,z}XS_{j,z,t} \quad (13)$$

$$CI_{j,z,t}=io_{j,z}XS_{j,z,t} \quad (14)$$

Where

$CI_{j,z,t}$ is total intermediate consumption of industry j in region z during time period t

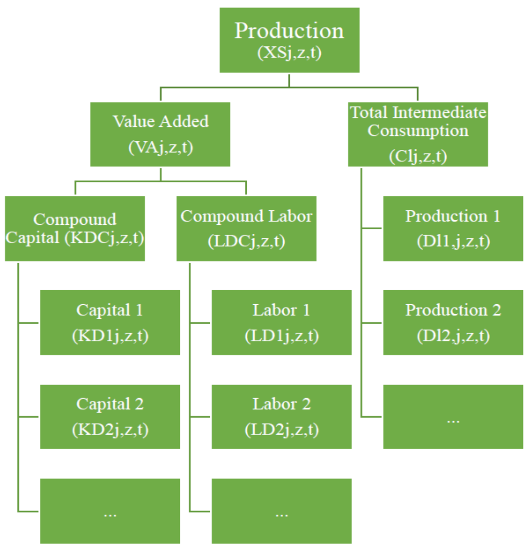

Figure 1: The nested structure of production.

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$VA_{j,z,t}$ is value added of industry j in region z during time period t

$XS_{j,z,t}$ is total manufacturing of the industry j in region z during time period t

$io_{j,z}$ is (intermediate consumption-Leontief) coefficient

$v_{j,z}$ is (value added-Leontief) coefficient

At the second level, value added of each industry includes compound labor and capital following CES specification.

Where,

$$VA_{j,z,t} = A^{VA}_{z,t} B^{VA}_{j,z} \left[\beta^{VA}_{j,z} LDC^{-\rho^{VA}_{j,z}}_{j,z,t} + \left(1-\beta^{VA}_{j,z}\right) KDC^{-\rho^{VA}_{j,z}}_{j,z,t} \right]^{\frac{-1}{\rho^{VA}_{j,z}}} \quad (15)$$

where

$KDC_{j,z,t}$ is demand for compound capital via industry j in region z

$LDC_{j,z,t}$ is demand for compound labor via industry j in region z

$A^{VA}_{z,t}$ is multi-factor productivity in region z during time period t

$B^{VA}_{j,z}$ is the scale parameter (CES-value added)

$\beta^{VA}_{j,z}$ is the share parameter (CES-value added)

$\rho^{VA}_{j,z}$ is the substitution parameter (CES-value added); $-1 < \rho^{VA}_{j,z} < \infty$.

Profit maximization (or cost minimization) in a firm is led to hiring of people and capital so that value of final production of each factor becomes equal to its price (wage rate and rental rate of capital respectively). Such behavior is described via demand for labor to capital in equation 17 using CES production function.

$$LDC_{j,z,t} = \left[\frac{\beta^{VA}_{j,z}}{1-\beta^{VA}_{j,z}} \frac{RC_{j,z,t}}{WC_{j,z,t}} \right]^{\sigma^{VA}_{j,z}} KDC_{j,z,t} \quad (16)$$

where

$RC_{j,z,t}$ is rental rate of compound capital of industry j in region z

$WC_{j,z,t}$ is wage rate of compound labor of industry j in region z

$\sigma^{VA}_{j,z}$ is elasticity of substitution (CES- value added); $0 < \sigma^{VA}_{j,z} < \infty$

According to CES function, we have $\rho^{VA}_{j,z} = \frac{1-\sigma^{VA}_{j,z}}{\sigma^{VA}_{j,z}}$.

At low level of diagram on the value added side, different groups of labor that have been indexed as *l ε L={ALAB,ULAB}* are combined with CES technology (eqn. (17)) that reflects incomplete substitutability among various types of labor. The firm chooses its labor mix to minimize cost of labor given relative wage rates. The demand for any type of labor is obtained from first-order conditions of cost minimization via the representative firm considering CES technology (eqn. (18)). Similarly, compound capital is a CES combination from different groups of capital that is indexed as *k ε K={CAP,LAND,NATR}*.

Like the labor, it is assumed that different groups of capital (natural resources, land, building, machineries and equipment, etc.) are incomplete substitutions of each other (eqn. (19)). Demand for any type of capital is obtained from cost minimization (eqn. (20)).

$$LDC_{j,z,t} = B^{LD}_{j,z} \left[\sum_{l} \beta^{LD}_{l,j,z} LD^{-\rho^{LD}_{j,z}}_{l,j,z,t} \right]^{-\frac{1}{\rho^{LD}_{j,z}}} \quad (17)$$

$$LD_{l,j,z,t} = \left[\frac{\beta^{LD}_{l,j,z} WC_{j,z,t}}{WTI_{l,j,z,t}} \right]^{\delta^{LD}_{j,z}} \left(B^{LD}_{j,z}\right)^{\delta^{LD}_{j,z}-1} LDC_{j,z,t} \quad (18)$$

$$KDC_{j,z,t} = B^{KD}_{j,z} \left[\sum_{k} \beta^{KD}_{k,j,z} KD^{-\rho^{KD}_{j,z}}_{k,j,z,t} \right]^{-\frac{1}{\rho^{KD}_{j,z}}} \quad (19)$$

$$KD_{k,j,z,t} = \left[\frac{\beta^{KD}_{k,j,z} RC_{j,z,t}}{RTI_{k,j,z,t}} \right]^{\delta^{KD}_{j,z}} \left(B^{KD}_{j,z}\right)^{\delta^{KD}_{j,z}-1} KDC_{j,z,t} \quad (20)$$

where

$KD_{k,j,z,t}$ is demand for capital k by industry j in region z

$LD_{l,j,z,t}$ is demand for labor l by industry j in region z

$RTI_{k,j,z,t}$ is the paid up rental rate by industry j for capital k in region z including wealth tax

$WTI_{l,j,z,t}$ is the paid up wage rate by industry j for labor force l in region z including total wage tax

$B^{KD}_{j,z}$ is the scale parameter (CES- compound capital)

$B^{LD}_{j,z}$ is the scale parameter (CES-compound labor)

$\beta^{KD}_{k,j,z}$ is the share parameter (CES-compound capital)

$B^{LD}_{l,j,z}$ is the share parameter (CES-compound capital)

$\rho^{KD}_{j,z}$ is the elasticity parameter (CES-compound capital); $-1 < \rho^{KD}_{j,z} < \infty$

$\rho^{LD}_{j,z}$ is the elasticity parameter (CES-compound labor); $-1 < \rho^{LD}_{j,z} < \infty$

$\sigma^{KD}_{j,z}$ is elasticity of substitution (CES-compound capital); $0 < \sigma^{KD}_{j,z} < \infty$

$\sigma^{LD}_{j,z}$ is elasticity of substitution (CES-compound labor); $0 < \sigma^{LD}_{j,z} < \infty$

According to CES production function, $\rho^{KD}_{j,z} = \frac{1-\sigma^{KD}_{j,z}}{\sigma^{KD}_{j,z}}$ and $\rho^{LD}_{j,z} = \frac{1-\sigma^{LD}}{\sigma^{LD}_{j,z}}$

Finally, by returning to the second level of diagram but towards intermediate consumption, total intermediate consumption is composed of various goods and services. It is assumed in this section that intermediate inputs are totally supplementary and are combined based on Leontief production function. As a result, no substitution is possible.

$$DI_{i,j,z,t} = aij_{i,j,z} CI_{j,z,t} \quad (21)$$

$DI_{i,j,z,t}$ is intermediate consumption of good i by industry j in region z

$aij_{i,j,z}$ is the input-output coefficient

Model Estimation

In this section, the effect of international risk spillovers from the channel of foreign exchange market on money market and macro-economic variables is explored.

Table 1 shows the effect of an impulse equal to 4.5 percent on macro-economic variables. Inflation is positively influenced by this impulse. As Table 1 and Diagram 1 show, the inflation index has had an incremental and slow trend from 2013 to 2016 and it will continue with a faster velocity up to the year 2025. The important fact is that

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
GDP	0.704	1.285	1.942	2.637	3.357	4.115	4.92	5.768	6.657	7.604	8.627	9.738	10.951
Inflation	3.822	3.814	3.861	3.972	4.136	4.359	4.657	4.99	5.342	5.708	6.098	6.511	6.949
Investment	4.552	5.68	7.178	8.926	10.791	12.992	15.647	18.711	21.923	25.305	29.001	33.033	37.449
Wealth	2.47	1.887	1.391	0.915	0.425	-0.117	-0.687	-1.339	-2.032	-2.779	-3.573	-4.415	-5.315
Welfare	0.946	1.101	1.277	1.452	1.371	1.215	0.931	0.578	0.131	-0.37	-0.911	-1.471	-2.034
Imports	10.081	10.524	11.334	12.485	13.859	15.529	17.453	19.654	21.96	24.398	27.038	29.913	33.07
Exports	-8.249	-8.189	-8.529	-9.168	-9.905	-10.759	-11.579	-12.444	-13.204	-13.932	-14.665	-15.424	-16.234
Source: Research findings.													

Table 1: Effect of international risk spillovers from the channel of exchange rate (output of the dynamic computable general equilibrium model).

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the exchange rate impulse has a relatively considerable positive effect on price index in Iran. Another important index that is influenced by the international foreign exchange risk is welfare index. It has had an incremental and temporary trend from 2013 to 2018 with the foreign exchange risk equal to 4.5 percent but it will be decreased gradually and become negative since 2019. Thus, exchange rate increase decreases welfare level ultimately.

Given that exchange rate impulse has increased the income level, it has been led to increase of imports with an insignificant rate that is upwards. This issue, i.e. one part of GDP and income increase is dedicated to imports and it means that increased production due to foreign exchange rate and relative increase of the obtained income from exchange rate increase have not been at the service of welfare and have reinforced imports more than anything else. It should not have changed welfare given the imported basket of Iran. An interesting point is that increase of foreign exchange impulses have decreased exports and this is in contrast with the theoretical principles of the effect of foreign exchange rate on exports. Generally, if main export elasticities acted properly, exchange rate increase should have been led to more exports.

Table 1 shows that the exchange rate impulse equal to 4.5 percent has gradually been led to decrease of the demand for money index. Considering that the wealth index in this study has been regarded as the demand for money, the results show that level of household wealth has gradually been reduced with exchange rate increase. This issue has also been resulted in decreased level of welfare. Hence, international risk spillover has decreased wealth level and as a result, demand for money which can be a factor for economic stagnation and provide the ground for more recession (Figures 2-4).

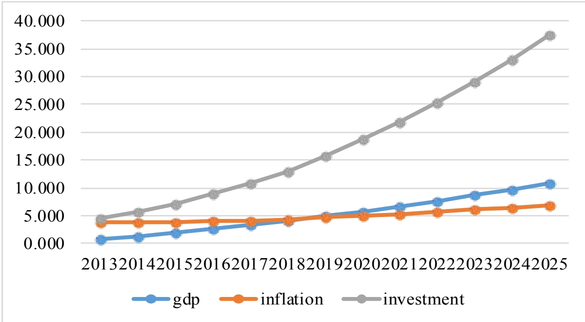

Figure 2: Effect of international risk spillovers of exchange rate on GDP, Inflation, Investment.

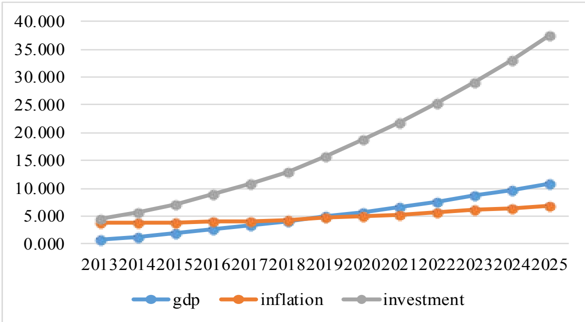

Figure 3: Effect of international risk spillovers of exchange rate on Imports and Exports.

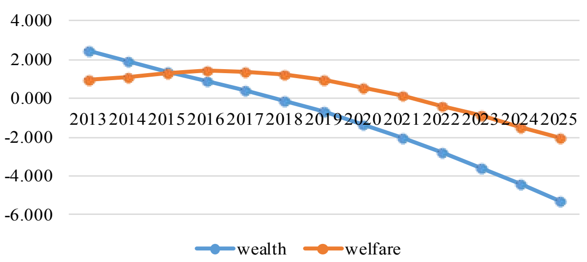

Figure 4: Effect of international risk spillovers of exchange rate on wealth and welfare.

Result and Conclusion

According to exploration of the behavior of foreign exchange rate in Iran in global financial crises especially when there is a drop in business cycle conditions, the exchange rate impulse equal to 4.5 percent has been considered in this study. It was attempted to explore its effect in a computable general equilibrium model from the past to the future. The first step is the effect of an impulse equal to 4.5 percent on macro-economic variables. Inflation is positively influenced by this impulse. The inflation index has had an incremental and slow trend from 2013 to 2016 and it will continue with a faster velocity up to the year 2025. The important fact is that the exchange rate impulse has a relatively considerable positive effect on price index in Iran. Another important index that is influenced by the international foreign exchange risk is welfare index. It has had an incremental and temporary trend from 2013 to 2018 with the foreign exchange risk equal to 4.5 percent but it will be decreased gradually and become negative since 2019. Thus, exchange rate increase decreases welfare level ultimately. This can be highly important in foreign exchange rate management and its sensitivity analysis. Hence, devaluation of national currency cannot enhance level of welfare in the community and it specifically is led to more poverty. This is while the process of gross domestic product is ascending, although its flow is slow. This suggests that there is not a significant relationship between GDP growth and welfare level. Therefore, despite policies of GDP increase can improve some economic variables, they are not finally led to welfare. Given that exchange rate impulse has increased income level, it has been led to the increase of imports with an insignificant rate that is upwards. This issue, i.e., one part of GDP and income increase is dedicated to imports. The interesting point is that increase of foreign exchange impulses have decreased exports and this is in contrast with the theoretical principles of the effect of foreign exchange rate on exports. Generally, if main export elasticities acted properly, exchange rate increase should have been led to more exports. Because the Marshall-Lerner condition (absolute value of sum of elasticity of exports and imports to foreign exchange rate greater than 1) does not hold, increase of foreign exchange rate has just decreased exports. However, the international risk has been incremental in investment. The main reason is the hope for improvement in export industries especially in fields related to oil and metals. In the same vein, the results revealed that the exchange rate impulse equal to 4.5 percent has been led to gradual decrease of the demand for money index. Considering that the household wealth index in this study has been regarded as the demand for money, the results show that level of household wealth has gradually been reduced with the increase of foreign exchange rate. This issue has also been resulted in decreased level of welfare. Hence, international risk spillover has decreased wealth level and as a result, demand for money which can be a factor for economic stagnation and provide the ground for more recession.

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