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The Effect of Monetary and Financial Policies on Iran's Food Security

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Abstract

Using appropriate policies to overcome food insecurity is one of the pillars of economic prosperity of countries. Economic decisions that change macroeconomic parameters can directly or indirectly affect food production and prices and affect food security. Therefore, achieving a clear understanding of how macroeconomic policies affect different dimensions of food security in the country can lead to providing solutions to improve the food security index. In this study, a framework of simultaneous equations is presented in order to investigate the relationship between monetary and financial policies with food production and prices in the country. In this regard, using the method of generalized moments, behavioral equations were estimated separately using the data of 1978-2018. The model was then implemented as a system of equations using the Gauss Seidel method. Different scenarios were simulated in this model to investigate the effects of changes in interest rates, money volume, and general government investment on various aspects of food security. The results indicated that government investment in the agriculture sector and public investment expenditures have a positive impact on food production through capital stock. Additionally, changes in interest rates have minimal effects on food production but significant negative effects on food prices. Overall, monetary policy decisions result in increased food prices alongside decreased food production due to the demand for money and private investment. Therefore, the implementation of these policies should be done more carefully in order to encourage farmers to increase production and therefore ensure food security for consumers.

Keywords: Food security, Generalized Moments method, Macro policies

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Introduction

Food security is one of the most important criteria for measuring the security, welfare and economic prosperity of countries (Anderson, 2001) and therefore, it is necessary to implement appropriate policies at all household, national and global levels in order to overcome food insecurity. Among the four main dimensions of food security, namely food availability, food access, food utilization and food sustainability (FAO,1998), the two dimensions of food availability and access are the main factors to ensure food security in each country (FAO,1998). In developing countries, food availability depends on a sufficient domestic production of food. In addition, most of these countries have a high population growth rate, and therefore a sustainable growth in food production that is greater than population growth is inevitable to achieve food security in them. On the other hand, access to food can be classified into physical access and economic access. Physical access requires the existence of sufficient market infrastructure, but economic access depends on the purchasing power of the household and therefore the income and price level of food. Considering the low growth of household income in developing countries, it can be concluded that economic access to food items is highly dependent on effective policies regarding food inflation control. The presence of high inflation in food prices can significantly hinder economic access to food. By considering the domestic production of food as the dimension of supply and access to food as the dimension of demand for food, it can be seen that both of these factors are significantly related to the price of food and in other words the gap between supply and demand in the competitive markets of food items (Anderson, 2001).

In Iran, in all medium-term development plans, ensuring food security is regarded as a primary responsibility of governments. Given its susceptibility to macroeconomic policies, governments have consistently sought to mitigate the rise in food prices through the implementation of various monetary and financial policies (Ghahramanzadeh *et al*., 2016). However, the issue that should be noted is that food security is a multidimensional issue and the various factors that affect it are varying at different international, national and household levels. At the national level factors such as economic growth (Bagherzadeh *et al*., 2016; Mehrabi Basharabadi & Mousavi Mohammadi, 2010; Ismaili, 2013), urbanization (Salem, 2016; Bagherzadeh *et al*., 2016), food prices (Pishbahar & Javdan, 2015; Bagherzadeh *et al*., 2016; Salem, 2016; Mohammadi, 2014), economic policies (Mehrabi Basharabadi & Ohadi, 2014; Ismaili, 2013), population (Ismaili, 2013) and at the household level factors such as household income (Bagheri *et al*., 2016; Tanhayi, 2015; Pakravan *et al*., 2015; Hosseini, *et al*, 2017, Sepahvand, 2014; Asgharian Dastnaei *et al*., 2013), the number of household members (Pakravan *et al*., 2015; Hosseini, *et al*, 2017), the literacy level of the head of the household (Pakravan *et al*., 2015; Hosseini, *et al*, 2017), food price index (Ghorbanian & Bakhshodeh, 2016, Mehrabi Basharabadi & Mousavi Mohammadi, 2010; Hakimi, 2015) and government policies (Hosseini, *et al*, 2017; Heidari *et al*., 2007; Sepahvand, 2014; Mehrabi Basharabadi & Mousavi Mohammadi, 2010; Hakimi, 2015) have been identified as effective factors in food security. Of course, other non-economic factors such as physical crises (climate change, drought, etc.) and phenomena such as war and embargo and global policies also affect food security.

In all the past studies, the role of the government's economic policies has been considered as a key and effective variable. This issue also has been emphasized in other abroad studies (Ramakrishna & Demeke, 2002; Bashir *et al*., 2013; Faradi & Wadood, 2010; Cock, 2013; Applanaidu, 2014; Gustafson, 2013; Dithmer & Abdulai, 2017). Different dimensions of the concept of food security are directly or indirectly affected by macro policies. What is important is the reliability of the impact of these policies on food security in order to understand the broad dimensions of

monetary and financial shocks.

The results of the study by Gahramanzadeh *et al*. (2016) showed that in the short term, the shock of food inflation has a positive and significant effect on food inflation. In the long term, the money volume shock has a positive and significant effect on food inflation and leads to an increase in food inflation by 0.0723. Azamzadeh Shurki & Khalilian (2010) showed that there is a long-term relationship between monetary policy variables and food price index, and food price index has a positive relationship with interest rate, liquidity and exchange rate. Therefore, the government should use monetary policies in order to control the price of food and ensure food security. Pish Bahar & Javadan (2015) also investigated the effect of monetary shocks on food prices in Iran and showed that in the long run, positive monetary shocks have a significant effect on food prices.

The increase in food prices in the country in recent years has raised major concerns regarding food policy because the price increase will have adverse effects on food security and household poverty. Therefore, on the one hand, the growth of domestic food production should be accelerated, and on the other hand, the economic access to food should be improved by controlling the growth of food prices. Considering the importance of food security at the national level, macroeconomic decisions that change macroeconomic parameters can directly or indirectly affect the rate of food production and inflation. Therefore, a clear understanding of how macroeconomic policies, including monetary and financial policies, affect different aspects of food security in the country can lead to providing solutions to improve the food security index. In this study, an attempt is made to simulate the effects of various shocks caused by the application of various economic policies on food security by providing a macro-framework for food policies at the national level.

Methodology

We investigated the impact of monetary and financial shocks on the availability and accessibility dimensions of food security. For both dimensions, affecting factors are estimated based on monetary, financial and other exogenous variables. All equations (1-11) of the model have been individually estimated using the generalized method of moments (GMM), which is considered superior to other methods in addressing econometric issues such as heteroskedasticity and non-linearity. Hausman's J statistic (1982) was used to test the validity of the over determined constraints in each equation. The LM serial correlation test, White's test for heterogeneity variance and F test for overall significance have been calculated. F test statistics along with standard error and adjusted R2 have been used as a test to check the goodness of fit of each of the estimated equations. After estimating the equations individually, all the equations, including the unions, are put together and the model is solved as a system of equations. All estimates were made in STATA 12 software. Following are details about model structure, variables and data.

Model Structure

In this model, food availability is assumed to obtain through domestic production, stocks and imports. So, food supply (Y_t^{FP}) is considered as a function of domestic production. On the other hand, the price of food is the most important factor in determining access to food in developing countries such as Iran. Therefore, the second equation considered in this study is food price (P_t^{FD}). These two equations are related to macroeconomic policy instruments through a system of simultaneous equations framework. It is assumed that there are two sectors in the economy: the agricultural sector and the non-agricultural sector in which non-food products are considered as exogenous. The production of the agricultural sector is also divided into two parts: food (Y_t^{FP}) and non-food (Y_t^{NF}):

(1) $$Y_t^{FP} = Y_t^{FP} + Y_t^{NF}$$

Food sector production depends on factors such as capital (K_t), labor (L_t) and other inputs such as chemical fertilizer consumption (F_t), and energy (E_t). The effects of credits granted to the agricultural sector (DC_t^A) and the total

population (N_t) have also been examined in the model. Therefore, the food production function is defined as:

(2) $$Y_t^{FP} = Y^{FP}(K_t, L_t, E_t, F_t, DC_t, N_t)$$

Food prices (P^{FD}) are determined by demand and supply side variables. Demand-side factors that determine the quantity demanded of food items are food prices, money supply (M2), and per capita income (Y^P), and supply-side factors that affect the quantity supplied of food items are food prices, the amount of production (Y^{FP}) and inflation (π):

(3) $$Q_F^D = f(P^{FD}, M2, Y^P)$$
$$Q_F^S = f(P^{FD}, \pi, Y_t^{FP})$$

By equating the quantity demanded with the quantity supplied, the price of food is determined, so the equation of food price can be written as follows:

(4) $$Q_F^D = Q_F^S$$
$$P_t^{FD} = P^{FD}(M2, Y_t^{PC}, Y_t^{FP}, \pi_t)$$

Credits granted to the agriculture sector and the population are exogenously included in the model. The demand functions for labor, energy, and chemical fertilizers are included in the form of conditional demand functions obtained from minimizing the variable cost per level of the product in the following form (Applanaidu *et al*., 2014):

(5) $$E_t = E\,(K_t, P_t^{EN}, P_t^{Fr}, W_t, FP_t)$$
$$F_t = F\,(K_t, P_t^{EN}, P_t^{Fr}, W_t, FP_t)$$
$$L_t = L\,(K_t, P_t^{EN}, P_t^{Fr}, W_t, FP_t)$$

In the above functions, energy and fertilizer prices are considered exogenous, and the wage rate (W_t) for the agricultural sector is a function of the general level of prices (P_t), the agriculture sector value added (Y_t^A) and the unemployment rate (UR_t):

(6) $$W_t = W^A(P_t, Y_t^A, UR_t)$$

The capital stock in the agriculture sector is determined based on private and public investment:

(7) $$K_t^A = \left(\frac{I_t^{PA} - I_t^{GA}}{\delta + g^A}\right)$$

Where δ is the annual depreciation rate of fixed capital in the agriculture sector, $g^A$is the annual growth rate of production in the agriculture sector, I_t^{GA} is public investment and $I_t^{GA}$is private investment.

The role of financial policies in the model is applied through fixed investment in the agriculture sector. The government makes investment decisions with the aim of reach to a target growth rate in agriculture. Investment in the agricultural sector (such as investment in irrigation canals, dams and roads) directly affects production in the agriculture sector:

(8) $$I_t^{GA} = I^{GA}(R_t, Y_t^A, I_t^{GG})$$
$$I_t^{GG} = I^{GG}(R_t)$$

Determinants of private investment (I_t^{PA}) in the agriculture sector are public investment in the sector (I_t^{GA}), interest rate (R_t), credits (DC_t^A) and agricultural sector value added. So we have:

(9) $$I_t^{PA} = I^{PA}(R_t, Y_t^A, I_t^{GG}, I_t^{GA}, DC_t^A)$$

Total inflation in the economy significantly affects food price growth. (Y_t^{FC}), nominal money supply (M2), exchange rate (ER_t) and energy price (P_t^{EN}) are considered as determinants of the general level of prices in the economy. So, the function of the general price level (P_t) includes supply side and demand side variables and is determined as follows:

(10) $$P_t = P(M2, Y_t^{FC}, P_t^{EN}, ER_t)$$

Given the exogeneity of the exchange rate, it's imperative to account for the behavior of money supply, given its significance in response to monetary policies. In this model, money supply is equated to the demand for money in the economy. Consequently, the quantity of money is set equal to the demand for liquidity, which, in turn, relies on factors such as the nominal interest rate, total demand, and the overall price level in the economy. Interest rate, total demand and per capita income are also exogenously included in the model:

(11) $$M2_t = m2(r_t, P_t, Y_t,)$$

Data used in the estimation of the model (equations 1 to 11) are from 1978 to 2018. We used the deflated time series data for energy demand, money supply, wage rate and exchange rate, gathered from the Central Bank of Iran and adjusted to the base year of 2013.

Results

Table 1 shows the diagnostic test statistics related to the estimation of 11 equations and 66 model coefficients. The results of Durbin-

Watson's test and White's test indicate the homogeneity variance and lack of autocorrelation in all the estimated equations. The probability values related to the J statistic are estimated to be greater than 0.1. This shows that the null hypothesis of normality conditions for accepted equations and therefore overspecification of all behavioral equations is confirmed. The values of R2 in most of the estimated equations are high. In addition, 50 coefficients out of 66 model coefficients, which include more than 75% of the estimated coefficients, are significant and all parameter estimates can be justified. Therefore, the validity of the estimated equations is established.

Table 2 shows the models estimation along with the explanatory variables related to each model, the effects of drought (D1) and war (D2) have also been included in the estimations. The results show that the effect of all the variables of the food production function is significant, except for the population and energy coefficients. Among the production inputs, labor force has a negative effect on food production. This shows that the agricultural sector is over-employed and any increase in the employment of labor will lead to a decrease in food production. The increase in population will lead to a decrease in food production because agricultural land will be converted into residential areas. The significant effect of agricultural sector credits on food production also shows the role of efficient distribution of agricultural projects in the development of the production of this sector.

Table 1- Results of diagnostic test statistics for behavioural equations

Dep. Var.	DW	R2 Stat.	F stat.	J Stat (p-value)	White Test (p-value)
Y_t^{FP}	2.11	0.94	402.6	0.95	0.860
F_t	1.98	0.76	253.8	0.52	0.550
L_t	1.89	0.8	420.9	0.79	0.830
W_t	2.00	0.83	344.6	0.85	0.901
I_t^{GA}	1.95	0.95	549.4	0.96	0.760
I_t^{GG}	1.84	0.96	623.5	0.86	0.910
I_t^{PA}	1.78	0.89	193.8	0.74	0.784
P_t	1.89	0.77	226.8	0.54	0.593
$M2_t$	2.09	0.89	498.7	0.66	0.695
P_t^{FD}	1.93	0.75	347.6	0.74	0.784
E_t	2.03	0.89	335.4	0.62	0.664

In the estimation of the food price function, the variables of food production, money supply and inflation rate were found to be significant and per capita income variable was insignificant. Money supply and inflation rate are directly related while food production has an inverse relationship with food balance. This shows that the food supply-demand gap is a key determinant of food prices in the country. Therefore, food production plays a key role in food security.

Fertilizer prices and agricultural wage rates do not affect energy demand, while energy prices negatively and significantly affect energy demand in the agricultural sector. Capital stock and food production have positive and significant effects on energy demand in the agricultural sector, which indicates that an increase in food production leads to the use of more energy by farmers and that an increase in the capital stock of the agricultural sector, such as machinery, increases the demand for energy. The wage rate plays a meaningless role in determining the demand for labor in the agricultural sector, because the supply of labor is greater than the demand for labor in this sector, and in fact there is a surplus of labor in this sector. Fertilizer price significantly and negatively affects labor demand, because an increase in the price of fertilizer has led to a decrease in the demand for chemical fertilizer consumption, which in turn reduces food

production. A reduction in food production results in a decrease in the wage rate. Furthermore, the price of energy significantly influences labor demand, with its positive sign indicating that energy serves as a substitute for labor in the agricultural sector. The positive and significant impact of food production on labor demand suggests that labor utilization as an input depends on production efficiency. Conversely, capital stock exerts a negative effect on labor demand, implying that the capital employed in the agricultural sector reduces the demand for labor. The price of energy and the wage rate directly affect the demand of chemical fertilizer in the agricultural sector. Food production and capital stock have no significant effect on fertilizer demand. Finally, the value added of agriculture and the unemployment rate are the determinants of the agricultural wage rate, while inflation has no significant effect.

Table 2- The results of estimating models

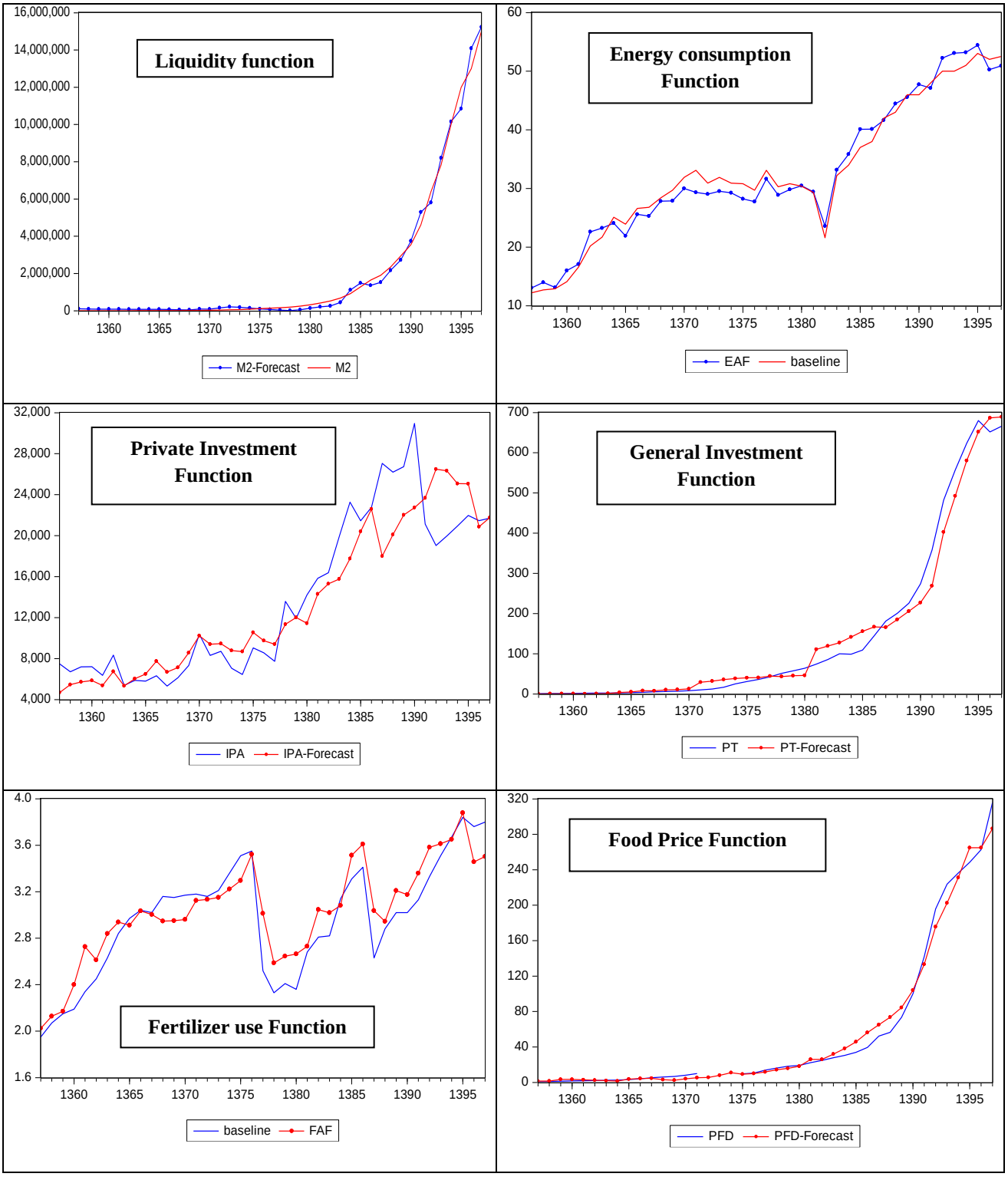
	P_t	$M2$	I_t^{PA}	I_t^{GA}	W_t	L_t	F_t	E_t	P_t^{FD}	FP_t
K_t	-	-	-	-	-	0.106	-0.5	0.21**	-	0.116**
L_t	-	-	-	-	-	-	-	-	-	-0.003**
E_t	-	-	-	-	-	-	-	-	-	0.001
F_t	-	-	-	-	-	-	-	-	-	0.08**
DC_t	-	-	0.42**	-	-	-	-	-	-	0.042**
N_t	-	-	-	-	-	-	-	-	-	-0.006
$M2$	0.502**	-	-	-	-	-	-	-	0.18**	-
Y_t^{PC}	-	-	-	-	-	-	-	-	-0.004	-
FP_t	-	-	-	-	-	0.22**	1.43	0.93**	-0.27**	-
π_t	-	-	-	-	-	-	-	-	0.68**	-
P_t^{EN}	0.47	-	-	-	-	0.63**	0.84*	-0.208*	-	-
P_t^{Fr}	-	-	-	-	-	-0.16**	-1.02**	-0.015	-	-
W_t	-	-	-	-	-	-0.11	0.05*	0.08	-	-
P_t	-	0.51**	-	-	1.82	-	-	-	-	-
Y_t^A	-	0.02	-0.33	0.22	0.052**	-	-	-	-	-
UR_t	-	-	-	-	0.26**	-	-	-	-	-
R_t	-	-0.62**	-0.05*	-0.47	-	-	-	-	-	-
I_t^{GG}	-	-	0.86**	0.53**	-	-	-	-	-	-
I_t^{GA}	-	-	0.19**	-	-	-	-	-	-	-
Y_t^{FC}	-0.28**	-	-	-	-	-	-	-	-	-
ER_t	0.03*	-	-	-	-	-	-	-	-	-
D1	-	-	-0.22	-	-	-	-	-0.52**	0.04	-0.105
D2	-	-	-	-	-0.04**	-	-	-	-	-0.11**
$Lag\ Dep_t$	-	2.43**	-	1.41**	0.172**	0.25**	-	-0.14**	0.71**	0.421**
Const	15.1*	-5.2**	9.24**	-0.4**	7.4*	-22.5*	-0.32**	11.8*	6.62**	12.5**

The effect of public investment of the government was recognized as direct and significant. This indicates that decisions regarding direct public investment in the agricultural sector should not be based on agricultural performance or production and available resources. However, public investment expenditures of the government are determined by public income and therefore, public income directly affects the decisions related to government investment in infrastructure development in this sector. Interest rates and agricultural production affect private investment in the agricultural sector. So, monetary policy decisions have a significant effect on private investment in the agricultural sector. Money demand is directly affected by the total demand and the general price level in the economy, while the interest rate negatively affects the money demand in the country's economy. And finally, money demand, exchange rate and energy prices have direct

effects, while total production has a negative effect on the general price level in the economy. After estimating the behavioral equations, all equations including unions were put together and the model was solved as a system of simultaneous equations using Gauss-Seidel iterative method to provide predicted values for years 1978 to 2018. The estimated Mean Absolute Percentage Error (MAPE) is given in Table 3. These statistics show that the values predicted by the model and the actual values are close to each other, because the values of this statistic are in an acceptable range. Also, the graphical predictions of the real and predicted values of the endogenous variables in Fig. 1 show that the real time values are well followed and therefore the validity of the model is established.

Table 3- The results of the prediction accuracy of models

Dep. Var.	Mean Absolute Percentage Error (MAPE)
E_t	0.042
F_t	0.034
L_t	0.052
W_t	0.056
I_t^{GA}	0.064
I_t^{GG}	0.057
I_t^{PA}	0.149
P_t	0.037
$M2_t$	0.044
P_t^{FD}	0.049
Y_t^{FP}	0.063


Liquidity function
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Energy consumption Function
EAF
baseline
Private Investment Function
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Fertilizer use Function
baseline
FAF
Food Price Function
PFD
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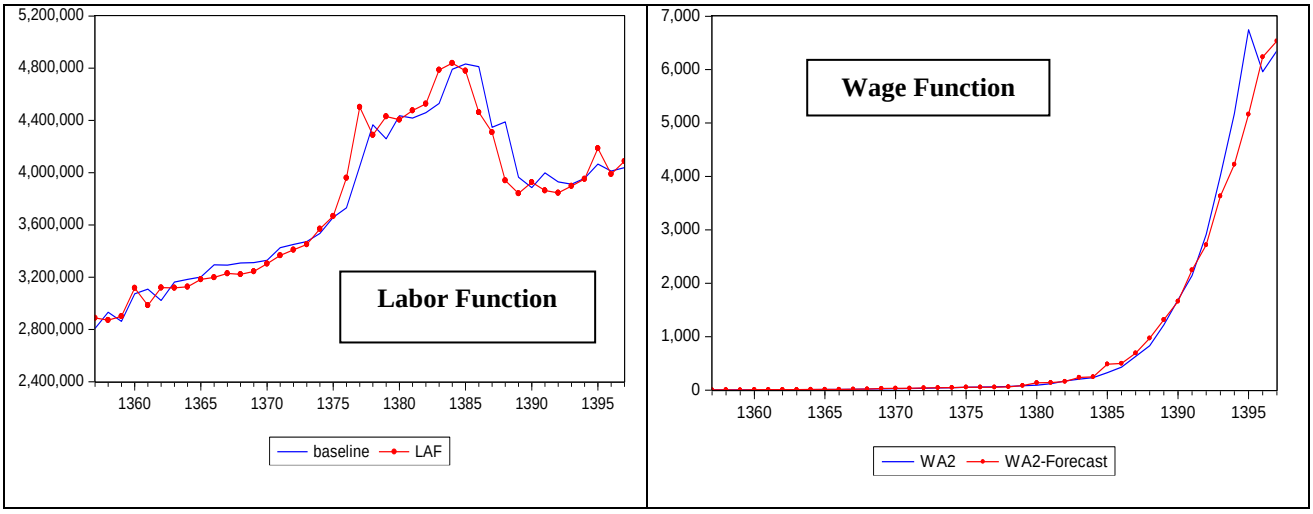

Figure 1- Comparison of in-sample prediction (dotted line) and real data (solid line)

Simulation

After establishing the validity of the estimated model, it can be utilized for simulation analysis to assess the impact of macro policy variables on food production and prices. This enables policymakers to gauge the potential effects of different policy interventions and make informed decisions regarding macroeconomic policies related to food security. What follows in this section is to examine the effect of changes in interest rates, liquidity volume and government investment expenditures during the period of 2019 to 2023. To this end, the above variables have been determined exogenously for a 5-year forecast horizon, and then the model has been run dynamically from 2019 to 2023. Changing the interest rate and the growth of the monetary base are among the conventional tools of monetary policy in countries. In this study, according to the trend of recent years in interest rate changes (weighted average interest rate of banking facilities to different sectors in terms of percentage), an interest rate increase scenario with an annual rate of 2% and an interest rate increase scenario in 2021 as an interest rate shock are considered. The continuation of the annual growth of 5% in liquidity has also been considered as another monetary policy.

Table 4- Changes in food production and price growth in different scenarios (%)

	FD_t	P_t^{FD}
Mean growth rate in base scenario	5.25	3.58
2% yearly increase in interest rate	-0.8	1.26
Interest rate shock in 2021	-0.105	0.59
5% increase in liquidity	-1.29	1.05
10% increase in public investment expenditure	1.53	-0.152

Table 4 shows the average growth rate of food production and price as two components of food availability and access to food in the discussion of food security and its percentage changes during the above scenarios. As can be seen, an increase in the interest rate reduces food production by 0.8% by reducing private investment in the agricultural sector. This decrease in investment and therefore food production will lead to an increase in the price of food, as mentioned in the studies of Pishbahar & Javidan (2015), Azamzadeh & Khalilian (2010) and Ghahramanzadeh *et al*. (2016). However, based on the second scenario, it can be concluded that an interest rate shock have a long and significant effect on the price and its increase will lead to an increase in the price of food due to the direct relationship with inflation. These results show that the monetary policies that are applied with the aim of

controlling food inflation have a small reducing effect on food production. These results can be related to the difference in the interest rate of facilities granted in the agricultural sector compared to other economic sectors, which causes the major effect of interest rate changes on food prices and inflation in the entire economy. A change in the volume of liquidity, which can be the result of any other economic policy in the economy, will lead to an increase in the price of food. It is predicted that the continued growth of liquidity in the studied period will lead to a 1.05% increase in food prices. This result is in agreement with the theory of the money supply and shows that the increase in the money supply has caused the increase in the price of food. However, by the application of appropriate policies, not only the growth rate of liquidity does not exceed its acceptable value, but also production decisions in the agricultural sector will not affect by external shocks.

Fiscal policies include increasing government revenue and public spending. Since the agricultural sector is exempt from taxes, tax policies will not have a significant effect on food production. Public expenditure includes current and capital expenditure, which investment expenditure plays an important role in the economy in terms of the role it will play in the formation of capital stock. In this section, a scenario of 10 per cent increase in public investment of the government is examined. In the implementation of this scenario, other investment variables are considered to be without change. The results of Table 4 show that the growth of public investment has a positive effect on food production and a negative effect on food inflation, so that a 10% increase in public investment by the government will lead to a 1.53% increase in food production and a 0.15% decrease in price. The positive effect is expected because the public investment of the government that used for the development of infrastructure that will lead to an increase in production in the agricultural sector. Therefore, this policy can be used to improve the availability of food in the country. These results are consistent with the findings of Mehrabi Beshrabadi & Mousavi (2010).

Conclusion

The recent rise in food inflation in the country has raised significant concerns regarding food security and household poverty. This trend underscores the urgency for effective measures to address the affordability and accessibility of food for all segments of the population. How macro decisions can help to improve the two main components of food security, i.e. food availability and access to food in the country, is an issue that has been addressed in the present study. In this regard, a framework of simultaneous equations has been presented to relate monetary and financial policies with food production and prices in the country. Using the GMM method, the behavioural equations were estimated separately using the data of 1978-2018 and then the model was implemented as a system of equations using the Gauss Seidel method. Then different scenarios were simulated to investigate the effect of changes in interest rates, money volume, and general government investment on food security dimensions. The simulation results showed that changes in interest rates have little effect on food production, but will have significant negative effects on food prices, and in general, monetary policy decisions can lead to an increase in food prices along with a decrease in food production. Therefore, the implementation of these policies should be done more carefully in order to obtain the maximum benefit in encouraging farmers to increase production and therefore ensure food security for consumers. This issue suggests that policies should be used to stabilize food prices and control the adverse effects of food price shocks on poor households. In addition, the government should also increase its expenditures for the development of public investment in order to develop agricultural infrastructure. This will lead to an increase in food production and a decrease in its price due to the reduction of the gap between supply and demand.

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اثر سیاست‌های پولی و مالی بر امنیت غذایی ایران

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چکیده

اجرای سیاست‌گذاری‌های مناسب به‌منظور غلبه بر عدم امنیت غذایی یکی از ارکان شکوفایی اقتصادی کشورها می‌باشد. تصمیمات اقتصادی که پارامترهای کلان اقتصاد را تغییر می‌دهد، می‌تواند به‌طور مستقیم یا غیرمستقیم بر تولید و قیمت مواد غذایی اثرگذار بوده و امنیت غذایی را تحت تأثیر قرار دهد. از این‌رو، دستیابی به درکی روشن از چگونگی تأثیر سیاست‌های کلان اقتصادی بر ابعاد مختلف امنیت غذایی در کشور می‌تواند به ارائه راهکارهایی برای بهبود شاخص امنیت غذایی بیانجامد. در این مطالعه یک چارچوب معادلات همزمان به‌منظور بررسی ارتباط سیاست‌های پولی و مالی با تولید و قیمت مواد غذایی در کشور ارائه شده است. در این خصوص با استفاده از روش گشتاورهای تعمیم یافته، معادلات رفتاری مربوطه به‌طور مجزا با بکارگیری اطلاعات سال‌های ۱۳۵۷-۱۳۹۷ برآورد شده و سپس مدل بصورت یک سیستم معادلات با بکارگیری روش گاوس سایدل اجرا شده است. در ادامه، شبیه‌سازی سناریوهای مختلف برای بررسی اثر تغییرات در نرخ بهره، حجم پول و سرمایه‌گذاری عمومی دولت بر ابعاد مختلف امنیت غذایی صورت گرفت. نتایج نشان داد، سرمایه‌گذاری دولتی در بخش کشاورزی و مخارج سرمایه‌گذاری عمومی دولت، بوسطه موجودی سرمایه، اثر مثبتی بر تولید غذا اعمال می‌کنند. همچنین تغییرات در نرخ بهره اثر کمی بر تولید غذا دارد اما اثرات منفی قابل ملاحظه‌ای بر قیمت مواد غذایی خواهد داشت و در مجموع، تصمیمات سیاست پولی منجر به افزایش در قیمت‌های غذایی همراه با کاهش در تولید غذا بواسطه تقاضا برای پول و سرمایه‌گذاری خصوصی می‌شود. لذا اجرای این سیاست‌ها باید با دقت بیشتری صورت گیرد تا حداکثر منفعت را برای تشویق کشاورزان به افزایش تولید و لذا تأمین امنیت غذایی برای مصرف‌کنندگان به دنبال داشته باشد.

واژه‌های کلیدی: ابعاد امنیت غذایی، روش گشتاورهای تعمیم یافته، سیاست‌های کلان

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