Int. J. Nonlinear Anal. Appl. 13 (2022) 2, 1089–1103
ISSN: 2008-6822 (electronic)
http://dx.doi.org/10.22075/ijnaa.2021.23849.2624

Investigating the impact of the devaluation of national currency and macroeconomic indicators considering the political effects of sanctions on stock prices

Hossein Khadivi[a], Jamal Bahri Sales[a,*], Saeid Jabbaradeh Kangarluyi[a], Akbar Zavarirezaei[b]

[a]*Department of Accounting, Urmia Branch, Islamic Azad University, Urmia, Iran*

[b]*Department of Accounting, Urmia University, Urmia, Iran*

(Communicated by Mohammad Bagher Ghaemi)

Abstract

The present article examines the effect of weakening the value of the national currency and macroeconomic indicators by considering the political effects of sanctions on stock prices and the SVAR structural self-regression model for the years 1370-1397. According to the SVAR estimates, an 89 percent increase in oil revenue will boost the stock price index, as well as a financial crisis and sanctions, a weakening of the national currency and a production gap of 11, 86, respectively. 53 and 12 percent of the stock price index, also based on the results of immediate reaction functions, the shocks received by endogenous variables up to the first two periods; it goes up and then goes down. In terms of economic structure and the principles of economics, a steady rise in the dollar will lead to economic prosperity and a decrease in the stock price index, but if this increase is temporary, the economic boom in the stock market will not be observed. In general, due to the different infrastructures, patterns and economic conditions of the country, a separate study of how the Iranian stock market is affected by the uncertainty of government monetary policy, government fiscal policy and government foreign exchange policy can be in the country's major decisions. Provide an accurate view of how Iran's financial market is changing as a result of these fluctuations.

Keywords: Weakening, National Currency Value, Political Change, Crisis, Stock Price, SVAR Model, mandatory
2020 MSC: 91B64

1 Introduction

Although in all countries, central banks are responsible for protecting the purchasing power of the people and not devaluing the national currency, but sometimes in some countries there are policies to deliberately devalue the national currency. In macroeconomic theories, one of the ways to boost exports and reduce imports is to devalue the national currency. In other words, the process of devaluation of the national currency against the value of foreign currencies is a conscious action to strengthen the export strength of countries, which requires conditions such as the Marshall-Lerner condition. In Iran, because the supply of currency is monopolized by the government and the central bank, the price

*Corresponding author
Email addresses: hosein.khadivi@gmail.com (Hossein Khadivi), jamalbahri1980@gmail.com (Jamal Bahri Sales), jabbarzadeh.s@gmail.com (Saeid Jabbaradeh Kangarluyi), a.zavarirezaei@gmail.com (Akbar Zavarirezaei)

Received: July 2021 *Accepted:* September 2021

of currency is not necessarily determined by supply and demand. Increasing or decreasing oil revenues, financial and monetary crises, the political effects of sanctions and the occurrence of shocks increase or decrease government foreign exchange earnings, and therefore, foreign exchange prices are not a sign of the real power of the Iranian economy and it imposes a set of artificial prices on the economy [17].

Generally; Economists' views on the impacts of the devaluation on the economy fall into two categories. From the point of view of traditional economists, the impact of the devaluation of money on the economy is expansionary. On the other hand, new structuralists rely on the contraction effect of the currency devaluation on economy. Evidence for this, is the group of economies in which the Marshall Lerner condition (in which exchange rate depreciation is the main reason for improving the trade balance) is violated and the devaluation of the currency leads to a decline in output. With the devaluation of money, the price of export goods falls; but on the other hand, the price of imported goods will rise. In a condition where foreign trade is in balance and the exchange relationship is unchanged, price changes cancel each other, but when imports exceed exports, the final result is a reduction in the country's real income and a slowdown in economic growth [9]. Countries exporting single products where aggregate demand has a weak response to the devaluation of the currency and export items are priced in dollars, the devaluation of the currency can lead to a contractionary position. In these economies, if the increase in nominal wages is delayed relative to the increase in prices, and the ultimate desire to save from profit is greater than the ultimate desire to save from wages, then national savings will increase and real output will decrease [2]. When the central bank does not have the foreign exchange reserves needed to attract the sale of the national currency by speculators due to issues such as sanctions, financial crises and oil price shocks, it has further stimulated speculators which it is enough to take all the central bank reserves. If currencies exchange reserves reach to zero or at a minimum, the stability of the exchange rate is lost and the value of the national currency is constantly decreasing [1].

Dornbusch [10] believed that targeting the real exchange rate would affect production stability and the price index in two ways.On the one hand, the stability of the nominal and real exchange rates will stabilize the total demand, and on the other hand, the exchange rate will affect the price level through the supply side, because the nominal exchange rate will affect the price index through the cost of imported intermediate goods. In other words, Dornbusch believed that on the one hand following the exchange rate rule would stabilize production and, on the other hand, destroy price stability. On the other hand, exchange rate fluctuations, the political effects of sanctions and the financial crisis in global markets will impose external restrictions on domestic economic policies, as shocks originating from the economic sector will spread to other sectors of the economy. Therefore, for the above reasons, he believes in the stability of the exchange rate, but accepts that in order to stabilize the nominal exchange rate, prices will lose their stability, and finally he concludes that according to the economic requirements of a country, sometimes following the nominal exchange rate rule is considered a good policy and at other times it is not a good policy [11]. Therefore, assessing the foreign exchange market and the devaluation of the national currency policy and the impact of a macroeconomic feature can be important in recognizing stock market irregularities, given the political effects of sanctions on stock prices.Therefore, the SVAR vector regression model is used to explain this effect. This paper is organized as follows. In the second part, theoretical foundations including theories and the results of empirical studies related to the subject are presented. In the third part, the model, the research method and tests used in study are described. The fourth part is dedicated to test the results and model estimation. The fifth section provides a summary and conclusion.

2 Theoretical foundations of the subject

In Iran, considering that the managed exchange rate system is currently applied and only two decades have passed since the implementation of this policy, it is necessary to discuss how much and how to manage the exchange rate and the government's optimal intervention in this market. There are several factors that affect the stock price index, including oil shocks, the effects of sanctions, financial crises, exchange rate fluctuations and the devaluation of the national currency. Extensive real exchange rate fluctuations are a feature of developing countries [27]. Developing countries, including Iran, have a high degree of uncertainty about macroeconomic variables. Growth, inflation, exchange rates and other macroeconomic variables are more prone to fluctuations than the economies of industrialized countries, and the effects of these fluctuations and their continuation can lead to the formation of more structural problems in different economic sectors. In the following, the theories related to the weakening of the national currency and the stock price index will be examined, taking into account macroeconomic indicators and the political effects of sanctions [8].

2.1 Investigating the relationship between the weakening of the national currency and the stock price index by considering the theory of commodity market approach:

Commodity market approach theory shows how the foreign exchange market and the value of the national currency affect the firm's foreign operations, firm profits and stock prices [15]. This theory, with the increase in national production following the devaluation of the currency and assuming the Marshall-Lerner condition ($\frac{CA}{S}$=$M(\varphi_X + \varphi_M - 1)$) expects future cash flows that are affected by aggregate domestic and foreign demand. As a result, the current stock price, which is equivalent to the present value of future cash flows, will interact with the current and future activity of the economy as measured by indicators such as industrial output, real economic growth rate and employment rate. Ma & kao [16] showed in their theory that exchange rate depreciation in export-oriented economies has a negative effect on the stock market and in import-oriented economies will cause the stock market to prosper. Therefore, the overall outcome of the effect of exchange rate fluctuations on the stock market in an economy depends on the combination of firms involved in export and import, the degree of firm dependence on imported raw materials and the elasticity of demand for export products [25].

2.2 Investigating the relationship between the devaluation of the national currency and the stock price index by considering the flow-oriented and stock-oriented theory:

There is still no general agreement on our dynamic relationship between the exchange rate and stock prices, so that we can separate the general view in this regard: Dornbusch and Fisher, by proposing current models, assume that the current account of the country and the current balance are two factors. Fog determines the exchange rate. Accordingly, changes in exchange rates affect international competition and the trade balance, and thus the real variables of the economy, such as real output and income, as well as the future and current liquidity flows of companies and their stock prices. According to this model, the devaluation of the domestic currency (increase in the exchange rate) makes local companies more competitive and makes their exports cheaper in an international comparison. Increasing the advantage of domestically produced goods and, consequently, increasing exports also leads to higher income, which in turn increases the stock prices of companies. Therefore, in these models, the exchange rate has a positive effect on stock prices. The second view is known as the shareholder model. In these models, it is assumed that the capital account is the determining factor of the exchange rate [12]. These models include the portfolio balance model and the monetary model. In the portfolio model, Branson states that there is a negative relationship between the exchange rate and stock prices, and according to this model, falling stock prices reduce the wealth of domestic investors, which leads to lower demand for money with lower interest rates. Lower interest rates cause capital outflows to foreign markets, assuming the stability of other conditions and the devaluation of the domestic currency and higher exchange rates [22].

2.3 Investigating the relationship between the weakening of the national currency and the stock price index by considering the transition function

In this study, the national currency weakening index of enhanced purchasing power parity is used, which is based on the standard purchasing power parity criterion and adjusted for the Balasa-Samuelson effect. In addition, the effect of strengthening the value of the national currency has been separated from the weakening of the value of the national currency, so that only the effect of weakening the value of the national currency will be examined. The calculation of this index is as follows:

First, the real exchange rate at the level (RER_t) or the ratio of the implicit GDP index is calculated as follows:

$$Log(RER_t) = \log(XRAT_t/PPP_t) = \log(Pusa/Pir) \tag{2.1}$$

Where XRAT is the nominal exchange rate of the domestic currency against the US dollar, PPP_t is the exchange rate derived from purchasing power parity theory. PUSA is the price level in the US and Pir is the price level in Iran. The above equation provides the simplest version of the purchasing power parity index. If the (RER_t) Log is positive, it indicates the weakening of the national currency and if it is negative, it indicates the real exchange rate overvaluation. The second step involves setting this criterion for the Balasa-Samuelson effect, using Calino Williamson's enhanced deviation index. This is done by regressing on the RER_t of the real GDP per capita $RGDPCH_t$, which is as follows:

$$Log(RER_t) = \alpha + \beta \log(RGDPCH_t) + \varepsilon_t \tag{2.2}$$

The beta coefficient tells us how much the country's real exchange rate tends to rise on average as the country gets richer (according to the Balasa-Samuelson findings).

Then we subtract the estimated values ($RER_t\ Log$) of Equation (2.2) from the values obtained from Model 2. This gives an improved purchasing power parity index, which is as follows:

$$MissPPP_t = \beta \log(RER_t) - \hat{Log(RET)} \tag{2.3}$$

Positive values of this index indicate that the exchange rate is adjusted in such a way that the level of prices inside is lower than the value predicted by the exchange rate index of purchasing power parity, and negative values of it indicate the opposite of the above. Given that the stock price dependent variable and the transition variables include; The weakening of the national currency and macroeconomic indicators, taking into account the political effects of sanctions, are as follows:

$$\Delta(\ln SP)_t = \varphi(OIL)_t + \gamma(RD)_t + \lambda(S \times SP)_t + \lambda(FC \times SP)_t + \lambda(BC)_t + \acute{\theta}(MISSppp)_t F(\gamma, s_t, c) + u_t \tag{2.4}$$

$$= \Big\{ \varphi + \theta F(\gamma, s_t, \acute{c})(MISSppp)_t + u_t, \qquad t = 1, \ldots, T$$

Where the transition function F is equal to:

$$F(\gamma, s_t, c) = (1 + MISSppp\left\{-\gamma(s_t - c\ )\right\})^{-1}, \qquad \gamma > 0 \tag{2.5}$$

Estimating the stock price model according to the above pattern and after removing the redundant variables, results in the following equation.

$$\Delta(\ln SP)_t = -C + \beta OIL_t + \beta\Delta(MISppp)_t + \beta(RD)_t + \beta(S \times SP)_t \tag{2.6}$$

$$+\beta FC \times SP_t + \beta BC_t$$

In the above equation due to the country's dependence on oil revenues (OIL) and despite the weakening of the national currency ($MISS_{ppp}$), real interest rates (RD) and business cycles (BC) as well as the adjusting effects of financial crisis variables (FC × SP) and sanctions (S × SP) on the stock price index (SP) are examined.

2.4 Literature Background

The search and review of numerous articles and sources inside and outside the country indicates that so far little attention has been paid to this subject. However there are some articles and books that are somehow related to the issues of economic crisis and Islamic banking that here will be mentioned.

Bugra Bagchi et al. [5] This empirical investigation aims at forecasting the macroeconomic determinants of Istanbul Stock Price (XU100) in Turkey from the January 2010 to December 2019. results indicate that variables such as inflation rate, gold prices,industrial production index, money supply, exchange rate, credit volume, and internal debt stock were found to be important for forecasting XU100 price. In an article, Shabir Mohsin Hashmi et al [14] This paper examines the short-run and long-run effect of oil prices across bullish, bearish, and normal states of the stock markets in oil-exporting and oil-importing countries where oil-exporting countries include Russia, Mexico, Venezuela, and Norway and oil-importing countries include India, China, Japan and Norway. For this purpose, we use quantile ARDL model and compare its findings with the standard nonlinear ARDL model. the quantile ARDL estimates indicate that oil prices asymmetrically affect stock prices both in the short-run and long-run and for all sample countries. Smita Mahapatra et al. [18] examined the impact of currency fluctuations on Indian stock markets: valuation, pricing of exchange rate risks during the period 2012-2016, and the random effects model. In this paper, there is evidence that stock returns react significantly to exchange rate fluctuations in the post-crisis period. In particular, over the past four years, our sample, 2012-2016, has become an exchange rate risk factor. A prominent factor is stock returns, and this indicates that Indian investors are increasingly expecting an increase in risk premiums and adjustment costs in their investments to expose their added exchange rate risk. It also emphasizes the fact that the industry's foreign exchange exposure is measured by measuring the trade balance (net income), rather than being more sensitive to exchange rate risk (βS). An acceptable reason for this Premiums can be the insufficiency of Indian companies to reduce the exchange rate.

In an article, Dilip K.patro et al. [19] studiedd the devaluation of the currency and the stock market response for 41 countries over a thirty-year period using the panel model. The results show that if the devaluation is larger and the country is one of the developing countries, stock returns will fall significantly. In addition, if the country's foreign exchange reserves are low and the real exchange rate has decreased over the past years and the capital account

decreases and the current account deficit increases and the country's credit rating declines, stock prices on the stock exchange will decrease.

Sefidbakht and Ranjbar [23] in a study examined the overflow of fluctuations between oil prices, exchange rates, gold prices and the stock market at intervals and structural failure: using the Garch model (BEKK), ICSS algorithm and also with the VAR model. Then the relationship between them was examined through Granger causality test. The results show that if we exclude the calculation of structural failure in the equations, exchange rate changes have no effect on oil prices but have a significant effect on gold prices and stock index, in which case changes in oil prices have no effect on any of the studied variables. On the other hand, changes in the price of gold can affect the stock index, and changes in stocks can also affect the exchange rate. But when structural failure is used in equations, the results will be different.

3 Research Methodology

Blanchard and Bernanke [3], Sims and Watson [24] developed the SVAR model by considering the theoretical limitations on the simultaneous effects of shocks; Then, Blanchard and Kolb [4], Cali and Clarida [7] and Ashli and Great [26] identified the immediate reaction functions by applying theoretical constraints on the long-term effects of shocks. In self-regression models, SVAR structural vectors explicitly contain an economic logic or the use of economic theories to apply constraints and constraints. In other words, the stability of the model depends on the damping or persistence of the effect of an impulse, including a disturbance. If the effect of the shock, including the disturbance over time, is damp, the model is stable, and if the effect of the shock is permanent, the model is unstable. It is worth noting that a stable model is also mana, in the sense that their first- and second-order torques are not a function of time. Therefore, the main relationship between the abbreviated form and the structural form in an SVAR model is as follows:

$$A\varepsilon_t = BU_t \tag{3.1}$$

In the above relation, ε_t and U_t are the vectors of abbreviated form disruption sentences ε_t and structural disruption sentences U_t , respectively. Both ε_t and U_t are vectors with dimensions $(K \times 1)$, respectively, and A and B are matrices with dimensions $(K \times K)$. According to the studies of Blanchard [3], Giannini [20] and Sims [24], the simultaneous correlation between variables by two square matrices inversions A and B can be expressed.

According to the above-mentioned notes and the defined variables, the structural vector autoregression model (SVAR) is used to investigate the effect of devaluation of the national currency and macroeconomic indicators, taking into account the political effects of sanctions on stock prices; In the structural equation designed for the Iranian economy and due to the dependence of the country's economy on oil, oil revenue enters the structural equation as the first variable and in the second equation because oil revenues and positive and negative oil price shocks are affected by financial crises and political effects of sanctions. The multiplicative control variable of financial crises in the stock price index and the political effects of sanctions on the stock price index are entered into the equation as the second and third variables. In the fourth equation, the devaluation variable of the national currency due to the impact of positive and negative oil price shocks, financial crises and the political effects of sanctions is calculated and enters the model as the fourth variable. Equation 5 discusses the real interest rate (the difference between the facility interest rate and inflation) for entering a high-risk stock market investment or low-risk bank deposits, which can affect the stock price index. In the sixth equation, the output gap is entered into the equation as an indicator of business cycles and showing the difference between potential output and actual output. Therefore, the variables of devaluation of national currency and macroeconomic indicators enter the model into the seventh equation by considering the political effects of sanctions and financial crises to show the effects of variables on the stock price index of Iran. Therefore, the structural equations in the following matrix are designed based on Iran's economic conditions:

$$\begin{bmatrix} \varepsilon_{OIL} \\ \varepsilon_{FC\times SP} \\ \varepsilon_{S\times SP} \\ \varepsilon_{MISSppp} \\ \varepsilon_{RD} \\ \varepsilon_{BC} \\ \varepsilon_{SP} \end{bmatrix} = A(L) \times \begin{bmatrix} U_{OIL} \\ U_{FC\times SP} \\ U_{S\times SP} \\ U_{MISSppp} \\ U_{RD} \\ U_{BC} \\ U_{SP} \end{bmatrix} \tag{3.2}$$

Or in a spreadsheet we have:

$$\begin{bmatrix} \varepsilon_{OIL} \\ \varepsilon_{FC\times SP} \\ \varepsilon_{S\times SP} \\ \varepsilon_{MISSppp} \\ \varepsilon_{RD} \\ \varepsilon_{BC} \\ \varepsilon_{SP} \end{bmatrix} = \begin{bmatrix} a_{11}(1) & 0 & 0 & 0 & 0 & 0 \\ a_{21}(1) & a_{22}(1) & 0 & 0 & 0 & 0 \\ a_{31}(1) & a_{32}(1) & a_{33}(1) & 0 & 0 & 0 \\ a_{41}(1) & a_{42}(1) & a_{43}(1) & a_{44}(1) & 0 & 0 \\ a_{51}(1) & a_{52}(1) & a_{53}(1) & a_{54}(1) & a_{55}(1) & 0 \\ a_{61}(1) & a_{62}(1) & a_{63}(1) & a_{64}(1) & a_{65}(1) & a_{66}(1) \end{bmatrix} \times \begin{bmatrix} U_{OIL} \\ U_{FC\times SP} \\ U_{S\times SP} \\ U_{MISSppp} \\ U_{RD} \\ U_{BC} \\ U_{SP} \end{bmatrix} \tag{3.3}$$

Where, the left side of the above equation actually shows the difference in the order of the the dependent variables logarithm. In the right, matrix $A(L)$ is a square matrix containing polynomials in terms of the interrupt operator.For example, in row i and column j, the matrix $A(L)$ is $a_{ij}(L)$, which indicates the response of the variable i to the j of the structural variable. The vector $E = [U_{ij}]$ contains structural disorder statements. Which are defined as follows:

- U_{OIL} : Impulses related to oil revenues.
- $U_{FC\times SP}$: Impulses related to the multiplier variable of financial crises in the stock price index.
- $U_{S\times SP}$: Impulses related to the control variable are multiplied by the political effects of sanctions on the stock price index.
- $U_{MISSppp}$: Impulses related to the devaluation of the national currency.
- U_{RD}: Impulses related to real interest rates.
- U_{BC}: Impulses related to business cycles.
- U_{SP}: Impulses related to stock price index.

According to Blanchard and Kolb [4], structural shocks are identified by applying a number of constraints on the long-term effects of shocks on some variables, and through this recognition, the devaluation of the national currency and macroeconomic indicators with political effects in mind. Sanctions and financial crises on the stock price index of Iran during the period 1397-1397 are evaluated.

4 Model estimation and analysis of findings

4.1 Calculation of business cycle index (GDP gap)

In this study, to calculate the potential production to show business cycles, the Hodrick Prescott filter approach has been used for the period 1370-1397. The results of this test are shown in the chart below and enter into the main model as GDPgap variable.

According to Figure 1, the obtained cyclic component is used to determine the periods of recession and prosperity. To determine the period of recession and prosperity using the cyclical component, it is necessary to be able to determine the peaks and crises. In this study, the studies of Hamberg and Verastendig [13] and Chin, Geweke and Miller [6] have been used to determine the rotational points. The results of this study show that the Iranian economy has gone through a total of five cycles from 1991-1997:

1. The Recesion period from 1992 to 1995
2. The prosperity period of 1996
3. The recession period from 1997 to 1999
4. The prosperity period of 2000 to 2007
5. The recession period from 2008 to 2009
6. The prosperity period from 2010 to 2011
7. The recession period from 2012 to 2015
8. The prosperity period from 2016 to 2017
9. The recession period of 2018

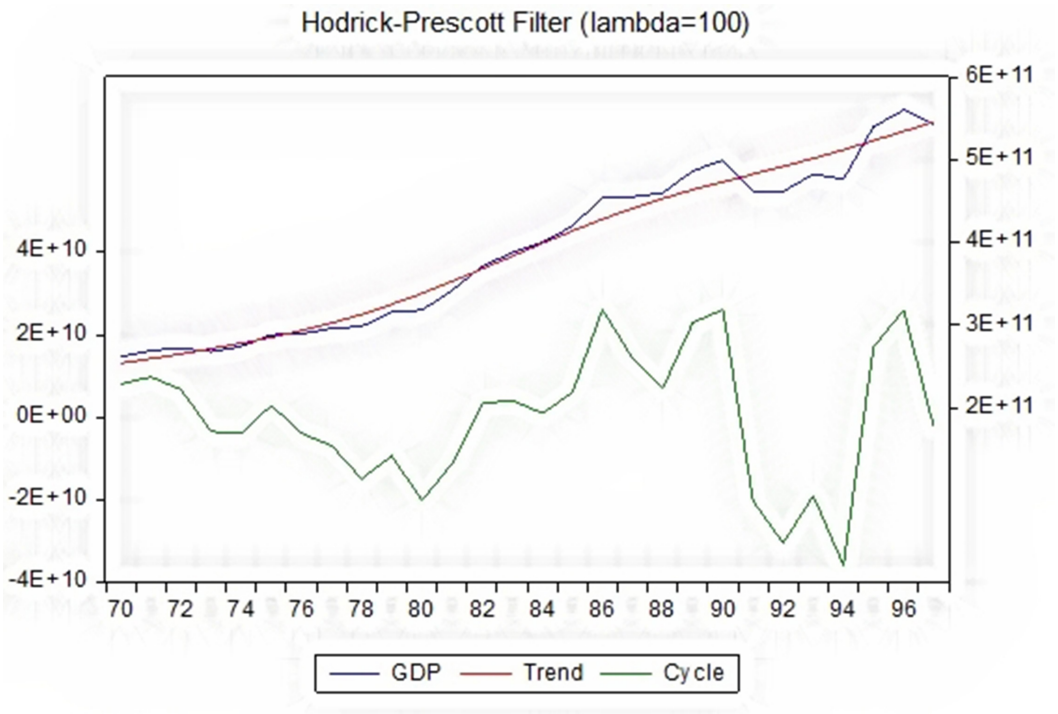

Figure 1: GDP gap graph to show business cycles

4.2 SVAR model Introduction

After static detection of model variables, the first problem in vector regression models is to determine the optimal interval length. Here, the Scwartz-bayesian (SC), Akaike (AIC), Final Prediction Error (FPE) and Hannan-Quinn (HQ) and Likelihood Ratio (LR) have been used to determine the interval length. The results of Table 1 show that in the model based on the criteria of likelihood ratio, the final prediction error, Akaike and Hannan-Quinn apply the second interval as the optimal interval of the model. While according to the Shuratz-Bayesian criterion, interrupt one is selected as the optimal interrupt. Finally, since the Schwartz-Bayesian criterion follows the principle of saving and gives the most importance to reducing the parameters or simplifying the device (for better fit), so it is more suitable for small sample size, especially the selected sample size, and therefore, interrupt one is selected as the optimal interrupt of the model.

Table 1: Determining the optimal interrupt in the VAR pattern

Lag	$LogL$	LR	FPE	AIC	SC	HQ
0	-573.3144	-	$110e^{+}10$	42.98625	43.32221	43.08615
1	-386.4446	$^{*}263.0019$	$^{*}458975.8$	$^{*}32.77368$	$^{*}35.46134$	$^{*}33.57286$

Source: * Indicates the number of interruptions selected by the criterion.

4.2.1 Unit Circle Root Test

Since according to the ADF test, the research variables are at the unstable level and in the second part, Schwartz-Bayesian criterion showed that the first interval is optimal for the research model, so in this part, the research model is a vector error correction with an estimated interrupt. To ensure that the regression was not false and virtual, the root unit of the whole regression model was tested. If the SVAR model is not stable, the results are not reliable. We use AR diagrams to evaluate the stability of the estimated model. This inverted diagram shows the characteristic roots of an AR process. If the absolute value of all these roots is less than one and is within the circle of the unit, the estimated SVAR model is stable. The AR diagram of the model in the figure shows that the inverse of the characteristic curves are inside the unit circle and the estimated SVAR model of these models provides the stability condition.

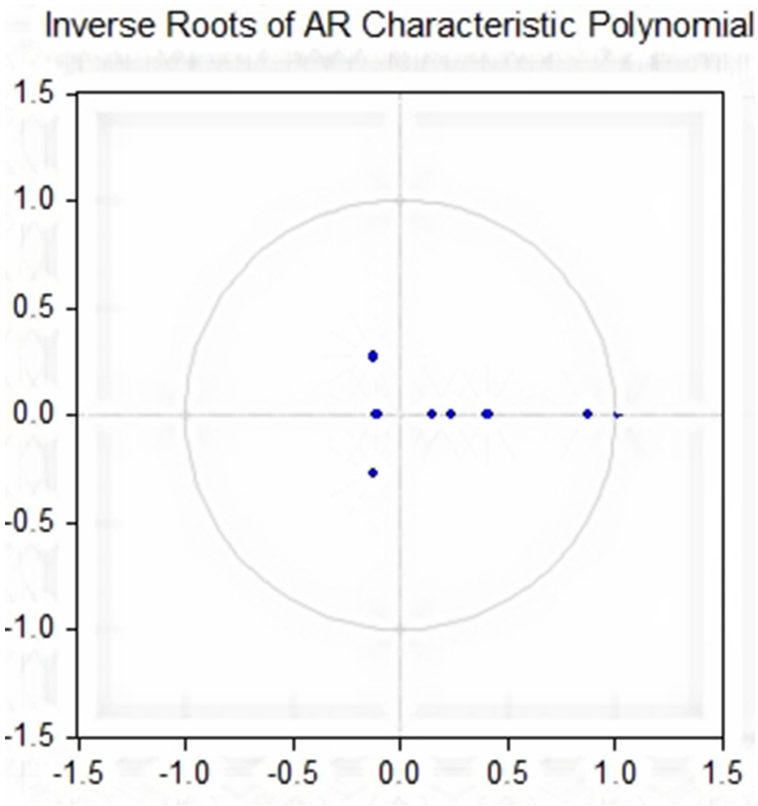

Figure 2: Circle unit root test

4.3 Model Estimation Results

The results of the SVAR model are reported in Table 2 to investigate the effect of the weakening of the national currency and macroeconomic indicators, taking into account the political effects of sanctions on stock prices. This table shows the system of equations of structural shocks and form shocks. In Table 2: @e1 shocks related to oil revenue, @e2 shocks related to the multiplier of financial crises in the stock price index, @e3 shocks related to the multiplier of the political effects of sanctions on the stock price index, @e4 impulses related to the devaluation of the national currency, @e5 impulses related to the real interest rate, @e6 impulses related to business cycles, @e7 Stocks, show that the results of model estimation can be presented in the table below.

Table 2: Estimation of the long-run equilibrium relationship for the research model

Structural VAR Estimates Sample (adjusted): 13701397 Structural VAR is just-identified
Model: $A\varepsilon_t = BU_t$ where E[uu']=I Restriction Type: short-run text form @e1 = -C(1)*@u1 @e2 = -C(2)*@e1 + C(3)*@u2 @e3 = -C(4)*@e1 + C(5)*@e2 + C(6)*@u3 @e4 = -C(7)*@e1 + C(8)*@e2 + C(9)*@e3 + C(10)*@u4 @e5 = -C(11)*@e1 + C(12)*@e2 + C(13)*@e3 + C(14)*@e4 + C(15)*@u5 @e6 = -C(16)*@e1 + C(17)*@e2 + C(18)*@e3 + C(19)*@e4 + C(20)*@e5 + C(21)*@u6 @e7 = -c(22)*@e1 + c(23)*@e2 + c(24)*@e3+c(25)*@e4+c(26)*@e5+c(27)*@e6+c(28)*@u7 Where @e1 represents OIL residuals @e2 represents FC*SP residuals @e3 represents S*SP residuals @e4 represents MISSppp residuals

@e5 represents RD residuals
@e6 represents BC residuals
@e7 represents SP residuals

	Coefficient	**Standard deviation**	**T statistics**	**probability level**
Coefficient of oil shocks in the equation of financial crises C(2)	0.218986	0.089194	2.455176	0.0159
Coefficient of Oil Shocks in Equation C(4)	0.506410	0.238220	2.125809	0.0339
Impact coefficient of financial crises in the embargo equation C(5)	0.009337	0.005305	1.759871	0.0784
Coefficient of oil shocks in the devaluation equation C(7)	0.004354	0.001396	3.117835	0.0018
Impact coefficient of financial crises in the devaluation equation C(8)	0.894853	0.296714	3.015880	0.0033
Coefficient of Impact of Sanctions in the Equation of Weakening of National Currency C(9)	0.018833	0.009218	2.043013	0.0415
Coefficient of oil shocks in the real interest rate equation C(11)	0.188014	0.237241	0.792503	0.4284
Impact coefficient of financial crises in the real interest rate equation C(12)	1.456170	45.30145	0.032144	0.9744
Coefficient of Sanctions Impact on the Real Interest Rate Equation C(13)	0.001675	0.002822	0.593339	0.5532
Impact coefficient of devaluation of the national currency in the real interest rate equation C(14)	0.018876	0.016614	1.136126	0.2563
Coefficient of oil shocks in the trade equation C(16)	0.611363	0.147189	4.153601	0.0000
Impact coefficients of financial crises in the business equation C(17)	1.484398	0.656300	2.261769	0.0237
Coefficient of Sanctions Impacts in the CE Equation(18)	0.001999	0.002985	0.669631	0.5031
Impact coefficients of devaluation of the national currency in the trade equation C(19)	0.001008	0.000366	2.755978	0.0059
Impact coefficients of real interest rates in the trade equation C(20)	0.088427	0.021983	4.022583	0.0001
Coefficient of oil shocks in the stock price index equation C(22)	0.898140	0.312275	2.876118	0.0050
Impact coefficient of financial crises in the stock price index equation C(23)	0.110214	0.019702	5.594031	0.0000
Coefficient of sanction shocks in the equation of stock price index C(24)	0.869605	0.065657	13.24474	0.0000
Impact coefficient of devaluation of the national currency in the equation of the stock price index C(25)	0.530516	0.196940	2.693798	0.0084
The coefficient of real interest rate shocks in the equation of stock price index C(26)	0.002923-	0.000637	4.586778-	0.0000
Coefficient of trade shocks in the stock price index equation C(27)	0.125433	0.015972	7.853166	0.0000
Coefficient of oil shocks in the oil price equation C(1)	4.865963	0.674788	7.211103	0.0000
Impact coefficient of financial crises in the financial crisis equation C(3)	0.029611	0.004106	7.211103	0.0000
Coefficient of Sanction Impulses in Equation C(6)	0.004292	0.000595	7.211103	0.0000

Coefficient of devaluation of national currency in the devaluation equation of national currency C(10)	0.034645	0.004804	7.211103	0.0000
Coefficient of real interest rate shocks in the real interest rate equation C(15)	6.797410	0.942631	7.211103	0.0000
Coefficient of shocks of business cycles in the equation of business cycles C(21)	6.40E-05	8.88E-06	7.211103	0.0000
Coefficient of stock price index shocks in the stock price index equation C(28)	0.084177	0.011673	7.211103	0.0000

The results of estimating the SVAR model indicate that the coefficients of the main variables and the impulses affecting each other in the matrix equations are significant and in accordance with the conditions of the Iranian economy. The main variables that are necessary and analyzable in the results of the SVAR model; Impacts from oil revenues, financial crises, sanctions, devaluation of the national currency, real interest rates and trading cycles are on the stock price index. Thus, a shock from oil revenues increases the stock price index by 89%. Also, a shock from the financial crisis and sanctions will increase the stock price index by 11 and 86 percent, respectively, and a shock from the weakening of the national currency will increase the stock price index by 53 percent, as well as a monopoly from the trade and production gap. Increases the stock price index by 12%. Normally, the occurrence of crisis, monetary and financial shocks, sanctions should lead to a recession in the country and lower prices in the stock market, but due to the growth of the exchange rate bubble and the weakening of the national currency, the stock price index of various industries. increase. In terms of economic structure and according to the principles of economics, a steady increase in the dollar rate will lead to economic prosperity in society, but if this increase is temporary, economic prosperity can not be observed. The floating and managed increase of the exchange rate will cause relative stability in the foreign exchange market, and this will enable economic actors to have long-term planning for their production and exports. With the rising value of the dollar, importing companies are having trouble with food and parts because they have to buy currency at a high price and buy the parts or products they need. Importers increase the price of offering their products to the consumer as the purchase price of their products increases. This will be to the detriment of the consumer and will increase the price of goods. This will increase the demand for domestic products and make the market more competitive. In terms of product prices. An increase in the exchange rate and a decrease in the weakening of the national currency will lead to an increase in the amount of foreign debt owed by these companies, and an increase in debt will lead to a general lack of liquidity. It has a negative effect on the distribution of dividends, stock returns and increase in their price index. Therefore, it can be said that a constant increase in the exchange rate will reduce the liquidity of the stock market, so that by looking at the graphic process of financial crises, sanctions, weakening of the national currency, the output gap can be seen that a shock from these variables The stock price index (Figure 3) has an upward trend for two periods and then continues its downward trend and adjusts in the long run. In other words, the oil, currency, conditions and political factors of the country have a positive effect on the stock price index in the short run and a negative effect on the stock price in the long run. In general, it can be concluded that with the increase of some factors such as; Political conditions and factors of the country, economic situation of the world and Iran, annual budget of the country, macro-monetary, fiscal and exchange rate policies, inflation rate, pricing, supply and demand of industrial products, macro and long-term investments, technological developments, P/E ratio (price to Profit), capital increase by companies, type of company ownership (shareholder composition), earnings per share forecast (EPS) and EPS trend stability, company development plans, company management, stock and currency price fluctuations, share risk, financial information transparency and much more Other factors have led to fluctuations in this market, and this factor is a reason for reducing returns and increasing the stock price index.

4.3.1 Instant Reaction Functions:

In order to analyse properly the results of the long-run equilibrium relationship for the SVAR structural autoregression model, we need to investigate the reaction functions and the analysis of variance for the model. In other words, the SVAR model offers two powerful tools for analyzing economic fluctuations: instantaneous reaction (IRF) functions and analysis of variance. Therefore, after estimating the SVAR model, the results of instantaneous reaction and analysis of variance functions can be examined. An instantaneous reaction function, in fact, expresses the effects of a shock standard deviation on endogenous variables in the pattern. For the model used in this study, the reaction of endogenous variables including; oil revenue, financial crises, sanctions, devaluation of the national currency, real interest rates, trading cycles and stock price index to a sudden shock or change as a deviation The criteria in each of

the endogenous variables of the model are shown graphically in Figure 3 for the model. On the horizontal axis, time is in the form of annual periods and on the vertical axis, in the form of the percentage of growth of variable changes.

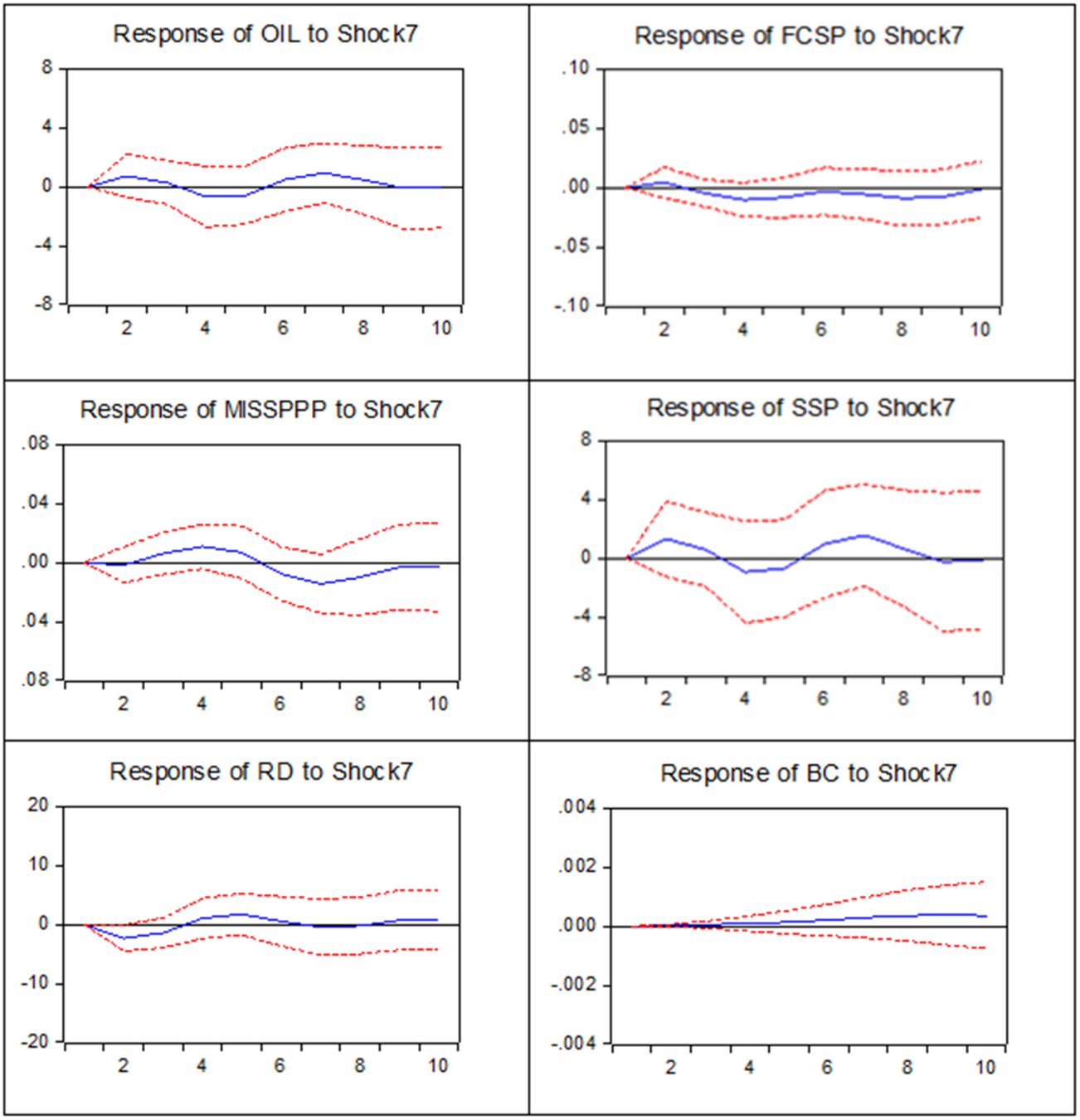

Figure 3: Results of instantant reaction functions for the model

The results of the instantaneous reaction functions (Figure 3) for the model show that the impact of shocks from oil revenues, financial crises, sanctions, devaluation of the national currency, business cycles on the stock price index of the first two periods; It goes up and then down. Some argue that the structural and institutional weaknesses of the country's society have created obstacles to the proper use of the potential for oil revenues, and in some cases, oil rents have exacerbated those weaknesses. As a result, while oil revenues have in some ways contributed to consumption and production in the country, in others they have led to economic and political backwardness. A group of supporters of this view believe that by trying to compensate for structural weaknesses and adopt appropriate policies, the positive effect of oil on the country's economy can be strengthened. But many also see the main problem as the existence of oil rents. In their view, oil as a whole is a great disaster for the country. According to the supporters of this

Table 3: Variance analysis for the model

		Shock1	Shock2	Shock3	Shock4	Shock5	Shock6	Shock7
period	**S.E.**	**OIL**	**FC×SP**	**S×SP**	**MISSppp**	**RD**	**BC**	**SP**
1	4.865963	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.408340	83.29085	1.875623	3.286844	4.853513	0.467815	5.833412	0.391943
3	6.280962	70.69037	1.603032	4.468082	16.79249	0.955004	5.193160	0.297865
4	6.467059	67.58129	2.596072	4.360946	16.97035	0.931816	7.052259	0.507257
5	6.742518	62.24701	3.124279	5.524280	20.06614	0.948082	7.519068	0.571135
6	6.919912	59.60084	3.457662	5.276593	19.44877	1.196562	9.139424	1.880147
7	7.512055	51.66641	4.467759	7.305640	19.37186	1.027842	12.05256	4.107930
8	8.016999	47.50224	4.237152	8.520586	22.53662	0.903376	11.23771	5.062318
9	8.183438	47.50878	4.077860	8.177523	23.54871	0.870185	10.88012	4.936828
10	8.276969	47.29932	3.990900	8.646608	23.45629	0.890828	10.65877	5.057291

view, oil revenues in other ways have prevented the country's productive forces from making the necessary efforts for industrial development. For example, these revenues have diverted the attention of the government and the private sector too much, away from production and to imports. More importantly, in some periods, the conflict between different social and political groups to seize a larger share of this huge rent has risen and imposed great costs on the country's economy. In some other periods, a few have been able to take control of oil rents and thereby monopolize power and perpetuate dictatorships. But in general, looking at the graphical trend of oil prices for the country's economy and also the results of instant reaction functions, we find that in periods of rising oil prices we see an increase in investment and production and thus an increase in stock price index and vice versa, when income Oil is falling, we are seeing declining production and falling stock prices. Of course, it can be emphasized that the price of oil is only one factor and other factors must be considered. also; Reviewing the country's economic record, it can be seen that the increase in oil revenues is mostly not well managed and instead long-term investments are spent on short-term current expenditures, which result in nothing but currency fluctuations, weakening national currency, inflation and increasing government budget deficit. There has been no fluctuation in the stock price index. The results of the instantaneous reaction functions also show well that after two periods of increase due to the effect of oil revenue shock, has led to a decrease in the stock price index, a cost that the country's economy due to lack of confidence and uncertainty and crisis and the effects of sanctions. Pays, is very high. The reason for the impact of oil price fluctuations and financial crises, sanctions, the weakening of the national currency and the output gap on the stock price index in the country's economy, is this lack of confidence, uncertainty and inefficiency as a result of which people do not invest enough.

4.3.2 Variance Analysis

In this section, according to the estimated model, the analysis of variance of fashion variables is performed, the results of which can be seen in Table 3 for the model. In this table, the S.E. column shows the prediction error of the relevant variables during different periods. Since this error is calculated each year based on the error of the previous year and the source of this error is a change in current values and future shocks, it increases over time. The results of Table 3 for the model show that the prediction error in the first period was 4.86 and in the second period was 5.40 and increased over time. Subsequent columns show the percentage of variance due to a sudden change or specific momentum. The third column shows that although in the first period 100% of the changes and in the second period 83.29% of the changes were due to oil revenue shocks, but in the third period the changes in this index were 70.69% related to oil revenue shocks and 1.60% related. To the shock of financial crises in the stock price index, 4.46% related to the shock of sanctions in the stock price index, 16.79% related to the shock of devaluation of the national currency, 0.95% related to the shock of real interest rates, 5.19% related to The impulse was business cycles and among model variables; Oil Revenue Impact, National Currency Impairment Impact, Business Cycle Impact, Sanction Impact Impact, Financial Crisis Impact and Real Profit Rate, respectively, accounted for the highest percentage of explanations for model changes during the period under review, which is entirely justifiable for the Iranian economy and was analyzed in general in pervious parts.

5 Conclusions And Recommendation

For oil-exporting countries, including Iran, revenues from oil sales are a very important source of governments' financial and foreign exchange earnings, and the dependence of these revenues on the price of oil in the world market,

in other words, its externalization can be considered as a reason for uncertainty and instability in economic policies. Therefore, it can be said that any fluctuation and instability in the global oil market leads to imbalances and even crises, unless the right policies are adopted by governments to deal with these fluctuations. On the other hand, changes in oil prices as supply-side shocks affect the economy of oil importing countries. Any change, especially an increase in oil prices, which is an important input to the production function, increases costs and reduces interest rates. In addition to creating economic cycles (real business cycles), stock prices and expected stock returns are also influential. What is certain is that among the stock market indices, the market share of refineries and petrochemical companies in the Iranian stock market is higher due to its direct relationship with the world markets and almost 30% of the Iranian market value is directly related to oil prices. Therefore, it can be said that the Tehran Stock Exchange, like the world stock exchanges, has been completely affected by oil prices and prices are expected to have the most necessary impact on oil prices. The general price of crude oil, depending on the type of activity of various industries, can have a greater impact on the general indexes of the stock market, especially the stock index of industries whose raw materials are dependent on oil and Or oil derivatives, home appliance companies are among the industries that are indirectly positively affected by fluctuations and falling global crude oil prices. Because the decrease in the world price of crude oil along with the decrease in the world price of raw materials can reduce the cost price and consequently the profitability of these industries that these companies have a small share in the country's production in a recession and their cost reduction is not significant. The atmosphere of recession in the country is also fueling. According to these issues, the purpose of this study was to investigate the effect of weakening the national currency and macroeconomic indicators by considering the political effects of sanctions on stock prices during the period 1991 to 1397, for this purpose the SVAR structural autoregression model; Used to estimate results. According to the results; Shocks from oil revenues, financial crises, sanctions, the devaluation of the national currency, business cycles up to the first two periods lead to an increase in the price index and then after adjusting the effect of shocks and return to normal market, will decline. According to the research results, the following suggestions are presented:

One of the factors that are considered important in the impact of exchange rate fluctuations and the weakening of the national currency, the performance and choice of the exchange system, is the nature of the shocks to the economy. Countries under domestic monetary shocks (developing countries) are better off benefiting from a fixed exchange rate system. In these countries, the money supply automatically adapts to changes in monetary demand, without affecting the real sector of the economy. Another factor that is considered in the performance of exchange rate fluctuations and the exchange rate system is the degree to which countries are related to the global capital market and the degree of openness of the economy. In this regard, Hussein et al. [21] concluded that in countries that are less exposed to international capital flows, a fixed exchange rate system can be an important tool in stabilizing monetary policy that leads to stable investment and improved aspects. Growth becomes long-term. But among the emerging markets of developing countries that have joined the global financial market and advanced economies, there is no relationship between the performance of the economy and the exchange rate system and exchange rate fluctuations, the fixed exchange rate system is like a double-edged sword; While choosing a fixed currency system has some credit advantages as well as some risks of financial crisis. Exchange rate fluctuations in countries that are exposed to liquidity shocks have a negative effect on the intensification of these shocks. Meanwhile, countries with high financial development are able to contain liquidity shocks and thus beware of the negative effect of exchange rate fluctuations and are expected to have a positive effect on exchange rate fluctuations in these countries. In contrast, in countries with low financial development, the negative effect of exchange rate fluctuations is intensified and the effect of exchange rate fluctuations on growth is expected to be negative.

Developing countries, including Iran, have a high degree of uncertainty about macroeconomic variables. Growth, inflation, liquidity, exchange rate and other macroeconomic variables are more prone to fluctuations than the economies of industrialized countries, and the effects of these fluctuations and their continuation can lead to more structural problems in different economic sectors. Fluctuations in these indices affect the stock market and consequently the stock price index by creating risk and uncertainty, affecting the investment and decisions of investors. Fluctuations in these indices have a significant impact on liquidity, investment, exports and imports. Will have production in the country and therefore is of great importance for the country's economic officials. These fluctuations affect the amount of investment of the private sector, both the importer of raw materials and the exporter of goods, by affecting the import and export of intermediate and capital goods related to production. Given the different infrastructures, patterns and economic conditions of developing countries, especially Iran, a separate study of how the Iranian stock market is affected by the uncertainty of government monetary policy, government fiscal policy and government monetary policy can give a correct view of how the country's macro decisions provide changes in the Iranian financial market due to these fluctuations.

Since stock market returns are one of the most accurate tools displayed in the economy and are highly sensitive to

economic conditions and can have a direct impact on interest rates and public confidence, policymakers should always adopt policies that lead to stimulation. In order to get their stagnant capital out of the banks and invest in the stock market, people should be provided with the ground for further development of this market.

6 Acknowledgments

Special thanks to my dear colleagues Mr. Khadivi, Mr. Zavarizade and Mr. Kangarluyi who helped me to gather, calculate and analyse data to write this paper.

References

[1] M. Al-Ameer, W. Hammad, A. Ismail and A. Hamdan, *The relationship of gold price with the stock market: The case of Frankfurt Stock Exchange*, Int. J. Energy Econ. Policy **8** (2018), no. 5, 357–371.

[2] E. Al-Hajj, U. Al-Mulali and S.A. Solarin, *The influence of oil price shocks on stock market returns: Fresh evidence from Malaysia*, Int. J. Energy Econ. Policy **7** (2017), no. 5, 235–244.

[3] B.S. Bernanke, *Alternative explanations of the money income correlation*, National Bureau of Economic Research Cambridge, Mass., USA, Autumn 1986.

[4] E.B. Blanchard, L.C. Kolb, R.J. Gerardi, P. Ryan and T.P. Pallmeyer, *Cardiac response to relevant stimuli as an adjunctive tool for diagnosing posttraumatic stress disorder in Vietnam veterans*, Behav. Therapy **17** (1986), no. 5, 592–606.

[5] B. BağCI and F. Çitak, *Forecasting Turkish Stock MarketPrice with macroeconomic variables from the multivariate adaptive regression splines (Mars) model*, J. Yaşar Univ. **15** (2020), no. 60, 759–771.

[6] D. Chin, J. Geweke and P. Miller, *Predicting turning points. Federal Reserve Bank of Minneapolis*, Research Department Staff Report 267, 2000.

[7] R. Clarida, J Galı and M. Gertler, *Monetary policy rules in practice: Some international evidence*, Eur. Econ. Rev. **42** (1998), no. 6, 1033–1067.

[8] J. Cui, M. Goh, B. Li and H. Zou, *Dynamic dependence and risk connectedness among oil and stock markets: New evidence from time-frequency domain perspectives*, Energy **216** (2021), 119302.

[9] G. Dominioni, A. Romano and C. Sotis, *A quantitative study of the interactions between oil price and renewable energy sources stock prices*, Energies **12** (2019), no. 9, 1693.

[10] R. Dornbusch, *Expectations and exchange rate dynamics*, J. Politic. Econ. **84** (1976), no. 6, 1161–1176.

[11] A. Dutta, J. Nikkinen and T. Rothovius, *Impact of oil price uncertainty on Middle East and African stock markets*, Energy, **123** (2017) 189–197.

[12] N. Giannellis and M. Koukouritakis, *Exchange rate misalignment and inflation rate persistence: Evidence from Latin American countries*, Int. Rev. Econ. Finance **25** (2013), 202–218.

[13] U.L.F. Hamberg and D. Verständig, *Applying logistic regression models on business cycle prediction*, Unpublished master's thesis, Stockholm School of Economics, Stockholm, Sweden), 2009. Retrieved from `http://arc.hhs.se/download.aspx`

[14] S.M. Hashmi, B.H. Chang and N.A. Bhutto, *Asymmetric effect of oil prices on stock market prices: New evidence from oil-exporting and oil-importing countries*, Resources Policy **70** (2021), 101946.

[15] A. Kubo, *Macroeconomic impact of monetary policy shocks: Evidence from recent experience in Thailand*, J. Asian Econ. **19** (2008), no. 1, 83–91.

[16] C.K. Ma and G.W. Kao, *On exchange rate changes and stock price reactions*, J. Bus. Finance Account. **17** (1990), no. 3, 441–449.

[17] Y. Mohamadi, A. Mohamadi and G. Esmaili Kia, *The effect of macroeconomic variables on stock portfolio performance based on traditional and modern network*, Adv. Math. Finance Appl. **6** (2021), no. 3, 1–25.

[18] S. Mahapatra and S.N. Bhaduri, *Dynamics of the impact of currency fuctuations on stock markets in India: Assessing the pricing of exchange rate risks*, Borsa Istanbul Rev. **19** (2019), no. 1, 15–23.

[19] D.K. Patro, J.K. Wald and Y. Wu, *Currency devaluation and stock marketresponse: An empirical analysis*, J. Int. Money Finance **40** (2014), 79–94.

[20] R.A. Posner, *A review of Steven Shavell's foundations of economic analysis of law*, J. Econ. Lit. **44** (2006), no. 2, 405–414.

[21] R.A. Posner, *Cognitive Theory as the Ground of Political Theory in Plato, Popper, Dewey, and Hayek*, Cognition and Economics, Emerald Group Publishing Limited, 2006.

[22] M. Ripoll, *Real exchange rate targeting, macroeconomic performance and sectoral income distribution in developing countries*, J. Trade Econ. Dev. **14** (2005), no. 2, 167–196.

[23] E. Sefidbakht and M.H. Ranjbar, *Volatility spillover between oil price, exchange rates, gold price and stock market indexes with structural breaks*, J. Financ. Engin. Secur. Manag. **8** (2018), no. 33, 51–87.

[24] C.A. Sims, *Are forecasting models usable for policy analysis?*, Quart. Rev. **10** (1986), no. 1, 2–16.

[25] M. Wellington, C. Clainos and Z. James, *Empirical test of the relationship between exchange rate and inflation in Zimbabwe*, J. Econ. Sustain. Dev. **4** (2013), no. 1, 52–58.

[26] M.A. Wilson, P.F. Barron and A.H. Gillam, *The structure of freshwater humic substances as revealed by 13C NMR spectroscopy*, Geochim. Cosmochimica Acta **45** (1981), no. 10, 1743–1750.

[27] Z. Zhao, W. Huwei and L. Ke, *Identifying bubbles and the contagion effect between oil and stock markets: New evidence from China*, Econ. Modell. **94** (2021), 780–788.