



Interaction between foreign exchange market and capital market fluctuations

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Received: 2022/10/25 Accepted: 2022/11/15 Published: 2022/12/01

Abstract

Over the past few years, we have witnessed intensive fluctuations and changes in our exchange market, which have deeply affected different economic foundations of our country. Following these fluctuations, capital markets have also changed profoundly, and they have had occasional interactions with exchange markets. The purpose of this research is to investigate how and to what extent these markets are connected and what are their interactions. In this research, aside from the effects of temporal factors in each market, the concurrent relationships between capital and exchange markets and their interactive effects were also examined. The data used for this research was gathered from an eleven-year period between Mar. 2008 and Feb. 2019, and has been checked on a monthly basis. Two multivariate regression models were analyzed by Eviews10 program. The outcome of the analysis of regression models using ARMA method, in accordance with first, second and third hypotheses, showed that previous-period fluctuations of the capital market have a meaningful, negative correlation with future fluctuations of this market, and as the fluctuations in the previous period increase, the future fluctuations decrease, but the fluctuations of exchange market don't cause a con-current effect on capital market fluctuations. The results of the fourth, fifth and sixth hypotheses show that the fluctuations in the previous period of the exchange market have a positive and meaningful effect on the future fluctuations of this market, and as the fluctuations increase in the previous period, the future fluctuations also increase. Also, the previous period fluctuations of the exchange market have a positive, meaningful and interactive effect on the capital market and exchange market fluctuations, but in return, the fluctuations in the capital market do not cause a concurrent turmoil in the exchange market.

Keywords

exchange market fluctuation, capital market fluctuation, economic fluctuation.

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Introduction

In recent years, the markets of countries across the world have experienced fluctuations in their economic variables due to various reasons. The intense fluctuations of economic variables in different countries have caused financial losses to governments and companies. Considering that investment at the level of companies is necessary and essential for growth, development of the increasing competitiveness, the economic department of companies pay a lot of attention to this matter. The capital market is one of the most important economic foundations of the company, which is closely related to the country's economic structure; So that its pros and cons can be considered an indicator for the analysis of the company's economic state. Considering that the balance of investment in different sectors is considered as one of the important components of the macro economy and the necessities of economic progress and development, the realization of the desired growth rate requires this effective index. Numerous researches conducted in the field of investment theories and models are mainly related to components such as market economy and so on. The existence of many problems in the economic structure of developing countries makes it difficult to use classical economic theories in these countries. Therefore, the economists of the developing countries inevitably pay attention to these differences and also recognize the economic characteristics of their country, design and use models that match their conditions. The amount of investment in different levels of these countries, despite the sensitivity to exchange rate changes, determines the amount of their economic growth. The lack of proper and coordinated adjustment of the exchange rate with the domestic and international markets can have negative effects on it (Kabiri Fard, 2016). According to the results of various researches, the existence of doubts regarding the sunk investment in the competitive levels of companies in the market based on the input share of the capital amount, as well as the exchange rate fluctuations, can have destructive effects on its volume (Guanzhong and Hemgaran, 2019).

Today, Iran's economic situation has changed and become very complicated. Price fluctuations, complex international relations, foreign pressures and sanctions, emotional behavior of people regarding the economic changes and news, and many other factors have caused irregular competitions and strict domestic and foreign acts. The set of mentioned factors have also affected the stock market and other markets. In the last few years, due to internal and external issues, we have observed significant and tangible changes in the exchange rate in Iran, and the impact of these changes and fluctuations in the exchange rate on the quality of life and well-being was clearly demonstrated for all social strata.

Among the factors with direct and indirect effects on these fluctuations, political and social factors can be considered as the most important factors. Instability or stability of the domestic political setting, distrust of society members to the market and existing policies, the intensity of sanctions and restrictions by foreign powers, instability or stability of the domestic economic setting and many other factors cause an increase or decrease in the currency prices. Other sections of the national economic market and various industries are affected by these changes. If fluctuations are properly adjusted in a positive direction, it is possible to provide a more appropriate setting for the economy. Positive and negative volatilities in the currency market easily led to inflation or economic recession.

In this way, with the decrease in the value of money due to currency policies, the demand for domestic goods will increase compared to foreign goods, and this will lead to an increase in the general level of prices and inflation.

On the other hand, the decrease in the import of primary and intermediate goods for the production sector leads to disruption in production and increase in its costs. As a result, the demand for investment and shares will decrease, and in this way, the efficiency of the stock market will also be affected. Also, devaluation of currency increases windfall profits in international transactions. In fact, it can be mentioned that the currency market of a country reflects the economic conditions of that society and country. Due to high risk, the intense fluctuations of the exchange rate affect the decisions of exporters or importers, to the extent that some industries may give up trading with other countries or seek higher profits by accepting higher risks.

According to the "flow-oriented" exchange rate theory, exchange rate fluctuations have a potential impact on the value of companies due to the direct relationship between firm returns and exchange rate changes. Unexpected changes in exchange rates are one of the main characteristics of global financial markets, especially since these rates are constantly changing and current and are usually identified as a source of unexpected risks. However, it shall be noted that if the central bank and the government are unable to maintain symmetry and balance in the system, some fixed exchange rate systems can also cause risks. As an example, we can mention the change of the Mexican peso in 1992, the Thai baht in 1997, or the Argentine peso in 2002, from an equal exchange rate parity with US dollar to a floating exchange rate, which was one of the consequences of the financial crisis of these countries (Bodnar and Gentley 1993, Khoo 1994, Williamson 2001).

Fluctuations undoubtedly has a potential impact on asset pricing. Also, accurate information for predicting fluctuations is one of the most important factors for investors. In addition to effect on pricing, financial market fluctuation is a crucial input for investment and financial market adjustments. Fluctuation in the market reduces the expected returns of shareholders, but this item shall not be considered as a measure of the level of uncertainty in financial markets. In particular, investors are looking to diversify their portfolios. Due to the complexity, these fluctuations can provide investment opportunities (Worth et al., 2017).

The uncertainty of the exchange rate affects the competitive position and pricing of domestic and multinational companies, the supply and demand, and the value of their competitors. International companies may lose their desire to invest in long-term projects due to the fear of reduced profits due to exchange rate fluctuations. Changes in the exchange rate alter the value of the company, input and output prices in multinational companies, and by continuously affecting the company's profitability and external performance, it leads to a change in the stock returns of these companies. Exchange rate fluctuations, in addition to affecting the stock value of companies present in the international arena, can also affect the stock returns of domestic companies. Domestic companies will be affected by exchange rate changes due to the possibility of importing some raw materials and exporting part of their products (Agrawal and Srivastav, 2010).

Financial markets are one of the basic foundations of every country and nation. In other words, changes in this market affect the entire economy. This market includes several channels, such as stock market, derivatives market, bond market, over-the-counter market,

and foreign exchange market. In general, the financial market can be divided into two categories: money market and capital market. In the stock market, investors naturally try to achieve higher profits and reduce losses, and to achieve this goal, they shall consider all the factors affecting the stock price. In this regard, currency market fluctuations are one of the most effective factors. Today, investors consider many factors to choose an investment. Based on the existing approaches, investors' decision-making is not only based on technical and rational analyzes (Vadiee and Shokohizadeh, 2011).

Broad volatilities and fluctuations in the financial asset markets cause the input and output of a large amount of capital, which causes uncertainty. This uncertainty can have a reciprocal effect on economic markets and this effect can be transferred from one market to another. In this regard, the government can use these transfers to promote appropriate monetary and financial policies in the economy by considering the current conditions and studying the market situation. How monetary and financial policies affect the economy is of key importance for policy makers and financial researchers. Recent theoretical works have shown that due to the financial constraints, the government can react differently in times of crisis. As a result, investigating financial asset markets and investigating the cause and extent of volatility in it, as well as investigating the effects of volatility in different markets on each other, can guide the use of appropriate policies to improve the overall economic situation.

In general, based on the transactions made in the financial market, such as purchase and sell shares, derivatives in the stock exchange and over the counter, bonds, etc., the financial market is the pulse of the country's economy, and any changes, ups and downs in its prices and states has a significant impact on management decisions. Some economists believe that the exchange market influences the capital market, but others believe that variation in the currency market are caused by changes in the capital market. Therefore, this issue has been investigated in present study.

Literature Review

Engle (2001) proposed the Autoregressive Conditional Heteroskedasticity model (ARCH) as a solution for time series. In ARCH models, the conditional variance is an autoregressive process that is obtained from the conditional heteroskedasticity of the errors. ARCH models are able to describe periods of constant and volatility in time series. But Bollerslev generalized the Engle model with a method that expressed the conditional variance in the ARMA process. Although it is a generalization of the ARCH model, in this model autoregression and moving average are used simultaneously in variance heterogeneity (Andres, 2002). The success of GARCH models has led to its widespread use in describing time fluctuations, cluster fluctuations and asymmetric response to negative and positive shocks.

Multivariate GARCH (MGARCH) models are used in order to use volatility and correlation transmission and spillover effects in field studies. The relationships of portfolio subsets can be modeled through the development of multivariate models (McAleer & Viegas, 2008). Creating acceptable flexibility for the dynamics of variances and conditional covariances is one of the desirable features of MGARCH. In addition, most of the parameters in the MGARCH model adapt quickly as the dimensions of the model increase. This feature provides sufficient thrift for easy model estimations (Engle et al., 2007).

The price of the currency in each country indicates its economic status compared to other countries and also reveals the international conditions and competitiveness of that country compared to other countries. Due to direct and indirect connections with other macroeconomic variables, the exchange rate has a significant domestic and foreign impact on monetary and financial and overall economic policies (Aziz Berdio et al., 2011). The goal of the financial market is to establish a close relationship between the two sectors of thrift and investment. In fact, the role of the financial market is to transfer money from the sectors facing excess liquidity to the sectors suffering from liquidity shortage. In countries like our country, the impact on the financial market increases the risk of this market's return, and as a result of this risk, people's desire to invest in the country is also affected. Today, the role and importance of capital markets and stock exchange as one of the main pillars of this market is not hidden from anyone. The international economic setting has seen significant fluctuations in the exchange rate parity between countries and this issue has also affected companies. Along with the increase in trade between countries, exchange rate fluctuations are considered as one of the most important sources of company risk. Since the stability of the exchange rate is lower compared to other macroeconomic variables such as interest rate and inflation (Jorion 1990), this issue increases the sensitivity of investors, financial managers and researchers on the extent of the effect of currency fluctuations on market components and fluctuations. The importance of this issue has increased since the US financial crisis in 2007. Although this event is considered the first global crisis since the Great Depression (Claisens et al., 2010), emerging economies seem to be able to somehow absorb the impact of these external shocks from the United States until the bankruptcy of Lehman Brothers in Sep. 2008, which led to a direct shock that quickly spread to these emerging economies (Dooley and Hutchinson, 2009).

Real exchange rate uncertainty can have destructive effects on investment decisions. Because this issue causes reallocation of existing resources to different sectors or leads to investment in profit-based financial activities instead of real investments (Yazdani and Pirpour, 2015). If the investment is irreversible, an uncertain environment is created for this action. Therefore, there are serious challenges in making decisions based on these factors. Considering the need of commercial companies for investment decisions in a world full of uncertainty, these groups should have a correct understanding of the effects of this uncertainty in their investment decisions (Rahimi and Bahri, 2014). In general, uncertainty and exchange rate fluctuations by intensifying various risks in the economic field, reduce the power of attracting financial resources and reduce investment in enterprises and companies (Sahabi and Zulfaghari, 2013).

Malik (2022) conducted a research titled Volatility spillover between exchange rate and stock returns under volatility shifts. This study re-examines volatility dynamics of the US Dollar exchange rate and the US stock market utilizing bivariate GARCH models using daily data from January 2003 to May 2018. The modified iterative cumulative sum of square (ICSS) algorithm is employed to identify shifts in the variance of the two-return series. The results show that if volatility shifts are ignored, there is significant volatility transmission from the US stock market to the US Dollar exchange rate but not vice versa, which is consistent with previously documented research. However, after accounting for endogenously determined

variance shifts in the bivariate GARCH model, no significant volatility transmission was found across markets.

Islam and Nosheen (2020) in research entitled Impact of exogenous variables (crude oil and gold) on stock returns volatility: A case of Karachi stock exchange, investigated the effect of gold and oil prices on volatility of Karachi Stock Exchange (the current stock exchange of Pakistan). This study uses 132 monthly observations for stock returns for a period ranging from 2005-2015. The results of this study reveal that oil prices and domestic inflation significantly affect the market returns volatility, whereas gold price has no significant effect on the volatility of Karachi stock exchange-returns. Pakistan's market is a developing market; therefore, it is not influenced by the gold prices like other developed countries.

Demirer et al. (2019) studied the impact of oil supply and demand shocks on the stock and stock market in research entitled Oil Price Shocks and Financial Markets: A Comparative Analysis of Stock and Sovereign Bond Markets. they show that international stock and sovereign bond markets react differently to oil price shocks depending on the nature of the shock. While oil demand shocks have a robust positive effect on stock market returns, we observe that the effect of supply related shocks is less pronounced and more heterogeneous across the stock markets. Oil price shocks are also found to affect bond market returns; however, the effect is rather heterogeneous and largely concentrated on demand shocks. Finally, we show that oil price shocks can also serve as a determinant of the degree of connectedness across the stock and sovereign bond markets with significant implications on the effectiveness of global diversification strategies.

Mohammadi Tabar (2022) studied the effect of growth opportunities on the volatility of stock returns in a study titled "Study of the Effect of Growth Opportunities on Stock Return Volatility ". The statistical population of the research is the companies listed on the Tehran Stock Exchange and the study sample includes 140 companies listed during the years 2016 to 2020. The research method is descriptive and correlational in terms of relationship between variables and is applied in terms of purpose. Regression method and panel data as well as fixed effects model have been used to process and test the hypotheses. The results obtained from the analysis of the hypothesis show that growth opportunities have a positive and significant effect on the volatility of stock returns at the 5% error level.

Damiri et al. (2019) in research entitled Modeling Exchange Rate Fluctuations with the System Dynamics Approach modeled the exchange rate fluctuations with the System Dynamics Approach. In this research, all the factors affecting the exchange rate have been identified and evaluated their systemic relationships. First, the trend and the exchange rate price were predicted using the system dynamics from 2004 to 2022, and the results were compared with the trend and real exchange rate of the exchange rate. The results show that the exchange rate trend over the 19-year period has always been with a slight upward slope, but during the years 2012 -2013 and 2018-2017 there was a sharp rise in price and slope that is exactly the same as the real exchange rate trend. Also, comparing the exchange rate data to the market price and the expected exchange rate until 2018 shows that this model has been able to accurately assess the trend and predict possible failures.

Nademi and Khochiani (2016) in the article "Comovement of Stock Market, Foreign Exchange and Gold in Iran: An Analysis of Econophysics", have investigated the co-movement and two-way relationship of these markets in Iran's economy from 30.09.1997-

21.07.2015 using coherence analysis. For this purpose, they deployed the Wavelet Coherence Analysis and Econophysics, for the period 1998-2016, and studied the mobility and two-way relationship of these markets in the Iranian economy (with weekly frequency). The findings of the Wavelet Coherence Analysis show that in the short-term time horizon (2006-2009) and the medium-term time frame (1994-1997), the relationship between the stock market rate of return and the exchange rate was negative (opposite phase). However, long term (2008-2011), the stock rate of return moves pursuant to the exchange rate and is considered a regressive variable. In addition, the correlation between the rate of return on stocks and gold coin prices indicate that the intensity of the relationship between these two variables was not very high during the study period; However, the relationship between these two variables during the 16-to-64-week interval of 2002-2005 was quite intense in the opposite direction.

In an article, titled “Surveying the Relation among Volume, Stock Return and Return Volatility in the Tehran Stock Exchange: A Wavelet Analysis”, Abbasi et al (2017) analyzed the hidden information in the time series of the mentioned variables in the period from April 2007- March 2015 by discrete wavelet with maximum overlap. The results show that during the 2007 to 2015, the relation between variables in different time intervals varies. As in some periods, the Granger causality test confirms the causal relation between time series, while in some other time periods it does not support the existence of such relation.

Research hypotheses

In the field of financing the economy of countries, financial markets are one of the most important tools. Considering the fundamental importance of this market, any major changes and fluctuations in the financial sector may face a serious crisis in the country's economy and financial resources. Unpredictable and sudden changes in the exchange rate are one of the factors that cause these fluctuations. Intense price fluctuations in the capital market and currency prices are one of the factors that cause losses for many domestic and foreign investors. These fluctuations create a very unfavorable atmosphere in the market, which causes long time uncertainty investors and buyers. This atmosphere has caused a crisis in the real sector of the economy and has caused heavy damage to the income level of the society, as well as deeply affecting international relations.

The purpose of this study was to investigate the mutual relationship between the fluctuations of the currency market and the financial market as two important foundations of the economy in order to determine how these two factors affect each other, economic decisions and the financial power of a society. The research hypotheses are as follows:

1. The previous period fluctuations of the financial market have a significant relationship with the future period fluctuations.
2. The currency market fluctuations simultaneously cause in the financial market fluctuations.
3. The previous period fluctuations of the financial market have a significant effect on the relationship between the currency market and the financial market fluctuations.
4. The previous period fluctuations of the currency market have a significant relationship with the of the future period fluctuations.
5. The financial market fluctuations simultaneously cause in the currency market fluctuations.
6. The previous period fluctuations of the currency market have a significant effect on the relationship between the financial market and the currency market fluctuations.

Methodology

Research typology prepares the path for its methodology. After determining the subject, the researcher shall choose the appropriate research method. While the opt of research method depends on the objectives, the nature of the research subject and its implementation possibilities. In this way, it is possible to decide on the method of investigating and conducting research when the nature of the research subject, goals and scope are clear. This research is considered as applied research in terms of purpose, because its results can be used in the decisions of managers and investors. Also, from the aspect of inference regarding the research hypotheses, it is placed in the correlation research group, because regression techniques are used to discover the relationships between the research variables. Also, since the result is obtained by testing the available data, this study is placed in the group of proof theories.

In order to clarify the purpose of each research, the studied population shall be defined. In any statistical study, the population is a set about which we want to make an inference. Population is a combination of all the things that match with a certain characteristic and shall be determined in terms of content, limits and time. The boundaries of each research population are determined based on its definition, and the definition is expressed by combining the common characteristics of the subject of each population, which are important and significant for the research. Based on this, in the present research, the economic market of Iran during the years 2008 to 2018 constitutes the statistical population of the present research.

In the phase of data collection, classification and initial processing, Excel software is used. At this stage, the data related to the stock market and foreign exchange market have been extracted from the Central Bank database and entered directly into Excel. After appropriate classification the data and calculations and preliminary processing, the output information has been used using Eviews 10 and Minitab software to run models and test hypotheses.

Applied model and research variables

In this research, to examine the mutual relationship between the fluctuations of the currency market and the financial market, we examine six main hypotheses, and since the goal is to investigate the mutual relationship, two models are used to test the hypotheses, the financial market fluctuations and the currency market fluctuations both It was considered as variable respectively. The two models are:

The following model is used to test the first three hypotheses of this study:

$$\Delta FM_t = \beta_0 + \beta_1 \Delta FM_{t-1} + \beta_2 \Delta ER_t + \beta_3 (\Delta ER_t * \Delta FM_{t-1}) + \varepsilon_{i,t}$$

Dependent variable:

ΔFM_t = Financial market volatility (stock value index) in year t.

Independent variables:

ΔFM_{t-1} = Financial market volatility (stock value index) in year t-1.

ΔER_t = Exchange rate volatility (dollars) in year t.

$\Delta FM_{t-1} * \Delta ER_t$ = The relationship between financial market volatility and currency market volatility in the previous period

The following model is used to test the second three hypotheses of this study:

$$\Delta ER_t = \beta_0 + \beta_1 \Delta ER_{t-1} + \beta_2 \Delta FM_t + \beta_3 (\Delta FM_t * \Delta ER_{t-1}) + \varepsilon_{i,t}$$

Dependent variable:

ΔER_t = Percentage of exchange rate changes (dollars) in year t.

Independent variables:

ΔFM_t = Percentage changes of Tehran Stock Exchange index in year t.

ΔER_{t-1} = Percentage of exchange rate changes (dollars) in year t-1.

Results

In this section, by collected information from the financial statements of the sample companies in the stock exchange, the analysis of the regression models corresponding to each hypothesis is expressed. In this research, Excel software was used to prepare data, analysis, estimation of models and testing of research hypotheses were done using Eviews10 econometric software. Descriptive statistics related to dependent, independent and control variables of the research are presented in Table (1). Descriptive statistics include mean, median, maximum, minimum standard deviation, skewness and kurtosis. Descriptive statistics of the variables included 132 observations of 12 months in the 11-year period between 2008 to 2018, which are shown in Table (1).

Table (1): Descriptive statistics of research variables

Variable	Mean	Median	Max	Min	STD	skewness	kurtosis
ΔFM_t	0.291	-0.011	7669	-0.914	1.159	3.598	19.943
ΔER_t	0.082	0.008	8773	-0.899	0.769	11.032	125.332
ΔFM_{t-1}	0.285	-0.013	7669	-0.914	1.159	3.620	20.063
ΔER_{t-1}	0.081	0.007	8773	-0.899	0.769	11.034	125.356
Observations	132	132	132	132	132	132	132

According to the table (1), all the coefficients of kurtosis are positive, which indicates that the distribution of the variables is higher than the normal distribution and that the data is more concentrated around the mean. In order to ensure the results of the research and the non-fakeness of the relationships in the regression and the significance of the variables, the Stationary test and the calculation of the unit root of the research variables were performed in the research model. The intended test was performed using EViews software and methods of Levin, Lin and Chou test, Im, Pesaran, and Shin test, Augmented Fisher-Dickey-Fuller test unit root test and Fisher-Phillips unit root test. In the unit root test, the null hypothesis indicates the existence of a unit root, and if the probability of the tests is lower than 0.05, the null hypothesis is not accepted by a probability of 95%. The results of the unit root test for the variables of the models described in Table 2.

Table (2): Results of the Stationary test of research variables

Variable	Test Method							
	Levin, Lin and Chou		Im, Pesaran, and Shin		Fisher-Dickey-Fuller		Fisher-Phillips Perron	
	Stat. Value	Cor. Prob.	Stat. Value	Cor. Prob.	Stat. Value	Cor. Prob.	Stat. Value	Cor. Prob.

ΔFM_t	-11.324	0.000	-8.432	0.000	103.918	0.000	126.063	0.000
ΔER_t	-4.385	0.000	-3.126	0.000	50.015	0.001	51.356	0.000
ΔFM_{t-1}	-11.534	0.000	-8.598	0.000	107.443	0.000	148.700	0.000
ΔER_{t-1}	-3.908	0.000	-10.345	0.000	55.584	0.000	75.185	0.000

The results of table (2) indicate the stationary of all research variables. Before estimating the regression model of the research in order to test the hypotheses, the collinearity of the variables shall be checked. Pearson correlation analysis was used to check the existence of collinearity between research variables. Table (3) shows the Pearson correlation coefficients between the variables.

Table (3): The results of the non-collinearity test of the variables

Correlation	ΔFM_t	ΔER_t	ΔFM_{t-1}	ΔER_{t-1}
ΔFM_t	1.000			
ΔER_t	0.032	1.000		
ΔFM_{t-1}	0.257	-0.071	1.000	
ΔER_{t-1}	-0.064	0.110	0.032	1.000

The results of the collinearity test of the variables (Table 3) indicated the absence of a very high or very low correlation coefficient (+1 and 1) affecting the results of the regression analysis. As a result, there is no linearity between research variables. Table 4 shows the results of the estimation of the first model using the ARMA model in Eviews10 software.

Table (4): The results of the first model estimation

$\Delta FM_t = \beta_0 + \beta_1 \Delta FM_{t-1} + \beta_2 \Delta ER_t + \beta_3 (\Delta ER_t * \Delta FM_{t-1}) + \varepsilon_{i,t}$				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔFM_{t-1}	-0.258	0.085	-3.017	0.003
ΔER_t	0.081	0.348	0.234	0.815
$\Delta ER_t * \Delta FM_{t-1}$	0.311	0.635	0.490	0.624
C	0.371	0.102	3.633	0.000
$R^2 = 0.270$		Adjusted $R^2 = 0.248$		
Durbin-Watson statistic = 1.959		F-statistic = 3.238		Prob. (F-statistic) = 0.004

According to the results of table (4), considering that the probability of the F-test is equal to 0.004 (less than 0.05) and since the F-statistic indicates the overall validity of the model, it can be said that this model is significant with a probability of 95% and of high validity. Also, the Adjusted R^2 of this model is equal to 0.248. This result shows that about 24% of the changes in the dependent variable can be explained by the explanatory variables of the model.

The first hypothesis: the results of table (4) show that the probability calculated for the independent variable of financial market fluctuations in the previous period (0.003), is smaller than 0.05 and the estimated coefficient of that variable (-0.258) is negative. As a result, it can be mentioned that the fluctuations of the previous period of the financial market have a negative and significant effect on the fluctuations of the future period. Based on this, the first hypothesis of the research regarding the fluctuations of the previous period of the financial market have a significant relationship with the fluctuations of the future period is accepted at the 95% confidence level.

The second hypothesis: the results of table (4) show that the probability calculated for the independent variable of exchange market fluctuations (0.815) is greater than 0.05 and the estimated coefficient of that variable (0.081) is positive. As a result, it can be mentioned that exchange market fluctuations do not have a significant effect on financial market fluctuations. Based on this, the second hypothesis of the research regarding the exchange market fluctuations simultaneously cause financial market fluctuations is rejected at the 95% confidence level.

The third hypothesis: the results of table (4) show that the probability calculated for the variable $\Delta ER_t \times \Delta FM_{t-1}$ (0.624) is greater than 0.05 and the estimated coefficient of that variable (0.311) is positive. As a result, it can be mentioned that the fluctuations of the previous period of the financial market have a significant effect on the relationship between the fluctuations of the exchange market and the financial market. Based on this, the third hypothesis of the research regarding the fluctuations of the previous period of the financial market have a significant effect on the relationship between the fluctuations of the exchange market and the financial market is rejected at the confidence level of 95%.

Table 5 shows the results of the estimation of the second model using the ARMA model in Eviews10 software.

Table (5): The results of the second model estimation

$\Delta ER_t = \beta_0 + \beta_1 \Delta ER_{t-1} + \beta_2 \Delta FM_t + \beta_3 (\Delta FM_t \times \Delta ER_{t-1}) + \varepsilon_{i,t}$				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔER_{t-1}	2.290	0.569	4.020	0.000
ΔFM_t	0.007	0.055	0.125	0.900
$\Delta FM_t \times \Delta ER_{t-1}$	3.498	0.905	3.862	0.000
C	0.149	0.067	2.214	0.028
$R^2 = 0.316$		Adjusted $R^2 = 0.296$		
Durbin-Watson statistic = 2.454		F-statistic = 5.642	Prob. (F-statistic) = 0.001	

According to the results of table (5), considering that the probability of the F-test is equal to 0.001 (less than 0.05) and since the F-statistic indicates the overall validity of the model, it can be said that this model is significant with a probability of 95% and of high validity. Also, the Adjusted R^2 of this model is equal to 0.296. This result shows that about 29% of the

changes in the dependent variable can be explained by the explanatory variables of the model.

The fourth hypothesis: the results of table (5) show that the probability calculated for the independent variable of exchange market fluctuations in the previous period (0.000), is smaller than 0.05 and the estimated coefficient of that variable (2.290) is positive. As a result, it can be mentioned that the fluctuations of the previous period of the exchange market have a positive and significant effect on the fluctuations of the future period. Based on this, the fourth hypothesis of the research regarding the fluctuations of the previous period of the exchange market have a significant relationship with the fluctuations of the future period is accepted at the 95% confidence level.

The fifth hypothesis: the results of table (5) show that the probability calculated for the independent variable of exchange market fluctuations (0.900) is greater than 0.05 and the estimated coefficient of that variable (0.001) is positive. As a result, it can be mentioned that financial market fluctuations have a significant effect on exchange market fluctuations. Based on this, the second hypothesis of the research regarding the financial market fluctuations simultaneously cause exchange market fluctuations is rejected at the 95% confidence level.

The sixth hypothesis: the results of table (5) show that the probability calculated for the variable $\Delta FM_t \times \Delta ER_{t-1}$ (0.000) is less than 0.05 and the estimated coefficient of that variable (3.498) is positive. As a result, it can be mentioned that the fluctuations of the previous period of the exchange market have a positive and significant effect on the relationship between the fluctuations of the exchange market and the financial market. Based on this, the sixth hypothesis of the research regarding the fluctuations of the previous period of the exchange market have a significant effect on the relationship between the fluctuations of the exchange market and the financial market is accepted at the confidence level of 95%.

Conclusion

The analysis of the regression models corresponding to the research hypotheses at the confidence level of 95% showed that the fluctuations of the previous period of the financial market have a negative and significant relationship with the fluctuations of the future period. In this way, by increasing the fluctuations of the previous period of the financial market, the fluctuations of the future period will decrease. On the other hand, exchange market fluctuations do not cause financial market fluctuations at the same time. The fluctuations of the previous period of the financial market do not have a significant effect on the relationship between the fluctuations of the exchange market and the financial market. The fluctuations of the previous period of the exchange market have a positive and significant relationship with the fluctuations of the future period. In fact, with the increase in the fluctuations of the previous period, the future period will also increase. Fluctuations in the financial market do not cause fluctuations in the exchange market at the same time. The fluctuations of the previous period of the exchange market have a positive and significant effect on the relationship between the fluctuations of the financial market and the exchange market.

According to the findings of previous studies, the researchers concluded that the fluctuations of the exchange market and the stock market in other countries do not have a significant effect on each other in the short term. In the researches of Jorion (1990 and 1991), Amihud (1994), Bartov and Bodnar (1994), Makar and Huffman (2000), the simultaneous relationship between the fluctuations of the US dollar rate and the stock returns of US companies was not

observed. While the experimental results of Hay and Enji (1998), Doukas et al. (2003), Pan et al. (2007) indicated the existence of a cause and effect relationship between exchange rate and stock price for Japanese companies in different periods. In their research, Nademi and Khochiani (2016) also investigated the co-movement and two-way relationship of these markets in Iran's economy from 30.09.1997- 21.07.2015 using coherence analysis. The results showed that in the short-term time horizon during the years 2005 to 2008 and the medium-term horizons during the years 2006-2009, the relationship between the stock return rate and the exchange rate was in the opposite direction; But in the longer term horizon in the years 2008 to 2011, the stock return rate moves pursuant to the exchange rate and is considered a regressive variable. In the present research, by examining the linear regression model, we found that exchange rate fluctuations and financial market fluctuations (stock market) do not affect each other simultaneously and this relationship shall be investigated in the long term. That is, changes in the exchange rate over time and in the long term affect the financial market and vice versa.

Based on the results of the first research hypothesis test, the fluctuations of the previous period of the capital market have a negative relationship with the fluctuations of the future period of this market, which means that the increase (decrease) of the fluctuations in the previous month causes the decrease (increase) of the fluctuations in the future period. As a result, it is suggested to pay attention to the fluctuations of the previous period in the implementation of financial policies in the stock market in order to make decisions in the current periods. According to the result of the second hypothesis, exchange market fluctuations do not cause capital market fluctuations at the same time. The results of the third hypothesis test indicate that the fluctuations of the previous period of the capital market do not have a significant effect on the interactive relationship between the fluctuations of the exchange market and the capital market. According to the results of the fourth hypothesis, the fluctuations of the previous period of the exchange market have a positive and significant relationship with the future fluctuations of this market, and with the increase (decrease) of the fluctuations of the previous month of the exchange market, the fluctuations of the current period of the exchange market also increase (decrease).

Based on this, it is suggested that traders and investors consider the fluctuations of the previous period in the exchange market when making their economic decisions, and the central bank, in order to control and reduce these fluctuations when implementing monetary policies in the exchange market, consider the fluctuations of the previous month in the decisions of the period. The results of the fifth hypothesis test showed that the capital market fluctuations did not have a simultaneous effect on the currency market fluctuations, but the results of the sixth hypothesis test indicated a positive and significant effect of the previous exchange market fluctuations on the interactive relationship between the exchange market fluctuations and the capital market. Special attention shall be paid to this relationship and investors should pay attention to the fluctuations of the previous periods of the exchange market in their investment decisions. It is also suggested that the government and the central bank design and implement appropriate policies and executive tools to attract investors to the domestic market with proper management and boost the country's economy. In all developing countries, attracting foreign investment is considered one of the powerful tools of economic development and progress. It is necessary to attract foreign investors to have a strong and

stable economic system in order to gain the confidence of this group. Fluctuations in the currency market and the financial market both indicate the instability of a country's economy. Based on this research, we have observed the intense fluctuations of these two basic foundations in the last 11 years, which were mostly due to foreign political and economic sanctions. In this regard, it is suggested to the government to control these fluctuations by implementing the necessary monetary and financial policies and find a way to solve this problem. Researchers are suggested to investigate and study the effects of exchange rate fluctuations on other foundations of the financial market, such as the derivatives market, in future research. Researchers are suggested to investigate the mutual effect of exchange rate fluctuations and financial market fluctuations in the long term in future research. It is suggested to investigate the effect of foreign political variables on exchange rate fluctuations.

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