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The Effect of Monetary Policy Uncertainty on Stock Market Uncertainty with NARDL Approach

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Abstract
The aim of this paper was to investigated the effect of monetary policy uncertainty on stock market uncertainty in Iran. In this paper, the positive and negative shocks of monetary policy uncertainty were calculated using nonlinear autoregressive distributed lag (NARDL) approach. The annual data of Iran's economy over the period 2000-2022 were used. The results of the linear and nonlinear models show that monetary policy uncertainty affects stock market uncertainty in the long-run. The ARDL model shows that monetary policy uncertainty increases stock market uncertainty in the long-run. The results of the nonlinear ARDL model show that monetary policy uncertainty shocks do not have an asymmetric effect on stock market uncertainty, and negative shocks have a positive effect on stock market uncertainty in the long-run.
Keywords: Uncertainty, Stock Market Uncertainty, Monetary Policy, NARDL Approach.
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1. Introduction

Economic Policy Uncertainty (EPU) has been an issue that has aroused great interest in recent years, being understood as the uncertainty generated by economic policy makers on the actions they will carry out. Based on this, we assume that the lack of changes in existing economic policies, or even the speed of the agreed economic policy changes, can influence investors generating a feeling of insecurity about their possible effects on the economy.

Thorbecke (1997) was among the first to make a convincing case against the nonneutrality of monetary policy an often articulated view among scholars in the 1990s (see Black, 1987 for a prominent example of this view) when he showed that stock returns responded to changes in monetary policy, measured as innovations in the Federal Funds Rate (FFR). His finding was in harmony with the dividend-discount model (DDM), where the stock price is equal to the present value of the expected stream of dividend payments. In other words, a monetary shock that increases stock returns hints that an expansionary monetary policy increases expected dividend payments because of higher earnings for the firms, decreases the discount factor of the dividend payments, or both.

Given the experience with stock market crises in recent decades, monetary policy plays an important role in such instabilities. Given the importance of the stock market for financing and due to the high fluidity and liquidity of this type of market, monetary policy has a larger and faster impact on it than on the goods and services market (Svensson, 2017). During the global financial crisis from 2007 to 2009, uncertainty increased dramatically, and the largest banks were forced to use interest rates to avoid losing their capital. Both of the above factors contributed to the Great Recession. The relationship between uncertainty and the business cycle has been a recurring concern for researchers and policymakers.

Theoretically, the impact of monetary policy uncertainty on asset prices can occur through several channels. First, it can increase risks in financial markets by reducing the potential value of support provided to markets by various government agencies (Pastor & Veronesi, 2012). Therefore, this uncertainty can alter important decisions such as investment, consumption and savings of firms, and other economic factors. Kang et al. (2017) found evidence that uncertainty further reduces the cost of establishing a link between firm-level investment and sales growth at a certain level. In addition, uncertainty can increase financing and production costs by affecting supply and demand channels, increasing investment, and shrinking the economy. It can also affect expected premiums, inflation, and interest rates (Batabyal & Kilins, 2014).

In developing countries, institutional constraints hinder financial intermediation and public policy effectiveness. For example, weaknesses in the legal environment, underdeveloped financial markets, and centralized banking systems hinder the transmission of monetary policy (Abuka et al., 2019).

The main purpose of this paper is to investigate the impact of monetary policy uncertainty on the uncertainty of the stock market in Iran.

The remainder of this paper is organized as follows. Section 2 provides the theoretical framework and research background of the research. In section 3, the research model is described, and in Section 4, data are analyzed. Finally, Section 5 concludes the paper.

2. Material and Methods

In general, there are two views on monetary policy: the classical view and the Keynesian view. According to Keynes and his followers, monetary policy does not have the necessary efficiency in developing economic activity and investment. According to this theory, government and tax expenditures can increase national income and products by having a strong impact on the level of aggregate demand and, in particular, by increasing demand. According to the new classics and the proponents of the monetary school, monetary policy is the best way to deal with volatilities such as inflation and recession. (Tehranian, 2023) Monetary policy advocates reject fiscal policy because, according to their analysis, increasing government spending means that the government competes with the private sector for funds, which involves issuing more profitable bonds. Increasing government demand makes it more difficult for the private sector to take advantage of financial facilities, and the "crowding out" effect that monetary policy advocates believe is almost synonymous with government investment, leading to the conclusion that there is no increase in aggregate demand (Hoshmand et al., 2012). Looking at the macroeconomic structure of each country and the different markets in each economy, one finds that one of the most fundamental markets in any economy is the capital markets. The stock market is one of the components and functions of the capital market as part of the economy. In developing countries, economic shocks are deeper than in developed countries because of stock market shocks. This is because concerns about the devaluation of capital are accompanied by fears of apparent instability in the economy. A change in the return on investment risk due to volatilities in macroeconomic variables can affect investment opportunities (Piraee & Shahsavar, 2011). The stock market increases the quantity of investment in society by attracting and using liquid capital. It can also provide a link between suppliers and demanders of capital and regulate capital market transactions. It also prevents price volatilities to a certain extent by fixing the prices of stocks and securities and encouraging people to save. In this way, people's savings are used for economic activities and the necessary capital is provided for the implementation of public and private projects (Nouri Namini, 2013). Monetary policy outcomes are known to be one of the most important tools for price stability, economic growth and preferred employment levels. Monetary policy outcomes are highly dependent on economic conditions, especially in terms of uncertainty and risk, and can deprive policymakers of the desired outcomes of their policies. In other words, the presence of uncertainty and risk, especially through investment, has affected economic growth and reduced demand by increasing precautionary savings, which ultimately affects economic growth (Abulhasani Hastiani et al., 2013) that these effects necessarily require a policy response.

The impact of uncertainty on investment is one of the most important topics discussed in economics. Theoretically, investment is affected in several ways, including risk aversion and adjustment costs. Abel & Eberly (1994) studied the effect of uncertainty on investment in models with risk analysis and the relationship between final income and effective variables and found that investment depends on uncertainty in variables such as price, sales of goods, prices of institutions and commodities, and wages. In this context, it is important that in the case of uncertainty due to exogenous shocks, the policymaker does not make any change in the process of policy making (Sack & Wieland, 2000).

EPU plays a significant role as an asset pricing factor, contributing to the elevation of stock risk premiums (Brogaard & Detzel, 2015; Pastor & Veronesi, 2012; Yue et al., 2019) offer a comprehensive equilibrium model that underscores the risk premium component introduced by EPU. In this framework, increasing policy change uncertainties elevate the prospective rate of return volatility and the stochastic discount factor’s volatility. This elevation in risk cascades into the stock market, influencing stock prices (Bekiros et al., 2016; Liao et al., 2021; Phan et al., 2018).

Rational Expectations Theory suggests that investors incorporate available information into their decisions. When economic policies are uncertain, investors may anticipate various outcomes and adjust their portfolios accordingly. If investors anticipate favorable policy changes that could benefit businesses or stimulate economic growth, they might drive up stock prices in anticipation of these potential gains.

The Theory of Information Asymmetry posits that when economic policies become uncertain, investors lack clear information about the future direction of the economy. In response, they may adopt a cautious approach,

leading to increased volatility and risk aversion in the stock market. As investors seek to hedge against uncertainty, the demand for safe-haven assets like stocks might rise, potentially driving up stock prices. This increased demand can contribute to a positive correlation between EPU and stock market uncertainty. (Korjanii, 2024)

EPU can lead to increased government interventions and policy responses to mitigate uncertainty's negative impacts. These responses, such as interest rate adjustments, fiscal stimulus, or regulatory changes, can provide support to the economy. Investors may interpret such interventions as positive signals and respond by increasing their stock holdings, potentially leading to a positive relationship between EPU and stock market uncertainty.
According to Mishkin (1996), in terms of monetary policy transmission channels, there are two important channels related to the asset market known as the asset price channel: the Tubin's Q channel and the wealth effect channel.

A) Tubin's Q Theory

This theory shows how monetary policy affects the economy through the valuation of assets. Tubin (1969) defined Q as the ratio between the market value of a firm's stock and its replacement values. If Q is high, the market price of the firm is higher than the cost of capital replacement, and the creation of a new firm and the cost of capital replacement are lower than the value of the firm. Therefore, the company can buy a large amount of capital goods by selling a small amount of its shares. In other words: When Q is low, firms will not buy new capital goods because the value of the firm is less than the cost of investment. On the other hand, if the money supply increases, the money available in society increases, so households reduce their money supply and increase their spending instead. Therefore, the purchase of shares in the stock market increases, which leads to an increase in the share price (Ebrahimi & Shokri, 2011).

B) Wealth Effect

An alternative channel for the transmission of monetary policy through asset prices is the wealth effect on consumption. It was first introduced by Ando & Modigiliani (1963). In Modigiliani's life-cycle model, consumption expenditures are determined by consumers' resources over their lifetime, which consist of human capital, real capital, and financial assets. An important component of financial wealth is the stock itself. When stock prices rise, the value of financial assets increases, and therefore consumption increases as resources increase. Thus, through this mechanism, monetary policymakers can increase volatility and uncertainty in the market by changing asset prices.

Benchimol and et al (2023) investigated how uncertainty impacts the effect of monetary policy surprises on stock returns. Using high-frequency US data, we demonstrate that stock markets respond more aggressively to monetary policy surprises during periods of high uncertainty. They also show that uncertainty asymmetrically influences the transmission of positive and negative monetary policy surprises to stock market prices. The amplifying effect of uncertainty is found to be stronger for expansionary shocks than for contractionary shocks. Their robustness analysis confirms that financial uncertainty has a significant role in shaping the influence of monetary policy on the stock market.

Sekandary and Bask (2023) studied the effects of monetary policy surprises on stock returns under low and high monetary policy uncertainty in the U.S. using the Panel Smooth Transition Regression (PSTR) model to identify the uncertainty regimes. Monetary policy surprises are unexpected changes in the Federal Funds Rate (FFR) on Federal Open Market Committee (FOMC) announcement days, where the mimicking portfolio method is used to obtain a regular time series with surprises since the announcements occur on an irregular basis. Using data for the period 1994–2008, we find a negative relationship between monetary policy surprises and stock returns under both uncertainty regimes but a less pronounced relationship between surprises and returns when uncertainty is low. Hence, it is more important to hedge against unexpected stock market volatility when the uncertainty in monetary policy is high compared to when uncertainty is low.

Ma and et al (2022) considered the effect of monetary policy uncertainty on stock market volatility. Higher monetary uncertainty leads to lower stock market volatility both in sample and out of sample. Monetary policy uncertainty matters more for the volatility of big firms, profitable firms and past winner firms. The channel of future cash flow volatility helps explaining the negative effect.

Fu & Luo (2021) examined the relationship between monetary policy uncertainty and bank leverage in China. First, they introduced a new model to measure Chinese monetary policy uncertainty. Second, they estimated the relationship between bank leverage and monetary policy uncertainty. The main result is that increasing monetary

policy uncertainty has a negative effect on the leverage ratio in China.

Paule-Vianez and et al (2020) studied the effect of Economic Policy Uncertainty (EPU) and Monetary Policy Uncertainty (MPU) on the return, volatility and liquidity of the stock markets. Taking the S&P 500 and NASDAQ 100 as reference, it is demonstrated how these uncertainties influence the return and volatility and, to a lesser extent, the liquidity of these indexes. It has been found that EPU have a greater effect on return and volatility during periods of recession, having only an effect on liquidity during periods of expansion. In contrast, MPU influences return and volatility more during periods of expansion, and liquidity only during periods of recession. These findings demonstrate the existence of behavioural biases consistent with Behavioural Finance, as well as the importance of controlling uncertainty on the part of economic policy makers to avoid the damages that EPU and MPU can generate in the stock markets.

3. Research Methodology

In terms of research type and purpose, this study is considered applied, and based on the control variables, it is a non-experimental research of descriptive-correlative type. This paper is conducted in the form of inductive deduction and its data is of event type. In this study, Iran's economy during 2000-2022 was investigated. The data used are from the database of the World Bank and the Central Bank of the Islamic Republic of Iran. ARDL and NARDL models were used to evaluate the selected models. It is worth mentioning that Eviews12 software was used to estimate the model.

The literature on macroeconomic uncertainty generally estimates the monetary or fiscal policy rule that allows for time-varying volatilities in its innovations, and these volatilities are interpreted as uncertainty about monetary or fiscal policy. Born & Pfeifer (2014) used the Taylor formula and time-varying volatility and estimate the volatilities in monetary policy innovations as monetary policy uncertainty. To estimate the volatilities in fiscal policy innovations, Fernandez-Villaverde et al. (2015) employed the fiscal policy law equation and time-varying volatility, which is interpreted as fiscal policy uncertainty.

3.1. ARDL Approach

This model is statistically a better and more meaningful to determine the cumulative relationships in small samples. Johansson's technique, on the other hand, requires large samples to validate its results. According to Shin et al. (2013), the long-run coefficients of stationarity in the model can be obtained by using the autoregressive model with distributed lags and determining the optimal lags between the desired variables. In this model, the optimal lags for each of the variables are selected based on criteria such as Schwarz's Bayesian information criterion (SBC), Akaike information criterion (AIC), Hannan-Quinn information criterion (HQC), or the adjusted coefficient of determination (Sepahvand et al., 2016).

3.2. NARDL Approach

To investigate the asymmetric effects of short- and long-term monetary policy uncertainty on stock market uncertainty, this study uses the NARDL model proposed by Grenwod-Nimmo et al. (2014), which is deemed to be one of the asymmetric cointegration models. The nonlinear ARDL model can be used to study the effects of positive and negative shocks to monetary policy uncertainty on short-run and long-run uncertainty in the stock market. The features of this approach allow for a joint analysis of the stationarity and nonlinearity issues in the unconstrained error correction model. Like the ARDL model, the NARDL model has some advantages over other cointegration test models. First, this test can be applied regardless of whether the I(0) and I(1) model variables are mutually cointegrated. Second, it does not include short-term dynamics in the error correction section. Third, it can be used with a small number of observations (Narayan & Narayan, 2004), and the fourth advantage is that it can be used even when the explanatory variables are endogenous (Alam & Quazy, 2003). Shin et al. (2013) introduced the autoregressive model with nonlinear ARDL. This model is explained based on the variables in this study.

$$\Delta lnSMU_t - \alpha_0 \sum_{k-1}^{n1} \alpha_{1k} \Delta lnSMU_{t-k} + \sum_{k-0}^{n2} \alpha_{2k} \Delta lnMPU_{t-k} + \sum_{k-0}^{n3} \alpha_{3k} \Delta lnEG_{t-k} + \sum_{k-0}^{n4} \alpha_{4k} \Delta lnInf_{t-k} + \sum_{k-0}^{n5} \alpha_{5k} \Delta lnInt_{t-k} + \sum_{k-0}^{n6} \alpha_{6k} \Delta lnEX_{t-k} + \sum_{k-0}^{n7} \alpha_{7k} \Delta lnGov_{t-k} \quad (1)$$

In this context, the short-run effects are obtained by estimating the coefficients of the first-order difference variables, and the long-run effects of the ARDL model are obtained by normalizing the coefficients of the error correction section by a factor of β_0. However, for the long-run coefficients to be valid, they must be cointegrated (coaccumulated). When the distinction between decreasing and increasing monetary policy uncertainty is tested separately for stock market uncertainty, based on the autoregressive model with NARDL and following the studies of Shin et al. (2014), the dynamic regression model is generalized in Equation 2 and the monetary policy uncertainty variable is decomposed into positive and negative effects.

4. Results

4.1. Stationarity Test

Before estimating the model, it is necessary to test the stationarity of all variables used in the research model, because the absence of such stationarity causes the problem of spurious regression. In this study, the Augmented Dickey-Fuller (ADF) unit root and Phillips-Prone tests (PP) were used to assess the stationarity of the variables. Based on the results of the ADF test, the variables of monetary policy uncertainty, economic growth and inflation are stationary. In other words, the degree of their integration is zero. In contrast, the variables for stock market uncertainty, the interest rate, the exchange rate, and the size of government were nonstationary and remained stationary even after a difference-in-differences operation. In other words, their degree of integration is one. According to the PP test results, the uncertainty variables of monetary policy and economic growth are at the stationary level. On the other hand, the uncertainty variables of the stock market, the inflation rate, the interest rate, the exchange rate and the government size, are first difference stationary. In other words, their degree of integration is 1. Thus, according to the results of the unit root test, there is no restriction in the application of ARDL and NARDL.

4.2. ARDL Model

According to the results of the unit root test that the variables are the sum of zeros and ones, we can use an ARDLmodel to estimate the short-term and long-term relationships. First, the results of the initial or short-term model were estimated. According to the HQC and the maximum lag of 1, the optimal model with ARDL lag (1,0,0,2,0,1,0) was finally estimated as the best model. The results in Table 1 show that the first lag in stock market uncertainty, monetary policy uncertainty, inflation and interest rates affect stock market uncertainty in the short-run. The error correction coefficient shows that 67% of the disequilibrium error is adjusted in each period. The coefficient of determination is 0.87, indicating that the explanatory variables could explain 87% of the changes in stock market uncertainty.

Table 1: Results of the estimation of the short-term NARDL model (1,0,0,1,0,1,0)

Variable	Coefficient	Significance level
lnSMU(-1)	0.65	0.002
lnMPU	0.23	0.000
lnEG	-0.01	0.654
lnInf	0.52	0.000
lnInf(-1)	-0.08	0.254
lnInt	-1.09	0.003
lnEX	-0.04	0.588
lnEX(-1)	0.67	0.009
lnGov	-1.21	0.215
Intercept	-1.89	0.768
ECM	-0.67	0.000
0.876=R2	**Adjusted 0.856=R2**	**465.22=F-statistic 0)/(000**
Hannan-0.056=Quinn	**-0.187=Akaike**	**Schwarz's Bayesian 0.342=**
Source: Research findings		

Before calculating a long-term relationship, its possibility should be considered. For this purpose, the bound test was used. According to the results, the value of the test statistic is 6.704, which is greater than the specified lags at the level of 5% and 10%. Therefore, the null hypothesis is rejected and thus we can say that there is a long-term relationship. According to the results of Table 2, monetary policy uncertainty has a positive significant impact on stock market uncertainty in the long-run. The estimated coefficient is 0.23, which is significant at 95% level. Moreover, the estimated coefficient sign is positive, indicating a direct effect of monetary policy uncertainty on stock market uncertainty. Economic growth and the government size do not have a significant effect on stock market uncertainty. Inflation and exchange rate have a positive significant effect, and interest rate has a negative significant effect on stock market uncertainty.

Table 2: Results of the estimation of the long-term NARDL model

Variable	Coefficient	Significance level
lnMPU	0.23	0.000
lnEG	-0.02	0.576
lnInf	1.09	0.007
lnInt	-1.67	0.003
lnEX	0.82	0.000
lnGov	-1.56	0.543
Source: Research findings		

4.3. NARDL Model

In the nonlinear model, the first step is to estimate the results of the initial or short-term model. Finally, according to the Hannan-Quinn criterion and a maximum lag of 2, the optimal model with ARDL lag (1,0,0,0,1,0,1,0) is estimated as the best model. The results in Table 3 show that the first lag in stock market uncertainty, the positive and negative shocks of monetary policy uncertainty, inflation and interest rates affect stock market uncertainty in the short-run. The error correction coefficient shows that 69% of the disequilibrium error is adjusted in each period. The coefficient of determination is 0.89, indicating that the explanatory variables could explain 89% of the changes in stock market uncertainty.

Table 3: Results of the estimation of the short-term NARDL model

Variable	Coefficient	Significance level
lnSMU(-1)	0.631	0.004
lnMPU_Pos	0.238	0.009
lnMPU_Neg	0.197	0.003
lnEG	-0.0031	0.372
lnInf	0.483	0.018
lnInf(-1)	-0.483	0.887
lnInt	-1.103	0.005
lnEX	-0.040	0.587
lnEX(-1)	0.502	0.265
lnGov	-1.045	0.227
Intercept	-1.036	0.584
ECM	-0.69	0.000
0.890=R2	**Adjusted 0.887=R2**	**167.54=F-statistic (0.000)**
Hannan 0.089=Quinn	**-0.167=Akaike**	**Schwarz's Bayesian 0.484=**
Source: Research findings		

According to the results, the value of the test statistic is 6.43, which is larger than the specified lags at the level of 5% and 10%. Therefore, the null hypothesis is rejected and consequently we can say that there is a long-term relationship. Finally, the long-term relationship is estimated. The results from Table 4 show that the positive shock of monetary policy uncertainty has significant effect on stock market uncertainty in the long-run. On the other hand, the negative shock of monetary policy uncertainty has a significant effect on stock market uncertainty. This result may be due to the popularity of financial markets, which is the result of the stability of the money market and price volatilities in this market. The estimated coefficient is 0.26 and is significant at the 95% level. Moreover, the sign of the estimated coefficient is also positive, indicating the direct effect of the negative shock of monetary policy uncertainty on stock market uncertainty. Economic growth and the size of the government do not have a significant impact on stock market uncertainty. Inflation and exchange rate have a positive significant effect and interest rate has a negative significant effect on stock market uncertainty.

Table 4: Results of the estimation of the long-term NARDL model

Variable	Coefficient	Significance level
lnMPU_Pos	0.31	0.009
lnMPU_Neg	0.26	0.009
lnEG	-0.08	0.865
lnInf	1.18	0.040
lnInt	-1.79	0.009
lnEX	0.62	0.022
lnGov	-1.75	0.453
Source: Research findings		

Finally, we used the Wald test and examined the long-run asymmetry of the positive and negative shocks to monetary policy uncertainty. Based on this test, we examined the long-run asymmetry of the positive and negative shocks to monetary policy uncertainty. According to the results, the null hypothesis of the test was not rejected, indicating that the positive and negative shocks to monetary policy uncertainty are not asymmetric in the long-run.

To assess the stability of the model coefficients, the cumulative sum (CUSUM) and cumulative sum squares (CUSUMQ) tests were applied. As can be seen from Figures 1 and 2, the statistics of these tests lie in straight lines that is the coefficients are stable at a significant level of 5%.

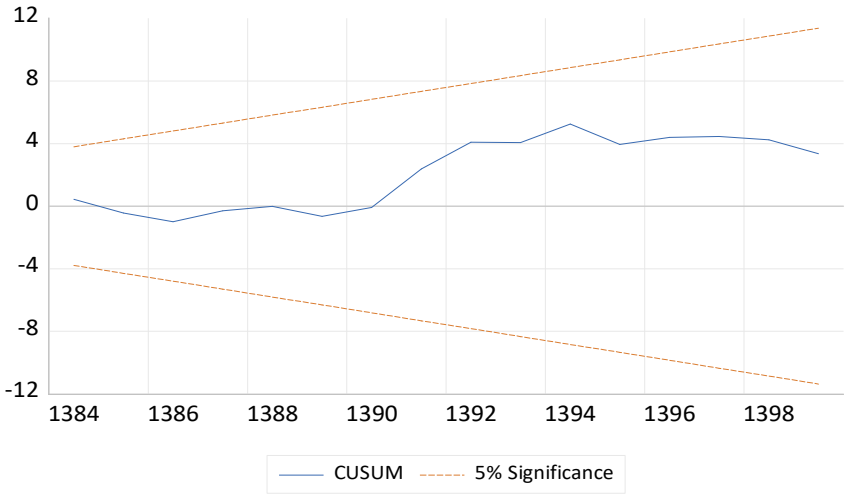

Fig. 1: Cumulative sum (CUMSUM) test
Source: Research findings

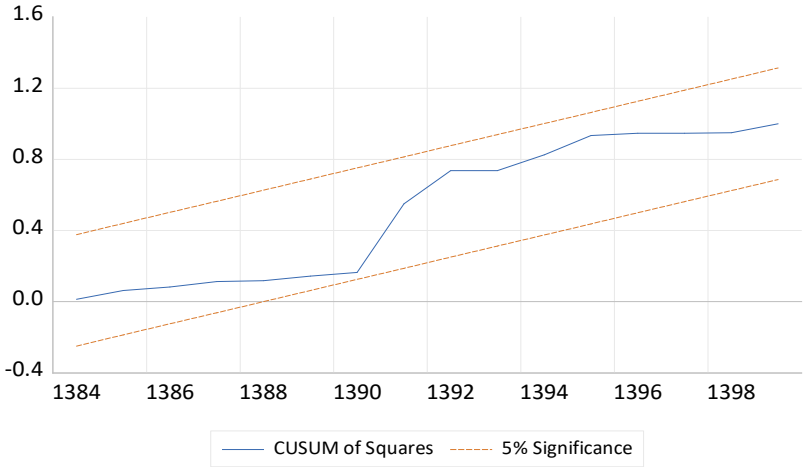

Fig. 2: Cumulative sum of squares (CUSUMQ) test
Source: Research findings

Finally, additional tests were performed. The serial autocorrelation LM test shows that the estimated model has no serial autocorrelation. The normality test shows that the model's errors has an abnormal distribution. The heterogeneity analysis of variance also shows that the model's errors has no variance heterogeneity.

5. Conclusion

The aim of this study was to investigate the effect of monetary policy uncertainty on stock market uncertainty in Iran using NARDL approach. In this study, in addition to the NARDL approach, the ARDL approach was also used and the linear and nonlinear approaches were compared in some ways. In the nonlinear model, the positive and negative shocks to monetary policy uncertainty were calculated using the NARDL approach and included in the model. The results of the linear and nonlinear models showed that monetary policy uncertainty affects stock market uncertainty in the long-run. In other words, uncertainty in the implementation of monetary policy exacerbates uncertainty in the stock market. The results of the nonlinear approach show that, first, the effects of negative and positive shocks are not asymmetric uncertainty. Second, the negative and positive shock of monetary policy uncertainty affects stock market uncertainty. In other words, when there is a negative shock to monetary policy uncertainty, stock market uncertainty increases. The results of the other variables show that economic growth and the government size, have a non-significant impact on stock market uncertainty, despite their importance for capital market uncertainty. On the other hand, the inflationary situation in Iran, due to both inflation and rising exchange rates, increases stock market uncertainty. However, rising interest rates reduce stock market uncertainty. Based on the obtained results, the following policy recommendations for the Iranian economy can be presented as a specific strategy:

The stock market is one of the important and vital conditions for the success of the economic activities of any country. By improving the stock market and developing a culture of intangible investment through the creation of medium- and long-term profitability in this sector, it is possible to attract and direct liquid capital to this market, and this can provide opportunities for economic growth by reducing the incentives to exchange promissory bills and invest in unproductive sectors.

Channel liquidity to firms through the investment of citizens in the capital market. The government should direct the country's liquidity to the stock market by properly planning and introducing the existing potentials and positions in the capital market.

References

Abel, A., & Eberly, J. (1994). A Unified Model of Investment under Uncertainty. *The American Economic Review*, *84,* 1369-1384

Abuka, C., Alinda, R.K., Minoiu, C., Peydro, J.L., & Presbitero, A.F. (2019). Monetary policy and bank lending in developing countries: Loan applications, rates, and real effects. *Journal of Development Economics*, *139*, 185-202. https://doi.org/10.1016/j.jdeveco.2019.03.004.

Alam, M. I., & Quazy, R. M. (2003). Determinant of Capital Flight: an Econometric Case Study of Bangladesh. *Review of Applied Economics, 17*, 85-103.

Ando, B., & Modigliani, F. (1963). The Life Cycle Hypothesis of Saving Aggregate Implication Test. *American*

Economic Review, 53, 55-84.

Born, B., & Pfeifer, J. (2014). Policy Risk and the Business Cycle. *Monetary Economics, 68*, 68–85.

Ebrahimi, M., & Shokri, N. (2011). Investigating the Effect of Macroeconomic Variables on Stock Prices with Emphasis on the Role of Monetary Policy. *Economical Modeling, 5(1)*, 23-45.

Fernandez-Villaverde, J., Guerron-Quintana, P., Kuester, K., & Rubio-Ramirez, J. (2015). Fiscal volatility shocks and economic activity. *American Economic Review, 105(11)*, 3352-84.

Fu, B., & Luo, D. (2021). Monetary Policy Uncertainty and Bank Leverage: Evidence from China. *Economics Letters*, doi:https://doi.org/10.1016/j.econlet.2021.109866.

Grenwod-Nimmo, M., Shin, Y., & Yu, B. (2014). *Modelling Asymmetric Co Integration and Dynamic Multipliers in a Nonlinear ARDL Framework. Festschrit in Honor of Peter Schmidt*, Springer, New York, 218-314.'

Kang, W., Lee, K., & Ratti, R. A. (2014). Economic Policy Uncertainty and Firm-level Investment. *Macroeconomics, 39*, 42–53. Retrieved from https://doi. org/10.1016/j.jmacro.2013.10.006.

Hoshmand, M., Daneshnia, M. Shahrivar, S., Ghezelbash, A., & Eskandari Pur, Z. (2012). The Relationship between Monetary Policy and Exchange Rate in Iran. *Quantitative Economics, 9(2), 109-127.*

Mishkin, F. (1996).The Channels of Monetary Transmission: Lessons for Monetary Policy, *NBER Working Papers*, https://doi.org/10.3386/5464

Narayan, P. K., & Narayan, S. (2004). Estimating Income and Price Elasticity's of Imports for Fiji in a co Integration Framework. *Economic Modelling, 22*, 423-438.

Nouri Namini, T. (2013). *The Impact of Monetary and Fiscal Policies on the Iranian Stock Market*. Unpublished master's thesis, Azad Islamic University of Yazd, Yazd.

Pastor, L., & Veronesi, P. (2012). Uncertainty about Government Policy and Stock Prices. *Finance, 67(4)*, Retrieved from https://doi.org/10.1111/j.1540- 6261.2012.01746.x.

Piraee, Kh., & Shahsavar, M. (2011). The impact of Macroeconomic Variables on the Stock Market*, Iranian Journal of Economic Researches, 9(10)*, 21-38.

Sack, B., & Wieland, V. (2000). Interest-Rate Smoothing and Optimal Monetary Policy: A Review of Recent Empirical Evidence. *Economics and Business, 52*, 205–228.

Shin, Y., Yu, B., & Greenwood - Nimmo M.,(2013). Modelling Asymmetric Co Integration and Dynamic Multipliers in a Nonlinear ARDL Framework. Festschrift in Honor of Peter Schmidt, W.C. Horrace and R.C. Sickles, eds., Forthcoming, http://dx.doi.org/10.2139/ssrn.1807745

Si, D. K., Zhao, B., Li, X. L., & Ding, H. (2021). Policy uncertainty and sectoral stock market volatility in China. *Economic Analysis and Policy*, *69*, 557-573.

Svensson, L.E.O. (2017). Leaning Against the Wind: The Role of Different Assumptions about the Costs. *NBER Working Papers*, https://doi.org/10.3386/W23745

Tobin, J. (1969). A general equilibrium approach to monetary theory. *Money, Credit, and Banking 1*, 15–29

Ma, Chaoqun and Hsiao, Shisong and Zhang, Ting and Deng, Liurui, Monetary policy uncertainty and stock market volatility (January 20, 2022). Available at SSRN: https://ssrn.com/abstract=4013502 or http://dx.doi.org/10.2139/ssrn.4013502

Jessica Paule-Vianez & RaÃºl GÃ³mez-MartÃ-nez & Camilo Prado-RomÃ¡n, 2020. "Effect of Economic and Monetary Policy Uncertainty on stock markets. Evidence on return, volatility and liquidity," Economics Bulletin, AccessEcon, vol. 40(2), pages 1261-1271.