Journal of Money and Economy
Vol. 19, No. 2, Spring 2024
pp. 229-248
DOI: 10.29252/jme.16.1.1

Original Research Article

Review to The Asymmetric Effect of Monetary Policy on Boom and Bust Cycles in the Iranian Stock Market

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Received: 09 Mar 2025 Approved: 25 May 2025

This study examines the relationship between Iran’s stock market index and monetary policy using the Markov Switching Vector Autoregressive (MS-VAR) model and quarterly data spanning from Spring 2009 to Fall 2023. The results indicate that monetary policy has asymmetric effects across different stock market phases (bull and bear markets). The stock index responds immediately and asymmetrically to changes in the interbank interest rate and liquidity growth. Specifically, in both bull and bear market regimes, an increase in the interbank interest rate has a contractionary effect on stock index growth, with the negative impact being more pronounced during recessionary periods. Moreover, liquidity growth consistently has a positive effect on stock index growth in both regimes, with a stronger impact observed during bull markets. Variance decomposition analysis further reveals that interbank interest rate shocks contribute more significantly to stock index fluctuations than liquidity shocks, with the magnitude of these effects varying across market regimes.

Keywords: Monetary Policy, Stock Index, Markov Switching
JEL Classification*:* E42, E44, G12

1 Introduction

One of the fundamental prerequisites for achieving sustainable development is the presence of stable and well-structured financial markets. These markets play a pivotal role in shaping the economic prosperity or recession of nations, as fluctuations in financial markets are often accompanied by significant changes in economic variables, policies, and decision-making processes. Consequently, there is substantial motivation for modeling stock market volatility.

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In Iran, monetary policy is primarily implemented by the Central Bank, which influences macroeconomic conditions through changes in the money supply and interest rates. As Bernanke and Kuttner (2005) argue, the effects of monetary policy on macroeconomic objectives are typically indirect and delayed, whereas its most immediate and direct impact is usually observed in the stock market. This assertion is supported by numerous empirical studies (e.g., Patelis (1997), Rigobon and Sack (2004), among others), which confirm the substantial and rapid influence of monetary policy on stock market behavior. A widely accepted view is that expansionary monetary policy tends to have a positive effect on stock performance. However, time-series evidence suggests that the relationship between monetary policy and stock returns is historically unstable and subject to temporal variation. Despite this, limited research has explored whether changes in stock market regimes—such as transitions between bull and bear markets—can alter the effectiveness of monetary policy. This question lies at the heart of the present study.

This research aims to analyze the relationship between monetary policy and stock prices in Iran. To this end, it employs a Markov Switching Vector Autoregression (MS-VAR) model to estimate and evaluate the effects of monetary growth, interbank market rates, and GDP growth on the quarterly changes in the Tehran Stock Exchange index (TEDPIX[1]) during the period from Spring 2009 to Fall 2023 (1388–1402 in the Iranian calendar). The study is predicated on the assumption that the effect of monetary policy on the stock index is nonlinear and varies across market regimes—namely, bull and bear markets. Accordingly, the central research questions are: Do stock prices in the Tehran Stock Exchange significantly respond to monetary policy actions? If so, to what extent? And does the impact of monetary policy—particularly interbank interest rate increases—differ between bull and bear market phases?

Given the prominent role of the government and the Central Bank in Iran's macroeconomic policymaking, analyzing the influence of monetary policy on stock prices can provide valuable insights. This issue can be approached from both microeconomic and macroeconomic perspectives. From a microeconomic viewpoint, the emergence of stock price bubbles may lead to severe consequences, including future recessions, financial crises, bankruptcies, and loss of public trust and personal wealth. From a

[1] TEDPIX (Tehran Exchange Dividend and Price Index) is the main index of the Tehran Stock Exchange, reflecting the overall performance of Iran's stock market. It accounts for price changes and dividends of listed companies and serves as the primary benchmark for evaluating market trends.

[DOI: 10.61882/jme.19.2.229]

macroeconomic perspective, such phenomena can contribute to broader economic instability and rising unemployment.

Therefore, addressing this issue from both analytical dimensions is crucial. It equips investors with a clearer understanding of how macroeconomic decisions affect stock prices and index volatility, enabling more strategic investment behavior. Simultaneously, it empowers policymakers to make more informed decisions based on the degree to which monetary policy influences the stock market.

2 Literature Review

The literature on the relationship between monetary policy and stock market performance spans several decades and covers a broad spectrum of methodologies and findings.

Li (2025) investigates the impact of national monetary policy on stock price increases, focusing on China's stock market. The paper highlights the significant role of monetary policy, particularly money supply and interest rate policies, in influencing stock market trends. Using empirical analysis, it explores the transmission mechanisms of monetary policy's effects on stock prices. Findings suggest that policymakers should employ both monetary and fiscal policies to ensure stock market stability and economic growth.

Blot and et al., (2024) sought to answer whether the impact of U.S. monetary policy on stock price bubbles is asymmetric. By estimating the dynamic effects of monetary policy over a 2-year horizon, they found that the impacts are indeed asymmetric, with the effects of contractionary policies being stronger than those of expansionary ones. This research underscores the need for differentiated responses to expansionary and contractionary shocks and suggests that restrictive monetary policies have a significant role in mitigating stock price imbalances.

Rahman and Serletis (2023) investigate the relationship between unconventional monetary policy and stock market returns when the federal funds rate reaches the zero lower bound. Using weekly changes in the Federal Reserve's balance sheet as a policy tool, their empirical analysis, based on a structural VAR model, reveals that unconventional expansionary monetary policy effectively stimulates stock market returns. The study also finds heterogenous and asymmetric responses of disaggregate returns to such policy shocks, highlighting the diverse impact of monetary policy across different sectors.

Early studies, such as those by Cornell (1983), laid the groundwork by exploring how the announcement of monetary supply changes could impact

[DOI: 10.61882/jme.19.2.229]

asset prices either positively or negatively, depending on the underlying hypothesis considered, including the expectations hypothesis, the Keynesian hypothesis, and the real activity hypothesis, along with the risk premium hypothesis proposed by Cornell himself. This complex relationship has been further explored through various analytical lenses, revealing the multifaceted impact monetary policy can exert on stock markets.

Lastly, Bhattarai et al., (2015) examined the global spillovers of U.S. monetary policy, finding that policy shifts in the United States have profound effects on stock markets worldwide, particularly in emerging economies. Their work underscores the importance of considering international dimensions when evaluating the impact of monetary policy on stock markets.

More recent analyses have delved into the asymmetric effects of monetary policy on stock markets under varying conditions. Chen (2007) utilized Markov switching models to examine the differential impacts of monetary policy in buoyant versus stagnant stock markets, finding that policy effects are more pronounced in less vigorous market conditions. This was further corroborated by the work of Rigobon and Sack (2004), who demonstrated a positive relationship between expansionary monetary policy and stock movement, particularly noting a significant adverse effect of short-term interest rate increases on stock prices.

The exploration of market reactions to Federal Reserve policies by Bernanke and Kuttner (2005) emphasized the nuanced ways through which monetary policy impacts stock values, suggesting that these effects are mediated not directly by changes in real interest rates but rather through future dividend yields or expected stock returns. Similarly, Crow (2010) examined stock returns on Federal Open Market Committee (FOMC) announcement days, revealing the heightened sensitivity of stock markets to monetary policy shocks, particularly during bear markets.

In the context of asymmetric impacts, Johnson and Tsai (2010) highlighted the significantly negative and statistically notable impact of monetary policy shocks in bear markets, suggesting a more pronounced effect on various industries during downturns. This theme of asymmetry is echoed in more recent studies, such as those by Gali and Gambetti (2015), who assessed stock price responses to monetary policy shocks over a 2-year horizon using time-varying VAR coefficients, finding that the effects of restrictive policies are more potent than those of expansionary policies.

Recent contributions to the literature include the work by Gertler and Karadi (2015), who used high-frequency data to assess the impact of monetary policy shocks on asset prices, finding that unconventional monetary policy

[DOI: 10.61882/jme.19.2.229]

measures have significant effects on stock prices. Similarly, Nakamura and Steinsson (2018) investigated the real effects of monetary policy using a narrative approach, showing that policy shocks can lead to substantial changes in stock market performance.

Fischer and Rupprecht (2017) explored the cross-country differences in the transmission of monetary policy to stock markets, revealing that institutional factors and market structures significantly influence the effectiveness of monetary policy. In addition, Adrian and Liang (2018) analyzed the implications of financial stability considerations for monetary policy, demonstrating that macroprudential measures can complement traditional monetary policy tools in stabilizing stock markets.

In summary, the literature review underscores a consensus around the significant impact of monetary policy on stock market dynamics, with a notable emphasis on the asymmetric effects of policy actions during different market regimes. While expansionary policies tend to boost stock market performance, the nuanced mechanisms through which these effects are mediated whether through anticipated inflation, real interest rate adjustments, or investor sentiment remain areas of active investigation. This rich body of work provides a solid foundation for further exploration of the intricate relationship between monetary policy and stock market fluctuations, particularly in the context of emerging economies with unique monetary and financial landscapes.

3 Methodology

This part delineates the methodological blueprint employed to dissect the asymmetric influence of monetary policy on the Iranian stock market, focusing on the nuanced interplay between monetary policy instruments and stock market dynamics across different economic cycles.

At the heart of this research lies the hypothesis that monetary policy exerts differential impacts on the stock market, contingent upon the prevailing economic regime (boom or bust). To unravel these dynamics, the study leans on the Markov Switching Vector Autoregression (MS-VAR) framework, renowned for its efficacy in capturing regime-dependent economic relationships.

Primary data spans quarterly observations from Spring 2009 (Spring 1388) to Fall 2023 (Fall 1402), encompassing key economic indicators such as the Tehran Exchange Dividend and Price Index (Tedpix), interbank market rates, and liquidity growth rates. Data is meticulously sourced from the Central Bank

[DOI: 10.61882/jme.19.2.229]

of Iran and Tehran Stock Exchange official databases to ensure accuracy and reliability.

- Dependent Variable: The Tedpix index, reflecting market performance.
- Independent Variables: Interbank market rates and liquidity growth, serving as proxies for monetary policy.
- Control Variables: GDP growth

The MS-VAR model is selected for its robustness in identifying and analyzing non-linear dynamics and regime shifts. The model is specified as follows:

$$Y_t = \mu_{s_t} + \Phi_{s_t} Y_{t-1} + \epsilon_t , \qquad \epsilon_t \sim N\left(0, \textstyle\sum_{s_t}\right)$$

where Y_t is the vector of the study variables at time t, μ_{S_t} represents the regime-specific intercept, Φ_{S_t} denotes the regime-specific autoregressive coefficients, st is the state or regime at time t, and ϵt is the error term.

Utilizes the Hodrick-Prescott filter to categorize market states into bull and bear regimes, facilitating a nuanced analysis within the MS-VAR framework.

Employs maximum likelihood estimation (MLE) for parameter estimation, with subsequent diagnostic checks (including stability tests and lag length criteria) ensuring model validity.

Assesses the temporal evolution of the stock market's response to a shock in monetary policy variables across different regimes.

Quantifies the proportion of forecast error variance in the Tedpix index attributable to shocks in monetary policy instruments, delineating the influence by regime.

To validate the findings, the study will perform sensitivity analyses, including alternative lag structures and model specifications. This ensures the robustness of the conclusions drawn from the primary MS-VAR model.

The research adheres to high ethical standards, ensuring data confidentiality and integrity, and the methodology is transparently reported to facilitate reproducibility and critical evaluation.

This chapter introduces a rigorous methodological framework, leveraging the MS-VAR model's strengths to explore the complex relationship between monetary policy and stock market cycles in Iran. Through meticulous data collection, careful model specification, and sophisticated analytical techniques, this research aims to contribute valuable insights into economic literature and policy formulation.

[DOI: 10.61882/jme.19.2.229]

4 Result

Following the collection and summarization of data using EViews 12 and Ox Metrics 7 software, the analysis phase of the study is undertaken. The primary objective of this research is to investigate the effects of monetary policy on stock market performance across different market regimes in Iran. The main dependent variable is the quarterly growth of the Tehran Stock Exchange index (TEDPIX), while the independent variables include quarterly liquidity growth, the interbank market rate, and GDP growth.

In the first stage of the analysis, the stationarity of all model variables is tested. Subsequently, the presence of cyclical fluctuations in the stock index growth is confirmed using the Hodrick-Prescott filter. The phases of expansion and contraction in Iran's stock market (bull and bear markets) are then identified through the application of a Markov Switching model. Finally, the impact of liquidity growth, the interbank market rate, and GDP growth on the stock index is estimated using an MS(2)-VAR(1) model.

To examine the asymmetric effects of monetary policy across different phases of the stock market cycle, the quarterly growth rate of the stock index serves as the key response variable. Interest rates and monetary aggregates are considered two central indicators of the Central Bank's monetary policy stance. In this study, the quarterly rate of the interbank market rate (R) and the quarterly growth of liquidity (M1) are employed as proxies for monetary policy.

The dependent variable is the quarterly growth of the stock index, and the independent variables include quarterly liquidity growth, the interbank market rate, and GDP growth. These variables have been selected based on established literature and their frequent application in prior empirical studies. It is important to note that, due to the application of the MS (2)-VAR (1) model, all variables are treated as endogenous within the system.

Data organization and summarization are essential steps in empirical analysis. For this purpose, descriptive statistics are calculated using standard statistical methods. Table 1 presents the descriptive statistics of the variables for the period spanning 2009 to 2023. EViews 12 software has been utilized to compute and report the descriptive metrics.

[DOI: 10.61882/jme.19.2.229]

Table 1
presents descriptive statistics of various financial indicators:

Name	Mean	Median	Standard Deviation	Skewness	Kurtosis	Variable Type
Tedpix	0.060576	0.027000	0.147127	2.772337	14.44146	Dependent
M	0.067507	0.061500	0.054839	0.625022	2.842305	Independent
R	0.013712	0.00100-	0.147785	1.226938	10.48731	Independent
Gdp	0.019661	0.020000	0.059566	0.107842-	3.254646	Independent

Source: Research Findings

In this section, several descriptive statistical concepts related to the research variables are presented, including the mean, median, standard deviation, skewness, and kurtosis. Central tendency measures describe the distribution of data and highlight the characteristics of values around the center of that distribution. The mean functions as the balance point or center of gravity of a distribution and is considered a reliable indicator of centrality. For instance, the mean value of the stock index growth variable is 0.060576, indicating that most of the data related to this variable are concentrated around this point.

Another key measure of central tendency is the median. As shown, the median value of the stock index growth variable is 0.027000, which implies that 50% of the data lie above this value and 50% lie below. When the mean and median values are close, it suggests that the distribution of the variable is approximately symmetrical and statistically appropriate for analysis.

Dispersion measures are another set of descriptive statistics that reveal how data are spread out or distributed relative to the mean. Among these, the standard deviation is one of the most important. A higher standard deviation indicates greater variability among observations. In this study, the quarterly interbank market rate variable exhibits the highest standard deviation (0.147785), while the quarterly liquidity growth variable shows the lowest (0.054839). Skewness is another important descriptive statistic that indicates the asymmetry of the distribution. A skewness value of zero represents a perfectly symmetrical distribution. Positive skewness indicates a right-skewed distribution, while negative skewness signifies a left-skewed one. Furthermore, the quarterly interbank market rate has demonstrated a relatively stable trend, averaging 0.013712 from Spring 2009 (1388 SH) to Fall 2023 (1402 SH). Its maximum value was 0.688000 in Autumn 2014 (1393 SH), and its minimum was -0.417000 in Spring 2020 (1399 SH). The quarterly liquidity growth rate has shown an upward trend in recent years, with an average value

[DOI: 10.61882/jme.19.2.229]

of 0.067507 over the study period. The highest value was recorded in Winter 2009 (1388 SH) at 0.216600, while the lowest was -0.019400 in Fall 2014 (1393 SH).

Figure 1 displays the time-series trends of the quarterly growth variables, including stock index growth, interbank market rate, liquidity growth, and gross domestic product (GDP) growth. According to the figure, fluctuations in GDP and the overall stock index have been largely synchronized from 2009 to Fall 2023.

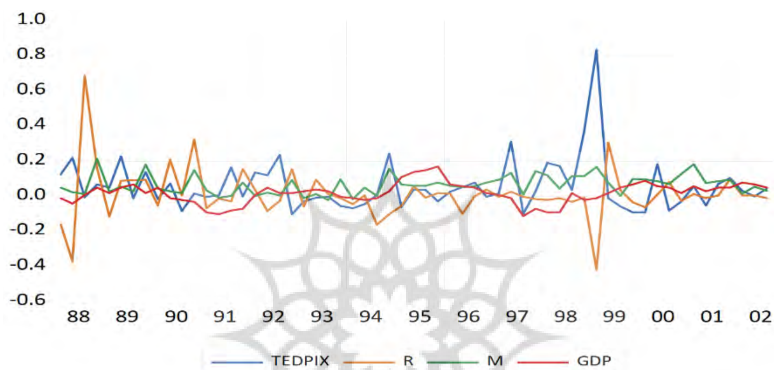

Figure 1. The trend of the stock index growth, gross domestic product (GDP) growth, liquidity growth, and interbank market rate.
Source: Research Findings

In this study, the Dickey-Fuller unit root test was employed to examine the stationarity of the model's variables. The results of the test indicate that, upon application to the variables of stock index growth, interbank market rate, GDP growth, and liquidity growth using EViews software, all variables are stationary. Accordingly, the null hypothesis of the presence of a unit root is rejected at the 10% significance level.

Table 2
The result of the unit root test

result	meaningful	statistics	variable
stable	0.0000	-6.567342	Growth of the stock index
stable	0.0001	-4.962214	Growth in liquidity
stable	0.0000	-9.294293	Interbank market rate
stable	0.0140	-2.536715	GDP growth

Source: Research Findings

[DOI: 10.61882/jme.19.2.229]

The null hypothesis in the Dickey-Fuller test is based on the assumption of non-stationarity of the variables under investigation, and the hypotheses can be stated as follows:

H : The variable under investigation is non-stationary.

H : The variable under investigation is stationary.

To reject the null hypothesis, the significance level must be less than 0.10.

According to Table 2, all variables are found to be stationary; therefore, the estimation process can be conducted.

Table 3 presents the value of the likelihood function, as well as the Akaike and Schwarz information criteria, and the likelihood ratio (LR) statistic. The LR statistic is 28.120, and based on its corresponding p-value (which equals zero), the null hypothesis (H) is rejected. This result confirms the presence of a nonlinear relationship among the variables—namely, stock index growth, liquidity growth, interbank market rate, and gross domestic product (GDP) growth—indicating that the nonlinear model is superior to its linear counterpart.

Table 3
Nonlinear test

Log- likelihood	37.40484
AIC	-1.132367
SC	-0.991517
Linearity LR-test	28.120
Chi^2 (46)	(0.0000)

Source: Research Findings

Figure 2 illustrates the inverse roots of the characteristic polynomial derived from the estimated VAR model. Since all inverse roots of the autoregressive (AR) polynomials lie within the unit circle, the stability of the estimated VAR model is confirmed.

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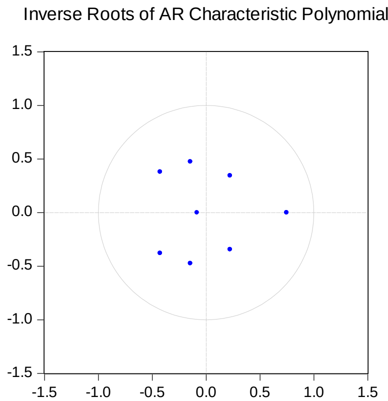

Figure 2. A chart of the characteristic roots of the autoregressive model.
Source: Research Findings

The first step in estimating VAR models is to determine the optimal lag order. Given that the sample size in this study is fewer than 100 observations, the Schwarz Information Criterion (SIC) has been employed. According to Table 4, one lag has been selected as the optimal lag for the model.

Table 4
Determination of the optimal lag.

Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	220.4218	NA	3.88e-09	-8.015622	-7.868290	-7.958802
1	267.4581	85.36210	1.23e-09	-9.165113	-8.428452*	-8.881012
2	280.8191	22.26845	1.37e-09	-9.067375	-7.741386	-8.555993
3	314.2018	50.69218*	7.40e-10*	-9.711177*	-7.795859	-8.972514*
4	329.9897	21.63530	7.84e-10	-9.703322	-7.198675	-8.737378

Source: Research Findings

To initially identify the presence of cyclical components in the stock index growth variable, the Hodrick-Prescott (HP) filter was applied. The results are presented in figure 3.

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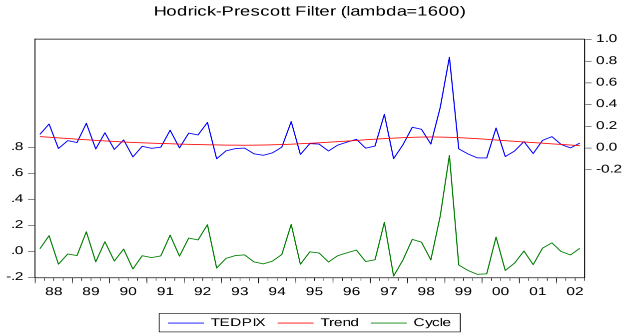

Figure 3. The Hodrick-Prescott filter result.
Source: Research Findings

In this study, all cycles above the trend line are classified as bull markets, while all cycles below the trend line are classified as bear markets. Accordingly, after identifying cyclical fluctuations in the stock index, the Markov switching method is employed. The results of the Markov switching model estimation are presented in Table 5.

Table 5
Results of the Markov switching estimation.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
		Regime 1		
TEDPIX(-1)	1.380416	0.312458	4.417924	0.0000
C	0.122165	0.039584	3.086246	0.0020
LOG(SIGMA)	-2.094731	0.186570	-11.22758	0.0000
		Regime 2		
TEDPIX(-1)	-0.060113	0.059847	-1.004447	0.3152
C	0.001963	0.013978	0.140423	0.8883
LOG(SIGMA)	-2.933135	0.208665	-14.05666	0.0000
		Probabilities Parameters		
P1-C	-0.653426	0.483543	-1.351329	0.1766
Mean dependent var	0.059448	S.D. dependent var		0.148154
S.E. of regression	0.161079	Sum squared resid		1.349218
Durbin-Watson stat	2.475248	Log likelihood		51.55792
Akaike info criterion	-1.536480	Schwarz criterion		-1.287806
Hannan-Quinn criter.	-1.439616			

Source: Research Findings

According to the results presented in Table 5, the variance coefficient (sigma) in the second regime (bull market) is higher than in the first regime (bear market). This suggests that the stock index growth variable exhibits greater fluctuations during bull markets, indicating increased volatility and risk for investors. Figure 4 illustrates the transitional probabilities of remaining in each of the two regimes.

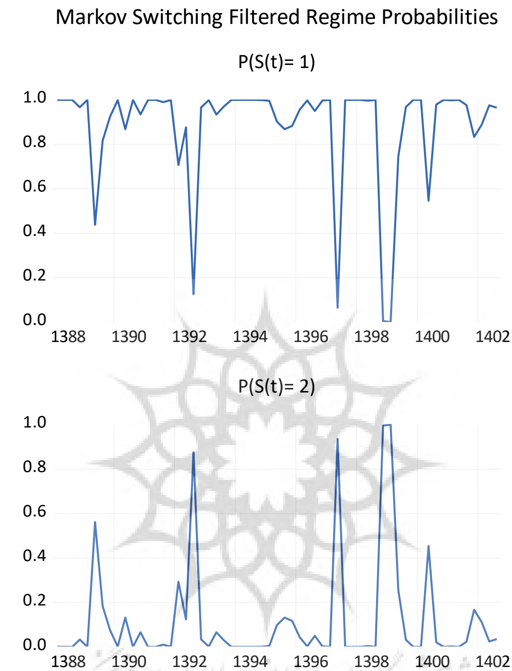

Figure 4. Probability of remaining in the two regimes – bearish and bullish.
Source: Research Findings

Table 6
Transition Probability Matrix

Regime 2 ، $t+1$	**Regime 1 ، $t+1$**	
0.018127	0.35698	Regime 1 ، t
0.98187	0.64302	Regime 2 ، t

Source: Research Findings

Table 6 presents the transition probability matrix. This matrix reflects the probability of remaining in or transitioning between regimes across periods t and t+1. Specifically, if the system is in regime 1 (bear market) during period

[DOI: 10.61882/jme.19.2.229]

t, there is a 0.35698 probability of remaining in regime 1 in the next period, and a 0.018127 probability of transitioning to regime 2 (bull market) in period t+1. Conversely, if the system is in regime 2 (bull market) during period t, there is a 0.64302 probability of transitioning to regime 1 in the following period, and a 0.98187 probability of remaining in regime 2.

These results imply that, during a bear market phase, the system is more likely to remain in the same regime in the next period. However, during a bull market phase, the system shows a higher probability of transitioning to a bear market in the subsequent period.

According to the Schwarz criterion, the optimal number of lags is one, and the number of regimes—or distinct states considered in the model—is two. The results of the VAR-MS (Vector Autoregressive Markov Switching) model estimation are as follows:

Table 7
Estimation of the Markov Switching VAR (1) - MS (2) Model.

	TEDPIX	**R**	**M**	**GDP**
		Regime 1		
TEDPIX(-1)	-0.194087 (0.11359) [-1.70863]	0.196735 (0.11852) [1.65998]	-0.091046 (0.06097) [-1.49326]	0.011952 (0.04214) [0.28364]
R(-1)	-0.270722 (0.13531) [-2.00082]	-0.468316 (0.14511) [-3.22740]	-0.125509 (0.07533) [-1.66611]	-0.067681 (0.05374) [-1.25952]
M(-1)	0.067657 (0.22423) [0.30173]	-0.383257 (0.23075) [-1.66090]	-0.425433 (0.12439) [-3.42014]	-0.029059 (0.09286) [-0.31294]
GDP(-1)	-0.225977 (0.26450) [-0.85437]	-0.058752 (0.28888) [-0.20338]	0.071496 (0.15136) [0.47236]	0.902868 (0.10821) [8.34399]
C	0.031963 (0.01238) [2.58273]	0.032503 (0.01254) [2.59223]	-0.024649 (0.00793) [-3.10800]	0.025622 (0.02347) [1.09185]
		Regime 2		
TEDPIX(-1)	1.691497 (0.23447) [7.21424]	-1.191523 (0.25393) [-4.69241]	0.029920 (0.12665) [0.23625]	0.012610 (0.08906) [0.14160]
R(-1)	-0.014350 (0.12759) [-0.11247]	0.237630 (0.13722) [1.73172]	0.210369 (0.06909) [3.04465]	0.089413 (0.04895) [1.82656]

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M(-1)	0.165397 (0.60063) [0.27537]	0.792680 (0.61103) [1.29729]	-1.093608 (0.31769) [-3.44238]	0.045055 (0.21225) [0.21227]
GDP(-1)	-0.659708 (0.37234) [-1.77181]	0.052243 (0.39008) [0.13393]	0.092983 (0.20750) [0.44812]	0.547046 (0.15551) [3.51765]
C	0.134850 (0.03706) [3.63832]	-0.044850 (0.02787) [-1.60926]	0.063890 (0.01604) [3.98234]	0.013203 (0.02041) [0.64692]

Source: Research Findings

Based on the estimation results of the Markov Switching model with two regimes and one lag, as presented in Table 7, the coefficients of the variables—interbank market rate, liquidity growth, and GDP growth—differ across the distinct stock market regimes.

In both stock market regimes, the interbank market rate has a negative effect on stock index growth; however, this impact is more pronounced during periods of market recession. Furthermore, during bullish periods, owing to the increased appeal of the securities market and individuals' heightened pursuit of returns, liquidity growth tends to stimulate the allocation of idle capital into the stock market, thereby positively influencing stock index performance. Although liquidity growth also has a positive effect in bearish periods, the impact is less pronounced. This is attributed to investors’ tendency to redirect capital toward alternative financial markets offering relatively higher returns. Accordingly, liquidity growth has a positive influence on stock index growth in both regimes, with the effect being more pronounced during bull markets.

The findings of the model are consistent with observable economic events. For instance, in the spring of 2020, the Central Bank of Iran—under governmental pressure—significantly reduced the interbank market rate, while the government simultaneously refrained from issuing securities. These developments laid the groundwork for a speculative bubble in the stock market. The government's abstention from selling securities contributed to a decline in the interbank market rate, which dropped to 9.72% by June 2020, accompanied by a substantial increase in surplus liquidity within the banking system.

However, this policy shift alone did not account for the entire bubble phenomenon—otherwise, similar behavior would have been observed across other markets. A critical factor was the banking sector’s decision to purchase equities using their surplus assets, which resulted in an abrupt surge of liquidity into the capital market. In effect, the sharp reduction in interbank

[DOI: 10.61882/jme.19.2.229]

rates incentivized banks to reallocate excess reserves from the money market to the stock market in pursuit of higher returns. Had the government opted to issue securities, these funds might have been directed toward purchasing bonds rather than stocks. Ultimately, the confluence of these events culminated in the financial disruption witnessed in the summer of 2020.

Table 8

Variance Decomposition Evaluation

Regime 1					
Regime 1 Variance Decomposition using Cholesky (d.f.adjusted) Factors					
Variance Decomposition of TEDPIX:					
Period	S.E.	Tedpix	R	M	GDP
1	0.115998	100.0000	0.000000	0.000000	0.000000
2	0.122556	89.97536	8.968557	0.536533	0.519550
3	0.125036	87.70699	11.10535	0.515598	0.672060
4	0.126172	87.15736	11.43872	0.509029	0.894893
5	0.126375	86.90263	11.40867	0.572771	1.115932
6	0.126593	86.65783	11.42057	0.570809	1.350787
7	0.126761	86.44287	11.39102	0.592180	1.573931
8	0.126962	86.20281	11.39177	0.595373	1.810047
9	0.127134	85.98559	11.36554	0.608089	2.040783
10	0.127328	85.75408	11.35412	0.614081	2.277718

Regime 2					
Regime 2 Variance Decomposition using Cholesky (d.f.adjusted) Factors					
Variance Decomposition of TEDPIX:					
Period	S.E.	Tedpix	R	M	GDP
1	0.115998	100.0000	0.000000	0.000000	0.000000
2	0.201368	95.84778	1.740246	1.922220	0.489757
3	0.296772	95.81619	1.850446	1.499501	0.833863
4	0.425616	95.15663	2.358667	1.416341	1.068363
5	0.600191	94.70455	2.687844	1.382425	1.225178
6	0.839704	94.43939	2.884956	1.356661	1.318995
7	1.170509	94.27633	3.005340	1.345065	1.373263
8	1.628512	94.18372	3.073554	1.338815	1.403908
9	2.263534	94.13219	3.111534	1.335461	1.420815
10	3.144619	94.10391	3.132356	1.333724	1.430012

Source: Research Findings

To assess the relative importance of each variable—liquidity growth, interbank market rate, and GDP growth—on stock index growth, variance decomposition is employed, as shown in the respective tables for Regime 1 and Regime 2. The first column presents the forecast error (standard error,

[DOI: 10.61882/jme.19.2.229]

S.E.) across different periods. Since this error is recursively calculated based on the previous period's forecast error, it naturally increases over time. The subsequent columns display the percentage of variance attributed to shocks in each variable. A higher percentage indicates a greater contribution of that variable to fluctuations in the dependent variable (stock index growth).

According to the results for Regime 1, stock market shocks contribute the most to stock index volatility in the short run. In the first period, they explain 100% of the variance, which declines to 85.75408% by the tenth period. These shocks typically stem from internal market dynamics such as investor demand, corporate profitability, dividend policies, and valuation metrics like the price-to-earnings (P/E) ratio. From the second period onward, the interbank market rate and liquidity growth begin to influence variance, reaching 11.35412% and 0.614081% respectively by the tenth period.

In Regime 2, stock market shocks also dominate in the short term, accounting for 100% of the variance in the first period and decreasing slightly to 94.10391% by the tenth period. The impact of the interbank market rate increases gradually, reaching 3.132356% in the tenth period. Liquidity growth maintains a relatively stable contribution, ending at 1.333724%. GDP growth begins to affect variance from the first period, reaching a contribution of 1.430012% by the tenth period.

As presented in Table 8, the interbank market rate has a stronger influence in Regime 1 (bear market) than in Regime 2 (bull market), indicating that monetary policy conducted via interest rates has a more pronounced effect during periods of market contraction. This result aligns with findings by Chen (2007), Johnson and Tsai (2010), and Crow (2010). Conversely, liquidity—another monetary policy tool—exerts greater influence in the bull market regime. Additionally, GDP growth has a stronger impact in the bear market phase (Regime 1).

Figure 5 illustrates the impulse response functions, showing how stock index growth reacts to shocks in interbank market rate, liquidity growth, and GDP growth. In essence, it reflects the dynamic behavior of the stock index in response to one-time innovations in these variables.

As seen in Figure 5, the stock index responds swiftly to changes in the interbank market rate and liquidity growth. During a bear market, a shock to the interbank market rate leads to a sharp negative impact on stock index growth in the first period, which gradually dissipates from the second period onward. A liquidity shock in this regime causes a notable positive effect up to the third period, but its influence diminishes over time. Similarly, a shock in GDP growth produces a significant negative effect through the second period,

[DOI: 10.61882/jme.19.2.229]

which also wanes thereafter. In the long run, the effects of all variables converge toward stability.

During bull market periods, as shown in Figure 5, a shock to the interbank market rate initially exerts a negative impact on the stock index up to the third period, after which the effect turns positive and gradually declines. Liquidity shocks enhance stock index growth significantly up to the third period, followed by a gradual decline in impact. GDP shocks initially reduce the index until the fourth period, after which their influence becomes positive.

[DOI: 10.61882/jme.19.2.229]

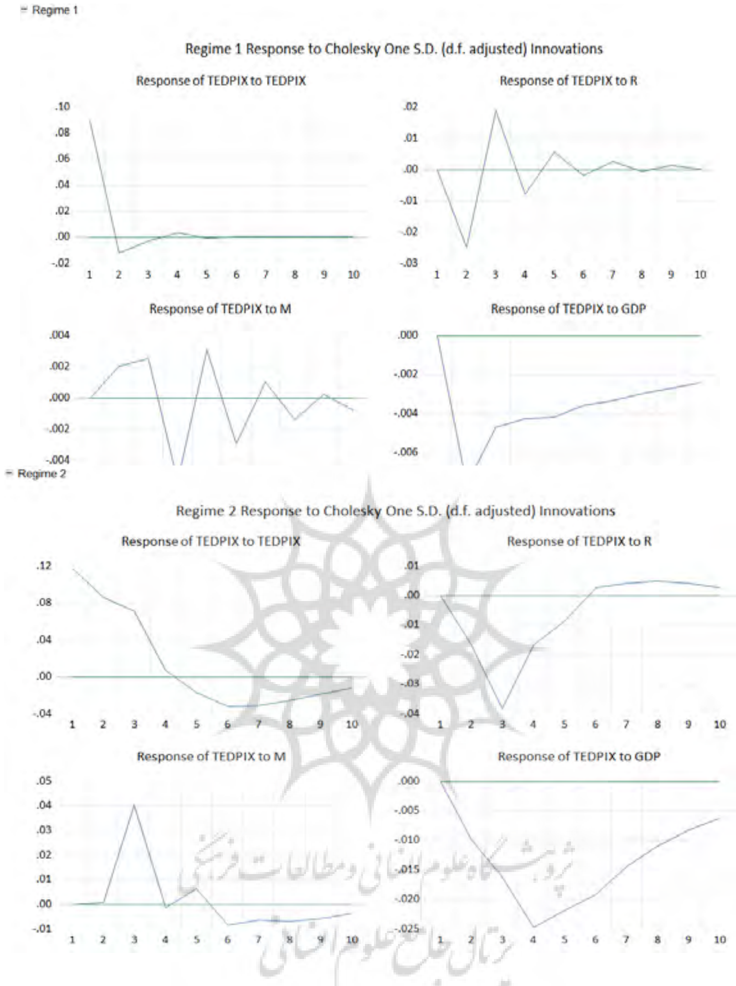

Figure 5. Impulse Response Chart
Source: Research Findings

In this study, the stationarity of the model variables was initially assessed using the Dickey-Fuller unit root test, which confirmed that all variables are stationary. Cyclical fluctuations in the growth of Iran’s stock index were identified through the application of the Hodrick-Prescott filter. In the next step, the stability of the VAR model was validated by conducting the inverse roots test of the autoregressive (AR) polynomial.

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Following this, the Markov Switching model was estimated for the growth of the stock index, allowing for the identification of regime classifications, their timing, and the transition probability matrix. Subsequently, by estimating the Vector Autoregressive Markov Switching (VAR-MS) model, it was demonstrated that the effect of the interbank market rate is negative in both regimes; however, this negative impact is more pronounced during the recessionary phase of the stock market (regime 1) compared to the expansionary phase (regime 2). Therefore, the interbank market rate generally leads to a decline in stock market growth; this effect is more pronounced during periods of market recession and operates through increased capital costs, reduced stock valuations, and changes in investor behavior.

Moreover, during bull market phases—characterized by expansion in the capital market—the increased appeal of the securities exchange and investors' pursuit of higher returns drive liquidity growth to positively affect stock index growth, as individuals allocate idle capital into the market. Even during bear market periods (stock market recession), liquidity growth maintains a positive impact on stock index performance. Therefore, it can be concluded that liquidity growth positively affects the stock index in both regimes, though the effect is more pronounced during bull markets.

The unexpected result of this study—that GDP growth negatively affects stock index performance in both bull and bear market regimes with different timing patterns—can be explained by several macroeconomic and structural factors. Iran's capital market is more reactive to political developments, exchange rates, and global prices than to fundamental economic indicators. Therefore, GDP growth does not necessarily translate into higher corporate profits or stock returns. Moreover, much of the economic growth originates from sectors outside the stock market, limiting its positive impact on listed firms. In bull markets, delayed effects of GDP on profitability may lead to investor caution due to concerns about overheating or policy tightening. Overall, the negative impact of GDP growth—short-term in bear markets and delayed in bull markets—stems from policy expectations, structural weaknesses in the capital market, and a disconnect between real economic activity and stock market dynamics in Iran.

Moreover, according to the results of the variance decomposition, shocks to the growth of the stock index account for the largest share in explaining its volatility under both market regimes. Additionally, in both bull and bear market conditions, shocks to the interbank market rate exert a greater influence on the volatility of stock index growth compared to liquidity shocks.

[DOI: 10.61882/jme.19.2.229]

5 Conclusion

Based on the theoretical framework discussed earlier in this study, the direct impact of monetary policy on stock returns operates through changes in the discount rate. A lower interest rate implies a reduced discount rate, which leads to a higher present value of future cash flows, thereby increasing stock prices. Moreover, as interest rates decline, the appeal of interest-sensitive investments—such as bank savings and bonds—diminishes. Consequently, investors tend to shift their funds toward equity investments, leading to increased demand for stocks and a subsequent rise in their prices.

In addition, lower interest rates benefit firms with high levels of debt on their balance sheets by reducing borrowing costs, which leads to higher net income and consequently, higher stock valuations. Likewise, as borrowing becomes cheaper, consumer demand for credit increases, which boosts corporate revenues and contributes to further growth in stock prices.

The model outputs further indicate that if the interest rate is utilized as a monetary policy instrument, it exerts an inverse effect on the stock market index under both bull and bear market regimes (i.e., during both expansionary and recessionary phases of the stock market). However, this negative impact is more pronounced during bear markets. In other words, during periods of stock market expansion, an increase in the interbank market rate results in only a mild negative effect on the stock index, whereas during periods of market recession, the same interbank market rate hike produces a considerably stronger negative impact on stock market performance.

Furthermore, an increase in liquidity disrupts the equilibrium of individuals' real money balances. Since individuals seek to maintain a constant real money balance, they tend to allocate excess liquidity to the purchase of financial assets, including stocks. From this perspective, an increase in the money supply leads to higher demand for stocks, which in turn results in higher prices and overall growth in the stock index. This effect is confirmed by the model results, which demonstrate that liquidity growth has a positive impact on the stock market in both bear and bull market regimes.

The findings of this research align with the results of previous studies, particularly those of Johnson and Tsai (2010) and Chen (2007). In this study, the impact of the policy interest rate on stock index growth is found to be asymmetric: it is significantly negative in the bear market regime and only mildly negative in the bull market regime. This behavioral pattern is consistent with Johnson and Tsai (2010), who also reported strong and adverse effects of monetary policy shocks during bear market conditions. From a methodological perspective, the use of a Markov Switching model in the

[DOI: 10.61882/jme.19.2.229]

present study mirrors the approach of Chen (2007), who used this framework to highlight significant differences in the intensity of monetary policy effects between stagnant and booming market phases. Additionally, the finding that liquidity growth has a stronger and more positive impact during bull market regimes is consistent with the results of Crow (2010) and Gali and Gambetti (2015), who emphasized the asymmetric effectiveness of monetary tools under varying market conditions. This alignment between theoretical and empirical insights reinforces the validity of the study's findings and highlights the importance of accounting for market structure in the evaluation of monetary policy impacts.

Therefore, based on the model results, theoretical rationale, and prior empirical literature, it can be concluded that if the central bank adopts the policy interest rate as its primary monetary instrument, the resulting monetary policy shocks will have negative effects on the stock market in both bull and bear regimes, with a stronger negative impact during recessionary (bear) markets. Conversely, if the central bank utilizes liquidity growth as a monetary tool, its effect on the stock market will be positive under both market regimes.

6 Suggestions

Utilize time-varying models to study the effects of monetary policy on stock market performance across different stock market regimes in Iran and various monetary policy regimes.

Employ general equilibrium and agent-based models to examine the impacts of monetary policy on stock market performance in different stock market regimes in Iran and various monetary policy regimes.

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