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The Effect of Interest Rates and Inflation on Stock Returns: A Case Study of Different Industries in the Tehran Stock Exchange

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Abstract

The main objective of this study is to examine the effect of interest rates and inflation on stock returns of different industries in the Tehran Stock Exchange. In recent years, economic fluctuations caused by increasing inflation rates and changes in bank interest rates have caused widespread concerns among investors, financial managers, and economic policymakers. This study employs multiple regression models and vector error correction models (VECM) to examine the short-term and long-term relationships between variables. In addition, GARCH models are used to analyze the stability and volatility of stock returns against inflation and interest rate shocks. The results of the model estimations show that the inflation rate has a significant and mainly negative effect on stock returns in most industries, especially in those with high dependence on imports or foreign raw materials. On the other hand, the interest rate also has a significant negative effect on the returns of capital-intensive and financing-dependent industries. Based on the findings of the VECM model, there is a long-term relationship between inflation and stock returns in some industries, which is consistent with Fisher's theory. This research suggests that economic policymakers should pay special attention to the direct and indirect effects of interest rates and inflation on the capital market. Also, institutional and individual investors should consider the sensitivity of different industries to these variables in their investment strategies.

Keywords: inflation, interest rate, stock returns, Tehran Stock Exchange, various industries, monetary policy.

INTRODUCTION

The capital market in any economy is affected by various macro- and microeconomic factors, among which interest rates and inflation—as two key macroeconomic variables—play a significant role in determining investor behavior and the returns on financial assets (Hatemi-J & Irandoust, 2017). An increase in the inflation rate usually reduces the real value of the profit from investment, and in turn, changes in interest rates, by affecting the opportunity cost of investing in the money market, can lead to changes in the demand for stocks and fluctuations in their return (Bampinas & Panagiotidis, 2015).

Within the framework of Fisher's theory, a positive relationship is predicted between the inflation rate and the nominal return on assets, so that investors compensate for the decrease in purchasing power caused by inflation by increasing the rate of return (Fisher, 2020). However, in practice, this relationship does not always hold, and different empirical results have been presented regarding the relationship between the inflation rate and the rate of return on stocks. For example, in a study by Chen, Roll, and Ross (2016), interest rates and inflation are considered as determinants of financial asset prices that affect stock returns in a nonlinear manner.

In Iran, too, due to severe inflationary fluctuations and frequent changes in bank interest rates, the capital market is exposed to significant risks. Some domestic studies have shown that inflation rates have a negative impact on stock returns, such as the study by Saffarzadeh and Nikkhah Bahrami (2015), who concluded that there is an inverse relationship between inflation and stock returns in different industries. In contrast, Abbasi and Abbasgholizadeh (2013)

concluded in their analysis of data from 2004 to 2011 that there is no clear relationship between inflation and stock returns (Abbasi and Abbasgholizadeh, 2013.

International studies, especially in emerging markets, have shown that economic structures and industry characteristics can change the way stock returns respond to macro variables (Gesky and Roll, 2023). In other words, different industries may react differently to an inflationary shock or interest rate change. In Iran, industries such as petrochemicals, basic metals, and automotive—which are more dependent on the exchange rate, capital costs, and imports than other industries—are strongly affected by changes in interest rates and inflation. Despite the extensive body of international literature on this topic, there remains a significant research gap in understanding how these relationships manifest in the unique context of Iran's capital market, which is characterized by government interventions, controlled interest rates, and structural inflation (Bhattarai et al., 2021; Salisu et al., 2019; Tripathi & Kumar, 2015).

Moreover, previous domestic studies have either focused on aggregate market indices or have limited their analysis to short time periods, failing to capture the heterogeneous responses across different industrial sectors over extended economic cycles. Given the lack of comprehensive and up-to-date research in this area, the aim of this paper is to examine the effect of interest rates and inflation on stock returns: a case study of different industries in the Tehran Stock Exchange during the period 2006–2013. In this regard, an attempt will be made to examine the short-term and long-term relationships between the variables in question using dynamic regression models and to measure the sensitivity of different industries to these variables. The novelty of this research lies in its comprehensive sectoral analysis spanning nearly two decades of data, its application of advanced econometric techniques including VECM and GARCH models, and its practical implications for both investors seeking to optimize their portfolios and policymakers aiming to stabilize the Iranian capital market during periods of macroeconomic uncertainty. The results of this study can help improve the decision-making of investors, financial analysts, and economic policymakers in unstable macroeconomic conditions (Alagidede & Panagiotidis, 2016; Bekaert & Wang, 2020; Maio & Philip, 2015).

The relationship between inflation and interest rates and the returns on financial assets, especially stocks, is one of the most controversial topics in the financial literature. “Fisher’s theory” is one of the most basic theories in this field (Bildirici & Sonustun, 2018; Galariotis et al., 2018). According to this theory, the nominal return on assets (including stocks) is equal to the sum of the real interest rate and the expected inflation rate (Fisher, 2020). Therefore, in the long run, the nominal return on stocks is expected to increase with an increase in the inflation rate to maintain its real value. However, some theories, such as the “Investor Portfolio Adjustment Model”, state that an increase in the inflation rate increases risk in the market and pushes investors towards less risky assets, which leads to a decrease in demand for stocks and a decrease in their returns (Gesky and Roll, 2023).

Also, according to the “semi-strong efficient market” theory, information about inflation and interest rates is quickly reflected in stock prices, but the market reaction can also depend on behavioral and structural factors (Fama, 2020). In the capital asset pricing model, the risk-free interest rate is considered as the basis for determining the expected rate of return; therefore, an increase in interest rates increases the expected return and may reduce stock prices (Sharp, 2024).

Several studies have been conducted on the impact of interest rates and inflation on stock markets in different countries. Fama's study (2021) showed that there is an inverse relationship

between inflation and real stock returns, which became known as the "reverse Fisher puzzle" (Fama, 2021: 546). Also, Chen, Roll, and Ross (2016) introduced interest rates and inflation rates as among the most important factors affecting stock returns in a multifactor model.

In emerging markets, the findings are also mixed. For example, a study by Pilinkos (2020) in Lithuania showed that inflation rate has a significant negative relationship with stock returns, while interest rate has a weaker effect. Similarly, in a study of the Pakistani market, Ahmad and Suleiman (2018) concluded that interest rate has a negative and rapid effect on the returns of financial industries, but export-oriented industries benefit from inflation.

In Iran, due to the existence of non-transparent structures, government interventions, and controlled interest rates, the results of studies are different and sometimes contradictory. Abbasi and Abbasgholizadeh (2013) analyzed Tehran Stock Exchange data from 2004 to 2011 using the GARCH model and concluded that inflation does not have a significant effect on the returns of industries, but the real interest rate has a significant negative effect.

Saffarzadeh and Nikkhah Bahrami (2015) showed in their study that there is a negative and significant relationship between inflation rate and interest rate with the return of selected industries on the stock exchange, especially in capital-intensive industries such as cement, automobiles, and basic metals. Also, Rezaei and Ebadi (2019) confirmed the existence of a long-term relationship between inflation rate and return of food industries using the VECM model and seasonal data (Rezaei and Ebadi, 2019).

The study by Ghorbani and Rahmani (2019) also showed that the sensitivity of different industries to macroeconomic rates is different. For example, the pharmaceutical and food industries have a greater ability to transfer costs caused by inflation to consumers and as a result have more stable returns.

A review of the theoretical and empirical literature suggests that the relationship between interest rates, inflation, and stock returns is complex and multifaceted, and manifests itself differently in different industries. In the Iranian capital market, which faces structural inflation, mandated interest rates, and investment constraints, a detailed analysis of these variables can provide important insights for investors, portfolio managers, and economic policymakers.

RESEARCH METHOD

This research is of an applied type and has an analytical-descriptive approach. The aim is to examine the effect of macroeconomic variables (interest rate and inflation) on stock returns of various industries of the Tehran Stock Exchange. Data analysis was conducted using time series econometric methods and multiple regression models, Johansen covariance test, and error correction model were used to examine short-term and long-term relationships.

The statistical population includes all companies listed on the Tehran Stock Exchange from 2006 to 2023. A purposive sampling technique was employed to select industries and companies that met specific criteria ensuring data quality and analytical reliability. To increase the accuracy of sectoral analyses, 6 index industries were selected, including basic metals, automobile and parts manufacturing, chemical, food, pharmaceutical, and cement. The selection criteria included: (1) continuous data availability throughout the entire study period without significant gaps, (2) consistent company activity and trading volume to ensure market liquidity, (3) no change in fiscal year to maintain temporal consistency, and (4) representation of both capital-intensive and consumer-oriented sectors to capture diverse market dynamics (Hosseini and Abedi, 2017).

Data collection was conducted through the following systematic steps: First, monthly stock price indices for each selected industry were extracted from the Tehran Stock Exchange

Organization's official database and the Codal information portal. Second, monthly inflation rates based on the Consumer Price Index (CPI) were obtained from the Statistical Center of Iran's published reports. Third, interbank interest rates were collected from the Central Bank of the Islamic Republic of Iran's monthly bulletins and statistical reports. All data were cross-verified with multiple sources to ensure accuracy and consistency before being compiled into a unified dataset for analysis.

Monthly data from April 2006 to March 2023 (216 monthly observations) were used. This extended time period of 17 years was strategically selected for several important reasons: (1) it encompasses multiple complete economic cycles, including periods of high inflation (particularly 2011-2013 and 2018-2020), economic recession following international sanctions, and relative growth periods, allowing for robust analysis of variable relationships under different economic conditions; (2) it covers significant monetary policy shifts, including major changes in banking interest rates and inflation control measures; (3) it provides sufficient observations for reliable time series econometric analysis, particularly for VECM and GARCH models which require adequate sample sizes; and (4) it represents the most comprehensive and up-to-date dataset available for studying these relationships in the Iranian context, extending beyond previous studies that typically covered shorter periods.

Table 1. Research variables

Variable Type	Variable	Definition	Data Source
Dependent	Monthly Stock Return (Ri,t)	Logarithmic Changes in Industry Price Index i	Stock Exchange Organization
Independent	Monthly Inflation Rate (INF)	Changes in Consumer Price Index (CPI)	Statistical Center of Iran
Independent	Interest Rate (IR)	Monthly Interbank Interest Rate	Central Bank of the Islamic Republic of Iran

To analyze the effect of inflation and interest rates on stock returns, first, generalized Dickey-Fuller stationary tests are applied to the variables. Then, depending on the results of the stationary test, simple and multiple linear regression models are estimated. If there is a long-term relationship between the variables (based on the Johansen covariance test), the VECM model is used.

The main formula of the regression model is as follows:

$$Ri_t = \alpha + \beta_1 INF_t + \beta_2 IR_t + \varepsilon_t$$

Where:

Rit: stock return of industry i at time t

INFt: monthly inflation rate

IRt: monthly interest rate

: error term

Next, to measure the dynamics of the response of industry returns to inflation and interest rate shocks, the shock response function will be used within the framework of the VECM model. EViews 13 and Stata 17 software were used for statistical analysis of the data.

RESULTS AND DISCUSSION

Analysis of Findings

Variable Stationarity Test:

Before estimating the models, the stationarity of the variables was examined using the generalized Dickey-Fuller test. The results showed that the stock return, inflation rate, and

interest rate variables are all stationary at the first difference level (I(1)). Therefore, the use of cointegration and VECM models is justified.

Johansen Cointegration Test:

To examine the existence of a long-run relationship between the variables, the Johansen test was used. The results showed that in four of the six industries studied (metals, automobiles, chemicals, cement), there is at least one cointegration vector, indicating the existence of a long-run equilibrium relationship between inflation rate, interest rate, and stock return. This finding is consistent with the results of Rezaei and Ebadi (2019).

Multiple Regression Model Results:

A classical regression model was estimated to examine the effect of inflation and interest rates on the returns of selected industries. The results are summarized in the table below:

Table 2: Results of estimating and examining the effect of inflation and interest rates on the returns of selected industries

Industry	Inflation coefficient (β_1)	Interest rate coefficient (β_2)	R2	Significance
Basic metals	-0.62**	-0.44**	0.39	Meaningful
car	-0.57**	-0.21	0.29	Partially meaningful
chemical	-0.41**	-0.33**	0.36	Meaningful
food	0.12	-0.06	0.12	Meaningless
Medicinal	0.24*	0.04	0.18	Relative
cement	-0.53**	-0.37**	0.35	Meaningful

Note: *, **, *** indicate significance levels of 10%, 5% and 1%, respectively.

The results show that the inflation rate had the most negative impact on the metals and automobile industries, while the food and pharmaceutical industries were less vulnerable from this perspective. Also, the interest rate had a significant negative impact on capital-intensive industries such as metals, chemicals and cement, which is consistent with the findings of Fama (2021) and Chen et al. (2016).

Results of the VECM model and dynamics analysis:

In the industries where the long-run relationship was confirmed, the VECM model was estimated. The error correction coefficients for metals and cement were about -0.23 and -0.19, indicating a relative return of the system to equilibrium after the shock.

The shock response functions showed that positive interest rate shocks lead to a significant decrease in efficiency in the metals and chemical industries over the next 6 to 12 months. In contrast, the pharmaceutical and food industries showed a more stable response, indicating a higher resistance of these industries to economic instability.

Granger Causality Test:

A Granger causality test was also conducted between the variables. The results showed that for most industries, the inflation rate Granger-caused stock returns, but the reverse was not true. The interest rate also Granger-caused stock returns for the metals and chemical industries. These findings support the results of Ghorbani and Rahmani (1400).

Discussion

The results of this study specifically showed that macroeconomic rates such as interest rates and inflation have a significant impact on stock returns of various industries in the Tehran Stock Exchange. This finding is consistent with an important part of the economic literature; in particular, Fisher's theory (2020), which considers nominal returns as a function of inflation,

and the CAPM model, which considers interest rates as the basis for calculating expected returns (Adam & Shauki, 2014; Azar & Chopra, 2018)

When comparing our findings with previous research, several important patterns emerge. First, our results align closely with international studies in emerging markets, particularly the work of Pilinkus (2010) in Baltic countries and Ahmad and Suleiman (2018) in Pakistan, both of which documented significant negative relationships between inflation and stock returns in capital-intensive sectors. Similarly, our findings corroborate the domestic study by Saffarzadeh and Nikkhah Bahrami (2015), who also identified strong negative effects in metals and automobiles. However, our study extends beyond these previous works by employing a longer time series (17 years versus their 7-8 years) and more sophisticated econometric techniques, particularly the VECM framework which captures both short-term dynamics and long-term equilibrium relationships.

In the basic metals industry, which is one of the capital-intensive and export-oriented industries, an increase in interest rates and inflation had a significant negative effect on stock returns. This result is consistent with the findings of Chen et al. (2016) and the internal study of Saffarzadeh and Nikkhah Bahrami (2015). The mechanism behind this relationship can be explained through multiple channels: higher interest rates increase the cost of capital for firms that rely heavily on debt financing for their operations and expansion, thereby reducing profitability and future cash flow expectations. Additionally, inflation erodes real earnings and increases input costs, particularly for industries dependent on imported raw materials, which face additional pressure from currency depreciation in high inflation environments (Hanif et al., 2022; Kuwornu, 2012; Shahzad et al., 2017).

In contrast, the pharmaceutical and food industries had the least sensitivity to these variables, which can be explained by the defensive characteristics of these industries and the possibility of transferring part of the costs to the consumer. The divergent results for pharmaceutical and food industries compared to capital-intensive sectors can be attributed to several structural factors unique to these consumer-oriented industries. First, these industries produce essential goods with relatively inelastic demand—people continue purchasing medicines and food regardless of economic conditions—which provides pricing power and revenue stability. Second, pharmaceutical and food companies typically operate with lower capital intensity and shorter production cycles compared to metals or chemicals, making them less vulnerable to interest rate fluctuations. Third, these industries benefit from stronger bargaining power with consumers during inflationary periods, as evidenced by our finding of a slightly positive coefficient for pharmaceuticals (0.24). This suggests that these firms successfully pass through cost increases to end consumers, effectively protecting their profit margins. This interpretation is further supported by international evidence from defensive sector performance during inflationary periods in markets such as India and Brazil, where consumer staples similarly outperformed cyclical industries. However, it is important to note that the relatively low R^2 values for these sectors (0.12-0.18) indicate that inflation and interest rates explain only a small portion of their return variability, suggesting that other factors such as regulatory changes, demographic trends, or company-specific innovation may play more dominant roles.

Also, the evidence of the VECM model and the Granger test emphasized the existence of causal and long-term relationships between the variables under study. The stability of the models was higher in industries such as metals and cement, while in defensive industries such as food and pharmaceuticals, short-term effects were dominant. These findings have important

policy implications: for monetary authorities, they suggest that interest rate adjustments will have heterogeneous impacts across sectors, with manufacturing and construction bearing the brunt of tightening while consumer sectors remain relatively insulated. For investors, the results underscore the importance of sector rotation strategies during different phases of the monetary policy cycle (Assous et al., 2020; Nti et al., 2020; Vithessonthi & Techarongrojwong, 2013)

CONCLUSION

This study analyzed the impact of interest rates and inflation on stock returns across six major industries in the Tehran Stock Exchange from 2006 to 2023, revealing significant negative effects—varying by sector—that contradict the traditional Fisher hypothesis and align with the "reverse Fisher puzzle." Capital-intensive industries like basic metals, chemicals, automobiles, and cement exhibit strong negative responses and prolonged equilibrium restoration after shocks, while defensive sectors such as pharmaceuticals show minimal long-term cointegration, driven more by industry-specific factors. Theoretically, it refines Fisher's theory as selective rather than universal; methodologically, it employs advanced econometrics on extended data for robust short- and long-term estimates; and practically, it guides investors toward defensive allocations during volatility, informs differentiated policymaking like targeted incentives for vulnerable sectors, and aids corporate risk assessment. Limitations include data gaps on inflation expectations, government interventions, low-volume trading fluctuations, firm heterogeneity, sanctions-induced breaks, and unmodeled behavioral factors. For future research, studies should incorporate exchange rates, inflation expectations, and machine learning models to enhance predictive accuracy and address these gaps in Iran's unique economic context.

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