Chapter 13

Does Inflation Hedge Stock Returns? Regime-Switching Evidence from Inflation–Stock Return Dynamics

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Abstract

The relationship between inflation and stock returns is important for the functioning of financial markets, but there is no consensus in the literature regarding the direction and magnitude of this relationship. This is due to the fact that the relationship varies depending on time and economic conditions. This study aims to examine the periodic structure of the relationship by analyzing the effect of inflation on stock returns in Turkey within the framework of linear and regime-based approaches. In the analysis, monthly data for the period January 2005–November 2025 were used; the Consumer Price Index was considered to represent inflation, and logarithmic returns calculated from the BIST100 index were considered to represent the stock market. First, the stationarity properties of the series were tested, and then simple regression and VAR models were estimated. Impulse response functions and variance decomposition results were obtained by applying structural SVAR analysis with the Blanchard-Quah approach. In addition, the Markov regime switching model was used to examine whether the relationship changes in different economic regimes. The findings indicate that demand shocks have short-term and limited effects on stock returns, while supply shocks have stronger and more lasting effects on inflation. Regime analysis results show that the relationship structure differs during periods of low and high volatility, but the impact of inflation on stock returns remains limited in both regimes.

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1. Introduction

Although there is no universally accepted definition, inflation refers to a sustained and significant increase in prices (Hatipoğlu, 2021; Sathyanarayana & Gargesa, 2018). Inflation occurs when purchasing power exceeds the quantity of goods and services available and is characterized as an increase in the money supply that causes prices to rise (Sathyanarayana & Gargesa, 2018). As a result of rising inflation, the purchasing power of money decreases over time, causing consumers' basic expenditures to increase faster than their income and investors' savings to lose value (Bulut, 2006; Hatipoğlu, 2021; Sathyanarayana & Gargesa, 2018).

The price increases observed particularly in the last fifty years have caused losses in the value of investors' savings and have brought the question of whether financial assets are a safe haven against inflation back to the forefront. According to classical financial theory, financial assets can protect investors against inflation through nominal price increases, and therefore stocks are considered a natural hedge against inflation. According to Fisher's indicator effect hypothesis, which forms the theoretical basis of this approach, the nominal interest rate is equal to the sum of the real interest rate and the expected inflation rate. The expected real rate of return is determined by real factors such as capital productivity and savers' time-dependent preferences and is independent of the inflation rate. If this hypothesis is adapted to capital markets, under the assumption that real interest rates remain constant, an increase in expected inflation is expected to increase stock returns by the same amount (Horasan, 2008; Sayılgan & Süslü, 2011). Companies can increase dividend payments during inflationary times by increasing sales and profits, which raises stock returns. Additionally, as the value of company assets rises with inflation, the ownership rights that stocks grant safeguard the actual value of investors' savings. Stocks are a safe haven against inflation because of the dynamic nature of capital markets, which include constant buying and selling as well as a propensity for higher demand to sustain positive real returns.

However, Fama's (1981) proxy theory suggests that the observed negative link between inflation and stock returns is not the result of direct causality, but rather of the fact that both variables are affected by real economic activity. According to this approach, inflation is an inverse indicator of real economic growth, and its effect on stock returns is indirect (Fama, 1981; Sayılgan & Süslü, 2011).

Numerous academic studies have investigated the relationship between inflation and stock prices. These studies, conducted in various countries and economies, have found a positive relationship between stock returns and inflation, supporting the Fisher hypothesis (Horasan, 2008; Boamah, 2017; Garayev, 2024). However, some studies have found a negative relationship, supporting the Proxy Hypothesis of Fama (Chopin & Zhang, 2000; Crosby, 2001; Ewing, 2022; Kim, 2003; Erbaykal, Okuyan & Kadıoğlu, 2008); and in some, no correlation has been observed at all (Floros, 2004; Raghutla, 2020; Saleem et al., 2013). Because of these differing findings, there is still no consensus on the relationship between inflation and stock prices, and this remains a persistent problem from the past to the present.

One of the main reasons for the lack of a clear consensus in the literature regarding the relationship between inflation and stock returns is that, although the analysis periods differ, studies largely rely on fixed-coefficient linear regression and cointegration models. However, considering that this relationship is not unidirectional and time-independent but rather can change in direction and magnitude depending on different economic regimes, it can be said that linear models are insufficient to fully capture this structure. In line with this perspective, the main objective of this study is to analyze the impact of inflation on the stock market in Turkey according to different regimes, revealing the periodic differences for investors and policymakers. Thus, it will contribute to investors, policymakers, and portfolio managers developing a regime-based perspective in their inflation-related decisions.

The study consists of five chapters. The first chapter establishes a conceptual framework for the relationship between inflation and stock returns, and the second chapter examines the studies in the literature. In the third chapter, a VAR model is estimated to examine the dynamic relationships between stock returns and inflation for Turkey, then structural SVAR analysis is applied with the Blanchard-Quah approach, the time-spread effects of shocks are evaluated with IRF and variance decomposition analyses, and examined with the Markov regime switching (MS-R) model. The fourth chapter presents the analysis findings, and the fifth chapter interprets the findings obtained in the analysis by comparing them with the literature.

2. Literature

The relationship between stock returns and inflation is still a source of interest for investors, policymakers, and academics, and it has been studied in the literature using a variety of assumptions and methods. Research supporting the Fisher hypothesis, one of the key hypotheses proposing that nominal stock returns can provide protection against inflation, has shown that equities keep their value, especially in high-inflation conditions (Boudoukh & Richardson, 1993; Ely & Robinson, 1997; Choudhry, 2001; Lutz, 2007; Horasan, 2008;

Boamah, 2017; Garayev, 2024). Another hypothesis, Fama's proxy hypothesis, predicts a negative relationship between inflation and stock returns, arguing that the effect of inflation influences stock returns through real economic activity (Fama, 1981; Solnik, 1983; Wahlroos & Berglund, 1986; Boyle & Young, 1992; Balduzzi, 1994; Najand & Noranha, 1998; Chopin & Zhang, 2000; Crosby, 2001; Ewing, 2022; Geske & Roll, 1983; Kim, 2003; Erbaykal, Okuyan & Kadıoğlu, 2008). Some studies, however, have found no association at all (Chatrath, Ramchander & Song, 1996; Floros, 2004; Saleem et al., 2013; Raghutla, 2020).

When the studies conducted are examined in terms of methodology, it is observed that cointegration (Muradoğlu, Taşın & Bigan, 2001; Tripathy, 2011; Çulha, 2019), VAR (Zhao, 2010; Nisha, 2015; Garayev, 2024), panel data analysis (Gazel, 2020; Sayılgan & Süslü, 2011), ARIMA (Gay, 2008), DCC-GARCH (Hatipoğlu, 2021), event study (Belen & Gümrah, 2016), and Toda Yamamoto (Erbaykal & Okuyan, 2007) methods are utilized. Additionally, studies that consider the multi-layered structure of the relationship between stock returns and inflation in more detail are rarely encountered. Kim & In (2005) investigated the relationship between stock returns and inflation at different time scales using wavelet analysis within the framework of the Fisher hypothesis. Variances, covariances, and correlations of nominal and real returns and inflation were calculated. The findings show a positive relationship in the short term, but a generally significant and negative relationship exists between real returns and inflation except at the shortest and longest time scales. The major empirical results demonstrate that time-based decomposition is an important method to evaluate the Fisher hypothesis, as it allows for the solution and explanation of many of the stock return and inflation concerns previously described in the literature using wavelet analysis.

Hondroyiannis & Papapetrou (2006) analyzed the relationship between real stock returns and expected and unexpected inflation using an MS-VAR model. Subsequently, inflation was decomposed into components where supply shocks were considered persistent and demand shocks temporary, and structural breaks were examined using a Markov regime-switching model. The findings show that total inflation has no significant effect on real returns, but persistent inflation is significantly and negatively correlated with real stock returns.

Generally, a review of studies reveals that one of the main reasons for the lack of a clear consensus in the literature regarding the relationship between inflation and stock prices is that analyses are largely limited to linear econometric models with fixed coefficients. But this relationship is not one-way or consistent over time; its direction and size vary across economic regimes, limiting linear models' ability to capture its entire complexity. This study adds to the literature by investigating the relationship among the stock market and inflation in Turkey using a regime-based approach, revealing periodic differences and providing a more realistic and dynamic perspective for investors, policymakers, and portfolio managers in the inflation decision-making process.

3. Data, Methodology and Findings

The aim of this study is to examine if the relationship between inflation and stock returns in Turkey varies with time and economic context within a regime-based approach. In this regard, the monthly Consumer Price Index obtained from the CBRT (2025) is used to represent inflation, and the monthly logarithmic returns calculated with equation (1) from the BIST100 index obtained from Investing (2025) are used to represent the stock market. Equation (1) is given below (Temiz & Acar, 2018).

$$R_t = \ln\left(\frac{BIST100_t}{BIST100_{t-1}}\right) - 1 \quad (1)$$

Here, R_t represents the return on the BIST100 index, and $BIST100_t$ represents the closing price of the BIST100 index at time t.

The analysis period chosen is January 2005-November 2025, which allows for a combined assessment of the effects of significant economic turning points such as the COVID-19 pandemic and crisis, the global inflation wave, the monetary policy tightening cycle, and Turkey's transition to a high inflation regime.

In the literature, the relationship between inflation and stock returns has been examined using models based on the assumption that it is in the same direction and of the same magnitude in different economic periods. However, it is thought that this relationship may vary over time, especially in economies with high inflation, financial instability, and intense monetary policy changes. Therefore, in this study, the dynamic relationships between stock returns and inflation were first examined with a VAR model using Turkish data, and then structural SVAR analysis was applied with the BQ approach. The effects of shocks over time were evaluated with impulse response functions (IRF) and variance decomposition analyses, and whether the relationship varies according to different economic regimes was analyzed with the Markov regime switching. In the analysis, the main relationship between stock returns and inflation was first examined with the simple linear regression model given by equation (2).

$$R_t = \alpha + \beta \mathrm{INF}_t + \epsilon_t \tag{2}$$

Here, R_t represents monthly stock returns, INF_t represents monthly inflation, α is the constant term, and β is the coefficient showing the effect of inflation on returns.

The basic linear model given in equation (2) reveals the general relationship between stock returns and inflation and will be used as a reference point to examine how the coefficients change in different economic regimes with the Markov regime switching model in the next stage. The Markov regime switching model assumes that the relationship between inflation and stock returns may change depending on different unobservable regimes. In this context, a two-regime model is defined by equation (3).

$$R_t = \alpha_{s_t} + \beta_{s_t} INF_t + \varepsilon_t, \quad s_t \in \{1, 2\} \tag{3}$$

Here, R_t represents the BIST100 index return, INF_t the inflation rate, and s_t the regime at time t. The s_t variable follows a first-order Markov process, and different coefficients ($\alpha_{s_t}, \beta_{s_t}$) are estimated for each regime. This enables us to determine if the impact of inflation on stock returns varies across low and high inflation regimes.

The model uses the maximum likelihood method for estimate, and transition probabilities between regimes are computed concurrently. These transition probabilities enable the investigation of the dynamics of the economy's movement from one regime to the next. This method allows you to see not only the average influence of inflation on stock returns, but also when this effect strengthens or diminishes. In the following step, a structural vector autoregression (SVAR) model was used to investigate the dynamic interactions between stock returns and inflation, as well as the effects of shocks. The Blanchard-Quah (BQ) method was used to estimate the SVAR model by decomposing inflation shocks into demand- and supply-side components. Equation (4) expresses the model using lagged values and short/long-term restrictions.

$$A_0 Y_t = A(L) Y_{t-1} + \varepsilon_t \tag{4}$$

Here, $Y_t = [R_t, INF_t]'$ represents the variable vector, A_0 is the matrix containing short-term effects, $A(L)$ is the polynomial containing lagged coefficients, and ε_t represents structural shocks. This model, supported by

IRF and variance decomposition (FEVD), quantitatively reveals the short- and medium-term effects of shocks on stock returns and inflation.

The study's technique is unique in that, unlike the linear models frequently employed in the literature, it investigates the inflation-stock market relationship in a time-varying and regime-dependent framework. In this regard, the dynamic relationships between variables are studied using VAR and SVAR models; the effects of shocks are evaluated using IRF and FEVD; and whether the relationship varies by regime is analyzed using the Markov regime switching model. This technique attempts to provide more detailed information for both investors and policymakers by indicating when inflation has a greater influence on Turkish financial markets. The findings from this investigation are reported in the following section.

4. Findings

The Augmented Dickey-Fuller (ADF) test was applied to examine the stationarity of the time series of the variables. The Dickey-Fuller statistic for stock returns was obtained as -5.34 ($p < 0.01$), while the first difference of the inflation series was -8.16 ($p < 0.01$). Therefore, the first difference of the inflation series and the stock return series are stationary, and the Markov regime model is applicable. Following the stationarity tests, a simple linear regression was used to determine the underlying relationship between stock returns and inflation before moving on to the Markov regime switching model. This model first provides a general overview of how inflation affects stock returns before establishing a fundamental reference point for capturing regime-specific coefficient changes. Before moving on to the Markov regime switching model analysis, the simple linear model established by equation (2) was investigated, and the results are shown in Table 1.

Table 1. Simple Linear Regression Findings

Variable	Coefficients	Std. Error	t value
Intercept	0.0067	0.0062	1.083
INF	0.0058*	0.0027	2.120
Residual Standard Error (RSE)	0.0781		
R^2	0.0178		
Adjusted R^2	0.0138		
F-statistic	4.493*		

* Indicates significance at the 5% level.

Table 1 shows a low R^2 value of 0.0178, showing that inflation barely accounts for 1.7% of the total variation in returns. The constant term in the regression is not statistically significant. But at the 5% level, the inflation variable's coefficient is both positive and significant. This suggests that higher inflation has a beneficial but limited impact on stock performance. This basic linear model indicates the general relationship between stock returns and inflation, and it will be used as a starting point in the next stage to analyze how the coefficients change in different economic regimes using the Markov regime switching model.

The Markov regime switching model generated two separate economic regimes. The first regime, Regime 1, portrays periods of relatively regular economic activity with moderate volatility, whereas Regime 2 depicts periods of severe market volatility or crisis, with volatile stock returns. The findings are reported in Table 2.

Table 2. Regime-Based Coefficients and Model Summaries

Regime	Variable	Coefficient	Std. Error	t value	p-value	Residual Std. Error	R^2
Regime 1	Intercept	0.002	0.024	0.108	0.914	0.115	0.040
	INF	0.010	0.007	1.266	0.206		
Regime 2	Intercept	0.008	0.006	1.344	0.179	0.065	0.007
	INF	0.003	0.003	1.030	0.303		

Examining the regime-based coefficients and model summaries in Table 2, Regime 1, which represents a normal time, produced a constant term of 0.002 and an inflation coefficient of 0.010; however, neither coefficient is statistically significant. The model's RSE = 0.115 and R^2 = 0.040 values show weak explanatory ability. Regime 2, which depicts more volatile market returns or crisis periods, had a constant term of 0.008 ($p = 0.179$) and an inflation coefficient of 0.003 ($p = 0.303$). Similarly, while the regime model results are substantial, the coefficients are not statistically significant. The model's RSE = 0.065 and R^2 = 0.007 values show a low explanatory power. Table 3 shows the alternatives for switching between regimes.

Table 3. Regime Transition Probabilities

Initial Regime	Regime 1	Regime 2
Regime 1	0.931	0.016
Regime 2	0.069	0.984

Table 3 shows that when examining the regime change probabilities, the probability of continuing under Regime 1 is 93%, while the probability of continuing under Regime 2 is 98%. It can be said that the economy is stable under both regimes, and transitions between them are rare.

When the findings in Tables 2 and 3 are considered together, it can be said that the inflation coefficient is statistically insignificant under both regimes, thus indicating that the effect of inflation on stock returns differs depending on the regime. Furthermore, the regimes have different levels of volatility and market movements, suggesting that the sensitivity of stock returns to inflationary pressures varies depending on the time period and market conditions.

Figure 1 shows the error analysis graphs for the Markov regime switching model.

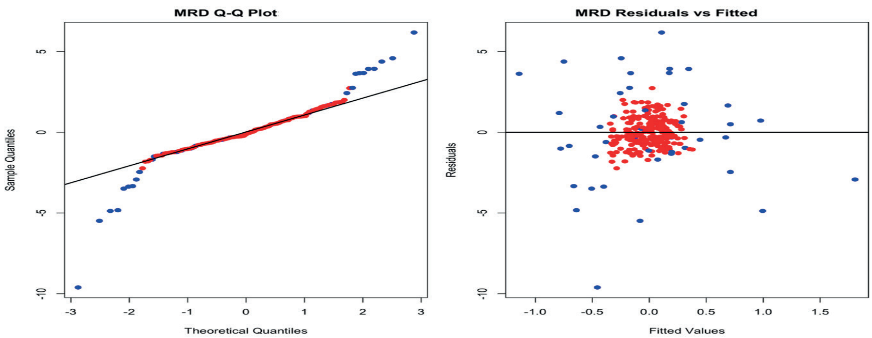

Figure 1. Error graphs of the Markov regime switching model

The Q–Q plot of the Markov regime switching model in Figure 1 shows a comparison of the error terms with the expected quantile values under a theoretical normal distribution. The fact that most of the errors are close to the diagonal line indicates a strong fit to the normal distribution in the middle quantile range. However, the significant deviations observed at the upper and lower ends of the distribution reveal that the error terms deviate from the normal distribution in the tails. This indicates that the extreme values, especially those occurring in high volatility regimes, are not fully consistent with the normal distribution and that the error distribution exhibits heavy-tailed characteristics. Since variations in variance depending on the regime are inherently expected in Markov regime switching models, the deviations at the extremes can be considered normal in terms of the model's operation. In the residuals vs. fitted plot, it is seen that the residuals are randomly distributed around the predicted values on the horizontal axis. This shows that the functional form of the model is generally correctly defined and that there is no systematic deviation. Furthermore, the small clustering of error terms in some locations, as well as the broadening and narrowing of variance with time, show that the Markov regime switching model well reflects regime-specific heteroskedasticity. This structure emphasizes the contrast between the broader error spread reported in high volatility regimes and the somewhat narrower distribution exhibited in low volatility regimes. When both graphs are examined together, it is clear that the error structure of the Markov regime switching model is broadly compatible with the model assumptions and demonstrates an error dynamic that is sensitive to regime changes. The tail deviations in the Q–Q plot show that the residual distribution exhibits heavy-tail characteristics in high volatility regimes, while the variance bands in the Residuals vs Fitted plot show that regime-specific volatility differences are accurately captured.

SVAR modeling was used to analyze the dynamic nature of the relationship between stock returns and inflation. The SVAR approach, when interpreted together with the periodic characteristics obtained from Markov regime switching analysis, offers a more holistic framework because it allows for the decomposition of inflation movements into supply-side and demand-side components.

The optimal delay length for the VAR model was determined using the Akaike Information Criterion (AIC), Hannan-Quinn (HQ), Schwarz (SC) criteria, and Final Prediction Error (FPE) values, and the findings are presented in Table 4.

Table 4. Results of VAR Delay Length Selection

Lag	AIC(n)	HQ(n)	SC(n)	FPE(n)
1	-4.389	-4.354	-4.301	0.01240
2	-4.359	-4.300	-4.213	0.01278
3	-4.403	-4.320	-4.198	0.01224
4	-4.388	-4.282	-4.124	0.01242
5	-4.408	-4.278	-4.086	0.01217
6	-4.415	-4.262	-4.034	0.01209
7	-4.409	-4.232	-3.970	0.01217
8	-4.401	-4.200	-3.903	0.01227
9	-4.385	-4.161	-3.829	0.01246
10	-4.398	-4.150	-3.783	0.01231
11	-4.371	-4.100	-3.698	0.01265
12	-4.387	-4.092	-3.655	0.01246

According to the results in Table 4, most of the information criteria reached their lowest values during the 6th lag. In particular, the AIC, HQ, and FPE values reached their minimum levels at the 6th lag. This indicates that when the model is built with 6 lags, the error is reduced and the loss of information is minimized. Although the SC criterion tends to prefer lower lags, it is generally a more restrictive criterion and in most cases chooses a lower lag than the AIC and FPE criteria. Considering that the AIC and FPE criteria are more commonly used in academic studies to optimize model fit and estimation performance, the optimal lag length was determined as 6 in this study. In this context, the 6-lag model was used in all subsequent stages of the VAR analysis. Accordingly, the estimation results of the VAR(6) models are given in Table 5.

Table 5. Estimation results of the VAR(6) models

	Variable	Coefficient	Std. Error	t-statistic	p-value
VAR(6) Model Based on the Return	R.l1	0.059	0.065	0.900	0.369
	INF.l1	0.002	0.003	0.734	0.464
	R.l2	0.061	0.066	0.928	0.354
	INF.l2	−0.003	0.004	−0.683	0.495
	R.l3	−0.076	0.066	−1.151	0.251
	INF.l3	0.003	0.004	0.682	0.496
	R.l4	−0.054	0.066	−0.828	0.409
	INF.l4	0.000	0.004	0.111	0.912
	R.l5	0.081	0.066	1.222	0.223
	INF.l5	0.002	0.004	0.604	0.547
	R.l6	−0.086	0.066	−1.304	0.194
	INF.l6	0.002	0.003	0.605	0.546
	Sabit	0.003	0.007	0.442	0.659
	R^2	0.050			
	Adjusted R^2	0.001			
	F-statistic	1.024 (p = 0.427)			

Table 5. Estimation results of VAR(6) models (continued)

	Variable	Coefficient	Std. Error	t-statistic	p-value
VAR(6) Model Based on the Inflation	R.l1	2.638	1.100	2.399	0.017
	INF.l1	0.596	0.065	9.149	0.001
	R.l2	0.719	1.110	0.648	0.518
	INF.l2	−0.190	0.075	−2.522	0.012
	R.l3	0.344	1.110	0.310	0.757
	INF.l3	0.262	0.076	3.448	0.001
	R.l4	−1.557	1.108	−1.405	0.161
	INF.l4	−0.136	0.076	−1.790	0.075
	R.l5	0.409	1.110	0.369	0.713
	INF.l5	0.103	0.075	1.375	0.170
	R.l6	0.508	1.109	0.458	0.647
	INF.l6	0.161	0.064	2.520	0.012
	Sabit	0.255	0.120	2.111	0.036
	R^2	0.510			
	Adjusted R^2	0.485			
	F-statistic	20.020 ($p < 0.001$)			

In the VAR(6) model established for the return equation in Table 5, neither the lagged values of inflation nor the lagged values of inflation are statistically significant. The T-statistics are low, and the p-values are well above the significance limits. The explanatory power of the model is limited with $R^2 = 0.050$. The F-statistic results are statistically insignificant, indicating that the model is not generally significant. These findings show that stock returns are not significantly affected by past inflation and past return movements in the short term. However, the results are significantly different in terms of the inflation equation. The lagged values of inflation itself, especially INF.l1, INF.l2, INF.l3, and INF.l6, are largely significant. In addition, the first lag of the return variable also has a significant and positive effect on inflation. $R^2 = 0.510$, indicating that the explanatory power of the model is quite high, and the F-statistic shows that the model is generally significant. This reveals that inflation dynamics have a strong autoregressive structure. Furthermore, R.l1, the first lag of stock returns, was found to be positive and significant. This finding indicates that strong market returns in the previous period had an inflationary effect. This effect reveals that pricing behavior operates through cost and expectation channels and is consistent with the findings from Markov regime switching analysis regarding periods of high volatility.

Error plots were created to provide a clearer interpretation of the validity of the VAR model findings and are presented in Figure 2.

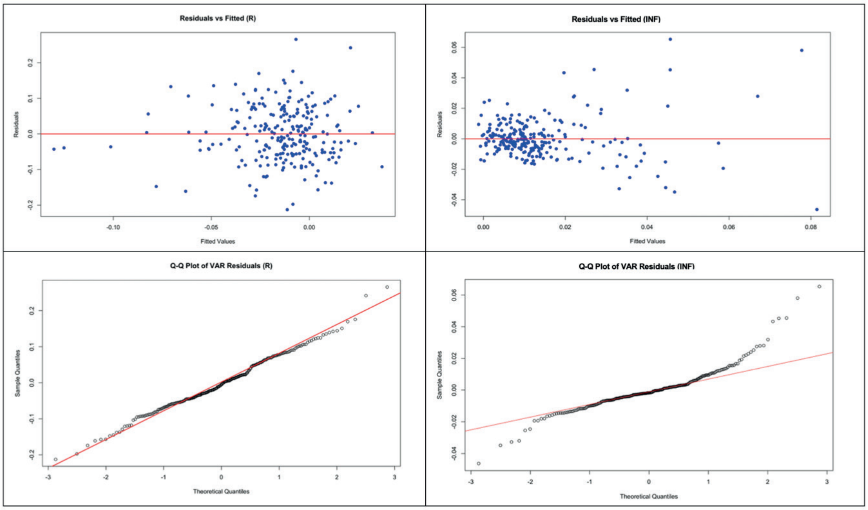

Figure 2. Error plots of the VAR(6) model

When examining the error plots of the and return VAR models in Figure 2, it can be said that in the Residuals vs Fitted plot of the model applied for return, the residuals exhibit a random distribution and no significant heteroskedasticity or nonlinear structure is observed. In the Q-Q plot, the residuals largely conform to a normal distribution, and only at the extreme values is a slight thick-tailed effect specific to financial datasets observed. When examining the error plots of the VAR model for the inflation equation, it is seen that in the Residuals vs Fitted plot, the error terms exhibit a random distribution around zero, and no significant heteroskedasticity, trend, or nonlinear structure is observed. The fact that the residuals do not form a systematic pattern according to the estimated values indicates that there is no significant specification error in the functional form of the model. When examining the Q-Q plot, it is observed that the error terms largely conform to a normal distribution and the point cloud is clustered around the reference line. It was found that only slight deviations specific to financial and macroeconomic data sets were present in the end-tails, but these did not constitute a serious violation of normality. Therefore, it is concluded that the error structure of VAR models related to the yield and inflation equation is generally consistent with the assumptions, and the model is consistent, statistically valid, and suitable for analysis.

The structural SVAR model was estimated using the Blanchard-Quah (BQ) method. This approach is based on the assumption that demand shocks have no effect on real economic activity in the long run, thus allowing for the decomposition of inflation shocks into supply and demand components. The short- and long-term impact matrix estimated within this framework is presented in Table 7.

Table 6. BQ-SVAR Short- and Long-Term Impact Matrix

		R	INF
Short-Term	**R**	0.0655	−0.0437
	INF	0.7890	1.0578
Long-Term	**R**	0.1105	0.0000
	INF	5.5435	5.2010

The short-term findings in Table 6 show that supply and demand shocks to inflation have simultaneous effects on both stock returns and inflation. The negative coefficient in the INF→R channel is consistent with the financial literature predicting that inflationary pressure lowers stock prices by increasing the discount rate. This indicates that price shocks in Turkey have instantaneous but clearly defined effects on financial markets.

Examining the long-term impact matrix in Table 6, the fact that demand shocks have a zero effect on R in the long run shows that the BQ constraint has been applied correctly methodologically. Conversely, the high and persistent sensitivity of inflation to both supply and demand shocks in the long run reveals that structural components are dominant in price formation processes in Turkey. The persistence of supply shocks, in particular, suggests that inflation has a long-term structural character rather than being a series of temporary fluctuations.

To provide a clearer interpretation of the validity of the structural SVAR model findings, error graphs were created and are presented in Figure 3.

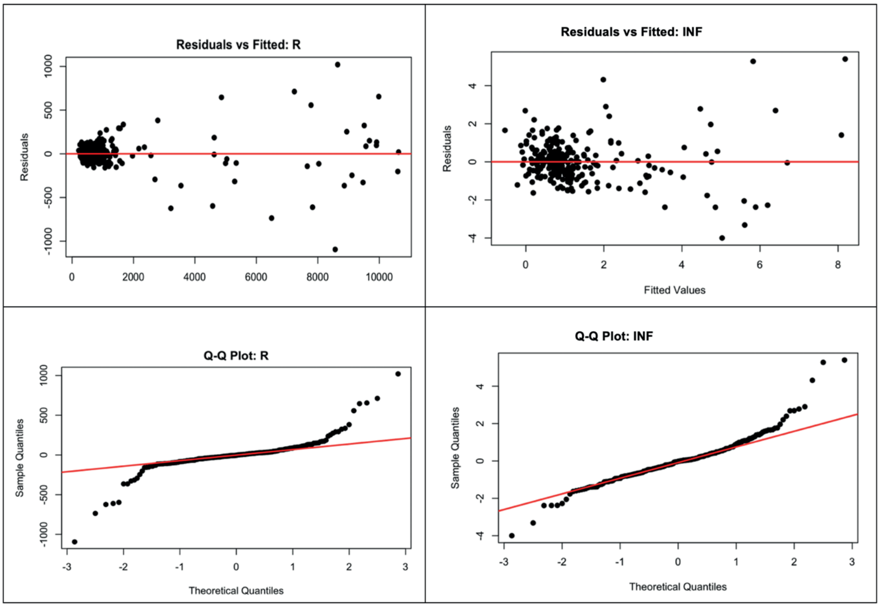

Figure 3. Error graphs of the BQ-SVAR model

Examining the error plots of the BQ-SVAR model in Figure 3, it is observed that the error terms for stock return (R) conform to a normal distribution in the middle region, but deviations are present at the extremes. However, the random distribution of residuals around the predicted values indicates that there is no significant specification error in the model. For the inflation (INF) variable, the error terms exhibit a structure closer to a normal distribution, and the residuals show a regular distribution with constant variance. These findings confirm that the BQ-SVAR model consistently captures structural relationships for both variables.

To demonstrate the dynamic effects of the supply and demand shocks separated in the BQ-SVAR model over time, Impulse Response Function (IRF) analysis was performed. While the BQ method's short- and long-term impact matrices are sufficient to separate the structural components of shocks, the number of periods over which these shocks are effective, their intensity, and their damping rate can only be evaluated with IRF. Therefore, IRF is a critical stage that reveals the time dimension of the findings and completes the economic significance of the model; its findings are presented in Table 7.

Table 7. Summary of IRF analysis findings presented in Appendix 1.

Shock	Response	Initial Impact (h = 0)	Max Impact	Duration of Effect	Significance
Demand (R)	R	0.066	0.066	1-2 periods	Significant at the beginning, insignificant thereafter.
	INF	0.789	0.789	3-4 periods	Significant in the first few periods, positive effect persists.
Supply (INF)	R	-0.044	0.008	1-2 periods	Mostly insignificant, effects are small.
	INF	1.058	1.058	3-4 periods	Significant at the beginning, persistent positive effect in the medium run.

The findings of the IRF model, presented in full in Appendix 1 and summarized in Table 7, show that demand shocks have a limited short-term effect on stock returns, with an initial positive and significant effect of 0.066, which diminishes in subsequent periods. In contrast, demand shocks have a strong and positive effect on inflation; the initial effect, which is a maximum of 0.789, remains significant in the first few periods and shows a positive trend in the medium term. Supply shocks, on the other hand, have a limited effect on stock returns, with an initial negative effect of -0.044, which becomes statistically insignificant in subsequent periods. However, the effect of supply shocks on their own series is strong and persistent; the initial effect of 1.058 remains significant in the first few periods and maintains its positive effect in the medium term. Overall, the findings show that demand shocks have a short- and medium-term upward effect on supply, while supply shocks have a limited effect on demand; demand shocks have a short-term effect on themselves, while supply shocks create persistent and medium-term inflationary pressure.

After examining the short- and medium-term effects of supply and demand shocks in the IRF analysis, a variance decomposition analysis was performed to assess the extent to which each shock explains the total variance observed in the stock return and inflation series. The variance decomposition analysis, which offers a more systematic way to observe the difference between the short-term effects of demand shocks and the long-term effects of supply shocks on inflation, is summarized in Table 8, with the full findings presented in Appendix 2.

Table 8. Summary of FEVD

Horizon	Stock Return		Inflation	
	Demand Shock	Supply Shock	Demand Shock	Supply Shock
1	1.0000	0.0000	0.0027	0.9973
6	0.9918	0.0082	0.0478	0.9522
12	0.9801	0.0199	0.0503	0.9497
24	0.9757	0.0243	0.0507	0.9493
50	0.9750	0.0250	0.0508	0.9492
100	0.9748	0.0252	0.0508	0.9492

Table 8 summarizes the FEVD findings, which show that demand-driven shocks account for the majority of the volatility in stock return error. For the first period, demand shocks account for 100% of the variance in stock return error, while supply shocks have no impact. Supply shocks steadily increase their effect over time, and by the 100th period, they account for 2.52% of the variance in stock return error. In contrast, the effect of demand shocks retains its dominant position at 97.48%. Supply shocks have a significant impact on inflation. In the first period, 99.73% of the variance of the error in inflation is explained by supply shocks, while the contribution of demand shocks is only 0.27%. This distribution remains largely unchanged until the 100th period, showing that supply shocks maintain their dominance in the variance of the error in inflation. The effect of demand shocks on inflation is limited and short-term. All of these data highlight the asymmetric impacts of shocks on stock returns and inflation in Turkey's economy: demand shocks cause short-term changes in market returns, whereas supply shocks have a long-term and persistent influence on inflation. These results quantitatively support the different response patterns of market and price dynamics to different types of shocks.

5. Conclusion

Inflation, which refers to the continuous increase observed in prices, has been particularly noticeable in recent years and causes losses in the value of investors' savings. Academics and investors who do not want to experience losses against inflation have sought safe havens and have put forward different hypotheses in this regard. One of these is Fisher's indicator effect hypothesis, which speaks of a positive relationship between stock returns and inflation, while another, Fama's proxy hypothesis, speaks of a negative relationship. Although there is evidence in the literature that the relationship is cyclical in addition to these two hypotheses, a definitive conclusion has not yet been reached. Considering that the relationship between stocks and inflation is not unidirectional and time-independent but rather changes in direction and magnitude depending on different economic regimes, it can be said that linear models are insufficient to fully capture this structure, and therefore studies have not reached a common consensus. Accordingly, this study aims to analyze the impact of inflation on the stock market in Turkey according to regimes and to reveal the cyclical differences from the perspective of investors and policymakers. This will contribute to investors, policymakers, and portfolio managers developing a regime-based perspective in their inflation-related decisions.

In this study, the relationship between inflation and stock returns in Turkey is examined comprehensively using both linear methods and regime-based approaches to determine whether it changes over time and depending on economic conditions. The monthly Consumer Price Index obtained from CBRT (2025) is used as the variable representing inflation, and the monthly logarithmic returns calculated from the BIST100 index obtained from Investing (2025) are used as the variable representing the stock market. In the analyses covering the period January 2005–November 2025, the stationarity properties of the variables were first tested; the stationarity of both series increased the reliability of the econometric results obtained. To examine the dynamic relationships between stock returns and inflation for Turkey, a simple regression and VAR(6) model were estimated, then SVAR analysis was applied with the BQ approach, the time-spread effects of shocks were evaluated with IRF and variance decomposition analyses, and it was examined with the Markov regime switching model. The results of the simple linear regression showed that inflation has a positive but low magnitude effect on stock returns and that the explanatory power of the model is limited. This finding suggests that inflation does not have a one-way and time-independent effect on returns and that the relationship may have a more complex structure.

Using the Markov regime switching model, the inflation-yield relationship was examined in two different regimes: Regime 1 for low volatility and normal periods, and Regime 2 for high volatility and crisis periods. According to the analysis findings, the inflation coefficients were not statistically significant in either regime model, revealing that the effect of inflation on stock returns is weak, independent of the regime. However, the high continuity within the regimes themselves indicates that the Turkish financial markets have distinct seasonal characteristics and that market volatility is structural. The graphs related to the error terms showed that the model assumptions were largely satisfied and that heavy tail structures became more pronounced, especially during periods of high volatility. The VAR(6) model used in the continuation of the study showed that stock returns are not sensitive to their past values and the lagged effects of inflation, and therefore, the short-term dynamics of returns cannot be significantly explained by inflation. In contrast, the fact that both the lagged values of inflation and the one-period lag of stock returns are significant in the inflation equation indicates that pricing behavior in Turkey has a strong autoregressive structure and that financial market developments can influence inflation via expectation and cost channels. To better understand the dynamic nature of the connection, a BQ-SVAR analysis was performed by separating inflation shocks into supply and demand components. It was discovered that demand shocks had favorable but short-lived effects on stock returns, whereas supply shocks have limited and statistically negligible effects on returns. When looking at the effects on inflation, it was discovered that supply-side shocks have long-lasting and strong repercussions, exposing the structural character of inflation. These findings are supported by IRF studies, which reveal that demand shocks have long-term consequences in the short term and medium-term effects in the case of supply shocks. The variance decomposition results confirm this asymmetric structure, demonstrating that demand shocks account for the majority of stock returns while supply-side shocks drive inflation dynamics.

When all the findings are considered together, it is concluded that inflation in Turkey has a weak and limited effect on stock returns in both linear and regime-based models. Although inflation can create short-term pressures on the stock market, it is clear that this effect does not have a determining characteristic of the overall market dynamics. This result is consistent with the findings in the literature that both the Fisher hypothesis and Fama's representation hypothesis can be partially supported in different periods, but a clear direction in the overall relationship cannot be determined. The fact that inflation in the Turkish economy is determined by structural components limits the stock market from being a complete hedge against inflation. The results of the study indicate that inflation is not a strong indicator for predicting stock returns for investors and that for policymakers, price stability policies should target structural components due to the decisive role of supply-side shocks in inflation. However, the periodic divergences revealed by regime-based analyses highlight the importance of volatility-sensitive strategies for portfolio managers and market analysts. In future studies, sector-based regime analysis, the use of data at different frequencies, or the inclusion of financial stress indices in the model may contribute to a more detailed examination of the relationship.

This study makes three main contributions to the literature. First, it is among the few studies that analyze the inflation–stock market relationship in Turkey using both linear frameworks and regime-dependent Markov regime switching models, providing evidence that this relationship is time-varying and regime-specific. Second, by decomposing inflation into supply and demand shocks through a structural SVAR framework, it distinguishes stock market responses to different inflation sources, allowing for clearer causal interpretation. Third, the joint analysis of inflation dynamics and asset returns provides a regime-based perspective for financial decision- making. Overall, the study offers both methodological and empirical contributions to the analysis of inflation–stock market interactions in Turkey.

Future research could examine the regime-dependent effects of different inflation components on stock market returns. The relationship between inflation and stocks could be investigated in more detail over time periods and sector-specific regime analysis.

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Appendix 1. IRF findings

	Horizon	Impulse	Response	Estimate	Lower95	Upper95
1	0	R	R	0.06557685	4.07E-02	0.07989650
2	1	R	R	0.00613479	-4.22E-03	0.01540491
3	2	R	R	0.00380558	-5.68E-03	0.01372620
4	3	R	R	-0.0030964	-1.32E-02	0.00706725
5	4	R	R	-0.0016825	-1.15E-02	0.00743200
6	5	R	R	0.00709344	-3.15E-03	0.01599299
7	6	R	R	-0.0002017	-1.15E-02	0.00864958
8	7	R	R	0.00383922	-1.69E-03	0.00885051
9	8	R	R	0.00084936	-4.00E-03	0.00494331
10	9	R	R	0.00164945	-2.25E-03	0.00519860
11	10	R	R	0.00191021	-8.77E-04	0.00511485
12	11	R	R	0.00094855	-2.66E-03	0.00396036
13	12	R	R	0.00245204	3.35E-05	0.00526297
14	13	R	R	0.00159319	-9.38E-04	0.00410059
15	14	R	R	0.00157237	-4.04E-04	0.00358739
16	15	R	R	0.00120410	-4.76E-04	0.00297162
17	16	R	R	0.00093836	-7.83E-04	0.00259863
18	17	R	R	0.00110002	-1.25E-04	0.00275116
19	18	R	R	0.00100252	-5.36E-04	0.00267922
20	19	R	R	0.00107579	-8.27E-05	0.00269991
21	20	R	R	0.00091241	-1.50E-04	0.00238047
22	21	R	R	0.00082295	-1.38E-04	0.00221213
23	22	R	R	0.00075389	-3.09E-05	0.00206092
24	23	R	R	0.00067145	-1.46E-04	0.00192116
25	24	R	R	0.00067437	-2.46E-05	0.00192429
26	0	R	INF	0.78909199	-1.65E-02	1.25511407
27	1	R	INF	0.64352505	1.59E-01	0.91164432
28	2	R	INF	0.29652877	7.78E-02	0.48582447
29	3	R	INF	0.29799171	1.46E-02	0.49450259
30	4	R	INF	0.07693769	-1.62E-01	0.28807122
31	5	R	INF	0.07307321	-1.61E-01	0.24995463
32	6	R	INF	0.30706556	-3.08E-02	0.50571804
33	7	R	INF	0.29677081	1.35E-02	0.47141620
34	8	R	INF	0.22153995	3.43E-02	0.34890278
35	9	R	INF	0.19370000	1.47E-02	0.32806809
36	10	R	INF	0.13787271	-1.41E-02	0.26314693
37	11	R	INF	0.11067955	-3.06E-02	0.23244621
38	12	R	INF	0.14523781	-1.28E-02	0.27496427
39	13	R	INF	0.15365583	-7.46E-04	0.28186728
40	14	R	INF	0.13442229	3.07E-03	0.25185159
41	15	R	INF	0.12568060	5.70E-03	0.23806277
42	16	R	INF	0.10592775	-5.81E-04	0.21189918

43	17	R	INF	0.08932678	-4.60E-03	0.19038428
44	18	R	INF	0.09052264	-3.37E-03	0.19233086
45	19	R	INF	0.08966779	-2.31E-03	0.19616896
46	20	R	INF	0.08369003	-2.64E-04	0.18551511
47	21	R	INF	0.07844192	4.25E-04	0.17438035
48	22	R	INF	0.07091144	4.13E-04	0.16169044
49	23	R	INF	0.06304510	-1.07E-04	0.15009884
50	24	R	INF	0.05927006	-7.36E-04	0.14570685
51	0	INF	R	-0.0437676	-6.43E-02	0.00494376
52	1	INF	R	0.00043423	-8.25E-03	0.01104293
53	2	INF	R	-0.0044618	-1.30E-02	0.00562100
54	3	INF	R	0.00500835	-5.44E-03	0.01527362
55	4	INF	R	0.00485102	-5.60E-03	0.01453731
56	5	INF	R	0.00062411	-8.49E-03	0.01021722
57	6	INF	R	0.00832870	-1.46E-03	0.01655713
58	7	INF	R	0.00199237	-3.07E-03	0.00633419
59	8	INF	R	0.00216104	-1.76E-03	0.00525633
60	9	INF	R	0.00103008	-2.52E-03	0.00354435
61	10	INF	R	0.00094895	-2.09E-03	0.00278762
62	11	INF	R	0.00205455	-6.76E-04	0.00427960
63	12	INF	R	0.00133827	-1.23E-03	0.00279119
64	13	INF	R	0.00172598	-2.75E-04	0.00314927
65	14	INF	R	0.00104182	-5.55E-04	0.00201293
66	15	INF	R	0.00107489	-2.92E-04	0.00201588
67	16	INF	R	0.00108414	-2.43E-04	0.00205029
68	17	INF	R	0.00090846	-2.88E-04	0.00148165
69	18	INF	R	0.00106847	-7.27E-05	0.00182991
70	19	INF	R	0.00090883	-1.48E-04	0.00148942
71	20	INF	R	0.00083731	-9.36E-05	0.00140935
72	21	INF	R	0.00074309	-9.24E-05	0.00120194
73	22	INF	R	0.00067087	-7.79E-05	0.00108261
74	23	INF	R	0.00064910	-4.78E-05	0.00109976
75	24	INF	R	0.00060817	-6.36E-05	0.00100324
76	0	INF	INF	1.05781356	6.23E-01	1.46796942
77	1	INF	INF	0.51521684	1.99E-01	0.84278057
78	2	INF	INF	0.07510836	-1.08E-01	0.28256116
79	3	INF	INF	0.19733232	3.27E-03	0.39524186
80	4	INF	INF	0.17267227	-2.83E-02	0.35928589
81	5	INF	INF	0.12103540	-8.75E-02	0.29993417
82	6	INF	INF	0.29654035	1.04E-01	0.45141465
83	7	INF	INF	0.27767108	1.18E-01	0.41253901
84	8	INF	INF	0.15351859	3.42E-02	0.25514428
85	9	INF	INF	0.16315481	4.41E-02	0.25167739
86	10	INF	INF	0.13553697	2.26E-02	0.20763719
87	11	INF	INF	0.10706687	-8.16E-03	0.17856786

88	12	INF	INF	0.14465337	3.05E-02	0.21369360
89	13	INF	INF	0.14548500	3.96E-02	0.21093753
90	14	INF	INF	0.11673435	2.37E-02	0.17191074
91	15	INF	INF	0.10774640	2.03E-02	0.16021639
92	16	INF	INF	0.09681564	1.31E-02	0.14612828
93	17	INF	INF	0.08315490	4.97E-03	0.12980922
94	18	INF	INF	0.08521348	8.16E-03	0.13238511
95	19	INF	INF	0.08471560	1.02E-02	0.12895528
96	20	INF	INF	0.07564923	7.22E-03	0.11782996
97	21	INF	INF	0.07019974	6.90E-03	0.11054753
98	22	INF	INF	0.06441595	5.74E-03	0.10397629
99	23	INF	INF	0.05765118	2.74E-03	0.09514972
100	24	INF	INF	0.05479247	2.41E-03	0.09172841

Appendix 2. Forecast Error Variance Decomposition (FEVD) - 100 periods

	Stock Return		Inflation	
Horizon	Demand Shock	Supply Shock	Demand Shock	Supply Shock
1	1	0	0.0027	0.9973
2	0.9977	0.0023	0.0276	0.9724
3	0.9973	0.0027	0.0433	0.9567
4	0.9964	0.0036	0.0484	0.9516
5	0.9949	0.0051	0.0482	0.9518
6	0.9918	0.0082	0.0478	0.9522
7	0.9847	0.0153	0.0477	0.9523
8	0.9826	0.0174	0.0479	0.9521
9	0.9818	0.0182	0.0499	0.9501
10	0.9813	0.0187	0.0505	0.9495
11	0.9808	0.0192	0.0504	0.9496
12	0.9801	0.0199	0.0503	0.9497
13	0.9791	0.0209	0.0502	0.9498
14	0.9783	0.0217	0.0502	0.9498
15	0.9779	0.0221	0.0504	0.9496
16	0.9775	0.0225	0.0506	0.9494
17	0.9772	0.0228	0.0506	0.9494
18	0.9769	0.0231	0.0506	0.9494
19	0.9766	0.0234	0.0506	0.9494
20	0.9764	0.0236	0.0506	0.9494
21	0.9761	0.0239	0.0506	0.9494
22	0.9760	0.0240	0.0507	0.9493
23	0.9758	0.0242	0.0507	0.9493
24	0.9757	0.0243	0.0507	0.9493
25	0.9756	0.0244	0.0507	0.9493
26	0.9755	0.0245	0.0507	0.9493
27	0.9754	0.0246	0.0507	0.9493
28	0.9753	0.0247	0.0507	0.9493
29	0.9753	0.0247	0.0508	0.9492
30	0.9752	0.0248	0.0508	0.9492
31	0.9752	0.0248	0.0508	0.9492
32	0.9751	0.0249	0.0508	0.9492
33	0.9751	0.0249	0.0508	0.9492
34	0.9750	0.0250	0.0508	0.9492
35	0.9750	0.0250	0.0508	0.9492
36	0.9750	0.0250	0.0508	0.9492
37	0.9750	0.0250	0.0508	0.9492
38	0.9750	0.0250	0.0508	0.9492
39	0.9749	0.0251	0.0508	0.9492
40	0.9749	0.0251	0.0508	0.9492

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