

# EFFECTS OF INTEREST RATE HIKES ON VARIOUS ASSET CLASSES

## Interest Rates

Interest rates affect everyone from consumers to businesses to entire nations. They are a tool of monetary policy set by central banks and used as a benchmark for business and consumer borrowing.

### What Are the Different Interest Rates?

The term “interest rate” is one of the most commonly used phrases in the fixed-income investment lexicon. The different types of interest rates, including real, nominal, effective, and annual, are distinguished by key economic factors, that can help individuals become smarter consumers and shrewder investors.



### Nominal interest rates

Nominal interest rates refer to the interest rates that are unadjusted for inflation. In other words, it is the stated or quoted interest rate on a loan or investment without taking into account the impact of inflation or deflation over time.

### Real Interest Rate

The real interest rate is so named, because unlike the nominal rate, it factors inflation into the equation, to give investors a more accurate measure of their buying power, after they redeem their positions.

Real interest rates are crucial for making informed financial decisions, especially in the context of investments and loans. When assessing investment opportunities or evaluating the cost of borrowing, it is essential to consider the real interest rate to understand the true economic impact and how inflation may affect the return on investment or the actual cost of borrowing.

### Effective Interest Rate

Investors and borrowers should also be aware of the effective interest rate, which takes the concept of compounding into account. For example, if a bond pays 6% annually and compounds semiannually, an investor who places \$1,000 in this bond will receive \$30 of interest payments after the first six months ( $\$1,000 \times .03$ ), and \$30.90 of interest after the next six months ( $\$1,030 \times .03$ ). In total, this investor receives \$60.90 for the year. In this scenario, while the nominal rate is 6%, the effective rate is 6.09%.

Mathematically speaking, the difference between the nominal and effective rates increases with the number of compounding periods within a specific time period.

### Applications of Nominal, Real, and Effective Rates

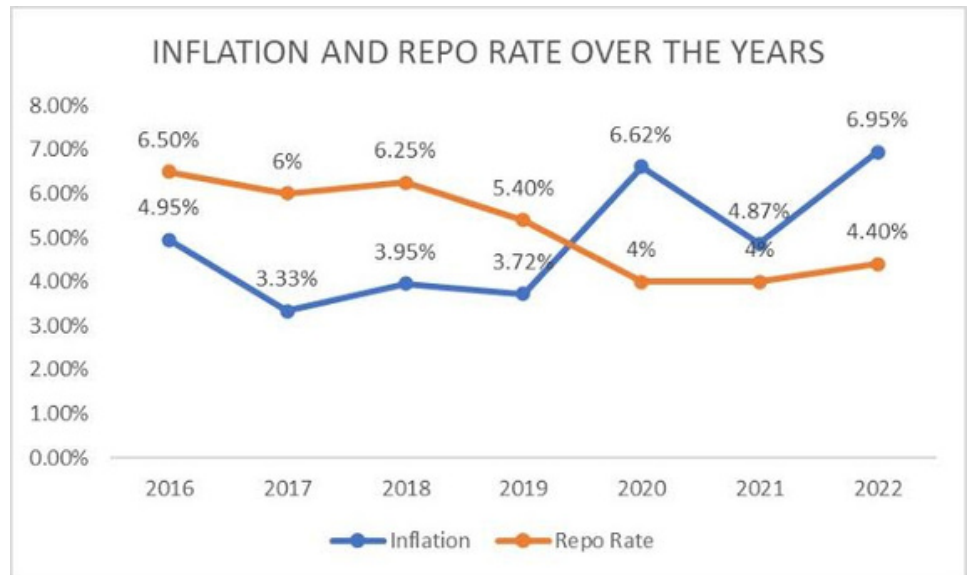
Many financial products state the interest rate as a nominal rate. For example, financial institutions often advertise their loan or deposit products using nominal interest rates. This allows customers to quickly understand the rate they would be receiving or paying without the need for adjustments. In addition, many financial contracts such as mortgages, personal loans, and credit cards, specify the nominal interest rate that will be applied to the principal amount.

## Inflation

Inflation is when the general prices of goods and services rise in an economy, which may be caused by a nation's currency losing value or by an economy becoming over-heated—i.e. growing so fast that demand for goods is outpacing supply and driving up prices.

When inflation rises, interest rates are often increased as well, so that the central bank can keep inflation in check (they tend to target 2% a year of inflation). If, however, interest rates fall, inflation can begin to accelerate as people buying on cheap credit can begin bidding up prices once again.

As you can see from the graph a conclusion can be drawn that as when interest rate was high the inflation rate was lower and vice versa. The Republic Bank of India uses interest rate as a tool to control inflation. We can see that when in 2019 repo rate was decreased the inflation



got higher. In the span of 2021 to 2022 RBI increased repo rate resulting the change in inflation rate.

## Types of Interest Rates

Interest rates vary based on their characteristics and how they are applied. The main categories include Simple and Compound Interests.

### 1. Simple Interest

It is calculated based on three main factors: the principal amount, the rate of interest, and the time. The calculation is straightforward:

**Simple Interest =  $P \times R \times T / 100$**

For example, if you borrow Rs 1,00,000 with a 10% annual rate of interest for 2 years, the interest would be Rs 20,000 ( $1,00,000 \times 0.10 \times 2$ ). Simple interest is commonly applied in certain loans, such as personal or short-term loans and savings accounts.

### Compound Interest

Unlike simple interest, compound interest considers the compounding effect, where the interest is added to the principal amount, and future interest is calculated based on the new total. The compounding frequency, whether annually, semi-annually, quarterly, monthly, or daily, determines how often the interest is added.

## Factors Affecting Interest Rates

Many factors, including economic indicators such as inflation, monetary policy, and market demand, influence interest levels. Inflation plays a significant role in determining rate of interest, reflecting the general price increase over time.

When it is high, lenders may require higher rates to compensate for the diminishing purchasing power of their money. Conversely, during periods of low inflation, rates are lower as the risk of eroding returns is reduced.

# Analysis of Central Bank Approach to Interest Rate Hike Execution

Interest rate hikes are one of the important tools in the central bank's armory, mainly used for the control of inflation and the sustaining of economic stability. The whole process of implementing an upward change in interest rates is a mixture of economic analysis, policy decision, and strategy in communication. This chapter will address the mechanics that the central banks, such as the RBI or the Federal Reserve in the US, put into practice to effect interest rate hikes, the economic indicators that ensure the processes take place, and the overall macroeconomic implications.

## 1. Mechanisms of Interest Rate Hikes

Central banks take action to influence the short-term interest rates, primarily the rate at which commercial banks lend to one another overnight, otherwise known as the interbank lending rate. It usually does this through the main levers of the central bank, which include the setting of a central bank key policy rate, some of which may include the repo rate in India or the titled federal funds rate in the United States.



### When the central bank raises that rate:

*Cost of Borrowing Increases:* Commercial banks pass on the enhanced cost to other consumers and business enterprises through higher interest on loan and credit, resultantly easy borrowing falls and spending decreases.

*Liquidity Management:* The central bank can also employ the tool of open market operations by selling government securities in the market and contract the money supply to support the hike in the interest rate .

## 2. Facilitators to execute the decision on increased interest rate

Members of the central banks observe a variety of economic indicators to decide on the amount and timing of increases in the interest rates. For instance, **INFLATION** indicators include but are not limited to the following:

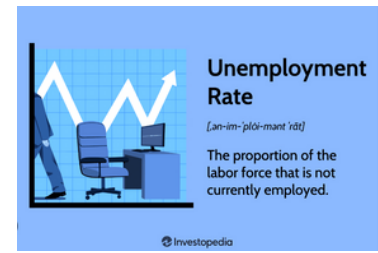
*Inflation Rates:* High inflation is a sensitive trigger for raising interest rates. The ideal target for most central banks is to maintain the inflation rate within an acceptable range, typically between 2 and 4 percent for most economies.



*Economic Expansion:* High economic expansion can become so rapid that it results in overheating: when demand increases over supply, the effect is a price increase. Central banks have a strategy to cool down such an economy: Interest rates are hiked to control demand.



*Unemployment Levels:* Low unemployment levels are desirable and are viewed as an indicator of a healthy economy. However, it can also result in wage inflation. In many cases, wage inflation has become the concern of most central banks in the world as they keenly observe the unfolding.



*Financial Stability:* Greater risk-taking in financial markets may result in asset bubbles. It can work as a counter-action on the increase of such rates.

### 3. Macroeconomic Implications of Interest Rate Increases

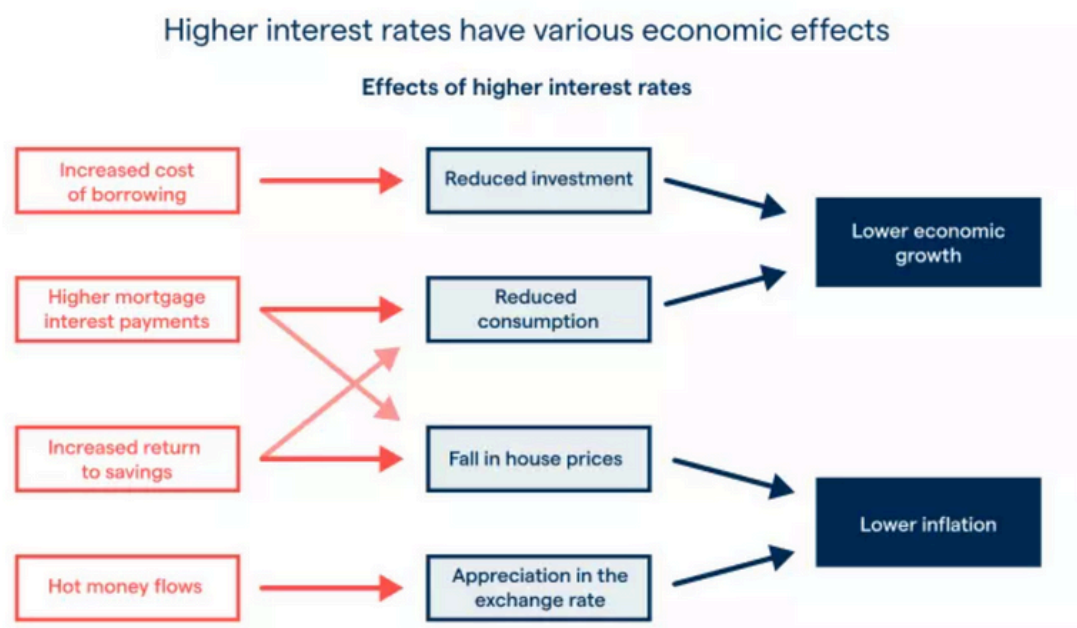
The implications of the rate increases creep throughout the economy in the following ways:

*Reduced Consumption:* High rates increase the borrowing cost for consumers, lowering the purchases of durable goods, such as houses and cars.

*Lower Business Investments:* Businesses can tend to postpone or reduce their investments in business as financing costs run high with the hike in interest rates, which can lead to slackened economic growth.

*Appreciation of the Currency:* An increase in interest rates attracts foreign money, and the more significant inflow of hot money in a country will also appreciate its currency. This can reduce inflation by lowering import costs but can hurt export competitiveness.

*Moderating Inflation:* Increased interest rates can trim down spending and investment, so the boost in these rates can help tone down inflation to the target rates.



# Impact of Interest Rate Hikes on Various Asset Classes

For example, an important arsenal linked with tool of central bank is increase in rate of interest, which in the process causes substantial changes in various asset classes such as equities, bonds, real estate, and commodities. It is incumbent on investors to understand these effects because the movements in the rate of interest are drivers of investment decisions and the performance of a portfolio. This section will focus on the effect of rising interest rates on equity markets and changes in investors' behavior and the general effect on the other classes of assets.

## 1. Impact on Equity Markets

This is often most visible for equity markets. Higher interest rates mean an increased cost of borrowing to companies:

A rise in interest rates increases the cost of borrowing for companies. Facing higher costs for financing operations, expansions, or debt repayment, the profitability of firms can be dented. This may lead to revised lower earnings and reduced growth prospects, thus lower stock prices.

**Discounted Future Earnings:** Stock values are just a reflection of discounted future flows. Discount rates go up if interest rates rise, and hence the value, at the present time, of anticipated cash inflows goes down. A leading cause of downward pressure.

**Change in Investor Preference:** When the interest rates increase, there is a shift in the interest of the investors towards investment in bonds and different fixed securities because here, the inflow of prepaid interest is insured rather than being an extreme risk in the involvement of capital in the equities. Investors begin shifting their funds away from equities and towards fixed securities, further hampering already floundering equities.

## 2. Effects on Bonds and Fixed Securities

The most direct effects of the interest rate increase are observed on bond prices and yields:

**Inverse Relationship with Bond Prices:** The price of existing bonds goes in the opposite direction of the new interest rate. This occurs since new bonds would offer higher interest rates, thus being more attractive to the investors having the willingness to let go of the existing ones and thereby lowering their prices.

**The More Attractive Yields on New Issuances:** While rising rates can hurt the prices of existing bonds, they create more attractive yields on the newly issued bonds in favor of those seeking income.

### **3. Real Estate Sector**

The real estate sector is another class of assets that responds strongly to changes in interest rates:

**Higher Mortgage Rates:** Higher interest rates are linked to higher mortgage rates, which increase the cost of financing homes for consumers. These factors can in the end reduce demand for housing and depress property prices.

**Lower Real Estate Investment:** With higher costs of financing, real estate developers and investors will be less capable of starting new projects or purchasing more properties, and this may translate into lower growth in the real estate sector.

### **4. Effects on Commodities**

Interest rate too can have an effect on medicines and other goods:

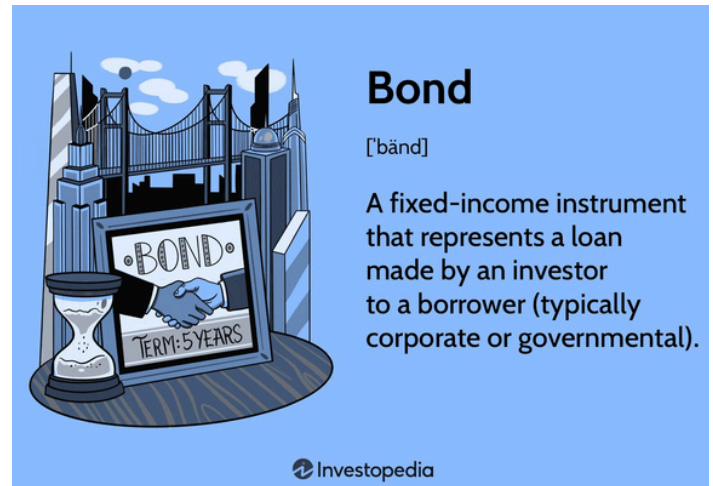
**Stronger Currency Effects:** Higher interest rates often lead to a stronger currency, as foreign investors seek higher returns. A stronger currency would make commodities, that are typically priced using the local currency, costlier in foreign markets thus reducing their demand and bringing the prices down.

**Impact on Demand:** With the increase of interest rates there is always slow economic growth which then leads to lesser requirement for these things like oil or metals thus bringing down their prices.



# INTEREST RATES & STOCK MARKET

Bonds are financial instruments that investors buy to earn interest. Essentially, buying a bond means lending money to the issuer, which could be a company or government entity. The bond has a predetermined maturity date and a specified interest rate. The issuer commits to repaying the principal, which is the original loan amount, on this maturity date. In addition, during the time up to maturity, the issuer usually pays the investor interest at prescheduled intervals, typically semiannually.



- Bonds are debt securities issued by corporations, governments, or other organizations and sold to investors.
- Not all bonds can be easily traded, and not all securities are available to private investors.
- Bonds typically have a low price correlation with stock markets. This lower correlation makes them an effective tool for diversifying investment portfolios.
- Besides buying individual bond securities, investors can access diversified bond portfolios via fund investments, such as bond exchange-traded funds (ETFs).
- Most bonds have regular and stable interest payments, making them well-suited for those on a fixed income.

## Types of Bonds

In finance, bonds represent a beacon of stability and security. Bonds come in many forms, each with unique characteristics and advantages. With so many choices available, it's essential to understand the sometimes subtle but important differences among the most common types.

### Corporate Bonds

Corporate bonds are fixed-income securities issued by corporations to finance operations or expansions.

### International Government Bonds

International government bonds are debt securities issued by foreign governments. They allow investors to diversify their portfolios geographically and potentially benefit from currency fluctuations or higher yields.

### Municipal Bonds

Municipal bonds (called “munis”) are debt securities issued by states, cities, or counties to fund public projects or operations.

### Green Bonds

Green bonds are debt securities issued to fund environmentally friendly projects like renewable energy or pollution reduction.

### Agency Bonds

Agency bonds are generally issued by government-sponsored enterprises or federal agencies

# HOW INTEREST RATE AND INFLATION AFFECTS BOND MARKET

The price of bonds decreases with a rise in inflation and interest rates due to the following reasons:

## 1. Inflation and Purchasing Power

- **Fixed Payments:** Bonds pay fixed interest payments (coupon payments) over time. When inflation rises, the purchasing power of these fixed payments decreases. For example, if inflation rises by 3%, a bond paying a 5% coupon now effectively offers only a 2% real return.
- **Demand for Higher Yields:** To compensate for this loss of purchasing power, investors demand higher yields. This means that they are only willing to buy bonds at a lower price, which increases the yield (since yield is inversely related to price).

## 2. Interest Rates and Opportunity Cost

**New Bonds with Higher Yields:** When interest rates rise, new bonds are issued at these

- higher rates. These new bonds become more attractive to investors because they offer better returns.
- **Reduced Value of Existing Bonds:** Existing bonds with lower coupon rates become less attractive compared to new issues. To sell these older bonds, their prices must decrease to offer a yield comparable to the new, higher-interest-rate bonds.



- **Inverse Relationship:** Bond prices and interest rates have an inverse relationship. When interest rates go up, the present value of the fixed payments from the bond decreases, leading to a drop in the bond's price.

## Mathematical Perspective

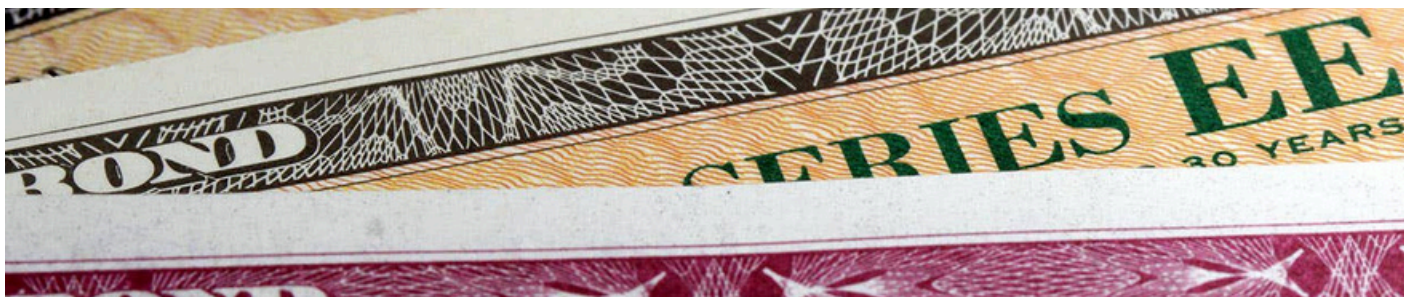
- **Present Value of Future Cash Flows:** A bond's price is essentially the present value of its future cash flows (coupon payments and principal repayment). When interest rates rise, the discount rate used to calculate the present value of these cash flows increases. This results in a lower present value, hence a lower bond price.

## Example

- Imagine you have a bond paying a 5% coupon when the prevailing interest rate is 5%. If interest rates rise to 7%, new bonds will be issued with a 7% coupon. To sell your 5% bond in this new environment, you would have to offer it at a lower price, so that its yield matches the new 7% level.

## In summary:

- Higher inflation → Reduces the real value of bond payments → Investors demand higher yields → Bond prices decrease.
- Higher interest rates → New bonds offer better returns → Existing bonds must decrease in price to offer competitive yields.





# Building an Analytical Framework to Analyze the Relationship Between Interest Rate Hikes and Market Movements

## 1. Introduction

This section aims to analyze how interest rate hikes, and in particular the ones made by Federal Reserve, impact financial markets; more precisely, the S&P 500 index. For this purpose, an analytical framework setting out the identification of some key economic indicators, extracting appropriate data, applying econometric techniques, and interpreting those outcomes that give information regarding the interest rate changes and their influence on other market movements will be built.

## 2. Analytical Framework

### 2.1 Problem Definition

The prime objective of this project is to learn and predict the impact when Federal Funds Rate changes on the S&P 500 index. In regard to this, the following are some of the key questions that can be stated as:

The S&P 500 and Federal Funds Rate Correlation

Can we actually measure the relationship between interest rate hikes and stock prices rather accurately?

### 2.2 Economic Indicators and Data Sources

Federal Funds Rate: The independent variable of prime interest is the rate at which the Fed sets interest.

S&P 500 Index: Dependent variable, aggregated performance of US equities.

Revolt: FRED, Federal Reserve meetings dates and rate decisions, 2022–24, S&P 500 on closing date.

### 2.3 Statistical Methods

**Single Linear Regression:** single linear regression to predict the relationship between Federal Funds Rate and S&P 500 index.

**Model Equation:**

$$\text{S\&P 500} = \beta_0 + \beta_1 \times \text{Federal Funds Rate} + \epsilon$$

## 3. Data Analysis

### 3.1 Data Overview

S&P 500 Index Data: Extracted for the given dates, along with the closing prices.

Federal Funds Rate Data: Extracted from the decisions of the Federal Reserve during the period 2022–2024.

### 3.2 Regression Analysis

Dependent Variable(Y): S&P 500 Closing Price.

Independent Variable (X): Federal Funds Rate.

# A Glimpse of Data:

FOMC Meeting Date	Rate Change (bps)	Federal Funds Rate
July 26, 2023	+25	5.25% to 5.50%
May 3, 2023	+25	5.00% to 5.25%
March 22, 2023	+25	4.75% to 5.00%
Feb 1, 2023	+25	4.50% to 4.75%
Dec 14, 2022	+50	4.25% to 4.50%
Nov 2, 2022	+75	3.75% to 4.00%
Sept 21, 2022	+75	3.00% to 3.25%
July 27, 2022	+75	2.25% to 2.50%
June 16, 2022	+75	1.50% to 1.75%
May 5, 2022	+50	0.75% to 1.00%
March 17, 2022	+25	0.25% to 0.50%

FEDERAL FUNDS RATE DATA

Date	Open	High	Low	Close	Adj Close	Volume
Aug 21, 2024	5,603.09	5,632.68	5,597.33	5,599.32	5,599.32	733,068,422
Aug 1, 2024	5,537.84	5,620.51	5,119.26	5,597.32	5,597.12	56,661,660,000
Jul 1, 2024	5,471.08	5,669.67	5,390.95	5,522.30	5,522.30	80,360,390,000
Jun 1, 2024	5,297.15	5,523.64	5,234.32	5,460.48	5,460.48	76,025,620,000
May 1, 2024	5,029.03	5,341.88	5,011.05	5,277.51	5,277.51	86,849,720,000
Apr 1, 2024	5,257.97	5,263.95	4,963.56	5,035.69	5,035.69	81,747,170,000
Mar 1, 2024	5,098.51	5,264.85	5,056.82	5,254.35	5,254.35	86,299,510,000
Feb 1, 2024	4,861.11	5,111.06	4,853.52	5,096.27	5,096.27	82,066,930,000
Jan 1, 2024	4,745.20	4,831.09	4,682.11	4,845.65	4,845.65	81,737,880,000
Dec 1, 2023	4,559.43	4,793.30	4,546.50	4,769.83	4,769.83	81,530,670,000
Nov 1, 2023	4,201.27	4,587.64	4,197.74	4,567.80	4,567.80	80,970,570,000
Oct 1, 2023	4,284.52	4,393.57	4,103.78	4,193.80	4,193.80	83,519,460,000
Sep 1, 2023	4,530.60	4,541.25	4,238.63	4,288.05	4,288.05	73,482,980,000
Aug 1, 2023	4,578.83	4,584.62	4,335.31	4,507.66	4,507.66	86,840,820,000
Jul 1, 2023	4,450.48	4,607.07	4,385.05	4,588.96	4,588.96	75,063,200,000
Jun 1, 2023	4,883.03	4,458.48	4,171.64	4,450.38	4,450.38	87,383,140,000
May 1, 2023	4,866.79	4,231.30	4,048.28	4,179.83	4,179.83	88,828,200,000
Apr 1, 2023	4,102.20	4,170.06	4,049.35	4,169.48	4,169.48	70,861,260,000
Mar 1, 2023	3,963.34	4,110.75	3,808.86	4,109.31	4,109.31	113,094,800,000
Feb 1, 2023	4,070.07	4,195.44	3,943.08	3,970.15	3,970.15	80,392,280,000
Jan 1, 2023	3,853.29	4,084.21	3,794.33	4,076.60	4,076.60	80,763,810,000
Dec 1, 2022	4,087.14	4,100.96	3,764.49	3,839.50	3,839.50	85,249,330,000
Nov 1, 2022	3,901.79	4,080.11	3,698.15	4,080.11	4,080.11	92,671,910,000
Oct 1, 2022	3,609.78	3,906.42	3,491.58	3,871.98	3,871.98	95,823,760,000
Sep 1, 2022	3,936.73	4,119.28	3,584.13	3,585.62	3,585.62	94,241,020,000

S&P 500 HISTORIC DATA

## 4. Results

### 4.1 Regression Output

Using the regression model:

**Intercept ( $\beta_0$ ):** The level that the S&P 500 would be if the Federal Funds Rate was zero.

**Slope ( $\beta_1$ ):** The expected change in S&P 500 for a one percentage point increase in the Federal Funds Rate.

**R-squared Value:** Proportion of variance in the S&P 500 explained by changes in the Federal Funds Rate.

**P-value:** Level of statistical significance where low p-values of less than 0.05 usually demonstrate that the relationship is statistically significant.

### 4.2. Interpretation of the Results

**Slope:** This refers to the effect on the S&P 500 — how much it moves for every change in the Federal Funds Rate. A negative value would then imply that rate hikes generally lead to a decline in the S&P 500, consistent with the theory that higher interest rates reduce present value for future cash flows, lowering stock prices.

**Significance:** If the p-value is significant, we can be pretty certain that what we are seeing is a relationship and not due to random chance.

**Model Fit:** The R-squared value will let us know how well our model explains the variability in the S&P 500 index.

## 5. Conclusion

In this part, an analytical framework that estimates the impact of interest rate hikes on the S&P 500 index has been successfully built. The regression analysis has shown the magnitude and direction of this impact. Further analysis could comprise model extension with variables like inflation or GDP growth, or using more complex econometric techniques to capture dynamic relationships over time.

# HOW MARKET EXPECTATIONS OF FUTURE INTEREST RATE HIKES INFLUENCE MARKET MOVEMENTS

The expectations of future interest rate hikes by the market may be an essential driving force of market movement. These expectations are derived based on economic indicators. Long before any change in interest rates takes place, the mere anticipation causes widespread fluctuations in asset prices of all kinds of financial market instruments, whether on equity, the bond and derivatives segment.

## 1. Formation of Market Expectation

Those in the market watch various indicators that help their expectations on potential rate increases.

### **Economic Indicators:**

**Inflation Rates:** Central banks often set target inflation rates. An increasing inflation rate tends to signal that rates will rise to prevent prices from going too high.

**Employment Data:** Higher employment and/or wage growth can be the notion of an overheating economy, which spurred potential interest rate hikes.

**GDP Growth:** Strong economic growth is usually followed by speculations of higher rates to avert an overheating economy.

### **Central Bank Communications**

**Monetary Policy Statements:** Central banks issue statements periodically giving indications regarding the future course of monetary policy. Signs of tightening provide indications of expected future rate increases.

**Minutes of Meetings:** Minutes from central bank meetings indicate probable future interest rate directions.

**Speeches by Central Bank Officials:** Statements by central bank leaders, are parsed for clues regarding prospective policy shifts.

## 2. Effect on Market Segments

### **Stocks:**

**Changes in Valuation:** The expectation of higher interest rates results in lower valuations for stocks because the discount rate used to value future cash flows goes up, reducing the present value of these cash flows.

**Sector rotation:** High valued sectors, like technology, would bear the brunt of sell-offs given the high value dependent on future growth. Other areas, like financials, may see a boost due to higher interest rates.

**Volatility:** Markets could be more volatile if investors are readjusting their portfolios in anticipation of interest rate hikes.

### **Bonds:**

**Yield Curve Shifts:** Expectations of future interest rate hikes often cause the yield curve to shift upwards. The long-term bond yields may rise as investors demand extra return to compensate for probable rate increases.

**Price Decline:** Generally, in anticipation of rate increases, the prices of existing bonds fall due to their fixed income being less attractive than that from new issues at higher rates.

- **Credit Spreads:** Corporate bond spreads can widen if rate hikes are anticipated to slow economic growth, thereby raising concerns about credit risk.

## **Derivatives:**

**Interest Rate Derivatives:** With an expectation of interest rate movements in either direction, instruments such as interest rate futures and options see increased activity as participants hedge against or speculate on further rate movements.

**Volatility Indices:** Implied volatility in the options markets generally rises as uncertainty about future rate hikes increases.

- **Currency Derivatives:** Expectations of rate hikes in one country can affect currency derivatives, since an increase in interest rates typically appreciates a currency and consequently impacts the foreign exchange market<sup>3</sup>.

## **3. Conclusion**

- It is the market's expectation of future rate hikes that provides the single most important factor in the movement of financial markets. These expectations are formed by analyzing economic indicators and central bank communications, and are likely to have a material impact on asset prices and investor behavior across various market segments. Understanding these dynamics is incumbent upon any investor desiring to navigate the complex landscape of global financial markets.

## **4. Recommendations**

- **For Investors:** Remain informed of key economic indicators and central bank communications. Keep on track of the kind of impact such foreseen rate climbs would have had on your portfolio, and hence, position your risk suitably.
- **For Policymakers:** Ensure a clear, open channel of communication to help guide market expectations and avoid unnecessary volatility.

As this analysis has illustrated, understanding how expectations of future interest-rate changes are made and their more general effect in financial markets becomes of extraordinary importance.

# ANALYZING THE DATA USING CHOSEN METHODS AND INTERPRET THE FINDINGS

## 1. Introduction

In this paper, there is an analysis that examines the relation between either the rise or fall of interest rates by the Federal Reserve and the S&P 500 index. Using a linear model and backdating data, we worked to quantify the influence raising of interest rates has on changed stock market performance. How changes in monetary policy affect the equity markets is also a very important state-of-the-art result and policy-relevant finding from this.

The approach is conducted in accordance with a simple linear regression model, where the dependent variable is the S&P 500 closing prices and the independent variable is the changes in Federal Funds Rate. Data on the S&P 500 index and Federal Funds Rate are obtained from reputable sources and fall between the months of March 2022 to August 2024.

**Dependent Variable (Y):** S&P 500 Closing Price

**Independent Variable (X):** Federal Funds Rate Change (in basis points)

The following linear regression model was used to study the impact:

$$\text{S\&P 500 Closing Price} = \beta_0 + \beta_1 \times \text{Federal Funds Rate Change}$$

where,

$\beta_0$  (Intercept) = value of S&P 500 closing price while Federal Funds Rate Change is 0

$\beta_1$  (Slope) = Estimated change in S&P 500 index when Federal Funds Rate Change is changed by one basis point

## 3. Results

The regression analysis showed the following:

**Intercept ( $\beta_0$ ): 4421.0442**

**Slope ( $\beta_1$ ): -6.0698**

What this means is:

The S&P 500 index is expected to be around 4421.0442 when the Federal Funds Rate remains the same.

An increase in the Federal Funds Rate of 1 basis point (0.01%) is predicted such that the S&P 500 index decreases by around 6.07 points.



#### 4. Interpretation of Results

##### 4.1 Interpretation of the Estimates regarding the Slope Parameter

The estimate of the slope  $-6.0698$  which has a negative sign indicates that there is an inverse relationship between property changes and the interest change with the S&P 500 index. This is because according to economic theory, when the interest rate increases, then the price of stock falls. This is because greater interest rates reflect increased costs of borrowing faced by companies, reduced spending by consumers, and more attractive fixed securities compared to equities, having a knock-on effect on stock prices, all of which depresses stock prices.

##### 4.2 Interpretation of Intercept

The intercept value of  $4421.0442$  states that if the interest rate changed to 0 percent, then the S&P 500 index would be at a value of  $4421.0442$ . This value is reasonable, as it is well within the value range that the S&P 500 has actually traded for the period analyzed.

#### 5. Qualitative Analysis

Along with the quantitative findings, it is relevant to consider some external factors that may have a bearing on the responsiveness of the S&P 500 to changes in interest rates:

**Economic Context:** In the period being examined, market sentiment and movements have been greatly shaped by inflation concerns, geopolitical events, and corporate earnings reports.

**Investor Sentiment:** Expectations could form how the market will react when interest rates rise. For example, if people are aware of a rate hike, the move would have likely been priced in and would show little reaction.

#### 6. Conclusions and Implications

The analysis supports the idea that firming interest rates are associated with downturns in the S&P 500. The slope coefficient's magnitude is such that the market is moderately sensitive to changes in the Federal Funds Rate.

	A	B	C	D	E	F	G	H	I	J	K	L
1	26-Jul-23	25	4507.66									
2	03-May-23	25	4450.38									
3	22-Mar-23	25	4169.48									
4	01-Feb-23	25	3970.15									
5	14-Dec-22	50	4076.6									
6	02-Nov-22	75	4080.11									
7	21-Sep-22	75	3871.98								-6.069831579	4421.044211
8												
9												

#### Implications for Investors:

**Portfolio Management:** Investors can adjust their portfolio in view of an upcoming rate hike by reducing the exposure to equity holdings and increasing the allocations to fixed income.

**Risk Management:** With an understanding of the relationship between interest rate and stock prices will help the investor manage their risk hence take prudent and effective decisions, especially during the monetary tightening

## **Limitations**

The study assumes a linear relationship between changes in interest rates and the S&P 500. This may be much of a reductionist view on market dynamics.

The model has not factored in other important macroeconomic variables and external shocks.

## **7. Final Remarks**

The analysis gives clear, strong ground on which to base an understanding of how interest rate changes will affect the stock market. Although the findings of this study are in consonance with economic theory, there are a lot of factors that investors need to consider before making decisions.