

Do Higher Interest Rates Predict Lower Stock-Market Returns?**Evidence from the U.S. S&P 500, 2000–2025**Author: Ryan R. Chami¹*Affiliation:*

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Abstract:

This study examines whether the level of the U.S. federal funds rate is associated with annual S&P 500 total returns over 2000–2025. The research combines two public datasets: the annual effective federal funds rate published by the Federal Reserve through the Federal Reserve Bank of St. Louis (FRED), and annual S&P 500 total returns reported by Slickcharts. A simple bivariate ordinary least squares regression is used to estimate the relationship between the annual federal funds rate and annual S&P 500 total return. The estimated coefficient on the federal funds rate is negative (-1.31 percentage points of S&P 500 return for a one-percentage-point higher annual rate), but it is not statistically significant at conventional levels ($p = .475$), and the model explains only about 2.1% of the variation in annual returns. A second exploratory specification using the annual change in the federal funds rate produces a positive coefficient, illustrating that annual rate changes can be strongly affected by the same economic shocks that move equities and therefore should not be interpreted causally. Overall, the sample provides limited evidence that the annual level of the federal funds rate alone predicts S&P 500 total returns. The findings are consistent with the broader literature showing that stock markets respond to monetary-policy surprises and transmission channels, while also demonstrating why a simple annual regression cannot identify those short-horizon causal effects.

Keywords:

Federal funds rate, S&P 500, monetary policy, stock market returns, interest rates, macroeconomics

Introduction:

Interest rates are among the most important variables in finance because they affect borrowing costs, discount rates, savings decisions, corporate investment, and the valuation of financial assets. For equity investors, a higher short-term policy rate can matter through several channels: it can raise the discount rate applied to expected cash flows, increase financing costs, and change the relative attractiveness of bonds and other interest-bearing assets. At the same time, stock prices respond to many other forces, including earnings expectations, risk premia, economic growth, geopolitical events, and investor sentiment.

Academic research generally finds that monetary-policy news can influence equity prices, but it also emphasizes an important distinction between expected and unexpected policy changes. Bernanke and Kuttner (2005), for example, find that an unanticipated 25-basis-point cut in the federal funds target was associated with roughly a 1% increase in broad stock indexes. Rigobon and Sack (2004) likewise show that identifying the effect of monetary policy is difficult because interest rates and asset prices respond simultaneously to other information. These findings suggest that a simple correlation between the annual interest-rate level and annual stock returns may not capture the mechanism emphasized in event-study research.

Research gap and problem statement. Much of the influential literature examines daily or high-frequency monetary-policy surprises, while students and individual investors often observe annual macro-financial data. This project therefore asks a narrower empirical question: does the annual level of the effective federal funds rate, by itself, have a measurable statistical relationship with annual S&P 500 total returns over 2000–2025?

Research questions:

- RQ1: What is the direction and magnitude of the association between the annual federal funds rate and annual S&P 500 total returns?
- RQ2: Is the estimated relationship statistically significant in a simple annual regression?
- RQ3: How much of the variation in annual S&P 500 total returns is explained by the annual federal funds rate alone?
- RQ4: Does an exploratory model using the annual change in the federal funds rate produce a materially different relationship?

Objectives:

- Construct a reproducible 2000–2025 annual dataset from public sources.
- Estimate a simple OLS model linking S&P 500 total returns to the effective federal funds rate.
- Report the coefficient, statistical significance, correlation, and explanatory power objectively.
- Discuss how the results compare with prior monetary-policy and equity-market research and identify limitations.

Literature Review:

The theoretical connection between monetary policy and equity prices is well established. One basic mechanism is the discount-rate channel: when interest rates rise, the present value of expected future cash flows can fall, holding other factors constant. A second mechanism operates through risk premia and financing conditions. Patelis (1997) shows that monetary-policy variables can help predict future excess stock returns, although they do not explain all observed return predictability. Thorbecke (1997) finds that expansionary monetary policy is associated with higher ex-post stock returns using several measures of monetary-policy shocks.

An important development in the literature is the separation of anticipated and unanticipated monetary-policy movements. Kuttner (2001) demonstrates that futures-market information can be used to distinguish expected from surprise changes in the federal funds target, with market responses differing substantially between the two components. Bernanke and Kuttner (2005) apply this logic directly to equities and find a sizeable stock-market response to unexpected monetary-policy changes. These studies imply that the information content of a rate change matters, not simply whether the observed rate is high or low.

Rigobon and Sack (2004) further highlight the endogeneity problem. Central banks change rates in response to economic and financial conditions, while stock markets simultaneously respond to those same conditions. Consequently, an observed negative association between rates and stocks cannot automatically be interpreted as evidence that higher rates caused lower returns. Ehrmann and Fratzscher (2004) similarly report that U.S. monetary-policy tightening can reduce equity returns, with effects varying according to expectations, the direction of the policy change, market uncertainty, and firm characteristics. Other elements, such as equity cost, are directly related to interest rates (Rizk & Sassine, 2023), and both attribute to the performance of companies. Big data analytics are not only positively impacting companies performance (Subrahmanyam et al., 2024), but also allowing central banks to make better decisions related to the optimum interest rate, with the latter heavily impacting enterprise performance especially in vulnerable environments and developing markets, where equity financing is harder to get due to associated high risk Mawad and Freiha (2024).

A variable significantly impact market return as well as enterprise performance is Artificial Intelligence (AI), SMEs can benefit the most from the developing technologies (Khalife et al., 2024), however these advantages are limited by proper country governance especially in vulnerable environments (Athari et al., 2023), and must be accompanied by other non-financial features (Kaspard et al., 2025) such as ESG (Athari et al., 2024).

Taken together, the literature suggests two conclusions relevant to this study. First, monetary policy is economically connected to equity-market pricing. Second, identifying the causal effect requires a richer design than a simple annual regression because expectations, economic conditions, and policy responses are jointly determined. The present project contributes a transparent annual-data exercise: rather than claiming to reproduce the causal estimates of high-frequency studies, it tests whether the broad annual interest-rate level contains a statistically detectable relationship with S&P 500 total returns over a recent 26-year period.

Methodology:

3.1 Research design and data

The study uses a quantitative, non-experimental research design based on annual U.S. financial data from 2000 through 2025 (26 observations). The independent variable is the annual effective federal funds rate, measured as the average of daily observations. FRED identifies the source as the Board of Governors of the Federal Reserve System and reports the annual series through 2025. The dependent variable is the annual total return of the S&P 500, which includes both price appreciation and reinvested dividends. The annual S&P 500 return series is reported by Slickcharts.

Using total return rather than price-only return makes the dependent variable closer to the realized return received by a buy-and-hold investor. Both variables are measured at the annual frequency and matched by calendar year. The final dataset and calculations are supplied in the accompanying Excel workbook.

3.2 Variables

Variable	Role	Measurement	Source
S&P 500 total return	Dependent variable	Annual percentage return including dividends	Slickcharts
Federal funds rate	Independent variable	Annual average effective federal funds rate (%)	Federal Reserve / FRED
Change in federal funds rate	Exploratory independent variable	Current annual rate minus previous year's rate (percentage points)	Calculated from FRED

3.3 Empirical models

The main model is:

$$\text{S\&P500Return}_t = \alpha + \beta(\text{FedFundsRate}_t) + \varepsilon_t$$

where β measures the average change in annual S&P 500 total return associated with a one-percentage-point increase in the annual federal funds rate. The model is estimated by ordinary least squares (OLS). Statistical significance is assessed using the conventional 5% threshold.

An exploratory second model replaces the rate level with the annual change in the federal funds rate. This is not treated as a causal identification strategy; it is included to show how the measured relationship changes when the variable is expressed as a year-to-year movement.

AI was used as a complementary research tool for brainstorming the research question, checking the structure of the statistical approach, and language editing. The empirical dataset, calculations, regression coefficients, and tables were generated from the cited public data rather than invented by AI.

Results:

4.1 Descriptive results

Across 2000–2025, the annual effective federal funds rate ranged from 0.08% (2021) to 6.24% (2000). The S&P 500 total return ranged from -37.00% (2008) to 32.39% (2013). The sample therefore contains both very low-rate periods and higher-rate periods, as well as several large positive and negative equity-market outcomes.

Statistic	Fed funds rate (%)	S&P 500 total return (%)	Interpretation
Minimum	0.08	-37.00	Lowest annual rate / lowest annual return
Maximum	6.24	32.39	Highest annual rate / highest annual return
Mean	2.01	9.69	Sample average
Standard deviation	2.01	17.97	Annual variability

4.2 Main regression

The estimated coefficient on the federal funds rate is -1.312. In the sample, this means that a one-percentage-point higher annual federal funds rate is associated with approximately 1.31 percentage points lower S&P 500 total return, holding the model structure constant. However, the coefficient is not statistically significant ($p = 0.475$). The model's R^2 is 0.021, meaning the federal funds rate alone explains approximately 2.1% of the variation in annual S&P 500 total returns.

Model 1 statistic	Estimate	Result
Intercept	12.321	Estimated baseline return
Federal funds rate coefficient	-1.312	Negative association
p-value	0.475	Not significant at 5%
R^2	0.021	2.1% of variation explained
Correlation	-0.147	Weak negative sample correlation

Objectively, the result does not establish that higher interest rates cause lower annual stock returns. The low R^2 and non-significant coefficient indicate that the annual federal funds rate, considered alone, is not a strong predictor in this sample.

4.3 Exploratory rate-change model

When the independent variable is changed from the rate level to the annual change in the rate, the estimated coefficient becomes +4.413, with $p = 0.084$ and $R^2 = 0.124$. This sign differs from the main model because large rate cuts can occur during severe economic downturns—for example, periods when equity returns are also weak—while rate increases can occur during strong expansions. The exploratory result therefore reinforces the methodological point that simple annual associations can mix monetary policy responses with the economic conditions that caused those policy responses.

Model 2 statistic	Estimate	Result
Intercept	10.796	Estimated baseline return
Change in rate coefficient	4.413	Positive sample association
p-value	0.084	Not significant at 5%
R^2	0.124	12.4% of variation explained

Discussion and Conclusion:

This study tested whether the annual effective federal funds rate is statistically related to annual S&P 500 total returns over 2000–2025. The main regression produced a negative coefficient of -1.31, but the relationship was not statistically significant ($p = 0.475$) and the model explained only 2.1% of return variation. Accordingly, the evidence from this annual dataset does not support treating the federal funds rate alone as a strong predictor of yearly S&P 500 total returns.

The result is not inconsistent with the broader monetary-policy literature. Earlier research generally focuses on unexpected policy surprises, high-frequency announcements, or richer predictive systems rather than the annual rate level. Bernanke and Kuttner (2005), for example, identify a meaningful equity-market response to unexpected monetary-policy changes, while Rigobon and Sack (2004) emphasize the endogeneity problem. The present study therefore illustrates an important finance lesson: an economically relevant variable may have a theoretically meaningful connection to asset prices without producing a strong standalone annual forecasting relationship.

Practical implication. For investors, analysts, and finance students, the findings suggest that the annual federal funds rate should not be used in isolation to explain or forecast S&P 500 returns. A more complete model could include inflation, earnings growth, valuation ratios, credit spreads, unemployment, volatility, and monetary-policy surprises. For corporate finance, the rate remains highly relevant to financing costs and discount rates even when its simple annual statistical relationship with stock returns is weak.

Theoretical implication. The findings support the distinction between monetary-policy conditions and monetary-policy shocks. The literature indicates that markets react particularly strongly to unexpected information, whereas an annual average rate may contain both anticipated policy and the central bank's response to underlying economic conditions.

Limitations. The study uses only 26 annual observations and one explanatory variable. Annual aggregation removes the timing information that is central to event studies. The S&P 500 is an aggregate index, so the analysis does not capture differences across industries or firms. Most importantly, the regression is associative rather than causal; omitted variables and reverse causality may bias the coefficient. Future research should use monthly or daily data, separate expected from unexpected policy changes, add control variables, test different market sectors, and evaluate structural breaks such as the global financial crisis and the COVID-19 period.

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Appendix A

Year	Fed funds rate (%)	S&P 500 total return (%)	Annual rate change (pp)
2000	6.24	-9.10	
2001	3.88	-11.89	-2.36
2002	1.67	-22.10	-2.21
2003	1.13	28.68	-0.54
2004	1.35	10.88	0.22
2005	3.22	4.91	1.87
2006	4.97	15.79	1.75
2007	5.02	5.49	0.05
2008	1.92	-37.00	-3.10
2009	0.16	26.46	-1.76
2010	0.18	15.06	0.02
2011	0.10	2.11	-0.08
2012	0.14	16.00	0.04
2013	0.11	32.39	-0.03
2014	0.09	13.69	-0.02
2015	0.13	1.38	0.04
2016	0.39	11.96	0.26
2017	1.00	21.83	0.61
2018	1.83	-4.38	0.83
2019	2.16	31.49	0.33
2020	0.37	18.40	-1.79
2021	0.08	28.71	-0.29
2022	1.69	-18.11	1.61
2023	5.03	26.29	3.34
2024	5.14	25.02	0.11
2025	4.21	17.88	-0.93

Research note: The accompanying Excel workbook contains the source-aligned annual dataset, regression calculations, and a scatter plot. The empirical results in this paper are calculated from those data and are not simulated.