The Impact of the Federal Reserve's 2022 Monetary Tightening Policy on Apple Inc.'s Stock Valuation

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Abstract. Since 2022, the Federal Reserve's aggressive monetary tightening, with a rapid interest rate growth and efforts to control the inflation caused by the COVID-19 lockdown, has significantly influenced the financial markets. This research uses a stock valuation model, macroeconomic analysis, and regression models to assess the correlation between the Federal Reserve's monetary policies and Apple's financial performance. The central research question explores how the monetary policies continued to shape Apple's stock valuation and investor sentiment. The results show that Apple's financial performance declined after the policies were implemented, but the firm rebounded after a short period. This research examines the relationship between monetary policies and the stock valuations of major tech companies, providing valuable insights for investors and policymakers navigating through a post-monetary-tightening environment.

Keywords: Federal Reserve, Monetary Tightening, Apple Stock Valuation, Inflation, Interest Rates

1 Introduction

The Federal Reserve utilized the most aggressive monetary tightening cycles in decades to combat the inflation brought by the COVID-19 lockdown. Higher interest rates, alongside persistent inflationary pressures, have influenced financial markets, raising doubts on the valuation of major corporations, particularly in the technology sector. Apple Inc., one of the world's most valuable, industry-leading, and closely watched companies, was chosen to effectively analyze these macroeconomic effects.

This research will utilize stock valuation models, regression analysis, and physiological analysis to analyze the evolving impact of the monetary tightening policy on Apple between 2022 and 2024. The key research question centers on how the Federal Reserve's monetary tightening has influenced Apple's stock valuation from 2022 to 2024. This research contributes to understanding how the stock valuation of tech giants like Apple fluctuates over time in reaction to broad economic policy shifts, offering direction for future investing and monetary policymaking. To provide context for Apple's valuation changes, chapter 2 will start by explaining the Federal Reserve's 2022 monetary tightening policy and its theoretical effects on investors' sentiments and the equity market.

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2 Monetary Policy and Stock Market Reactions

2.1 Overview of the Federal Reserve's 2022 Monetary Tightening

Monetary tightening is a policy employed by central banks to combat inflation and rapid economic growth. The goal of this policy is to cool the overheated economy by hiking the federal funds rate, the rate at which banks lend to each other, to decrease borrowing and spending, which in turn achieves the goal. The Federal Reserve, the central bank of the United States, employed this policy during 2022 to lower the inflation caused by the COVID-19 lockdown. The Federal Reserve committee started the policy in March 2022. They raised the target range for the federal funds rate from near zero to 1/4 to 1/2 percent [1]. Throughout 2022 and into 2023, the federal funds rate peaked at around 5%. This series of rate increases marked a dramatic shift from the ultra-loose federal funds rate during the COVID-19 pandemic, where the rate reached nearly 0% [2].

The committee also implemented quantitative tightening by ceasing net asset purchases in early March and began reducing its securities holdings in June [1]. Changes in both federal funds rate and securities holdings emphasize the firming stance of the monetary policy. These policies reshaped investors' sentiment and the financial market, impacting firms' financial performance across various sectors, especially for the interest-sensitive technology industry.

2.2 Theoretical Perspectives on Interest Rate Fluctuations and Equity Markets

Rising interest rates affect the stock market in various ways. As economist Damodaran explains, slight increases in discount rates can significantly reduce valuation for high-growth companies whose profits are expected further into the future [3]. This relationship is part of the monetary transmission mechanism, through which monetary policies influence investment and stock prices. As the Federal Reserve notes, higher rates also result in higher interest costs for companies borrowing from direct lenders, which can make it more difficult for some companies to pay their interest payments, potentially leading to credit losses [4]. Therefore, technology firms tend to rely heavily on future earnings and often operate with higher leverage, which will lead to experiencing sharper price corrections in high discount rate situations.

3 Apple's Financial Performance in a Changing Economic Landscape

This chapter will explore and analyze Apple's financial performance from 2022 to 2024, as well as compare it with Microsoft's economic performance.

3.1 Apple's Financial Metrics Analysis

To evaluate how Apple's performance was affected by the monetary tightening policies from 2022 to 2024, this section focuses on three important financial indicators: earnings per share (EPS), price-to-earnings (P/E) ratio. These three metrics can reflect investors' sentiment and the company's performance under monetary tightening.

Apple's EPS shows consistent profitability. According to data from Yahoo Finance [5], Apple's EPS exhibited correlations with macroeconomic policies. For instance, EPS suffered a significant decrease starting from Q1 2022 to Q3 2022, which coincided with the Federal Reserve's monetary policies. Although there are continuous fluctuations in Apple's EPS, this shows Apple's strong reliance on and adaptability in monetary tightening scenarios.

Lastly, based on Yahoo Finance data [5] Apple's P/E Ratio decreased in 2022 compared to 2021, reflecting investor risk aversion and increased discount rates caused by the monetary tightening policies. In 2023, Apple's P/E ratio bounced back resiliently and kept increasing the year after, suggesting investors regained their confidence in Apple with the end of the monetary tightening period.

3.2 Comparative Analysis of Apple with Microsoft

To better understand Apple's stock valuation trends in the context of monetary tightening and market sentiment, it is important to compare Apple with its peer tech giant, Microsoft. Both companies share similar investor profiles, operate in some same industries, and are sensitive to interest hikes and inflationary pressures. A side-by-side comparison is conducted between Apple and Microsoft using tables for Earnings Per Share (EPS), Price-to-Earnings (P/E) ratio from 2021 to 2024.

According to data from Yahoo Finance [5], the EPS shows that Microsoft consistently outperformed Apple in earnings. From 2021 to 2024, Microsoft's EPS rose significantly faster than Apple's, especially in 2024 Microsoft's EPS rose 21.9% compared to Apple's modest 0.82%. This underscores the growing divergence in earnings growth.

Furthermore, data from Yahoo Finance [5], reveals the investor's sentiment. For each year, Microsoft has a higher decrease and lower increase in the P/E ratio than Apple. In 2024, Apple experienced a 16.21% increase, while Microsoft saw a 3.67% decrease. This suggests the market optimism increases towards Apple during the later stages.

Overall, Apple remains superior in P/E ratio growth, but Microsoft stays strong in EPS growth. This suggests that Microsoft's earnings strength aligned more directly with investor expectations during the monetary tightening period. As economists Chen, Roll, and Ross note, innovations in macroeconomic variables are risks that are rewarded in the stock market [6], emphasizing how investors may have reallocated capital in response to earnings and inflation changes.

4 Evaluating Monetary Policy's Impact on Apple's Valuation

4.1 Stock Valuation Models and Macroeconomic Indicators

To investigate the impact of monetary tightening on Apple's stock valuation shifts, this section uses basic stock valuation models with macroeconomic indicators. The Discounted Cash Flow method calculates a company's value by projecting its future cash flow and discounting to the present using the current discount rate. Therefore, in this situation, high discount rates will cause a lower present value and a lower stock valuation of a company. This concept explains Apple's P/E ratio decrease in 2022, where investors' sentiment dropped in response to a higher discount rate and economic uncertainty. Additionally, the P/E ratio, EPS, and Apple's stock price—mentioned in the overview of the Federal Reserve's 2022 monetary tightening—will be used to show the economic pressure brought by the monetary tightening. Using macroeconomic indicators such as the Federal Funds Rate, Consumer Price Index (CPI), and 10-Year Treasury Yield can help further reflect on the influence of monetary policy on Apple's stock valuation.

4.2 Correlation Between Monetary Policy and Apple's Stock Performance

This section analyzes the correlations between Apple's financials and Macroeconomic indicators. It will include two correlation graphs: the Consumer Price Index vs. Apple's EPS, the Federal Funds rate vs. Apple's P/E ratio. To effectively interpret these relationships, the analysis will apply the Capital Asset Pricing Model (CAPM) as a guiding framework. According to economist Cheol S. Eun, in equilibrium, the expected return on an asset should be linearly related to the market beta of the asset [7], emphasizing the model's central idea where increased risk-free rates raise the return investors demand, especially for higher-risk stocks. As Beyer et al. note, Bank interest rates can affect agents' investment, consumption, and saving decisions, debt service costs, and savings income, as well as asset values, all of which affect real economic outcomes [8].

According to data from Yahoo Finance [5] and the Federal Reserve Bank of St. Louis [2], the correlation between Consumer Price Index and Apple's EPS, as shown in Figure 1, reflects a slight negative and weak correlation with an R-square of 0.112. While weak, the slightly downward sloping trend line aligns with theoretical expectations: rising inflation likely pressured input costs and reduced consumers' purchasing power, which may have lowered earnings in certain quarters. However, the weak correlation indicates that Apple's earnings were not strongly dependent on CPI levels alone.

In contrast, data from Yahoo Finance [5] and the Federal Reserve Bank of St. Louis [2], the correlation between Federal Funds Rate and Apple's P/E Ratio, as shown in Figure 2, yields a slightly positive and a moderate correlation with an R-squared of 0.425. This result is counterintuitive, where in a typical situation, a rising Federal Funds rate usually decreases the equity valuation, especially for the growth of stocks. One possible explanation could be investors' confidence in long-term strength in Apple's fundamentals and anticipation of future rate cuts. Therefore, increased P/E ratios tend to correspond with looser monetary policies. While CAPM would predict downward

pressure on valuation as the risk-free rate increases, Apple's resilience after 2022 suggests positive sentiment and forward-looking expectations played a significant role.

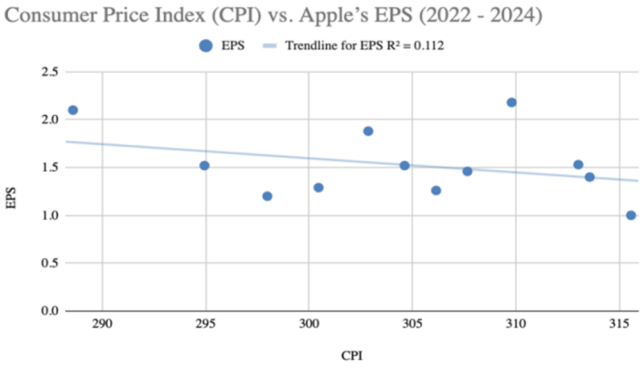

Fig. 1. Correlation between Consumer Price Index and Apple's EPS

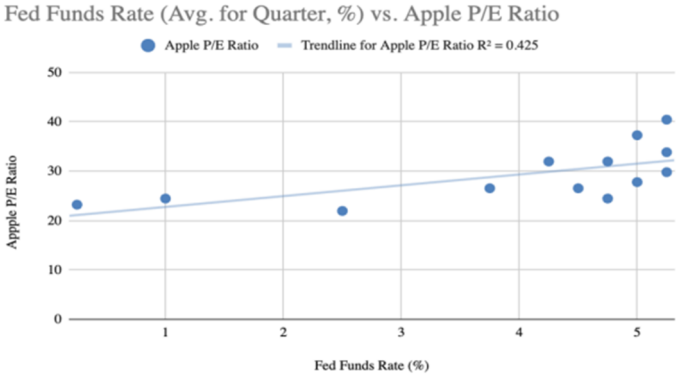

Fig. 2. Correlation between Federal Funds Rate and Apple P/E Ratio

Together, these graphs all showed a moderate or weak correlation between the macroeconomic indicators and the effect of the monetary policy on Apple's financial performance from 2022 to 2024. This underscores the idea that Apple remained resilient from the start of, during, and after the policy.

5 Challenges and Market Implications

5.1 Limits of Evaluation and Valuation Interpretation

While there is a clear short-term impact on Apple's financial performance, interpreting Apple's long-term impact remains indeterminate. Apple's valuation metrics shift, such as the dip in the P/E ratio in 2022, may reflect not just the fundamentals. Economists

Jegadeesh and Titman found out that stock prices are driven by past performance [9], with investors tending to react to recent trends rather than monetary policy. Thus, even if the valuation metrics like the P/E ratio dropped during the monetary tightening, attributing the shift entirely to federal interest hikes could potentially oversimplify a more complex situation.

5.2 Behavioral Reactions and Strategic Implications for Investors and Policymakers

Investors' behaviors often distort and could exaggerate market reactions to monetary tightening policies. One study notes that investors can use EPU (Economic Policy Uncertainty) data to forecast the development of Chinese stocks and adjust their portfolios accordingly [10]. This highlights that the investors' sentiment and perceived policy direction can forecast and affect market decisions. In 2022, Apple's valuation decline could be investors' overreaction to the monetary tightening. By late 2023, Reuters reported Apple reached a record high after the Federal Reserve signaled rate cuts [11], pointing out the power of expectation from investors. For investors, this means valuation should be interpreted in a wider framework, not solely on valuation metrics. For policymakers, it emphasizes the role of communication: thinking about people's sentiment is often as critical as making the policy.

6 Conclusion

This research reveals that the Federal Reserve's 2022 monetary tightening impacted Apple's stock valuation from 2022 to 2024. Apple's P/E ratio and EPS decline in 2022 demonstrated the policy's short-term effect on financial performance. By 2023, Apple's financial performance recovered, reflecting the company's solid fundamentals as one of the leaders in the industry, and widespread brand popularity gained investor confidence even before the monetary tightening policies ended.

While macroeconomic indicators like the Federal Funds Rate, CPI, and 10-Year Treasury Yield showed a relatively weak correlation between Apple's financial performance and the monetary tightening policies, their influence cannot be excluded. These observations underscore that money policy is one of many factors that influence Apple's financial performance: company-specific news, macroeconomic forces, and sentiment shifts. Behavioral finance was also crucial: Apple's stock increased towards the end of 2023 when the Fed merely hinted at lowering rates, demonstrating the power of investors' belief over policy action.

Overall, this research suggests that monetary tightening did have a measurable, though small and temporary, impact on the stock valuation of Apple. Long-term destinies of the company appeared more sensitive to positioning strategy and investor psychology than monetary tightening policies. For policymakers and investors, the study therefore highlights the value of considering valuation metrics as part of a larger picture—one that encompasses not only economic indicators but also investor psychology, market psychology, and firm fundamentals.

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