Analysis of Influencing Factors of Stock Return Rate

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Abstract: The stock market is one of the important components of the financial market, and the stock return rate refers to the index reflecting the return level of the stock. The stock gains the favor of investors through high return rate, so it is also known as the "barometer" of the stock market. This research into the factors influencing stock returns can improve the effectiveness of the government and associated departments in decision-making, as well as the regulatory consequences, so as to help the public better predict the macroeconomic trend through the stock market. This paper uses Excel to perform multiple regression analysis to explore the linear relationship between CPI, EPU and economic cycle on stock returns. The results of the study show that EPU and stock yields change inversely, and when a recession (economic growth) occurs, stock returns fall (rise), and CPI shows a weak correlation with the dependent variable.

1 INTRODUCTION

The global economy has been in a long-term shock situation since the outbreak of the subprime mortgage crisis in 2008. From Brexit, and the outbreak of COVID-19, to the war between Russia and Ukraine, the international situation has become increasingly complex and investment uncertainties have increased. As a result of the COVID-19 pandemic, a contraction of about 4.4% of global GDP was noted in the IMF's World Economic Outlook 2021 report. In order to cope with the impact of major events on the international economy, recover the national economy and adjust investor sentiment, countries around the world have issued a series of economic policies according to their own national conditions, and the variables in the establishment and implementation of these economic policies sometimes in turn grow the uncertainty of the stock market. Investors remain skeptical about the feasibility and effectiveness of government policies and thus affect the choice of investment. In addition, inflation is also an important factor affecting the stock market.

On the one hand, inflation plays a role in stimulating the stock market and stimulating the stock return rate to a certain extent. On the other hand, as a kind of currency devaluation, the tightening monetary policy implemented by the government will lead to a huge amount of funds to be lost from the stock market, which is not conducive to the improvement of the stock return rate. For example, the U.S. Consumer Price Index (CPI) rose to 8.8% in 2022, well above the 4.7% inflation rate in 2021, and U.S. inflation is at a 40-year high. In order to combat excessive inflation in America, the Federal Reserve hiked interest rates seven times in 2022, raising the federal funds rate by nearly 5%. To fill the liquidity gap, Silicon Valley banks had to sell their portfolios, and with interest rates already high, asset sales led to huge losses, leading to bankruptcies. Continued interest rate increases will cause the United States itself to flow money back to the banks in the financial market, resulting in a dramatic fall in the United States stock market, and the impact will spread from the United States to the world. For financial markets, the stock market is an important part of it, the fluctuations of the stock market will have a large or small impact on the global economy. The stock return rate can be obtained by dividing the total return from investing in the stock with the amount of the original investment, which is an important indicator to measure the prosperity of the stock market. This paper will analyze the influencing factors of stock return from the three aspects of economic policy uncertainty, inflation and business cycle.

2 LITERATURE REVIEW

2.1 The First Influencing Factor of Stock Return: Economic Policy Uncertainty

Economic policy uncertainty (EPU) refers to the numerous unpredictability components contained in future economic policy changes, such as the standpoint content of economic policy, the potential and timing of execution, the frequency and intensity of application, and the impact caused by governance (Huang and Luk 2020).

US economic policy uncertainty is roughly weighted by three parts (Liu and Yan 2022). The first part was obtained by a monthly search of ten major American newspapers containing terms such as "economy," "Federal Reserve", and "uncertainty." The second part was obtained by referring to reports from the Congressional Budget Office (CBO). CBO studies the uncertainty caused by temporary tax policies to companies and residents. The third part measures the dispersion of CPI, surveys the purchasing power of different subjects and makes forecasts for the next year. Finally, after standardizing each section, the US Monthly EPU Index is weighted to obtain the US Monthly EPU Index, in which the news keyword search that is regarded as the most important part accounts for half of the weight (Baker et al 2016). The impact of economic policy uncertainty on stock markets has attracted a long time to study by economists from around the world. By exploring the dynamic synergistic movement of economic policy uncertainty and equity returns and stock market volatility, Antonakakis, N. et al in 2013 found that, with the exception of the recent financial crisis, the dynamic correlation between policy uncertainty and the above two variables remained negative over time, which in turn inhibited equity returns and stock market stability (Antonakakis et al 2013). Two years later, further research by Liu, L., & Zhang, T. took into account out-of-sample volatility prediction and concluded that the addition of EPU as a predictor within current volatility prediction models could significantly enhance their predictive power (Liu and Zhang 2015). According to a study by Thomas C. Chiang using the coherent framework method, the EPU coefficient in the stock return equation is negative. Investors lack confidence in the market because of the rising EPU and subsequently sell shares, causing prices to fall (Chiang 2020).

2.2 The Second Influencing Factor of Stock Return: Inflation

The "Fisher effect", as described by economist Irving Fisher, holds that nominal interest rates rise exactly as the rate of inflation. The positive association between stock returns and inflation in most cases in the G7 nations is reexamined in this study (Alagidede and Panagiotidis 2012). However, in the 1970s, the phenomenon of economic stagflation occurred in the United States, and inflation was negatively correlated with stock returns. A large number of scholars tested the correctness of the Fisher effect, and the research conclusion was collectively referred to as Fisher's paradox. However, there are still multiple explanations for the negative correlation between inflation and stock returns. According to the "agency hypothesis" put forward by Fama, real stock returns, which reflect corporate profitability, are positively correlated with real economic growth, while inflation reduces with real economic growth. Therefore, the real economy affects both stock returns and inflation, resulting in a negative correlation. This negative correlation is only a proxy form of the positive correlation between stock returns and the real economy (Fang 2009). In addition, Modigliani and Cohn proposed the inflation illusion hypothesis in 1979, arguing that the rise in inflation would increase the yield on debt to a certain extent, but because investors mistakenly discounted cash flow by using higher nominal interest rates when implementing investment behaviors, the rise in nominal interest rates led to too low stock prices, in other words, the higher the inflation rate, the easier it is for stock prices to be undervalued, and vice versa (Modigliani and Cohn 1979). Geske and Roll believe that rising inflation due to falling stock yields is a factor that negatively correlates stock yields with inflation. Unlike the above studies, many literature proves that there is a neutral relationship between the two. For example, Rapach's 2002 study of 16 OECD countries demonstrated long-term inflation-neutral stock markets (Rapach 2002).

2.3 The Third Influencing Factor of Stock Return: Business Circle

The word "business cycle" refers to the periodic fluctuations of economic activity, and it also describes the overall trend of economic growth. The development of the economy is cyclical for various causes, and numerous cycles finish with financial emergencies and recessions, requiring considerable effort in preparation for the next economic ascent

(Grinin et al 2016). A number of economists study it with the objective of precisely forecasting the economic cycle in order to get relevant information such as the unemployment rate, national income, and GDP per Capita. The Keynesian business cycle hypothesis divides the economic cycle into four stages: boom, panic, depression, and recovery.

When an economy is experiencing prosperity as a result of consumer confidence in the market and a substantial boost in investment, the marginal output of capital and profits gradually drop, potentially leading to an overcapacity crisis and an economic catastrophe, resulting in a lack of market confidence, lower investment, increased joblessness, inventory overstock, along with other concerns. However, according to Friedman, the most fundamental elements influencing aggregate demand and defining the business cycle are the expansion and contraction of money and credit. After that, Samuelson combined Keynes' "multiplier effect" with economics' "acceleration principle" to produce the neoclassical business cycle theory, which held that external changes will lead to periodic cyclical variations in aggregate demand via the multiplier effect and acceleration principle.

3 METHODOLOGY

This paper mainly uses quantitative analysis to study various factors influencing stock returns. Compared with qualitative analysis, this method is less affected by personal subjective emotions, so as to reveal the law more scientifically, grasp the essence, clarify the relationship, and help the author analyze and comment on the research results more accurately and give relatively objective opinions. In order to explore the linear relationship of multiple independent variables to a dependent variable, the authors plan to use Excel to perform multiple linear regression analysis to obtain the regression equation of the factors influencing stock yields, hoping to obtain the results of CPI, EPU, and economic cycles that can explain the changes in stock returns to a certain extent.

4 ANALYSIS OF INFLUENCING FACTORS OF STOCK RETURN RATE

4.1 Model Introduction and Variable Setting

In this paper, multiple linear regression is used to study three factors related to stock return. A multiple linear regression model is one that has numerous explanatory factors and is used to explain the linear relationship between the variable to be explained and several variables that provide explanations. and is more comprehensive and practical than unitary linear regression (Brown 2009). The assumptions of multivariate regression analysis are normal distribution, linearity, independence from extremum and no multiple relationships between independent variables (Uyanık and Güler 2013). In this study, regression tools in Excel were used for linear regression analysis.

The mathematical model of multiple linear regression in this paper can be represented by formula 1.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon. \quad (1)$$

In formula 1, x_1, x_2, x_3 correspond to three independent variables respectively, and the independent variable Y consists of two parts. The first section describes the linear change in the dependent variable produced by an alteration in the independent variable $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$, and the second part is the effect of the random variable on the dependent variable, also known as the random error ε.

4.2 Data Source

As shown in Figure 1, It can be seen that the two variables have a negative correlation. To make the trend clearer, the EPU and the US 10-year Treasury yield correspond to the left and right vertical axes respectively.
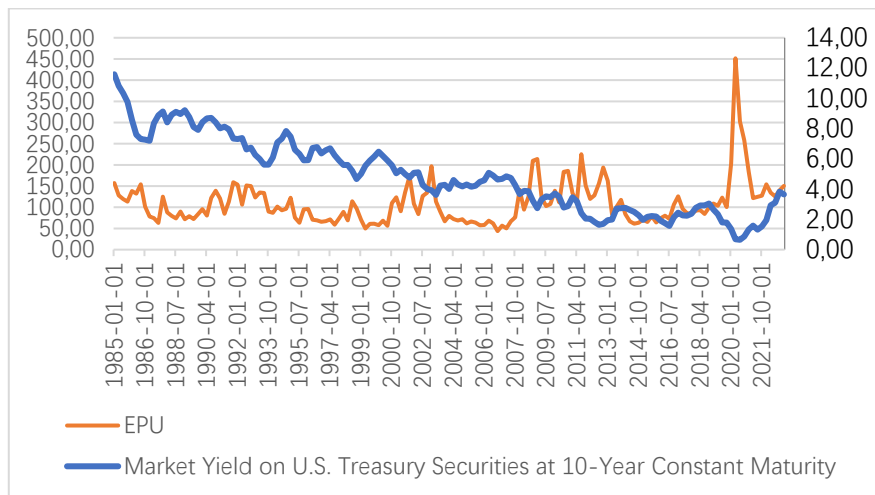
Figure 1: U.S. EPU and 10-year stock return rate (Photo/Picture credit: Original).

However, in order to make the experimental results more objective and accurate and make the regression model more meaningful, the authors looked for the US CPI value and GDP recession index in the same period, trying to take inflation and economic cycles into account within the range of independent variables.

Data in this paper are mainly found from the OECD Economic Outlook, Board of Governors of the Federal Reserve System (US), and statistical results released by several economists. The data sources are authoritative. The statistical frequency of all data used in this paper is once a quarter, and the time span is from 1985 to 2023. The time span is relatively long, and the latest date is as far as possible, so it is timely. Table 1 below lists the variables.

Table 1: Variable and its meaning.

Variables	Meaning
Y	Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity
X1	Economic Policy Uncertainty in America
X2	GDP-Based Recession Indicator Index
X3	Consumer Price Index: Total All Items for the United States

4.3 Result Analysis

Using Excel to perform regression analysis of US Stock return rates, the regression equation for estimating US 10-year treasury yields was established, As shown in formula 2,

$$Y = 6.04602 - 0.01754X_1 + 0.02501X_2 + 1.07260X_3 + \varepsilon \quad (2)$$

The R^2 value in this regression is 0.14538, which represents the US economic cycle, CPI, and EPU can explain the change in the yield of 14.5% US ten-year bonds, and the fit is small.

When the model is F-tested, it is found that the model passes the F-test (F=8.448856, p=0.0000<0.05), which proves that at least one of the three independent variables selected will have an impact on the yield of 10-year US Treasury bonds. . In addition, the P value is the measure used for the t-test and the F test, in this experiment the P value is less than 0.05, indicating that the corresponding independent variable has a significant influence relationship on the dependent variable. What is more, according to Table 2, except for CPI, the other independent variable's P-value are less than 0.05, which means that there is a strong correlation with the dependent variable, and the EPU and GDP-Based Recession Indicator Index show a negative correlation and positive correlation with Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, respectively. CPI is less correlated with the dependent variable.

Table 2: Multiple linear regression results.

	Coefficients	P-value
Intercept	6.04602	0.00000
EPU	-0.01754	0.00002
GDP-Based Recession Indicator Index	0.02501	0.00240
Consumer Price Index: Total All Items for the United States	1.07260	0.11487

5 CONCLUSION

As an indicator to reflect the level of stock returns, the impact of stock returns on investor confidence should not be underestimated. In recent decades, many domestic and foreign scholars have conducted quantitative research on its influencing factors, but the opinions of scholars are still different.

This paper uses the method of constructing a multiple linear regression model to analyze the three independent variables (EPU, GDP-Based Recession Indicator Index, Consumer Price Index: Total All Items for the United States) and the dependent variable (Market Yield on U.S. Treasury Securities at 10-Year) in the model Constant Maturity) has a significant predictive effect. According to the experimental conclusion, stock returns fall as economic uncertainty rises and the two have a significant negative correlation. The higher the GDP recession index, the higher the stock yield, and the two have a significant positive correlation. The correlation between CPI and stock yields is low, and priority should be given to economic policy uncertainty and the GDP recession index when considering the factors affecting stock yields.

In response to the findings, the authors propose that the government actively evaluate and predict policies before enacting them, identify factors unfavorable to their operation and take corresponding measures before enacting policies with good expected effects, and abandon policies with poor expected effects, so that policies are more targeted and effective to the market, and reduce the impact of economic policy uncertainty. Furthermore, the government should energetically build the domestic real economy, encourage high-quality firms to go public, preserve mature large enterprises, foster a rational investment environment, and encourage consumers to perceive economic policy uncertainty rationally (Xie and He 2023).

Some of the data sources in the article are artificial measurement data, and their measurement methods are still not perfect. Although the GDP recession index used in this article comes from the highly authoritative NBER, the calculation of the start date of the US recession is still based on the subjective judgment of scholars, so the estimation results are usually delayed compared to the actual date of the event, so the data may be artificially changed due to political factors before the announcement, and the committee members have a certain personal emotion when making decisions that misjudge the actual situation, so the data is not completely objective. In addition, scholars only took into account newspapers when estimating the frequency of news coverage in the first component of the EPU, and did not consider other sources of news coverage, such as news agency services and magazines, and there is a risk of incomplete statistics.

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