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Economic Policy Uncertainty and Stock Market Performance: The Role of CSR

Can Corporate Social Responsibility protect firm value against Economic Policy Uncertainty?

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Abstract

This research study aims to examine the association between economic policy uncertainty (EPU) and stock market performance, and to investigate whether corporate social responsibility (CSR) has an impact on this relationship. The dataset used in this study comprises firms listed on the S&P 500 index from 2013 to 2022 and is applied on two models, the Capital Asset Pricing Model and Fama French Three Factor Model. The results indicate a significant negative relationship between EPU and weighted stock market returns on a portfolio level in both models. When constructing portfolios based on the firm's CSR score over the years, the study finds that this negative relationship persists for all portfolios except for the best-performing CSR quartile, where the EPU factor becomes insignificant. The findings thus confirm previous literature by concluding a negative relationship between EPU and stock market performance, and provides additional perspectives to the CSR literature by demonstrating that CSR may protect shareholder value during uncertain times through the trust it entails.

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Key words: Economic Policy Uncertainty, Corporate Social Responsibility, Capital Asset Pricing Model, Fama French Three Factor Model, Stock Market Returns, S&P 500
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1. Introduction

1.1 Background

Recent events such as the COVID-19 pandemic, the Russia-Ukraine war and rising tensions between the US and China, have brought increasing attention to the impact of economic policy decisions and their effect on the economy. In the light of accelerating political division, surging government spending, and growing global interdependence, uncertainties regarding the future are always present. While the aforementioned events all have caused the levels of uncertainty to spike (Baker et al., 2023), both firms and investors have to deal with some degree of uncertainty at any point in time. Therefore, the question becomes how these actors are affected by it, and what they potentially can do to mitigate the subsequent effects.

The academic research studying the impact of uncertainty on economic growth and investment dates back to at least Bernanke (1983), where it is established that the decision to undertake an investment only should occur when the costs of postponing the project is higher than the expected value of information that can be gained by waiting. The presence of uncertainty in this context elevates the value of waiting for new information, which then slows down the current pace of investment. While uncertainty from this rational standpoint may impact the growth of the economy, later studies have also been able to confirm that uncertainty affects investment decisions, consumer confidence, and business planning (Bloom, 2009; Wang et al., 2014; Gulen and Ion, 2015).

The changing sentiment in recent times has led to more research targeting the economic policy uncertainty (EPU) index developed by Baker et al. (2016), as a way to quantify this uncertainty and study its corresponding relationship with capital markets (Hammoudeh and McAleer, 2015). As a consensus among previous scholars, a higher level of EPU has historically been found to lead to higher market volatility and have a negative relationship with stock market returns in a variety of different settings (Sum, 2012; Antonakakis et al., 2013; Alexopoulus and Cohen, 2015; Arouri et al., 2016).

Whereas research on EPU seems to have produced consistent conclusions, studies on Corporate Social Responsibility (CSR) have yielded more ambiguous results. Despite being a popular research topic since the 1950s, the conclusions drawn from CSR research lack consensus (Garriga and Melé, 2004). While some argue that CSR is value destroying

(Friedman, 1970; Brammer, 2006), other scholars suggest evidence of the contrary (Waddock and Graves, 1997; Brown, 1998; Margolis et al., 2009; van Beurden and Gössling, 2008; Flammer, 2015).

Amongst practitioners however, there is a widespread belief that CSR performance can provide trust (PricewaterhouseCoopers, 2013). In the context of macroeconomic events, some researchers have studied how trust from CSR performance can protect firm value during shocks such as the 2008 Financial Crisis and the COVID-19 pandemic, where an overwhelming consensus points towards CSR protecting shareholder value during shocks (Lins et al., 2017; Albuquerque and Koskinen et al., 2020; Engelhardt, Ekkenga et al., 2021; Fiordelisi et al., 2022).

When looking at research within the intersection on how CSR activities may mitigate the effects of economic policy uncertainty on stock market performance, there is an interesting shortage of knowledge. This study tries to enrich this literature by examining the role of CSR in the context of economic policy uncertainty and its relationship with stock market performance.

1.2 Purpose and Research Question

The purpose of this study is to investigate the relationship between economic policy uncertainty and stock market performance, and to further examine whether CSR performance has any impact on this relationship. Investors, firms, and other stakeholders, could benefit from understanding how uncertainty affects capital markets and how CSR may bring trust to mitigate this uncertainty. Hence, this study aims to answer the following research question:

"How does EPU relate to stock market performance and what role does CSR performance play in this relationship?"

1.3 Contributions

This report aims to contribute to three strands of literature. First, evidence of the relationship between economic policy uncertainty and stock market returns is provided by applying the index to well-established portfolio theory models, specifically the Capital Asset Pricing Model and the Fama French Three Factor Model. Secondly, the study contributes to the vast body of CSR literature and in particular the area covering the effect of CSR during

macroeconomic uncertainty. While most studies within this field are focused on a specific event, this report takes a broader approach and establishes a more general relationship between how shareholder value is affected during times of uncertainty. Finally, the intercept between EPU research and CSR research has up until this point been largely unexplored. To the best of our knowledge, combining EPU and CSR when modelling stock returns has never been studied on U.S. stocks before.

1.4 Delimitation

This study is delimited to American firms of the S&P 500 index as of the 1st of March 2023 for the years 2013-2022. This is to ensure a high quality of the conclusions drawn in this study, by maintaining consistency in the data availability and external environment in which the firms operate. As the study is examining external factors and their impact on stock returns, it is important that we aim to gather data within a landscape where the external conditions are held as constant as possible between the observations. By delimiting the study to S&P 500 stocks, the study will reflect firms that are subject to similar political and social scrutiny and norms, which is important to ensure reliability of the findings.

1.5 Disposition

The outline for this paper will continue as follows. First, a literature review is done in section 2, where theory and previous research on EPU, CSR and the interception between them is presented. Followingly, two hypotheses are formulated in section 3, drawing on the implications of the literature review. Section 4 will outline the methodology and underlying theory used to evaluate the hypotheses, along with presenting and justifying the regression models. In section 5, the selection process for the sample, the data used, and the measures taken to enhance reliability will be explained. The results of all tests will be presented in section 6. In section 7, the findings will be discussed in relation to the literature and the contributions of this study will be formulated as well as potential endogeneity issues. Finally, the study will be summarised in section 8 and areas for future research will be presented.

2. Literature & Previous Research

2.1 Economic Policy Uncertainty

Economic policy uncertainty refers to the level of uncertainty that exists regarding government economic policies and their potential effects on the economy (Baker et al., 2016). This uncertainty can build up due to many factors, e.g. changes in political leadership, policy proposals and unexpected events such as a natural disaster or the COVID-19 pandemic (Al-Thaqeb et al., 2022). The level of economic policy uncertainty can have significant impacts on the economy, as it affects investment decisions, consumer confidence, and business planning. For instance, high levels of uncertainty can lead to decreased investment and spending (Bernanke, 1983; Wang, Chen et al., 2014; Gulen and Ion, 2015) and increased market volatility (Alexopoulos and Cohen, 2015).

2.1.1 Economic Policy Uncertainty Index

One of the first measures of economic policy uncertainty was made by Alexopoulos and Cohen (2009) who proposed a new general economic uncertainty (GEU) measure based on counts of economic uncertainty articles in the New York Times. While the GEU measure served as a foundation within the field, the Economic Policy Uncertainty (EPU) Index established by Baker et al. (2016) was a further development of the news-based approach and has since been the most prominent way to measure policy-related economic uncertainty in the following literature (Al-Thaqeb et al., 2019).

The US EPU index is constructed by three underlying components. First, newspaper coverage is used to measure the frequency of economic-policy related terms in the ten largest US newspapers. Secondly, the index accounts for the number of federal tax code provisions set to expire in future years. Lastly, disagreement among professional economic forecasters over future government purchases and inflation is measured using the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. Altogether, the index is conducted monthly and covers the period from 1985 up to present time, providing a comprehensive measure of economic policy uncertainty that can be used to analyse its effects on various economic outcomes including investment, employment, and consumption. (Baker et al., 2016)

In addition to robustness tests conducted by Baker et al. (2016), numerous empirical studies utilising the EPU index have discovered that these measures serve as an effective representation of actual economic policy uncertainty (see e.g. Gulen and Ion, 2015; Wang et al., 2014) and can thus confidently be used as a proxy in this report.

2.1.2 Economic Policy Uncertainty and Stock Market Performance

Building on the EPU index by Baker et al. (2016), previous literature has been able to confirm the relationship between EPU and stock market performance in a variety of different settings.

A study by Antonakakis et al. (2013) analysed the general relationship between EPU and stock market returns on the S&P 500 between 1985-2013. Throughout this period, the study found a consistent negative correlation between EPU and stock market returns. Moreover, the study discovered that an increase in both the volatility of the stock market and policy uncertainty leads to a decrease in stock market returns, which in turn leads to an increase in policy uncertainty (Antonakakis et al. 2013). Similarly, Arouri et al. (2016) employed both linear and market switching models to assess the relationship of EPU on stock returns in the U.S. between 1900-2014. The findings also revealed that an increase in EPU leads to a significant reduction in stock returns. The EPU-stock returns relationship was found to be non-linear, with a stronger and enduring effect of EPU on stock returns during periods of extreme volatility (Arouri et al., 2016).

In Europe, similar observations have been made by Sum (2012). By separately regressing the monthly returns on all European countries' stock indices from 1993-2012, the study found a negative effect of changes in EPU on stock market returns in 25 out of the 33 observed countries (Sum, 2012). Furthermore, Alexopoulos and Cohen (2015) have researched this based on an updated version of their GEU measure in their article from 2009. Likewise, the study found their uncertainty measure to have a negative relationship with stock returns and a positive relationship with stock market volatility on the S&P 500, providing evidence for the correlation with a different measurement than the EPU index by Baker et al. (2016) (Alexopoulos and Cohen, 2015).

On the same topic, Kang and Ratti (2013) investigated the relationship between structural oil shocks, EPU, and real stock returns. The study found that an unanticipated increase in EPU has a significant negative effect on real stock returns (Kang and Ratti, 2013). Furthermore, Kang and Ratti (2013) found that oil-market specific demand shocks accounted for over 30% of the variation in EPU, and that EPU and structural oil shocks both had a notable impact on long-term variability in real stock returns.

2.2 Corporate Social Responsibility

The adoption of Corporate Social Responsibility (CSR) is widespread among firms all over the world. Definitions of the concept have matured with the literature since its beginning in the 1950s (Carroll, 1999). Earlier definitions focus on the conception of CSR responsibilities being supplementary to those of the law, such as Davis (1973) stating that "[CSR] is a firm's acceptance of a social obligation beyond the requirements of the law" (Davis, 1973). More recent definitions follow the same idea, with McWilliams and Siegel (2001) highlighting that it means going beyond the law when defining CSR as "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams and Siegel, 2001).

The popularity of CSR has continued throughout the new millennium as well, with prominent contributors such as Porter and Kramer (2006) claiming that engaging in CSR creates shared value by making choices that benefit both sides, rather than focusing on the friction between businesses and civil society, which has previously been the predominant narrative (Porter and Kramer, 2006). As the view of CSR being beneficial to both businesses and society has advanced, so has its adoption among firms. In 2022, 96% of the G250 companies reported on sustainability, as compared to 30% in 2005 (KPMG, 2022).

2.2.1 Does CSR Performance Pay?

Although the advocacy for CSR as a business case has undergone a change in sentiment during this millennium, the literature remains ambivalent on the relationship between CSR performance and financial performance. Present scholars still often refer to the early research made on the subject, where Friedman's shareholder theory (1970) and Freeman's stakeholder theory (1984) are the two prevailing bodies of literature (Garriga and Melé, 2004).

Friedman (1970) famously argued that making socially responsible actions as a corporate executive implies reducing returns to shareholders, as socially responsible actions are costly (Friedman, 1970). Since then, researchers such as Brammer et al. (2006) have supported his claim through demonstrating a negative relation between CSR and firm value. Brammer et al. (2006) looked at 451 UK firms over a period of 42 months and found that firms that scored higher on social performance had lower stock returns and that the firms with the lowest social performance score outperformed the market.

In contrast to Friedman's shareholder theory, Freeman (1984) argued that corporate social performance is required for business legitimacy, in turn enhancing financial performance. There is a vast body of research aligning with this theory (van Beurden and Gössling, 2008). For instance, Brown (1998) found a significant premium of stock prices for firms reputable for their corporate social performance, using a sample of 1600+ firms from 1984 to 1996. This positive relationship has been concluded in later studies as well, for instance on the S&P 500 firms (Waddock and Graves, 1997) and on accumulated data of S&P 1500 and Russell 3000 firms from 1997 to 2012 (Flammer, 2015).

The research results on this topic are largely impacted by differing research methods, making it difficult to compare and make conclusions of the research (Griffin and Mahon, 1997). Margolis et al. (2009) conducted a meta-analysis of 251 previous studies in order to be able to draw implications based on the previously inconclusive research. By encompassing studies from 1972 to 2007, they found that the 35 years of research has landed in a mildly positive relationship between CSR and corporate financial performance (Margolis et al., 2009).

2.2.2 Value of CSR During Periods of Low Trust

The definitions of CSR generally involve aspects such as civic engagement and shared beliefs, aligning closely with the theoretical foundations of trust (Lins et al., 2017). Eccles et al. (2014) explain that CSR performance is a good measure of firm trust by being interrelated with disclosure of nonfinancial information. Moreover, as CSR actions increase stakeholder engagement and a long-term focus of strategies and targets, they increase the trust that investors and other stakeholders assign to a firm (Eccles et al., 2014). In addition, Sacconi and Degli Antoni (2011) suggest that the belief that CSR performance generates trust is not limited to theory but also is a widespread belief amongst practitioners. For instance, there is a

widespread belief among CEOs that CSR performance can enhance trust in their firm (PricewaterhouseCoopers, 2013). Moreover, Guiso et al. (2008) argue that firms with high trust receive a valuation premium and that stock market participation is higher when trust in firms is higher. In turn, this results in investors making portfolio investment decisions based on the trust of firms, where high-trust firms are favoured when general trust is low. Shortly, deciding to invest in a firm is a decision to place trust in the firm (Guiso et al., 2008).

The research on how CSR relates to trust indicates that the relationship between CSR and firm value is highly dependent on the context within which it is being studied. This can be displayed through the different situational contexts that have been studied. For instance, previous scholars have tested the relationship during macroeconomic shocks, such as the COVID-19 pandemic and the 2008 financial crisis. (Lins et al., 2017; Albuquerque, Koskinen et al., 2020; Bae, El Ghoul et al., 2021; Demers, Henikse et al., 2021; Engelhardt, Ekkenga et al., 2021; Fiordelisi et al., 2022)

Lins et al. (2017) studied the effect of CSR on stock performance during the 2008 financial crisis and the 2001 Enron scandal. They found that firms which scored high on CSR performed four to seven percentage points better on the stock market during the financial crisis, as compared to lower scoring firms. These findings were validated in the Enron crisis scandal as well, where high performing CSR firms also demonstrated higher returns. This is due to CSR generating trust, which can be a significant determinant of stock market performance through investor confidence, when the overall economy faces a lack of confidence (Lins et al., 2017).

Building on the research from Lins et al. in 2017, scholars have later tested the robustness of this argumentation by applying it on other macroeconomic events such as the COVID-19 pandemic. Using a sample of 1789 firms from 27 countries, Fiordelisi et al. (2022) found that CSR and its accompanying trust protected shareholder value during the COVID-19 stock market crash. Although Bae et al. (2021) found no significant relationship between CSR performance and stock return on 1750 studied US firms during the first pandemic wave, Albuquerque, Koskinen et al. (2021) found empirical evidence suggesting the firms with high ES (omitting the G in ESG) scores did outperform other firms on the stock market, using a sample of 2171 US firms.

Understanding that the predominant empirical evidence of the aforementioned scholars indicates that CSR performance has protected shareholder value against sudden and extreme uncertainty shocks to the stock market, there is a case for studying the general role of CSR and its impact on the relationship between market uncertainty and stock market performance. As investors seemingly value trust when uncertainty is high, the relationship identified by scholars such as Lins et al. (2017) and Fiordelisi et al. (2022) might extend beyond a single shock period and be relevant during general periods of high uncertainty.

2.3 Economic Policy Uncertainty and CSR

During both aforementioned macroeconomic shocks, the EPU reached new historical peaks (Baker et al., 2016). Given that the literature indicates a particular relationship between CSR and firm financial performance during these macroeconomic events characterised by very high EPU, this study aims to investigate whether CSR plays a role in the general relationship between economic policy uncertainty and stock returns.

The only article found to combine the two strands of literature similar to the topic of this thesis is a recent study by Liao et al. (2021). With a sample of listed firms on the Shanghai and Shenzhen 300 index, the study was the first to explore the role of corporate environmental responsibility (CER) on stock returns in regard to the EPU index. To do so, Liao et al. (2021) conducted their own measure of CER using a score system based on 5 dimensions; legal consciousness, social evaluation, eco-friendly production, low carbon emission and green management. Firms were then divided into quartiles based on their scores. First, the study found that an increase in EPU has a negative impact on market-driven common stock returns similar to the previously mentioned literature on EPU and stock market performance (see Sum, 2012; Antonakakis et al., 2013; Alexopoulos and Cohen 2015; Arouri et al., 2016). Furthermore, the study found that high-CER firms are less affected by the negative impact of EPU on common stock returns compared to low-CER firms through demonstrating a close to linear relationship. Additionally, the report showed that EPU has a more significant positive impact on idiosyncratic stock returns for high-CER firms compared to low-CER firms (Liao et al., 2021).

3. Hypotheses

To answer the research question *"How does EPU relate to stock market performance and what role does CSR performance play in this relationship?"*, two hypotheses will be formulated. The first hypothesis corresponds to the literature on the relationship between EPU and stock market performance. As previous scholars have found this relationship to be negative (see e.g. Sum, 2012; Antonakakis et al., 2013; Alexopoulos and Cohen 2015; Arouri et al., 2016), we expect to find similar results. Hence;

H1: There is a negative relationship between EPU and stock market returns

The second hypothesis is aiming to test the latter part of the research question. Here, CSR will be introduced and its role on the relationship in H1 will be tested. Since earlier scholars have found that higher CSR performance indicates better stock market performance during periods of macroeconomic uncertainty and low trust (see e.g. Lins et al., 2017; Liao et al., 2021, Fiordelisi et al., 2022), we hypothesise that CSR will positively impact the relationship between EPU and stock returns. Therefore;

H2: CSR plays a positive role in the process of EPU affecting stock market returns

4. Method

This section will outline the methodology and its underlying theory that will be applied to evaluate the hypotheses. Furthermore, the regression models will be presented and justified.

4.1 Research Method

The methodology will apply portfolio theory to test the hypotheses. By testing the hypotheses through the lens of two widely accepted theoretical models for explaining investments, we use a theoretical structure that captures economists and practitioners' fundamental understanding of the determinants of stock returns. (Perold, 2004)

4.1.1 Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) is a theoretical framework for estimating the expected return of an investment for a given amount of risk undertaken. It was developed during the 1960s by multiple economists, such as Sharpe (1964), Lintner (1965), and Black (1972), building on the research by Markowitz (1952). Sharpe separated the risk factor into systematic and unsystematic risk, where only systematic risk can drive stock returns. Since unsystematic risk is specific to a given asset, expected returns will show a consistent relationship with the systematic risk (Sharpe, 1964). Through these findings, the model is formulated as follows:

$$ER_{it} = Rf_t + \beta_i(Rm_t - Rf_t)$$

Where:

ER_{it} = Expected return of investment

Rf_t = Risk-free rate

β_i = Beta of the investment

$(Rm_t - Rf_t)$ = Market risk premium

4.1.2 Fama French Three Factor Model

Besides the excess return factor captured in the CAPM formula, other variables have been identified to be correlated with stock market performance (Fama and French, 1992). In 1993,

Fama and French formulated the Three Factor Model, an extension of the CAPM, where they added a size premium and a value premium as common risk factors for stock returns (Fama and French, 1993). The size premium is denoted SMB (small minus big) and is computed using the firm's market capitalization. The value premium is denoted HML (high minus low) and is computed using the firm's book-to-market ratio. Fama French found that these factors have explanatory power on the cross-section of average returns on the NYSE, Amex and NASDAQ between 1963-1990 and should therefore be used to extend the CAPM and increase its explanatory power (Fama and French, 1993). The three-factor model is formulated as follows:

$$ER_{it} = Rf_t + \beta_1(Rm_t - Rf_t) + \beta_2 SMB_t + \beta_3 HML_t$$

Where:

SMB_t = Size premium

HML_t = Value premium

4.2 Statistical Tests

The multiple linear regression model will be used as the estimation model. This is based on the Gauss-Markov assumptions, under which the OLS estimators are the best linear unbiased estimators (BLUEs). The first assumption is that the population in the model is linear in parameters. Second, we assume a random sampling of the population. Third, there is no perfect correlation between independent variables. The fourth assumption is that the expected value of the error term is zero for all values of the independent variables, implying that no variables that have no essential variables have been omitted. Finally, homoscedasticity is assumed, meaning that the error term has a constant variance (Wooldridge, 2012). If these assumptions do not hold true, OLS may not be the best estimator. The validity of the assumptions are further addressed in 5.4 and 7.3.

4.2.1 Hypothesis 1

H1: There is a negative relationship between EPU and stock market returns

In order to test the first hypothesis and see if there is a negative relationship between EPU and stock market returns, two separate models will be tested. In Model I, the monthly

weighted portfolio returns on the S&P 500 stocks will be regressed against the EPU index to see if it has any additional explanatory power to CAPM as formed below.

Model I:

$$Weighted\ Portfolio\ Return_{st} = \alpha\ + \beta_1 EPU\_US_t + \beta_1(Rm_t - Rf_t) + \varepsilon$$

EPU_US: Percentage change, U.S Economic Policy Uncertainty Index
i: Cross-sectional unit, portfolio
t: Valuation month
ε*:* Error term

If the hypothesis holds true and can be accepted when tested in Model I, a second test will be conducted to see if EPU also has any explanatory power over the extended Three Factor Model developed by Fama and French (1993). Followingly, Model II is an extension of Model I as formed below.

Model II:

$$Weighted\ Portfolio\ Return_{st} = \alpha + \beta_1 EPU\_US_t + \beta_2(Rm_t - Rf_t) + \beta_3 SMB_t + \beta_4 HML_t + \varepsilon_{st}$$

To address the possible impact of year-fixed effects that can appear in the use of panel data, this factor will also be addressed in both models to ensure the isolation of portfolio returns without any variations resulting from differences in year. For both models that are run, there will thus be one version with, and one without year fixed effects to capture any influence of unobserved heterogeneity across different years.

To either accept or reject H1, β1 will be the determinant coefficient. If β1 is statistically significant and negative at a 10% level, the null-hypothesis will be rejected in favour of accepting H1.

$$H0: \beta 1 \geq 0\ ,\ H1: \beta 1 < 0$$

4.2.2 Hypothesis 2

Building on the first hypothesis, the second hypothesis aims to investigate how CSR performance impacts the relationship between economic policy uncertainty and stock market performance:

H2: CSR plays a positive role in the process of EPU affecting stock market returns

Given that significant results are presented for one of the models in H1, the second hypothesis will be tested using one of the models presented in H1. If EPU only is significant over Model I, this model will be used to analyse any differences in this relationship based on CSR performance. If EPU turns out to be significant over both models, Model II will be used as it is deemed to be the more elaborate of the two, including the SMB and HML factors as additional control variables.

Four new portfolios will be created, where the firms will be split into different portfolios based on CSR performance. This follows a similar approach to Lins et al. (2017) and Liao et al., (2021), where a firm's CSR value is arranged into quartiles. Once arranged into quartiles, each portfolio will be tested against the determined model and the coefficients of the EPU variable can be compared between each portfolio.

$$\text{H0: } \beta_{1\ Quartile\ 1} = \beta_{1\ Quartile\ 2} = \beta_{1\ Quartile\ 3} = \beta_{1\ Quartile\ 4}$$

H1: At least one coefficient is different from the others

To accept H2, we first need to accept H0 and then consider how the coefficients differ in order to draw any conclusions on how the EPU factor is impacted by a portfolio's CSR performance.

5. Empirical Data

5.1 Sample Selection

The sample includes 424 firms from the S&P 500 index as of the 1st of March 2023. Data for these firms have been collected monthly over a period of ten calendar years between 2013-2022. Out of the initial 500 firms, 76 firms were removed due to incomplete data; 63 firms due to missing ESG data for the entire sample period, and 13 were removed due to missing market capitalisation data which is needed to weigh the portfolios. This gives us monthly data for 424 firms across 10 years, resulting in a combined total of 50880 observations.

5.2 Data Collection

5.2.1 Dependent Variable

The underlying data for the dependent variable Weighted Portfolio Return was retrieved from Refinitiv Eikon's database using the 1 Month Total Returns for each firm on the S&P 500 in our sample between January 2013 and December 2022. The Weighted Portfolio Return is then calculated using the formula:

$$Weighted\ \ Portfolio\ Return_{st} = \sum(1\ Month\ Stock\ Return_{it} * Weight_{it})$$

where

$$1\ Month\ Stock\ Return = (Ending\ price_{it} - Beginning\ price_{it} + Distributions_{it}) / Beginning\ Price_{it}$$

and

$$Weight = Market\ Cap_{it} / Market\ Cap_{st}$$

Where the ending price is the stock's closing price on the last trading day of the month, the beginning price is the stock's opening price on the first trading day of the month, and the distributions take any paid-out dividends or distributions during the one month period into account. Given that the sample consists of the firms on the S&P 500 as of March 2023, firms that were not listed or missing data points during the entirety of the period were consequently removed from the dataset.

5.2.2 Main Independent Variables

The main independent variable, the economic policy uncertainty index (EPU_US) data is gathered from the founder's official Policy Uncertainty website (Baker et al., 2023). The website has EPU data for 28 countries including the US EPU index which given the sample is the primary index used in this report. As previously stated in 2.1.1, the US EPU index is the most advanced country-index constructed by three measures. Firstly, the frequency of economic-policy related terms in the top 10 largest US newspapers is tracked. Secondly, the index considers the number of federal tax code provisions that are scheduled to expire in the coming years. Lastly, the level of disagreement among professional economic forecasters regarding future government purchases and inflation is assessed using the Survey of Professional Forecasters from the Federal Reserve Bank of Philadelphia. (Baker et al., 2016)

The US EPU index is conducted monthly and available for the entirety of the sample period between January 2013 and December 2022. Consequently, no observations were removed due to incompleteness of EPU data. To account for any underlying trends in the EPU data, the percentage change was used. This was defined as the current month's EPU value subtracted by the previous month's EPU value, with the difference being divided by the previous month's EPU value.

5.2.3 Control Variables

In total, three control variables are used across the two models. The market risk premium (MRP) which is present in both Model I and II is defined as the difference between the return on a market portfolio and the risk-free rate. In this report, the risk-free rate is defined as the $1\ Month\ US\ Treasury\ Rate^{1/12}$ for a given month and retrieved from Capital IQ (S&P Capital IQ, 2023). As for the market portfolio, the S&P 500 index is used as this previously has been recognised as a good market proxy by researchers (see e.g. Harris, Marston et al., 2003). The S&P 500 index returns are also collected from Capital IQ and are available for the entirety of the sample period (S&P Capital IQ, 2023).

For clarifying purposes, it is important to notice that using the S&P 500 index as the market proxy when calculating the MRP does not imply that the MRP is equal to the dependent variable. Firstly, our sample consists of the S&P 500 constituents as of March 2023. The underlying companies in the sample are thereby not the same as the ones that constitute the

S&P 500 index for the last 10 years. These S&P 500 constituents are being updated regularly and are thereby not equal to our sample. For instance, 176 constituents as of March 2023 were not included in S&P 500 as of January 2013. Moreover, our sample excludes 76 of the S&P 500 firms for missing data, implying that our sample further differs from the market. There is still some resemblance between our sample and the market portfolio, however that is inevitable since the S&P 500 accounts for 80% of the US market (S&P Global, 2023).

The additional control variables in Model II, SMB (small minus big) and HML (high minus low) are both retrieved from the official Kenneth French website with monthly data of the Fama French Three Factors for the entirety of the sample period. The SMB factor is the average return on three small portfolios minus the average return on three big portfolios, and the HML factor is the average return on two value portfolios minus the average return on two growth portfolios. The portfolios are based on all stocks on NYSE, NASDAQ and AMEX. (Kenneth R. French, 2023)

5.2.4 CSR Portfolios

When constructing the CSR portfolios, ESG data from Refinitiv Eikon will be used as a proxy for CSR performance, as it has been used by a lot of previous scholars of the peer reviewed articles that we aim to contribute to (Albuquerque, Koskinen et al., 2020; Demers, Henikse et al., 2021; Engelhardt, Ekkenga et al., 2021; Bae, El Ghoul et al., 2021). Refinitiv Eikon offers a high-quality coverage of ESG scores on the US firms, with 437 of the current S&P 500 firms having complete ESG data for each of the last 10 years. The ESG score is based on industry-specific weighting of three different scores, the environmental, social and governance pillars. In turn, these pillars are based on 186 of the most comparable and material measures for each firm based on publicly reported information (Refinitiv, 2022). Each ESG score is within the range of 0-100 and is a relative score, where scores received by a company are benchmarked against its industry ESG scores (Refinitiv, 2022).

For each month, the firms have been divided into quartiles based on their ESG score. Since the ESG scores are updated on a yearly basis, whereas stock returns and EPU are updated monthly, a firm will consequently belong to a certain portfolio for at least twelve 1-month periods before potentially switching. Table I in Appendix I provides a summary of the ESG scores in each quartile. Interestingly, the table indicates that the quartiles do overlap on ESG

scores, as shown by the min and max values not being mutually exclusive. This is explained by the yearly ESG data shown in Table II, Appendix I. As seen by the annual means in the table, the average ESG scores have gradually increased for each year in the panel. The practical implication of this is that the quartile limit increases year by year, explaining how the max value of Q1 can be higher than the min value of Q3. As an example, an ESG score of 62.9 placed Starbucks Corp in the third quartile in 2017, whereas the same score placed Chipotle Mexican Grill Inc in the first quartile in 2022.

5.3 Descriptive Statistics

Table III: Descriptive Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Weighted Portfolio Return	120	0.0137	0.0433	-0.1096	0.1174
EPU_US	120	135.22	49.333	71.26	350.46
MRP	120	0.0069	0.0428	-0.1269	0.1251
HML	120	-0.0009	0.0281	-0.0924	0.1196
SMB	120	-0.0015	0.0151	-0.0416	0.0331

Table III displays the descriptive statistics used for all variables in the full sample portfolio. The US EPU index ranged between 71.26 and 350.46 during the research period, where the minimum value point was noted in August 2014 and the highest at the start of the Covid-19 Pandemic in May 2020 (see Figure I, Appendix III). Additionally, the descriptive statistics show that the two Fama French factors HML and SMB are on average negative over the time period. The average return of the HML portfolio is -0.0009 and the average return is -0.0015 for the SMB portfolio. The spread is higher for the HML factor however, as shown in the standard deviation of 0.028 and max value of 0.1196. The SMB factor has a standard deviation of 0.0151 and a max value of 0.0331. As for the MRP variable, it does display a slightly smaller variation than the weighted portfolio, which is shown in the standard deviation of the portfolio returns being 0.0433 as compared to the standard deviation of 0.0428 of the MRP variable. The MRP variable and the portfolio constructed to be the

dependent variable are fairly close in their descriptive statistics, as further supported by the min and max values being -0.1096 and 0.1174 respectively for the portfolio returns, and -0.1269 and 0.1251 respectively for the MRP factor.

5.4 Robustness Tests

To ensure validity of the models, a number of measures and tests have been applied to assess the reliability of the results.

5.4.1 Autocorrelation

The presence of autocorrelation, also known as serial correlation, in a regression model with time-series data implies that the error terms are correlated with one another (Newbold et al., 2020). This can occur when variables that affect the dependent variable are omitted, so that their effect over time is included in the error terms. When autocorrelation is present in a regression model, it can lead to estimated coefficients and confidence intervals being misleading, and the wrong conclusions being drawn. As a robustness test to the models used in this study, all error terms have been checked for autocorrelation using a Wooldridge test on the CAPM model with and without time fixed effects. In both tests, H0 of no autocorrelation cannot be rejected. Table IV in Appendix II shows the results of the Wooldridge test, with a p-value = 1.1096 for the CAPM model and p-value = 1.1983 for the CAPM model with time fixed effects. As the null hypothesis of no autocorrelation cannot be rejected, it is safe to assume that no autocorrelation is present. The results remain the same for the models applying Fama French variables as well, since there are no variables omitted when switching from CAPM to Fama French Three Factor Model.

5.4.2 Heteroskedasticity

Heteroskedasticity in a linear regression model implies that the variance of the unobserved error terms varies across all levels of the independent variable. This violates the important assumption of homoscedasticity, i.e., uniform variances across all levels of the independent variable, which can lead to unreliable confidence intervals and *t* statistics as these are based on the variances (Wooldridge, 2012). The models have been tested with a Breusch-Pagan test to check for heteroskedasticity which can be viewed in Table V, Appendix II. With a p-value = 0.065 for the CAPM model and p-value = 0.063 for the Fama French model, the null hypothesis that variances are uniform is not rejected. As for the models applying fixed

effects, low p-values of 0.000038 for the CAPM FE model and 0.00003 for the Fama French FE model. Hence, the Breusch-Pagan tests indicate that heteroskedasticity is present. As the Breusch-Pagan test cannot ensure that heteroskedasticity is not present with the null hypothesis stating that there is homoscedasticity, the models without fixed effects will be assumed to be subject to some heteroskedasticity as well, since the p-values for both models are close to the threshold value of 0.05. To account for the heteroskedasticity, robust standard errors will be applied to all models.

5.4.3 Multicollinearity

Table VI: Correlation Matrix and VIF

	Return	EPU	MRP	HML	SMB	VIF
Return	1					1.064
EPU	-0.004	1				1.036
MRP	0.737	0.036	1			1.060
HML	-0.011	-0.157	0.057	1		1.065
SMB	0.107	0.093	0.149	-0.107	1	1.064

A Pearson correlation matrix has been done for all observations used in the model to check the model for multicollinearity. Multicollinearity occurs when one or more independent variables are highly correlated with each other, which poses a limitation to the reliability of the model as the coefficients and the statistical significance may be deceptive. (Newbold et al., 2020). The results are displayed in Table VI, where all independent variables and the dependent variable are included. The table shows that there are no independent variables with a high correlation between each other. Neither are there any VIF scores indicating multicollinearity, as all VIF scores are <1.1 and thus far from 10, which is a common limit for when multicollinearity becomes problematic. VIF calculates how much variance in a variable that is inflated due to its correlation with another variable (Newbold et al., 2020). It is further noticed from the matrix that the market risk premium variable has a high (0.734) correlation with the dependent variable Return. This is a result derived from the construction of the model, as the dependent variable being the weighted return of the S&P 500 portfolio constitutes approximately 80% of the entire US market (S&P Global, 2023).

6. Results and Analysis

6.2 Hypothesis 1

Table VII: CAPM Regression Results

	Dependent variable:	
	Weighted Portfolio Return	
	(1)	(2)
Fixed Effects	*No*	*Yes*
Robust Standard Errors	*Yes*	*Yes*
EPU	-0.057**	-0.046*
	(0.031)	(0.031)
MRP	0.766***	0.457***
	(0.069)	(0.114)
Constant	-0.004	0.018
	(0.006)	(0.011)
Observations	120	120
R^2	0.562	0.631
Adjusted R^2	0.555	0.594
Residual Std. Error	0.062 (df = 117)	0.059 (df = 108)
F Statistic	75.124*** (df = 2; 117)	16.801*** (df = 11; 108)

Note: Robust standard errors are shown in parenthesis
*p<0.1; **p<0.05; ***p<0.01

To test the first hypothesis and see if there is a negative relationship between EPU and stock returns, two regressions were performed on the EPU index with regard to the Capital Asset Pricing Model. The two regressions include one without time fixed effects (1) and one with time fixed effects (2). In both, weighted portfolio returns served as the dependent variable, EPU as the main independent variable while controlling for the market risk premium.

The results can be viewed in Table VII. In the first regression (1), the results show the EPU index being negatively related to the weighted portfolio returns at a 5% significance level. The MRP shows a positive impact at a 1% significance level and with a substantially higher explanatory value over the weighted portfolio returns. Including time fixed effects in regression (2) yields similar results to regression (1). EPU is still negatively correlated to weighted portfolio returns, but the relationship becomes weaker and is only significant at a 10% level. It can be observed that time seems to be accounting for some of the variation in the dependent variable, as it decreases the coefficients of EPU and MRP.

Based on the results from Model I, we reject H0 and accept H1: $\beta 1 < 0$, given the significant results of a negative β1 at the 5% level in regression (1) and 10% level when including time fixed effects in regression (2). In other words, stock market returns tend to decrease in times of higher economic policy uncertainty as defined by the index conducted by Baker et al. (2016).

To strengthen the base for a conclusion for the first hypothesis, a second analysis will be conducted based on the results from the regressions made on Model II. Modell II includes additional control variables and will either solidify or weaken the results for accepting the first hypothesis which is discussed in the following part.

Table VIII: Fama French Regression Results

	Dependent variable:	
	Weighted Portfolio Return	
	(1)	(2)
Fixed Effects	*No*	*Yes*
Robust Standard Errors	*Yes*	*Yes*
EPU	-0.065**	-0.052**
	(0.031)	(0.028)
MRP	0.778***	0.471***
	(0.073)	(0.124)
SMB	-0.217	-0.183
	(0.444)	(0.503)

HML	-0.285	-0.172
	(0.279)	(0.327)
Constant	-0.004	0.018
	(0.006)	(0.011)
Observations	120	120
R^2	0.570	0.634
Adjusted R^2	0.555	0.589
Residual Std. Error	0.062 (df = 115)	0.060 (df = 106)
F Statistic	38.070^{***} (df = 4; 115)	14.109^{***} (df = 13; 106)

Note: Robust standard errors are shown in parenthesis
*p<0.1; **p<0.05; ***p<0.01

To further test the first hypothesis, two more regressions were conducted but with the developed Fama French Three Factor Model instead of the Capital Asset Pricing Model with the objective to see if the EPU index still had any explanatory power when including the factors of SMB (size) and HML (value). Similar to the previous model, the two regressions include one without time fixed effects (1) and one with time fixed effects (2). In both, weighted portfolio returns served as the dependent variable, EPU as the main independent variable while controlling for the MRP and the Fama French SMB and HML factors.

Table VIII displays the results. Similar to the results in Table VII, regression (1) shows that the EPU index has a negative relationship with the weighted portfolio returns at a 5% significance level. The MRP also shows a positive impact at a 1% significance level, but with substantially higher explanatory power over the weighted portfolio returns. The control factors SMB and HML are both negative and do not have any significant explanatory power.

Contrary to the results from Model I, including time fixed effects in regression (2) did not impact the significance level of EPU in this regression as it stays at a 5% level. Nonetheless, time seems to have accounted for some of the variation in this model as well, as it decreases the coefficients of all variables. SMB and HML are both still negative and without any significant explanatory power.

Together with the results from Model I, the aggregate conclusion is therefore to accept the first hypothesis stating that *there is a negative relationship between EPU and stock market returns*. Both models provide significant results of $\beta 1 < 0$ on at least the 10% significance level, leading to a rejection of H0: $\beta 1 \geq 0$ and acceptance of H1: $\beta 1 < 0$. In other words, this means that the stock market returns from the portfolio tended to decrease in times of higher economic policy uncertainty as defined by the index conducted by Baker et al. (2016).

Going forward, this provides a solid foundation to test the second hypothesis, which will investigate if a company's CSR performance has any influence on the now established negative relationship between EPU and stock returns.

6.3 Hypothesis 2

Table IX: ESG Quartiles Regression Results

	Dependent variable:			
	Weighted Portfolio Return			
	(1)	(2)	(3)	(4)
Fixed Effects	*No*	*No*	*No*	*No*
Robust Standard Errors	*Yes*	*Yes*	*Yes*	*Yes*
EPU	-0.061**	-0.073**	-0.065**	-0.018
	(0.031)	(0.035)	(0.032)	(0.022)
MRP	0.756***	0.793***	0.769***	0.767***
	(0.076)	(0.079)	(0.073)	(0.052)
SMB	0.009	-0.012	-0.277	-0.216
	(0.461)	(0.514)	(0.437)	(0.315)
HML	-0.084	-0.269	-0.338	0.054
	(0.285)	(0.320)	(0.282)	(0.131)
Constant	-0.003	-0.001	-0.004	-0.007
	(0.006)	(0.007)	(0.006)	(0.005)
Observations	120	120	120	120
R^2	0.543	0.531	0.566	0.647

Adjusted R^2	0.527	0.514	0.551	0.634
Residual Std. Error (df = 115)	0.064	0.069	0.061	0.051
F Statistic (df = 4; 115)	34.149***	32.496***	37.522***	52.636***

Note: Robust standard errors are shown in parenthesis
*p<0.1; **p<0.05; ***p<0.01

To test the second hypothesis and examine if CSR plays a positive role in the process of EPU affecting stock market returns, the data has been divided into four weighted CSR portfolios based on Refinitv Eikon's ESG score in each month as explained in 5.2.4. Regression (1) represents the 0-25% lowest scoring CSR firms, (2) the 25-50% lowest scoring CSR firms, (3) the 25-50% highest scoring CSR firms and (4) the 0-25% highest scoring CSR firms.

The results are presented in Table IX. When dividing the observations into portfolios based on their CSR scores, the results for the four quartiles are in general similar to the ones presented for the market portfolio in Table VIII.

In regression (1), representing the lowest scoring CSR quartile, the main independent variable EPU is negatively correlated with weighted portfolio returns at a 5% significance level. MRP is highly positively correlated with the weighted portfolio returns at a 1% significance level. The SMB factor is positive and the HML factor is negative, but neither have a significant relationship with weighted portfolio returns.

In both regression (2) and regression (3), representing the two CSR portfolios closest to the average, the results are almost the same as in (1). EPU still has a negative correlation at a 5% significance level and a positive MRP at a 1% significance level, with the difference being a change in coefficient of the SMB factor from positive to negative, although still insignificant.

In regression (4), which contains the best performing CSR quartile, there are some noticeable differences. The most distinct difference from the other three portfolios in regression (1), (2) and (3) is that the effect of EPU in regression (4) becomes closer to zero and does not have a significant relationship with the weighted portfolio returns. Further, MRP is still highly correlated with the weighted portfolio returns at a 1% significance level, while the SMB and HML factors are insignificant.

Summarising the results from Table IX, we can conclude that β1 in Quartiles 1-3 display similar results with regards to the EPU variable, each of these quartiles having a $\beta 1 < 0$ at the 5% significance level. The results from Quartile 4 deviate however, as there is no significance to the negative β1 coefficient. Hence, we reject H0: $\beta_{1\ Quartile\ 1} = \beta_{1\ Quartile\ 2} = \beta_{1\ Quartile\ 3} = \beta_{1\ Quartile\ 4}$ since $\beta_{1\ Quartile\ 4} \neq \beta_{1\ Quartile\ 1-3}$ and accept H1: At least one coefficient is different from the others. This implies that the relationship found between EPU and portfolio returns is impacted by CSR performance.

7. Discussion

7.1 Discussion of findings

As the results in the previous section suggest, the US EPU shows support for accepting *H1: There is a negative relationship between EPU and stock market returns*, since the US EPU has significant explanatory power both in the CAPM and Fama French Three Factor Model. As for the second hypothesis, the non-significant coefficient for the US EPU in the fourth portfolio suggests that the highest performing CSR firms are less sensitive to economic policy uncertainty. Hence *H2: CSR plays a positive role in the process of EPU affecting stock market returns* is accepted.

7.1.1 Hypothesis 1

When relating these findings to earlier research, our study finds empirical evidence to support the previous findings on EPU and stock market performance, where a negative relationship is consistently being found (Antonakakis et al., 2013; Arouri et al., 2016; Sum, 2012; Alexopoulos and Cohen, 2015). The most evident support is with regards to Antonakakis et al. (2013) and Arouri et al. (2016) as both studies also test the EPU index on S&P 500 stocks. They both found a consistent negative relationship between EPU and stock market returns on the S&P 500, where Antonakakis et al. (2013) examined the S&P 500 stocks between 1985-2013 and Arouri et al. (2016) takes on a broader scope by researching the years 1900-2014. As our paper takes recent years into consideration, we provide support for their findings and ratify the negative relationship of EPU on the S&P 500 stocks between 2013-2022.

There are, however, noticeable differences in the methodology between the studies mentioned above and this paper. Whereas we apply portfolio theories to the methodological approach, the aforementioned scholars examine the relationship by testing it on individual stock returns without portfolio theory models. By demonstrating that the findings remain empirically supported when methodologies and control variables differ, our paper enhances the reliability of their findings while their studies simultaneously augment the reliability of ours.

Continuing to look at prior literature beyond the American stock market setting, the generalisability of our study is arguably high. Whereas the other studies on the S&P 500 stocks indicate that our findings are not limited to the sample period, Sum (2012) demonstrates support for the hypothesis in a European context. This points towards a generalisability of our findings that is not limited to the time period nor to the geographical market.

Aiming to understand why EPU is negatively correlated with the portfolio returns, Bloom (2009) examines several consequences of uncertainty shocks that might provide explanations for the relationship. Firstly, Bloom (2009) identified pausing of investments and hiring as a result of high uncertainty. These findings have later been ratified in studies by Wang, Chen et al. (2014), and Gulen and Ion (2015). As firms pause these activities, it is reasonable that they become less attractive to investors as they are signs of decreasing performance. This rationale is also strengthened by another finding by Bloom (2009), where he discovers rapid drops in output and productivity growth being caused by uncertainty. Altogether, these are evidence that arguably justifies the negative relationship found between the portfolio returns and EPU in our study.

7.1.2 Hypothesis 2

Accepting the second hypothesis aligns with the previous research by Liao et al. (2021) on how the relationship between EPU and stock returns is positively impacted by CSR. Our study provides support to their research, where it is found that high-CER firms are less affected by the negative impact of EPU on common stock returns compared to low-CER firms. While they found an almost linear relationship between the four CER quartiles, the results from Model II in our study differ somewhat, as it only shows a distinct difference for the best performing CSR quartile.

There are several possible explanations for this difference. Firstly, it is important to consider that Liao et al. (2021) are studying the impact of corporate *environmental* responsibility, whereas our study takes on a wider approach by looking at the broader definition of CSR when using Refinitiv's ESG score as a proxy. This difference in measuring CSR performance could explain the contrasts of the statistical results, as the different proxies imply that there may be inconsistencies between a firm's score and its actual CSR performance. There is a

lack of standardised metrics for companies to use when reporting on their CSR performance, making this performance difficult to quantify which in turn creates discrepancies between different metrics. This is a general shortcoming of the literature on CSR performance which is both a drawback when comparing the findings of different studies, and an explanation for why results can be very different (Griffin and Mahon, 1997).

Moreover, our study applies a different methodology to test the hypothesis, which provides nuance to their paper whilst also explaining the differences. Liao et al. (2021) use a sample of Chinese stocks to test the hypothesis, and they do not use portfolio theory to formulate their control variables. The usage of different control variables and different geographical samples does unavoidably introduce dissimilar outcomes, which also serves as an explanation. On the flipside however, it also indicates that the findings of Liao et al. (2021) are not limited to the context of their study but also are supported with different methodological approaches. Thereby, our study does not only support their findings, but also creates nuance. Our empirical evidence points towards their findings being relevant also under the assumptions of two widely accepted portfolio theories. Despite the statistical results somewhat differing, the practical implication is the same for both studies; firms may be able to mitigate the negative impact of EPU by improving their CSR efforts.

Continuing to relate our findings to earlier research on the contextual value of CSR during different macroeconomic conditions, we also provide nuance to the literature on CSR value during shocks. Several studies have found that high-CSR firms performed better on the stock market during the financial crisis and during the COVID-19 pandemic (Lins et al., 2017; Albuquerque, Koskinen et al., 2020; Engelhardt, Ekkenga et al., 2021; Fiordelisi et al., 2022). Lins et al. (2017) found that firms in the highest scoring CSR quartile had stock returns that were four to seven percentage points higher during the 2008 financial crisis, as compared to low scoring CSR firms. Additionally, they also found that high-CSR firms exhibited better stock market performance during the Enron crisis scandal in 2001. Similar to our findings, Lins et al. (2017) did not find a linear relationship between CSR performance and stock returns. Instead, they found that stock returns were primarily different when moving from the third to the fourth quartile and from the first to the second quartile. Like ours, these findings suggest that investors are primarily concerned with companies' CSR performance when it deviates from the ordinary. We provide nuance to their findings however, by demonstrating

that their findings are not limited to specific periods of shocks but also when looking at a continuous measure of uncertainty.

A possible explanation of these results can be found in the research by Eccles et al. (2014), and Guiso et al. (2008). Eccles et al. (2014) argue that a firm's CSR performance generates trust as CSR efforts entail high stakeholder engagement and a clear long-term oriented strategy. In addition, Guiso et al. (2008) suggest that firms perceived as more reliable may receive a premium valuation from investors when general trust is low among firms due to macroeconomic conditions or corporate scandals. Interpreting our results through this line of argumentation, the impact of CSR performance on the relationship between EPU and stock market performance conceivably originates from the trust that CSR generates. By generating trust, high-CSR firms arguably become more attractive to investors when uncertainty is high. This logic can be applied to both our research and earlier research by Lins et al. (2017) and other studies on the value of CSR during macroeconomic shocks (see e.g., Albuquerque, Koskinen et al., 2020; Engelhardt, Ekkenga et al., 2021; Fiordelisi, Galloppo et al., 2022).

7.2 Endogeneity

Issues related to endogeneity are always an important factor to consider when using OLS regressions since explanatory variables can be correlated with the error term, resulting in inconsistent or biassed coefficients. In the context of this study, one example of this could be the findings of Kang and Ratti (2013) where it was established that oil-market specific demand shocks accounted for over 30% of the variation in EPU, and that both had a notable impact on long-term variability in real stock returns. If oil shocks cause spikes in economic policy uncertainty which consequently affect stock market returns, this could result in our coefficients being biassed through other factors than the policy uncertainty itself, in turn explaining the dependent variable. Moreover, there may be a reverse causality issue as indicated by Antonakakis et al. (2013). As EPU increases and stock market performance decreases, EPU might increase further in a reinforcing cycle.

Another possible cause could be that CSR's impact on the correlation between stock returns and the EPU simply is not causal. It is possible that CSR performance is correlated with stock market performance, meaning that the firms in the highest scoring CSR quartile have

performed better regardless of EPU, and that there are other factors explaining why the firms in this quartile have performed better. Alternatively, endogeneity may be found in the correlation between governance and firm performance. Under the premise that better governed firms are overall better performing, there is a possibility that CSR is a proxy for this governance factor since the CSR performance is being measured through the ESG scores which include governance. If so, this could cause endogeneity since that would imply that governance is then both correlated with CSR performance and stock market performance.

There are several reasons as to why endogeneity may affect our results that go beyond the ones discussed above. The factors given in the examples, and others, might be affecting the outcome of the results and needs to be acknowledged. Establishing a causal relationship between EPU and stock market performance is difficult due to the many factors being interconnected.

8. Conclusion

8.1 Contributions

This paper aims to contribute to the literature on the relationship between economic policy uncertainty and stock market returns, and to further investigate whether CSR performance may influence the relationship. This is studied by testing the EPU index on the weighted portfolio returns of the S&P 500 index and then creating portfolios based on CSR performance. Based on the results, we answer the research question *"How does EPU relate to stock market performance and what role does CSR performance play in this relationship?"*. By answering this research question, we contribute to three strands of literature; research on EPU and stock market performance, the vast body of CSR literature and the less researched intercept between EPU and CSR when modelling stock returns.

First, we conclude that EPU does exhibit a statistically significant relationship with stock market performance, which aligns with previous literature. As EPU increases, our results show that the weighted portfolio returns decrease. This relationship holds true both when tested using the Capital Asset Pricing Model and the Fama French Three Factor Model. Furthermore, we conclude that CSR performance does have a positive impact on the relationship between stock market performance and EPU. The portfolio with the highest scoring CSR firms does not exhibit a significant negative relationship between EPU and stock market performance, whereas all other three portfolios exhibit this relationship to be negative and statistically significant.

The implications of these findings are of interest beyond the theoretical contributions to previous literature. In practice, understanding how stock market performance relates to external factors such as economic policy uncertainty is of value to various stakeholders. First, it is important for investors to understand how firm value is related to economic policy uncertainty. Evidently, understanding the factors that are related to stock market performance is important as it can affect investment decisions and thereby returns. Consequently, the relationship between EPU and stock market performance can be of value when developing investment strategies which consider external market conditions.

Furthermore, understanding how this relationship is impacted by the trust that a higher CSR score entails may be of value for both investors and firms. From our conclusions, investors could make investment decisions where they consider the CSR performance of a firm as a potential hedge against times characterised by higher EPU. As for firm managers, the practical implications of our conclusions are that efforts to improve CSR performance may mitigate the negative effects of EPU, thus working as protection of shareholder value in times of higher uncertainty. Since it is, as previously highlighted, a common belief among CEOs and practitioners that CSR efforts impose trust, finding empirical evidence to support that the trust provides a value premium during uncertain times is useful to guide future CSR efforts.

Finally, our conclusions have practical implications for US authorities. As the findings indicate that stock markets demonstrate worse performance when EPU is high, this emphasises the significance of the US authorities striving to maintain transparency and stability in their economic policies. By doing so, they can help to avoid the negative effects of EPU on stock markets and promote more favourable capital markets.

8.2 Future Research

There are several interesting areas for future research from this paper. The findings are limited to providing empirical evidence of the relationship between EPU and stock market performance. While this research sheds light on the nature of this relationship, it does not explain why this relationship exists. As the EPU is made up of several constituents, a suggestion for future research is to study these constituents separately and examine which factors are the main drivers of the relationship to deepen the understanding. Moreover, our paper does not provide proof of a causal relationship between EPU and stock market performance. Further research is required to identify the underlying mechanisms of the EPU index that might drive stock returns, to determine whether the observed relationship is causal or simply a correlation.

Additionally, there are differences between our findings and earlier research on how CSR performance affects the relationship. Since CSR performance can be quantified in various ways, a suggestion for future research is to continue to study the impact of CSR on this relationship. Applying different metrics of CSR helps enrich the literature and understand the

differences between results. Since our results show that only the highest scoring CSR portfolio may protect shareholder value as EPU increases, studying whether or not there is a limit as to when CSR can shield firm value from EPU could be of interest.

Another interesting field for future research would be to examine *why* the relationship between EPU and stock market performance appears differently depending on CSR performance. If it is due to the trust it entails as discussed earlier, further examining the logic behind CSR bringing trust is required to better understand the practical implications. There might be tangible factors which correlate with a high CSR performance that make these firms less risky investments. Perhaps, high performing CSR firms are better governed and thereby better managed to withstand uncertainty. These are examples of further research topics that might provide an explanation for the existence of the relationship found in our study.

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Appendices

Appendix I: ESG Data

Table I: Quartile Descriptive Statistics

Quartile	Mean	Std. Dev	Min	Max
Q1	37.03	12.57	1.91	62.92
Q2	54.52	9.03	34.86	70.85
Q3	66.11	6.78	50.20	79.26
Q4	79.01	6.08	65.92	93.84

Table II: Yearly Descriptive Statistics

Year	Mean	Std. Dev	Min	Max
2013	50.05	19.62	1.91	91.31
2014	51.11	19.17	2.49	92.28
2015	52.09	18.25	2.46	92.39
2016	55.66	17.66	5.81	92.84
2017	58.25	16.78	11.52	91.28
2018	60.81	16.16	14.35	91.89
2019	62.43	15.70	18.29	93.18
2020	64.54	14.86	21.04	93.84
2021	67.15	14.08	6.35	93.45
2022	69.80	12.21	30.34	92.90

Appendix II: Robustness Tests

Table IV: Wooldridge Test for Autocorrelation

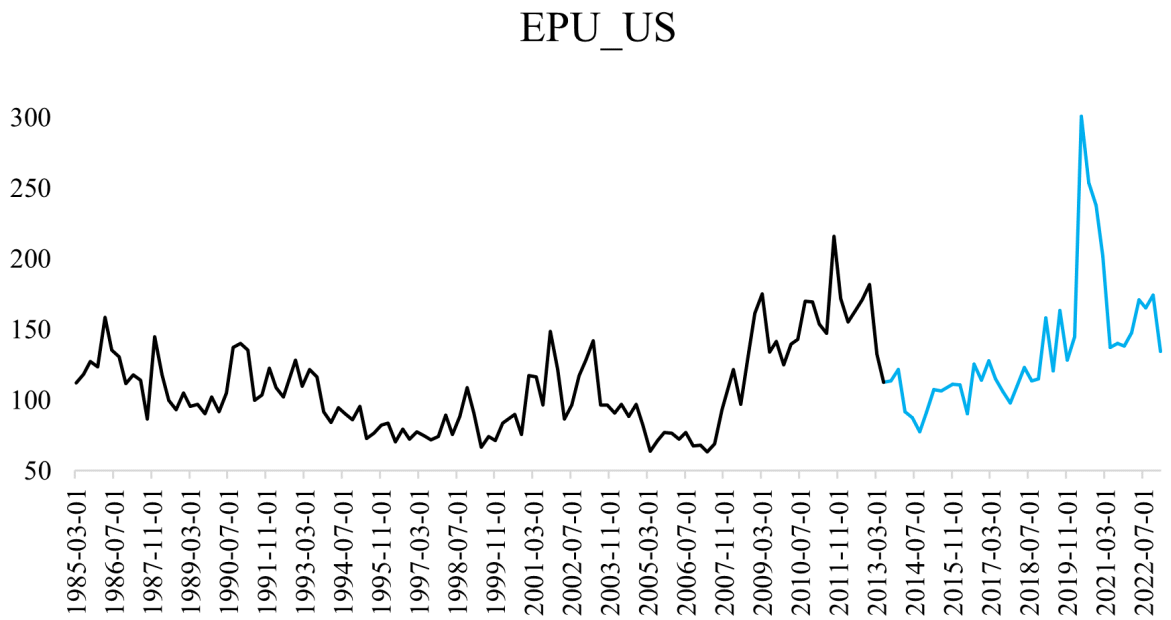
Model	W	p-value
CAPM	2.09	1.1096
CAPM FE	1.87	1.1983

Table V: Breusch-Pagan Test for Heteroskedasticity

Model	Statistic	p-value
CAPM	5.493944	0.0641217
CAPM FE	39.84574	3.8e-05
Fama French	8.976776	0.0616825
Fama French FE	44.05768	3e-05

Appendix III: EPU Diagram

Figure I: U.S. Economic Policy Uncertainty Index



Note: The data is displayed as quarterly averages between the years 1985-2023. The blue colour indicates the researched time period. Source: Baker et al. (2023)