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# Political Ideology and Environmental Investments: Empirical Evidence from the EU and US

Henri Essert

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## **Abstract**

In this thesis I examine the effect of political ideology on environmental investments, namely green and brown stocks. Previous research has shown that climate change beliefs vary between different political stances. People with right ideological views seem to distrust scientists regarding this issue, while the majority of left oriented people trust in the scientific consensus. In an effort to analyse the impact that political ideology has on stock returns, an index of political stance (IPS) is created with the help of yearly survey data from the European Commission. My results add to the existing literature by finding a significant positive effect of the IPS on green and brown stock returns. This analysis is repeated for European and American stocks. I find a significantly larger effect of the IPS on American stocks, compared to European stocks. This is in line with previous literature which highlights the differences in political systems in these two regions and the importance of media attention regarding green and brown stock returns. Furthermore, a classic event study methodology is used on six different climate change related policy implementations in the two regions, to analyse the short-term effect they have on cumulative abnormal returns of green and brown stocks. I find varying effects of these policies, further highlighting the importance of the major political ideology present in the region at that time, media attention on policies and sectoral effects of green policies.

**Title:** Political Ideology and Environmental Investments: Empirical Evidence from the EU and US

**Author:** Henri Essert

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## **Resumo**

Nesta tese, examino o efeito da ideologia política nos investimentos ambientais, nomeadamente nas acções verdes e castanhas. Estudos anteriores mostraram que as convicções sobre as alterações climáticas variam consoante as diferentes posições políticas. As pessoas com visões ideológicas de direita parecem desconfiar dos cientistas relativamente a esta questão, enquanto a maioria das pessoas de esquerda confia no consenso científico. Para analisar o impacto que a ideologia política tem nos retornos das acções, é criado um índice de posição política (IPS) com a ajuda de dados de inquéritos anuais da Comissão Europeia. Os meus resultados contribuem para a literatura existente, ao constatarem um efeito positivo significativo do IPS nas rendibilidades das acções verdes e castanhas. Esta análise é repetida para as acções europeias e americanas. Verifico que o efeito do IPS é significativamente maior nas acções americanas do que nas europeias. Este facto está de acordo com a literatura anterior, que salienta as diferenças entre os sistemas políticos destas duas regiões e a importância da atenção dos meios de comunicação social para a rendibilidade das acções verdes e castanhas. Além disso, é utilizada uma metodologia clássica de estudo de eventos em 6 diferentes implementações de políticas relacionadas com as alterações climáticas nas duas regiões, para analisar o efeito a curto prazo que têm nos retornos anormais acumulados das acções verdes e castanhas. Constatos efeitos variáveis destas políticas, salientando ainda a importância da principal ideologia política presente na região nessa altura, a atenção dos meios de comunicação social às políticas e os efeitos sectoriais das políticas verdes.

**Título:** Ideologia política e investimentos ambientais: Evidências empíricas da UE e dos EUA

**Autor:** Henri Essert

**Palavras-chave:** Ideologia política, acções verdes, acções castanhas, regressões de efeitos fixos, estudo de eventos

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## 1. Introduction

Climate change is one of the most pressing global challenges of our time and it has far-reaching implications for society, the environment, and the economy. Given the urgency of the issue, it is imperative to gain a thorough understanding of the variables influencing public opinion, policy decisions and actions regarding climate change.

Although there exists a large body of scientific proof that climate change does exist and is indeed man-made (e.g. Nordhaus, 2019), it became apparent over the last few decades that different political parties have different views and beliefs on climate change. Most research regarding this issue highlights that in the EU especially right-wing parties (Inglehart and Norris, 2016) and in the US the republican party (Hamilton et al., 2015) seem to distrust scientists regarding the issue of the earth's climate.

This observation would lead people to believe that if a country's major political ideology is either left or right oriented, this would also reflect itself on the stock market, as so-called green stock (high ESG Score and low carbon emission) and brown stock (low ESG score and high carbon emission) returns could be in line with the prevalent ideology's beliefs on climate change. This hypothesis is tested in this thesis by constructing an index of the political stance for each country by year, using survey data from the European Commission and running regressions with different fixed effects models to analyze the long-term effects of politics and especially political stance on green and brown stock returns.

As policies are an important tool of governments in combating climate change and adjusting a "greener" economy, the different political stances can have a large impact on the implementation of such policies. This was especially obvious in the US during the presidential campaign of republican president Donald Trump, who, compared to his predecessor, did not see climate change as a top priority. I will further highlight these differences in green policy implementations by different political parties in the literature review of this thesis.

The reaction of investors to climate change related policy implementations has been researched in many studies (e.g. Antoniuk and Leirvik, 2021; Borghesi et al., 2022). However, the question whether investor reactions differ in different regions around the

world (especially EU and US) seems to still be unanswered. In order to analyze the reaction of these investors, following the implementation of climate change related policies, an event study is conducted for a few major policies implemented in the EU and US. This also highlights the short-term influence that political ideology has on green and brown stocks.

The structure of this thesis is as follows. First, the existing literature regarding this topic and the main findings are reviewed. In the next section, the data used for the empirical study is presented. In section four the methodology used is explained and after, I will present the results obtained from my regression models and event studies. Finally, I will come to a conclusion, present some limitations of this study and provide potential ideas for future research.

## **2. Literature Review**

In the following chapter, previous relevant studies about the relationship between political ideology and climate change and the impact of climate related policies on stock markets are reviewed.

### *2.1. Political Ideology and Climate change*

Over the last decades, the share of votes for right-wing populism parties in Western European Democracies has almost doubled (Inglehart and Norris, 2016). As these parties often express skepticism about climate change and are largely against the implementation of climate change related policies (Jacob et al., 2020), this could lead to difficulties in addressing the issue in these regions. These findings are supported by Kulin et al. (2021), who conduct a study focusing on the impact that nationalist ideology has on climate change skepticism and climate policy attitudes. Regarding attitudes towards policies, the authors find that nationalist ideology has a large influence. However, when comparing their results with previous research, they find that the impact of traditional left-right ideology on climate change skepticism is more influential (Mayer and Smith, 2019).

In another study analyzing the divide in views on climate change, McCright et al. (2016) find further evidence suggesting that left- or right-ideological views have a strong impact on peoples beliefs in climate change. By examining Eurobarometer survey data

from the European Commission, the authors find that citizens on the left part of the political spectrum expressed more belief in climate change and support for mitigation measures than did citizens on the right. This is not only observable in the EU. Hamilton et al. (2015) for example find that these differences also exist in the US, as republicans seem to distrust scientists regarding climate change questions, whereas Democrats seem to trust in the scientific evidence regarding this issue. This became especially apparent during the 2016 presidential election campaign and through the actions of the republican Trump Administration over the following four years. As Donald Trump and his political base view climate change as an ideological issue, the president announced the assault on climate policy early on in his presidency and even promised that the United States would withdraw from the Paris Agreement. The Paris Agreement is seen by many as one of the key achievements of the previous democratic president Barack Obama (Jotzo et al., 2018). This withdrawal was made official in November 2020, but only lasted until January of the following year, when newly elected president Joe Biden (Democrat) rejoined the agreement, further showing the ideological divide regarding climate change of these two parties.

This thesis takes advantage of the methods used in these studies to construct an index of political stance and analyze its impact on stock markets and especially the performance of green and brown stocks in these two regions over the last 14 years (post crisis).

## *2.2. Climate change related policies and the Stock Market*

Over the last decades, humanity's comprehension of the factors influencing the earth's climate has dramatically improved due to a large body of research on the topic (e.g. Phillips et al., 2020; Hansen et al., 2005). The vast majority highlights the importance of a decrease in carbon emissions over time (Nordhaus, 2019). In order to achieve goals related to carbon emissions set by various governments, more and more climate change related policies have been implemented, for example the Paris Agreement. This accord was one of the most significant results of global multilateral progress, demonstrated member nations' willingness to collaborate and made it evident that the global community needed to move towards a low-carbon economy (Zhang et al., 2017). However, due to the above explained impact of political ideology on climate change views, the 2016 presidential election and the withdrawal of the US from the agreement presented major threats, because long-term goals were threatened to not be achieved

and international cooperation regarding climate change suffered major setbacks (Zhang et al., 2017). As the impact of these policies and the related political actions on the stock market is not immediately observable, it is in the interest of many investors to understand how businesses are impacted by this transition to a greener economy.

Antoniuk and Leirvik (2021) conduct an event study in which they investigate how events related to climate change policies affect stock returns in climate-sensitive sectors. By examining the abnormal excess returns of selected US ETFs around four different event dates (Climategate, Fukushima, Paris Agreement, and the US presidential election), the authors find that these events have significantly impacted returns. The Paris Agreement, Climategate and Fukushima helped the renewable energy industry, because they raised the public's awareness of climate change and increased the support for measures meant to lessen its effects. The fossil energy sector on the other hand benefited from events weakening climate change policy, like the 2016 US presidential election (Antoniuk and Leirvik, 2021). The effects of said election on five important American indices is also analyzed in a paper by Ahmed et al. (2020). The authors find that there is a negative shock on the American stock market observable after the election, highlighting the responsiveness of stock markets to elections and political actions.

Borghesi et al. (2022) find similar results in the EU. Here, an event study methodology is used as well, but rather than focusing on ETFs in climate-sensitive sectors, the authors utilize the stocks included in the "STOXX All Europe 100 Index" (12 different European Countries) to construct green and brown portfolios. The authors divide stocks into green and brown based on the Environmental Pillar Score developed by Thomson Reuters. In order to obtain additional insights on how green policies introduced in the 12 sample countries affect sectoral returns, they apply the OECDs' green policy classification: (i) climate mitigation, (ii) adaptation, (iii) air pollution, (iv) biodiversity, (v) water, (vi) waste and recycling and (vii) other environmental related measures (OECD, 2021). After conducting their event study, the main findings suggest that both green and brown portfolios are positively and significantly impacted by green policy-related announcements. However, the benefits of policies aimed at combating climate change are greater for green portfolios than for brown. In addition, the gap in cumulative abnormal returns between the two types of portfolios further illustrates that green portfolios outperform brown portfolios in the event windows (Borghesi et al., 2022).

The event studies conducted in this thesis will use a sample of 987 stocks from 20 European countries and the US, in order to draw comparisons between the effect climate change related policy announcements have on the stock market in these two regions. Stocks are classified into green and brown using the Environmental Pillar Score developed by Thomson Reuters. To define events, one main climate change related policy for each president in office during the sample period and three of the primary EU policies responsible for the implementation of national policies and measures (EEA, 2018) are chosen. In addition, due to the Paris Agreement being an event which directly affects both regions, it is chosen as well.

### **3. Data**

In this section, the different dependent, independent and control variables used in the regressions are explained (see Appendix E) including a specific chapter covering the construction of the Index of Political Stance (IPS). Furthermore, an outline of the summary statistics is presented.

#### *3.1. Variable Description*

##### 3.1.1. Index of Political Stance

In the first part of the data collection process, an Index of Political Stance is created for the United States covering the period between 2009 and 2022. The time period is chosen to capture the influence of the three different presidents who were in office during this period, two being Democrats and one being republican. This is relevant for the main analysis, because there exists a large body of research proving that the views on climate change of these two parties differ greatly (e.g. Hamilton et al., 2015; Jotzo et al. 2018). As the aim of this study is to draw comparisons between the impact of the political stance on green and brown stock returns in the EU and US, the next step was to create an IPS for a number of European countries covering that same time period. In line with McCright et al. (2016), the Eurobarometer survey is used to construct this index. This survey, which is published twice a year, was established in 1974 by the European Commission to reflect public opinion in the European Union and consists of around 1000 face-to-face interviews per country (European Commission). The results obtained by McCright et al. (2016), a special Eurobarometer survey on climate change conducted in 2021 (European Commission, 2021) and a study by Gregersen et al. (2020), show

that the views on climate change by right-leaning individuals in the European Union are very comparable with the views of republicans on this topic. According to these findings, in the construction of the IPS (in this study) being republican in the US is seen as being right-leaning in the EU. The index of political stance is a dummy variable that is set equal to 1 if the majority of the surveyed population in the sample country is left-leaning/ democratic in that year, and 0 otherwise (right-leaning/ republican). The majority is defined if less than 33 percent of the surveyed population in the EU place their views on the right of the left-right political scale when asked about it or, in the case of the US, if a democratic president is in office in that year. For the EU, only countries are chosen where survey data on political views of individuals is available over the entire 14-year time period (2009-2022).

Appendix A shows the development of this index over time for each of the 21 selected countries. Most European countries seem to be consistent in their political views over the sample period (left-leaning), however there are some countries included in the analysis, for example Hungary, Finland, Sweden or Turkey, which show quite a large variation in views on political matters. This variation in political views will be very important for the empirical analysis conducted later on in this study.

### 3.1.2. Returns of Green and Brown Stocks

For the 21 countries selected, individual monthly stock returns of stocks included in the main index of each country are obtained from Datastream. Appendix B shows a list of these indices. Refinitiv Datastream is again used to obtain data on both the Environment, Social and Governance (ESG) Score and carbon emission for each stock. This data is used to classify the stocks into green and brown. The Classification based on the ESG Score is done by computing the median by country and year. If a stocks ESG Score is above the median, it is classified as green, if it is below, it is classified as brown. Panel A of this classification consists of all green stocks included in the dataset and comprises 68,652 observations. Panel B, which consists of all brown stocks, comprises 70,337 observations. This classification is repeated for the carbon emission of each stock, whereas in this case it is the other way around. If a stocks carbon emission is above the median, it is classified as brown and if it is below the median it is classified as green. This leads to Panel C (green stocks) which comprises 55.172 observations and Panel D with 56.647 observations. The carbon emission classification serves as a Robustness check later on. After excluding all stocks where data on either returns or ESG Scores is

unavailable, I am left with a sample of 987 stocks and 166.824 observations included in the regressions.

### 3.1.3. Control Variables

The final panel dataset consists of 987 stocks from 21 different countries which are observed over a time period of 14 years. Previous research highlights the importance of the inclusion of control variables in panel data regressions. In line with these findings and due to the global scope of this study, not only firm-specific control variables are included, but also two country-specific controls in order to take into account the economic circumstances of the nation in which a firm operates.

Finance theory suggests that there should be a correlation between real sector economic news and stock returns, but there has not been much empirical data to back this up. Birz and Lott Jr. (2011) however, research the impact of macroeconomic news on stock returns in the US using newspaper stories as a measure of macroeconomic news. They find significant evidence that news about GDP growth and unemployment affect stock returns. Furthermore, there exists a large body of research which includes GDP growth as a proxy for a country's economic situation in their regressions (e.g. Duque-Grisales and Aguilera-Caracuel, 2019). The second country-specific control variable included in this study is inflation, measured through the Consumer Price Index (CPI) of each country. Regarding its impact on stock returns, the majority of studies find a negative relationship between the two measures, suggesting that the real component of stock returns may decline as a result of inflation (Madadpour and Asgari, 2019). The annual data for these two measures is obtained from the World Development Indicators database supplied by the World Bank.

Regarding firm-specific control variables, leverage and liquidity of each firm are included in the final dataset. Leverage is generally understood to be the ratio of total debt to total assets and liquidity as the ratio of cash and cash equivalents to total assets. Existing research finds a positive and robust relationship between leverage and variance in stock returns, focusing on a sample of US industrial firms (Aharon and Yagil, 2019). These findings are supported by many recent studies, which introduce the leverage effect hypothesis. This hypothesis states that a decline in stock prices causes financial leverage to rise, raising the volatility of stock returns (e.g. Bollerslev et al., 2012). The effect of liquidity on stock returns is analyzed for example by Chiang and Zheng (2015)

who examine the relationship between the risk of illiquidity in G7 markets and expected excess stock returns. The authors show that there exists a positive correlation between excess stock returns and market illiquidity risk, but a negative correlation with firm-level illiquidity. These two measures are computed with monthly data obtained from Refinitiv Datastream.

### 3.2. Summary Statistics

Table 1 presents summary statistics of the variables included in the empirical analysis. These statistics are computed over the observations included in the two different panels based on the classification by ESG Score explained above. The summary statistics of the country-specific control variables (GDP growth and CPI) are almost equal for the two panels, as the data included in the final dataset for these two variables is obtained annually. Yet in the statistics for returns, leverage and liquidity, there are differences observable which suggest that returns in brown stocks seem to be higher over the sample period. Moreover, green stocks have on average a higher leverage than brown stocks and brown stocks have on average a higher liquidity than green stocks.

Variable	Mean	Min	Max	SD	Kurt	Skew
<i>Panel A: Green Stocks (classified by their respective ESG Score)</i>						
<b>Returns</b>	0,013	-0,897	2,170	0,095	16,711	0,874
<b>GDP Growth</b>	1,634	-11,325	24,370	3,249	5,282	-0,662
<b>CPI</b>	113,778	92,109	542,439	29,180	123,594	9,874
<b>Leverage</b>	27,888	0,000	255,959	16,401	13,157	1,489
<b>Liquidity</b>	10,747	0,008	91,253	10,830	5,998	2,100
<i>Panel B: Brown Stocks (classified by their respective ESG Score)</i>						
<b>Returns</b>	0,015	-1,000	2,596	0,101	21,999	1,266
<b>GDP Growth</b>	1,619	-11,325	24,370	3,271	5,096	-0,671
<b>CPI</b>	113,765	92,109	542,439	29,067	122,969	9,827
<b>Leverage</b>	26,679	0,000	391,589	20,844	47,877	3,793
<b>Liquidity</b>	12,810	0,000	92,993	13,496	4,721	2,001

**Table 1: Summary Statistics of Regression Variables**

Regarding the observation made about the returns of green and brown stocks, this is also observable in Appendix C and Appendix D, where summary statistics of stock returns by country using the ESG Score classification are computed. For all countries

included in the sample, over the sample period brown returns are higher than green returns.

#### 4. Methodology

The empirical study aims to analyze the impact of politics on the performance of green and brown stocks in two ways. First, the long-term effect of politics is captured by analyzing the effect that the predominant political stance in a country has on stock returns. Next, the short-term effect of politics is analyzed by utilizing a classic event study methodology on selected climate change related policies. Both these methodologies are applied to data from the US and the EU, so comparisons between the two regions can be drawn.

The first empirical model uses a classic fixed effects regression model, with stock returns as the dependent variable and the IPS for each country and year as the independent variable. Furthermore, the model includes two firm-specific and two country-specific control variables. The regressions are run on Panel A, which consists of all the data on green stock returns and corresponding data for control variables, and Panel B, which consists of all the data on brown stocks. The final dataset is split into these two panels by using the ESG Score classification explained in the data section of this thesis. In addition to the control variables, year and country fixed effects are included. The regression equation can therefore be described as follows:

$$\text{Return}_{i,j,t} = \alpha + \beta_1 \text{IPS}_{j,t} + \beta_2 \text{GDPgr}_{j,t} + \beta_3 \text{CPI}_{j,t} + \beta_4 \text{Lev}_{i,t} + \beta_5 \text{Liq}_{i,t} + \delta_j + \gamma_t + \varepsilon_{i,j,t} \quad (1)$$

where the monthly Return ( $\text{Return}_{i,j,t}$ ) for a company (i) from a country (j) at time (t), are determined by the Index of political stance ( $\text{IPS}_{j,t}$ ) of country (j) at time (t), the GDP growth ( $\text{GDPgr}_{j,t}$ ) and Consumer Price Index ( $\text{CPI}_{j,t}$ ) of country (j) at time (t), and the Leverage ( $\text{Lev}_{i,t}$ ) and Liquidity ( $\text{Liq}_{i,t}$ ) of company (i) at time (t). Country and time fixed effects are captured by delta ( $\delta$ ) and gamma ( $\gamma$ ). The standard error term is  $\varepsilon_{i,j,t}$ .

As a Robustness check, the same model is run on two additional Panels (C and D), which are split using the carbon emission of each stock as a classification.

In order to draw comparisons between the effect of the political stance in the EU and US on stock returns, the final dataset is divided, so that each part only includes stocks

from the region in question. Unlike the fixed effects model used on the entire sample, the empirical model used for the comparison of the two regions does not include country-specific control variables due to the US Panel only including stocks from one country. Moreover, only year fixed effects are included in the US regressions, but for the EU regressions the included fixed effects stay the same. This is because in the EU sample, 20 different countries are included and there could exist certain variation between these countries which I account for by including country fixed effects. This produces the following two models:

$$\text{US:} \quad \mathbf{Return}_{i,t} = \alpha + \beta_1 \mathbf{IPS}_t + \beta_2 \mathbf{Lev}_{i,t} + \beta_3 \mathbf{Liq}_{i,t} + \gamma_t + \epsilon_{i,t} \quad (2)$$

$$\text{EU:} \quad \mathbf{Return}_{i,j,t} = \alpha + \beta_1 \mathbf{IPS}_{j,t} + \beta_2 \mathbf{Lev}_{i,t} + \beta_3 \mathbf{Liq}_{i,t} + \delta_j + \gamma_t + \epsilon_{i,j,t} \quad (3)$$

In an effort to examine the behaviour of green and brown stocks around the implementation date of climate change related policies, a classic event study analysis is used. This analysis is repeated separately for both the US and EU stocks included in the final dataset. The events chosen for the US are the Clean Power Plan implemented by Barack Obama on the 3rd of August 2015, the withdrawal from the Paris Agreement by Donald Trump on the 4th of November 2020, and the rejoin of the Paris Agreement by Joe Biden on the 20th of January 2021. For the EU, three of the primary EU policies responsible for the implementation of national policies and measures regarding climate change (EEA, 2018) are chosen, which namely are the Renewable Energy Directive (14th of July 2021), the Energy Efficiency Directive (25th of October 2012) and the Energy Performance of Buildings Directive (30th of May 2018). Furthermore, the development of green and brown stock returns around the implementation of the Paris Agreement on the 4th of November 2016 is observed for both regions. Green and brown stocks are again classified using the ESG classification, but only the stocks that were classified as green in the year that the event took place are classified as green stocks in the event study. This is due to the fact that ESG Scores change over time and more and more companies have become “greener”, so companies that were once classified as brown could be classified as green later on in the selected time period. Only focusing on the year that the event took place leads to a more even split in stocks. The time period in trading days used to estimate the expected (average) return is set from t-160 to t-60 with respect to the event which occurred at time t. Furthermore, a gap of 50 trading days

between the estimation and the event window is established to reduce the likelihood that the estimation of the expected return is affected by the event-induced return variance. This leaves an event window of  $t-10$  to  $t+10$ . As a Robustness check, the event window is reduced to  $t-5$  to  $t+5$ . The difference between the realized and the predicted/ estimated returns is then defined as abnormal returns. The cumulative abnormal returns (CARs) are then calculated over the different event windows and in order to graph the cumulative abnormal returns, the average of the CARs of all stocks at every specific event time is calculated.

## **5. Empirical Results**

In this section the empirical results of the analysis are discussed. First, the results of the above explained panel regression models are described and after, the graphs representing the development of stock returns around announcement dates of climate change related policies are presented.

### *5.1. Index of Political Stance and Stock Returns*

As mentioned in the methodology section, the first (1) empirical model uses a fixed effects regression with returns of green and brown stocks as the dependent variable. Table 2 shows the regression results for green stocks, classified by their respective ESG Score (Panel A) including the IPS as the independent variable and all country- and firm-specific control variables. Table 3 on the other hand presents the results for brown stocks (Panel B). In the four columns of the two tables, different fixed effects models were used. The respective standard errors are shown in parentheses and significance is indicated at the one percent, five percent and ten percent levels, respectively, by the symbols \*, \*\*, and \*\*\*.

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	0,001 (0,001)	0,002 (0,001)	0,004*** (0,001)	0,004*** (0,001)
<b>GDPgr</b>	-0,001*** (0,0001)	0,000 (0,0002)	-0,001*** (0,0001)	0,000 (0,0002)
<b>CPI</b>	0,00004*** (0,00001)	0,0001*** (0,00001)	0,0001*** (0,00002)	0,0001*** (0,00002)
<b>Lev</b>	-0,0001*** (0,00002)	-0,00005** (0,00002)	-0,0001*** (0,00002)	-0,00004* (0,00002)
<b>Liq</b>	0,0002*** (0,00003)	0,0002*** (0,00003)	0,0002*** (0,00003)	0,0002*** (0,00003)
<b>Constant</b>	0,008*** (0,002)	0,028*** (0,003)	-0,0001 (0,004)	0,016*** (0,004)
Year Fixed Effects	No	Yes	No	Yes
Country Fixed Effects	No	No	Yes	Yes
Observations	68.652	68.652	68.652	68.652
R2	0,002	0,019	0,003	0,021
Adjusted R2	0,002	0,019	0,003	0,020

Note: \* $p < 0,1$ ; \*\* $p < 0,05$ ; \*\*\* $p < 0,01$

**Table 2: ESG Green Classification Regressions**

As seen in table 2, the results unveil a positive relationship between the IPS and green stock returns for all four different specifications, indicating that if a country's main political ideology was left-leaning during the sample period, this increases returns of green stocks. Regarding the statistical significance of these results, only the IPS results obtained from specification (3) (Country fixed effects) and (4) (Year and Country fixed effects) are significant at the one percent level. In addition to the significance level increasing over the four specifications included in table 2, the impact of the IPS on green stock returns grows larger as well. While specification (1) only indicates an increase of 0,1 percentage points, this impact quadrupled in specification (4) to an increase of 0,4 percentage points. Furthermore, through the inclusion of fixed effects, more variation in the dependent variable (green stock returns) is explained, which can be observed in the Adjusted R-squared reported in Table 2. Here, especially the inclusion of year fixed effects seems to be very important.

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	-0,0002 (0,001)	0,001 (0,001)	0,003*** (0,001)	0,004*** (0,001)
<b>GDPgr</b>	-0,001*** (0,0001)	0,0001 (0,0002)	-0,002*** (0,0001)	0,0001 (0,0002)
<b>CPI</b>	0,00003** (0,00001)	0,0001*** (0,00001)	0,00003* (0,00002)	0,0001*** (0,00002)
<b>Lev</b>	-0,00001 (0,00002)	0,00001 (0,00002)	0,00000 (0,00002)	0,00001 (0,00002)
<b>Liq</b>	0,0003*** (0,00003)	0,0003*** (0,00003)	0,0003*** (0,00003)	0,0003*** (0,00003)
<b>Constant</b>	0,011*** (0,002)	0,033*** (0,003)	0,002 (0,004)	0,021*** (0,004)
Year Fixed Effects	No	Yes	No	Yes
Country Fixed Effects	No	No	Yes	Yes
Observations	70.337	70.337	70.337	70.337
R2	0,004	0,022	0,005	0,023
Adjusted R2	0,003	0,022	0,005	0,023

Note: \* $p < 0,1$ ; \*\* $p < 0,05$ ; \*\*\* $p < 0,01$

**Table 3: ESG Brown Classification Regressions**

In Table 3 the regression results for brown stocks are reported. Similarly to the results presented in table 2, we can observe a positive impact of the IPS on brown stock returns, which increases over the four fixed effects models included in the table and is statistically significant at the one percent level for specification (3) (Country fixed effects) and (4) (Year and Country fixed effects). Regarding the adjusted R-squared, more variation in the dependent variable can be explained when only looking at brown stocks, classified by their respective ESG Score. Furthermore, it is important to point out that although a similar development of the IPS over the four specifications is observable for both green and brown stock returns, in general, when looking at all four specifications, this impact seems to be slightly larger for green stock returns.

The results regarding green stocks are expected and in line with McCright et al. (2016), who show that people's beliefs about climate change are strongly dependent on whether a person has left- or right-ideological views. This would suggest that someone with left-ideological views would pay more attention to the world climate and therefore be more interested in investing in green stocks. Furthermore, if the majority of a country's

population supports these ideological views (IPS equal to one), the government of this country is more likely to implement policies in support of green stocks and the climate. This would make green companies more attractive for investors and force brown companies to adjust to the new political circumstances in order to be able to compete in the market in the future. These factors would suggest that the impact of the IPS being equal to one (majority of the population supports left-ideological views) on brown stocks is significantly smaller or even negative. However in Table 2 and Table 3, not a large difference between the two coefficients is observable. This is surprising and could partly be explained by the method used to classify the main political stance of the countries included in the sample. As only a small fraction of each country's population is surveyed by the European Commission, there exists the possibility that this small fraction does not fully capture the main ideology of each country. I would suggest that future research should therefore focus on increasing the surveyed population and maybe even including questions to find out whether the surveyed person is active on the stock market, as the ideology of this kind of person is the most relevant for this study, due to their direct impact on green and brown stock returns.

To add robustness, the same regressions are run over a sample split by the carbon emission of each stock. This process is explained in detail in the data section of this thesis. The results are observable in Appendix F and Appendix G. I find very similar results regarding the impact of the IPS, the significance level, the adjusted R-squared and fixed effects, suggesting that my results are robust and do not differ significantly depending on the classification method used.

In order to draw comparisons between the impact of political stance on green and brown stock returns in the EU and US, Table 4 and Table 5 show the results obtained from the second (2) and third (3) empirical model. Here, country-specific control variables are excluded. In the four columns of the two tables, different stock classifications are used. In specification (1) and (2), stocks are classified into green and brown by their respective ESG Score and in specification (3) and (4), stocks are classified by their carbon emission.

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	0,015*** (0,002)	0,019*** (0,003)	0,020*** (0,003)	0,016*** (0,003)
<b>Lev</b>	-0,00001 (0,00003)	0,00003 (0,00002)	0,00000 (0,00003)	0,00001 (0,00004)
<b>Liq</b>	0,0002*** (0,00004)	0,0003*** (0,00003)	0,0002*** (0,00004)	0,0002*** (0,0001)
<b>Constant</b>	0,014*** (0,002)	0,016*** (0,002)	0,017*** (0,002)	0,011*** (0,002)
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	34.119	34.135	24.853	24.742
R2	0,017	0,018	0,022	0,016
Adjusted R2	0,017	0,017	0,021	0,015
Note:	* $p < 0,1$ ; ** $p < 0,05$ ; *** $p < 0,01$			

**Table 4: US Regressions**

Table 4 shows the regression results for US stocks. Here, a positive impact of the IPS on both green and brown stocks is observable, which is significant at the 1 percent level for all four classifications. The IPS has the largest impact on green stocks classified by their respective carbon emission (majority of the population has left ideological views increases green stock returns by 2 percentage points) and the lowest impact on green stocks classified by their respective ESG Score (majority of the population has left ideological views increases green stock returns by 1,5 percentage points). When analyzing the adjusted R-squared of the four specifications, for US stocks, the classification into green and brown by carbon emission seems to be the one which is best suited and explains most variation in the dependent variable.

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	0,006*** (0,003)	0,005** (0,003)	0,004 (0,003)	0,005** (0,003)
<b>Lev</b>	-0,0001*** (0,00004)	-0,00005 (0,00004)	-0,0001 (0,00004)	-0,0001** (0,00004)
<b>Liq</b>	0,0002*** (0,0001)	0,0002*** (0,0001)	0,0002*** (0,0001)	0,0001* (0,0001)
<b>Constant</b>	0,041*** (0,005)	0,044*** (0,005)	0,039*** (0,005)	0,040*** (0,005)
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Observations	34.533	36.202	30.319	31.905
R2	0,025	0,028	0,027	0,024
Adjusted R2	0,024	0,027	0,026	0,022
Note:	* $p < 0,1$ ; ** $p < 0,05$ ; *** $p < 0,01$			

**Table 5: EU Regressions**

For European stocks, the regressions results are presented in table 5. Similar to the US, I find a positive impact of the IPS on green and brown stock returns for all four classifications. Nevertheless, the coefficient is not always significant at the 1 percent level and the impact on European stocks is much smaller than on US stocks. For example, if the IPS is equal to one, this increases returns of green stocks classified by their respective ESG Score only by 0,6 percentage points which is less than half of the impact the IPS has on US stocks. This much smaller effect is observable for all four classifications. For European stocks, according to the adjusted R-squared, the classification into green and brown stocks by ESG Score seems to be the one which is best suited and explains most variation in the dependent variable.

One possible explanation for the differences in the size of the IPS effect in these two regions could be that in the case of the US, one single country and its main political stance is observed and in the case of the EU, a region consisting of 20 different countries, each with different political ideologies, is observed. This could mean that in the EU sample countries, some have a larger IPS effect than others, leading to the effects canceling each other out.

Furthermore, the two regions have different political systems. While in the US a president is elected, which is either republican or democratic, the political system in the

EU is mostly based on party politics. This means, in the US there exist two main political ideologies and if an elected president belongs to one of these two parties, it is expected that the majority of the population really does support that specific ideology. In the EU on the other hand, people can give their vote to a variety of different parties, all with different political aims. In this way, the government ends up being led by a combination of the different parties with the most votes. This gives voters more freedom and leads to a more “diversified” government regarding political ideologies. These two different political systems also show themselves in actions against climate change. While a republican or democratic president has a lot of power regarding the implementation of policies that reflect his or her beliefs about climate change (see also event study section of this thesis), in the EU these actions are not as easy to impose by a single party, but rather by a coalition of the governing parties. This could be a possible explanation for the difference in the IPS effect on green and brown stocks in the EU and US.

Lastly, the election campaigns in the US include a lot of media attention and possible candidates travel around the country while their corresponding party organizes large gatherings where each candidate is able to give speeches in order to win votes. The impact of media attention on climate change is covered by a large body of research (e.g. Tavakolifar et al., 2021; Boykoff and Farrell, 2019) which highlights the role of the media in shaping people’s beliefs about climate change and also shows that increased media attention can lead to companies committing to take action against climate change. In the US, the media attention arising from election campaigns of democratic or republican presidents could be a major factor in explaining the larger impact of the IPS on green and brown stock returns compared to the EU.

### *5.2. Event study on Climate Change related policies and the stock market*

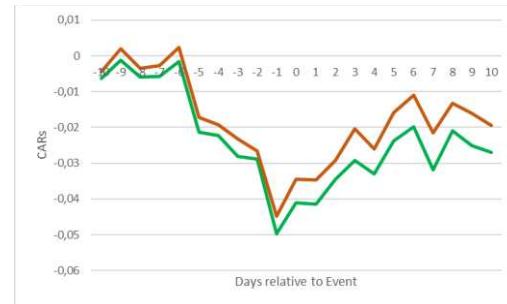
In this section, the different event studies conducted are evaluated. First, I focus on climate change related policy implementations in the EU. After, the short-term effects of such policies in the US are observed. To conclude this chapter, the event study on the Paris Agreement in both regions is presented. The obtained results are robust, as Appendix H shows a similar development of cumulative abnormal returns of green and brown stocks, using a smaller event window.

### 5.2.1. EU Policies

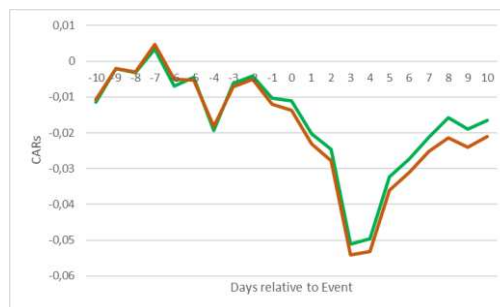
Figures 1 to 8 depict cumulative abnormal returns (CARs) for green (green line) and brown (brown line) stocks around the implementation dates of climate change related policies. Green and brown stocks are classified by their respective ESG Score and CARs are estimated from t-10 to t+10 with respect to the event which occurred at time t.



**Figure 1: Energy Efficiency Directive**



**Figure 2: Energy Performance of Buildings Directive**



**Figure 3: Renewable Energy Directive**

The event studies conducted for climate change related policy implementations in the EU presented in Figures 1 to 3 show different results regarding their effect on green and brown stocks. In the event window of the Energy Efficiency Directive a decrease in CARs is observable a few days prior to the event, but after the implementation took place, green and brown CARs increase slightly, only to be followed by a decrease in CARs at the end of the event window. Furthermore, green stocks seem to slightly outperform brown stocks following the implementation of this policy, suggesting somewhat of a success of this policy.

This is also the case for the Renewable Energy Directive. Here, a large decrease in CARs is observable from a few days prior to the event until three days after the implementation date, followed by a strong increase in cumulative abnormal returns until the end of the event window. The green-brown gap in CARs at the end of the event window is around 0,3 percent. Additionally, it is important to point out that prior to the event, CARs of brown stocks seem to be slightly above green CARs, but after the event,

this is the other way around, further highlighting that green stocks benefit more from this policy.

For the Energy Performance of Buildings Directive, a similar decrease in CARs is observable until a day before the event date, followed by a large increase until the end of the event window. Following this climate change related policy however, brown stocks benefit much more than green stocks. This is observable through the gap in CARs at the end of the event window of around 0,8 percent.

One possible explanation for the different benefits green and brown stocks have from these three policies could be that they impact different sectors more than others. This would be in line with Borghesi et al. (2022), who show that not all sectors benefit from green policy announcements and that occasionally brown portfolios show higher CARs than green portfolios. Regarding the decrease and increase in CARs, the importance of media coverage has to be highlighted again. As these policies draw more attention to green stocks and climate change in general, investors could adjust their investment strategies following this increased attention. Ardia et al. (2020) find similar results regarding media attention to climate change and stock price performance of green and brown firms.

### 5.2.2. US Policies

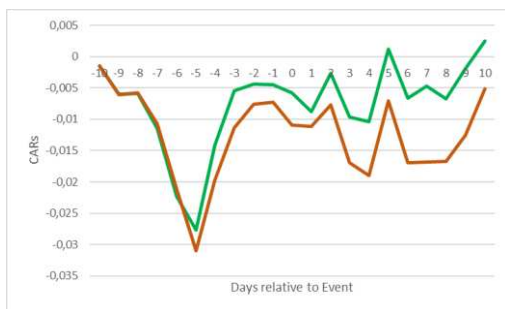


Figure 4: Clean Power Plan



Figure 5: Withdrawal from Paris Agreement

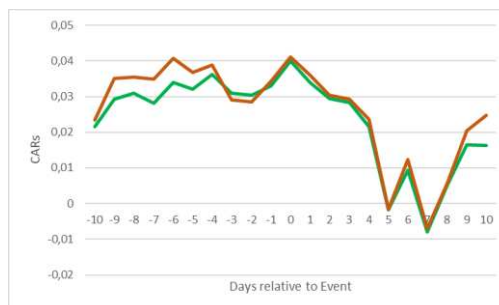


Figure 6: Rejoin of Paris Agreement

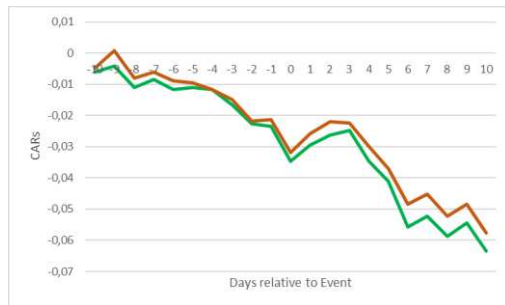
Figures 4 to 6 show the development of cumulative abnormal returns of green and brown stocks around a selection of climate change related policies in the US. Ten days before the implementation date of the Clean Power Plan by democratic president Barack Obama a large decrease in CARs is observable both for green and brown stocks. Five days prior to the event though, these cumulative abnormal returns increase, only interrupted by small fluctuations, all the way until the end of the event window. During this period, it becomes obvious that green stocks benefit a lot more from the implementation of this policy than brown stocks, which is especially demonstrated by a green-brown gap in CARs of around 1,6 percent at the end of the selected event window.

The Paris Agreement will be covered in the next section of this thesis, but in this section, I will already analyze the effects of the withdrawal from this agreement by republican president Donald Trump and the rejoin to this agreement by democratic president Joe Biden. These two policy implementations lead to an almost contrary CAR development. While for the withdrawal green and brown CARs increase from t-4 almost until the end of the event window, following the rejoin to the agreement, green and brown CARs decrease by a lot in the week after the policy implementation. For both policies the development of green CARs and brown CARs is very similar and only at the end of the event window chosen for the rejoin of the Paris Agreement does it seem as if brown stocks benefit a little bit more from this policy. Another important observation regarding the withdrawal of the agreement is that in the week prior to the event green stocks perform better than brown stocks. However, this changes after the event as green and brown stocks show an almost identical CAR development.

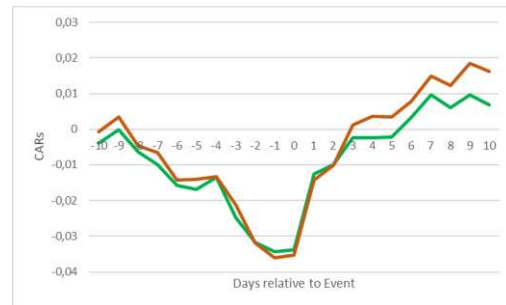
In line with Borghesi et al. (2022), the Clean Power Plan seems to have impacted sectors that have been identified to benefit a lot from green policy announcements. This would explain the exceptionally large green-brown gap in CARs observable in Figure 4. Regarding the withdrawal from, and rejoin to the Paris Agreement, the different major political stance in the US during the implementation dates of these policies has to be taken into account. At the time of the withdrawal, republican president Donald Trump had announced his discontent with the agreement for a few years and when he was finally able to accomplish the goal to withdraw from the agreement, the majority of the population (IPS equal to one) thought of it as a good idea for the economy, explaining the increase in CARs following the implementation date. The rejoin on the other hand

was announced by democratic president Joe Biden in the very beginning of his presidency campaign, following an, according to Donald Trump, controversial election (IPS equal to one). Although this would suggest a positive impact of this policy especially on green stocks, here the increased media attention on Donald Trump and especially his social media activities could have influenced investors to have increased skepticism regarding the agreement, explaining the decrease in CARs.

### 5.2.3. Paris Agreement



**Figure 7: Paris Agreement EU**



**Figure 8: Paris Agreement US**

Figures 7 and 8 show the cumulative abnormal returns of green and brown stocks in the EU and US around the implementation date of the Paris Agreement. The CAR development in these two regions differs a lot. In the EU a decrease in CARs is observable over the entire event window, only interrupted by a small increase in the two days after the implementation date. In the US on the other hand, CARs decrease up until the event date, only to be followed by a large increase in the following ten days. Furthermore, in both cases brown stocks seem to benefit more from the Paris Agreement than green stocks.

These observations partly support the findings presented in table 4 and 5 of this thesis as they further highlight the larger impact of political stance in the US on green and brown stocks compared to the EU. Moreover, the above explained different media attention and political system in the US could also explain the opposing development in cumulative abnormal returns of green and brown stocks in the US and EU.

To summarize, the above conducted event studies further highlight that the political stance of a country does have an impact on the development of green and brown stock returns. In addition, the findings of previous literature regarding media attention and sectoral effects of climate change related policies can be used to further explain the development of cumulative abnormal returns around the implementation dates.

## 6. Conclusion

Previous research has shown that differences exist in the views on climate change depending on which political ideology a person belongs to. However, to the best of my knowledge, how this reflects itself on the stock market has not yet been researched.

This thesis provides evidence that the major political stance of a country does indeed impact the stock market. I find that green and brown stock returns increase by around 0,4 percent in times where the majority of a country's surveyed population has left ideological views, based on a yearly survey conducted by the European Commission. Here, it is surprising that, although theory would suggest that in these times only green firms benefit a lot, brown firms show increasing returns as well. This could partly be explained by the relatively small fraction of surveyed population and because no data is available on investor ideology, who would have the largest impact on stock returns.

Furthermore, I find that the impact of political stance on stock returns differs between regions. By splitting the data sample into US and EU stocks, I show that the impact of the created index of political stance on US stocks is more than twice as large than its impact on EU stocks. For example US green stock returns increase by 1,5 percent in times where a democratic president is in office, whereas in the EU these stock returns only increase by 0,6 percent in times where the majority of the population sees itself as left oriented. A few possible explanations for this are presented in the results section of this thesis, but by working through previous research, I come to the conclusion that the major drivers of the different effect in the two observed regions are the different political systems and media attention. These results prove that long term effects of political orientation on the performance of green and brown stocks exist. I also use different classification methods for green and brown stocks (ESG Score and carbon emission). Between the results obtained for the two different classifications, no large difference is observable, which adds robustness to my findings.

Throughout this thesis I demonstrate that the implementation of climate change related policies is also dependent on the major political stance of a country. This is especially observable in the US. In order to analyze the effect of such policies on green and brown stock performance, I use a classic event study methodology. I find differing results in the EU and US regarding the cumulative abnormal returns of sample stocks, which lead me to believe that some policies have been more successful than others, regarding the

performance of green stocks. However, once again, the major political stance of a country can be seen as a possible explanation for CAR development in the chosen event windows. Furthermore, regarding policy implementations, previous research also highlights the importance of media attention and sectoral effects of some policies.

To end off this thesis I want to summarise the major limitations I see in this study and present some possibilities for future research.

First, this study only covers industrialized western regions. Here, it could be interesting for future research to analyze the impact of political ideology on environmental investments in less advanced markets and other continents of the world.

Next, I have pointed out throughout this thesis that the classification of the major political stance is very general. This is especially the case in the EU as only a fraction of the population is surveyed by the European Commission. Future research could therefore conduct larger surveys in order to gather a more thorough understanding of the major political stance present in a country at that point in time.

The third thing I want to point out is linked to the differences in political systems in the two regions. In the US it is quite easy to deduce the major political stance from the governing party (Republican is seen as right wing and democratic as left wing), however this is not as easy in the EU due to the multi party system. Future research could somehow analyze the election manifesto of governing parties in the EU regarding their actions towards climate change and derive the major political stance of a country from this.

Next, there exists no general consensus on the classification of green and brown stocks. Although the ESG Score is a very useful tool, the point at which a stock is seen as green or brown is defined differently by different authors (some use median, some use upper quartile and so on). If in the future such a general classification exists, future research should definitely use this classification to conduct this study again.

Lastly, as for this study investor reactions are the most relevant, we don't know from the survey data whether investors see themselves as left or right wing. This could be analyzed in future research by integrating questions regarding the stock market activity of individuals in the survey.

# Appendices

Appendix A: Index of political stance by Country over time

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Belgium	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Czech Republic	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Denmark	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Germany	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ireland	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Greece	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spain	1	1	1	1	1	1	1	1	1	1	1	1	1	1
France	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Italy	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Luxembourg	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hungary	1	0	1	1	0	0	1	1	1	0	0	0	0	0
Netherlands	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Austria	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Poland	1	1	1	1	1	1	0	1	1	1	0	0	1	0
Portugal	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Romania	1	1	1	1	1	1	1	1	1	1	1	0	1	0
Finland	0	1	0	1	1	1	1	1	1	1	1	0	0	0
Sweden	0	1	0	0	0	1	0	1	1	0	1	1	0	0
Turkey	0	1	0	0	0	1	1	0	0	0	0	0	0	0
UK	1	1	1	1	1	1	1	1	1	1	1	1	1	1
US	1	1	1	1	1	1	1	1	0	0	0	0	1	1

*Appendix B: List of Indices*

<b>Country</b>	<b>Index</b>
<b>Belgium</b>	BEL 20
<b>Czech Republic</b>	CTX
<b>Denmark</b>	OMX Copenhagen 20
<b>Germany</b>	DAX 40
<b>Ireland</b>	ISEQ
<b>Greece</b>	Athex
<b>Spain</b>	IBEX 35
<b>France</b>	CAC 40
<b>Italy</b>	FTSE MIB
<b>Luxembourg</b>	LuxX
<b>Hungary</b>	HTX
<b>Netherlands</b>	AEX
<b>Austria</b>	ATX
<b>Poland</b>	WIG 20
<b>Portugal</b>	PSI
<b>Romania</b>	ROTX
<b>Finland</b>	OMX Helsinki 25
<b>Sweden</b>	OMX Stockholm 30
<b>Turkey</b>	ISE 100
<b>UK</b>	FTSE 100
<b>US</b>	S&P 500

*Appendix C: Summary Statistics of Green Stock Returns by Country*

<b>Country</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>SD</b>	<b>Kurt</b>	<b>Skew</b>
<b>Austria</b>	0,009	-0,456	0,515	0,095	2,929	0,353
<b>Belgium</b>	0,011	-0,506	0,768	0,104	6,559	0,959
<b>Czech Republic</b>	0,012	-0,456	0,408	0,099	3,050	-0,104
<b>Denmark</b>	0,013	-0,379	0,701	0,093	4,708	0,567
<b>Finland</b>	0,011	-0,465	0,585	0,103	2,886	0,269
<b>France</b>	0,011	-0,521	0,767	0,092	4,120	0,443
<b>Germany</b>	0,010	-0,508	0,556	0,088	2,011	0,090
<b>Greece</b>	0,004	-0,897	1,849	0,195	15,137	1,526
<b>Hungary</b>	0,003	-0,332	0,385	0,089	1,792	0,170
<b>Ireland</b>	0,009	-0,741	2,170	0,185	30,835	2,944
<b>Italy</b>	0,009	-0,397	0,546	0,100	2,356	0,097
<b>Luxembourg</b>	0,009	-0,337	0,504	0,131	1,417	0,466
<b>Netherlands</b>	0,013	-0,445	0,704	0,090	5,192	0,308
<b>Poland</b>	0,006	-0,467	0,530	0,114	2,038	0,296
<b>Portugal</b>	0,002	-0,407	0,614	0,095	3,464	0,426
<b>Romania</b>	0,011	-0,456	0,408	0,105	4,714	-0,535
<b>Spain</b>	0,007	-0,408	0,744	0,097	3,866	0,516
<b>Sweden</b>	0,014	-0,438	0,843	0,088	5,234	0,754
<b>Turkey</b>	0,012	-0,511	1,111	0,129	3,919	0,742
<b>UK</b>	0,012	-0,576	1,242	0,088	9,226	0,579
<b>US</b>	0,015	-0,713	0,997	0,082	7,401	0,344

*Appendix D: Summary Statistics of Brown Stocks by Country*

<b>Country</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>SD</b>	<b>Kurt</b>	<b>Skew</b>
<b>Austria</b>	0,010	-0,547	0,738	0,112	5,940	0,929
<b>Belgium</b>	0,012	-0,301	0,423	0,076	2,482	0,455
<b>Czech Republic</b>	0,006	-0,380	0,738	0,097	9,344	0,824
<b>Denmark</b>	0,016	-0,686	0,560	0,102	3,719	0,134
<b>Finland</b>	0,013	-0,428	0,704	0,097	3,496	0,507
<b>France</b>	0,012	-0,451	0,612	0,090	3,230	0,249
<b>Germany</b>	0,012	-0,549	1,243	0,099	12,429	1,025
<b>Greece</b>	0,007	-1,000	1,448	0,159	8,724	0,710
<b>Hungary</b>	0,011	-0,335	0,974	0,124	10,695	1,584
<b>Ireland</b>	0,011	-0,659	0,872	0,123	6,408	0,718
<b>Italy</b>	0,008	-0,690	0,651	0,115	2,224	-0,023
<b>Luxembourg</b>	0,003	-0,479	0,219	0,084	3,991	-0,928
<b>Netherlands</b>	0,013	-0,399	0,478	0,095	2,099	0,253
<b>Poland</b>	0,011	-0,549	0,703	0,126	3,301	0,773
<b>Portugal</b>	0,011	-0,326	0,427	0,099	1,867	0,447
<b>Romania</b>	0,015	-0,358	0,738	0,117	6,085	0,693
<b>Spain</b>	0,009	-0,558	0,672	0,108	4,017	0,472
<b>Sweden</b>	0,015	-0,398	0,734	0,101	4,286	0,618
<b>Turkey</b>	0,014	-0,440	0,767	0,137	2,389	0,741
<b>UK</b>	0,016	-0,561	0,966	0,097	8,566	0,859
<b>US</b>	0,017	-0,832	2,596	0,095	47,651	2,240

*Appendix E: Table of Variables*

Name	Type	Description	Source	Reference
<b>Return</b>	Dependent	Percentage change in Dollar value of a stock over time	Datastream	Borghesi et al. (2022)
<b>Index of Political Stance (IPS)</b>	Independent	Dummy variable indicating whether the majority of a country is seen as right-leaning (0) or left-leaning (1)	European Commission	McCright et al. (2016) (similar)
<b>GDP growth (GDPgr)</b>	Control	Annual percentage growth rate of GDP at market prices based on constant local currency.	World Bank	Duque-Grisales and Aguilera-Caracuel (2019)
<b>Consumer Price Index (CPI)</b>	Control	Changes in the cost to the average consumer of acquiring a basket of goods and services	World Bank	Madadpour and Asgari (2019)
<b>Leverage (Lev)</b>	Control	Ratio of Total Debt to Total Assets	Datastream	Aharon and Yagil (2019)
<b>Liquidity (Liq)</b>	Control	Ratio of Cash and Cash Equivalents to Total Assets	Datastream	Chiang and Zheng (2015)

*Appendix F: Carbon Emissions Green Classification Regressions*

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	-0,0005 (0,001)	0,002 (0,001)	0,003** (0,001)	0,004*** (0,001)
<b>GDPgr</b>	-0,001 (0,0001)	-0,00002 (0,0002)	-0,002*** (0,0001)	0,0003 (0,0003)
<b>CPI</b>	0,00003** (0,00001)	0,0001*** (0,00002)	0,0001*** (0,00002)	0,0002*** (0,00002)
<b>Lev</b>	-0,00004** (0,00002)	-0,00003 (0,00002)	-0,00003 (0,00002)	-0,00001 (0,00002)
<b>Liq</b>	0,0002*** (0,00003)	0,0002*** (0,00003)	0,0002*** (0,00003)	0,0002*** (0,00003)
<b>Constant</b>	0,011*** (0,002)	0,033*** (0,003)	-0,006 (0,004)	0,013*** (0,005)
Year Fixed Effects	No	Yes	No	Yes
Country Fixed Effects	No	No	Yes	Yes
Observations	55.172	55.172	55.172	55.172
R2	0,003	0,023	0,005	0,025
Adjusted R2	0,003	0,023	0,004	0,025
<i>Note:</i>	<i>*p&lt;0,1; **p&lt;0,05; ***p&lt;0,01</i>			

*Appendix G: Carbon Emissions Brown Classification Regressions*

Dependent Variable:				
Return				
	(1)	(2)	(3)	(4)
<b>IPS</b>	0,002** (0,001)	0,003** (0,001)	0,005*** (0,001)	0,005*** (0,001)
<b>GDPgr</b>	-0,001*** (0,0001)	0,0003 (0,0002)	-0,001*** (0,0001)	0,0005* (0,0003)
<b>CPI</b>	0,0001*** (0,00001)	0,0001*** (0,00001)	0,0001*** (0,00002)	0,0002*** (0,00002)
<b>Lev</b>	-0,00003 (0,00003)	-0,00003 (0,00003)	-0,00003 (0,00003)	-0,00003 (0,00003)
<b>Liq</b>	0,0001** (0,00005)	0,0001*** (0,00005)	0,0001*** (0,00005)	0,0002*** (0,00005)
<b>Constant</b>	0,004* (0,002)	0,026*** (0,003)	-0,004 (0,004)	0,016*** (0,004)
Year Fixed Effects	No	Yes	No	Yes
Country Fixed Effects	No	No	Yes	Yes
Observations	56.647	56.647	56.647	56.647
R2	0,001	0,019	0,002	0,020
Adjusted R2	0,001	0,018	0,002	0,019
<i>Note:</i>	<i>*p&lt;0,1; **p&lt;0,05; ***p&lt;0,01</i>			

Appendix H: Event Window of  $t-5$  to  $t+5$



**Energy Efficiency Directive**



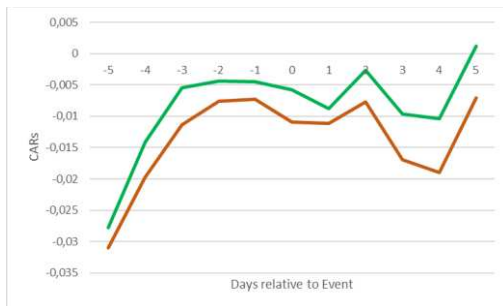
**Energy Performance of Buildings Directive**



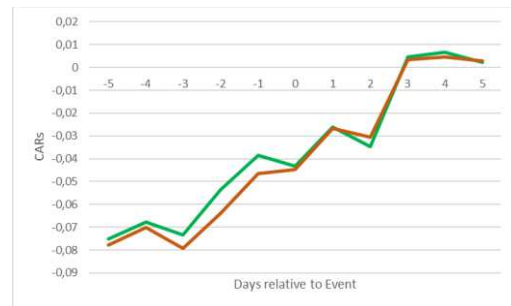
**Renewable Energy Directive**



**Rejoin of Paris Agreement**



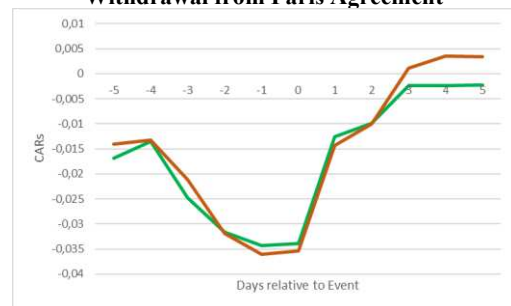
**Clean Power Plan**



**Withdrawal from Paris Agreement**



**Paris Agreement EU**



**Paris Agreement US**

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