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Responsible investments: An analysis of preference

The influence of local political views on ESG portfolio return

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Abstract

The objective of this study is to analyze whether environmental, social, and governance (ESG) investments generate different abnormal excess returns depending on preferences towards ESG assets in the United States. We aim to verify whether these results are consistent with the previously exposed theories explaining the relationships between ESG preferences and excess returns. To measure investor preferences for ESG assets, two different proxies are used: whether the headquarter of the company resides in a Democratic or Republican state, and how the state scored in an Environmental survey from Yale University. Our paper presents evidence that when investors have a strong preference for socially and environmentally responsible investments (Democrats), the abnormal excess returns on ESG investments in these states are negative. Since ESG-motivated investors gain additional utility by holding green assets, they are willing to sacrifice a portion of their returns to incorporate the ESG factor into their portfolio. Conversely, when investors do not value ESG factors to the same extent (Republicans), abnormal excess returns are not significantly different from zero. As a corollary, we also divided states according to their opinions on environmental issues using a Yale University survey and performed the same analysis, confirming the previous results. Our methodology gains validity since the U.S. is in a context of home bias (Coval and Moskowitz, 1999). As a result, people will tend to invest more in their home state, thus the returns will reflect their preferences. Furthermore, the results of our research and the theories it supports are in agreement with the theories of Pastor et al. (2020) and Pedersen et al. (2020), which connect preferences for ESG investments and expected excess returns.

Keywords: ESG, Responsible investing, ESG preferences, Portfolio performance, Environmental awareness

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1. Introduction

The consequences of political and cultural factors on the economy have been extensively analyzed in the economic literature in recent years. The field of political economics has developed into an important sub-branch of the discipline. Although in a more limited way, this branch has also influenced financial research. Socially responsible investing is intrinsically linked to individual and collective values, and our research has its roots in this relation. This study aims to identify the relationship between the returns of socially responsible investments and different political views. Using U.S. data, our goal is to test whether investment strategies based on environmental, social, and governance (ESG) scores in Democratic and Republican states yield different results. Democrats are believed to have a predisposition for CSR-related issues such as Environmental protection, anti-discrimination laws and Affirmative action, employee protection, and helping the poor (e.g. Di Giuli and Kostovetsky (2013)). In this research, we use political views to approximate ESG investment preferences. Moreover, we try to explain the state- and political differences in empirical results by drawing on previous research within the field of preferences and utility regarding ESG-investments.

Although investments in ESG-positive companies have grown substantially, with the Principle of Responsible Investments (PRI) signatories reaching 2.981 in March 2020 with a total of $103.4 trillion in assets under management (AUM), there still exists a broad division between the academic literature regarding the performance of ESG assets. Despite the increasing AUM of ESG investments, there still exists a separation between what kind of companies and investors invest in ESG and CSR. Di Giuli and Kostovetsky (2013) show that if a company has a Democratic CEO and a Democratic board of directors, they spend on average $20 million more on CSR related activities in relation to SG&A expenses than a comparative Republican company. The same authors also point at the fact that Democratic-leaning firms are correlated with more socially responsible business conduct than that of a Republican-leaning firm. These results make it reasonable to believe that Democratic shareholders have a higher preference for ESG investments relative to their Republican counterparts. Even though the political separation between Democrats and Republicans are constant click-bait headlines, the differences in opinions between ESG related matters are substantial. The National Consumer League found that 96% of Democrats believe Congress should guarantee that companies abide and address social issues, compared to 65% of Republicans. Rubin (2008) analyzed the outcome of the 2004 presidential election in communities where companies' headquarters are located and found that the political affiliation of the community and the CSR rating of the company were strongly correlated, with companies in Democratic communities scoring higher on the CSR charts.

Despite the U.S. being a single country, the cultural differences between the states give the feeling of a continent with independent countries. If you were to put a foreigner who never heard of the country in New York City, rural Texas, Wyoming, and northern Oregon, she would believe the places to be from different continents. The same, in our opinion, can be said for their preferences for ESG and ESG investments. Pastor et. al. (2020) shows that in equilibrium, we can expect green assets to have lower expected returns because investors like holding them and since they hedge for future climate risk. Pedersen et. al. (2020) agrees with the notion about certain investors liking to hold green assets, but they also propose to divide investors into three types: ESG-aware, ESG-unaware, and ESG-motivated. The first two are not willing to accept lower returns in return for a green portfolio, but the third one is. The authors state that ESG-motivated (type M-investors) derive utility from holding green assets. In extension, what type of investor you are and what preferences you have will derive your choice of green assets. Meskinimood (2021) demonstrates what it costs for investors to incorporate the ESG factor into their portfolio. The author examines the effect on the investors Sharpe ratio when she transitions from an ESG-unaware investor to an ESG-motivated investor, prompting her to shift her preferences towards green assets. Meskinimood found that being ESG-motivated lowers expected returns and that these preferences stretch across country borders. Although the difference in returns might exist, an investor can choose to invest her money wherever she likes since the technology of today allow her to do so. She can choose to focus her attention on the ESG companies that perform the best and weed out the non-performers, but research shows that investors focus their attention on the home market. Coval and Moskowitz (1999) demonstrate that home bias exists within states in the U.S. as well as in between countries and that investors often choose to invest their money locally, or at least in companies whose headquarters reside in the same state as themselves.

The objective of the thesis is to analyze whether ESG preferences can be proxied by using political opinions in different states and if the performance of ESG investment depends on investor preferences. We also aim to verify whether these results are consistent with the previously exposed theories explaining the relationships between ESG preferences and excess returns. Using the Fama and French (1993) times series four-factor model, we found that abnormal excess returns in Republican states are never significantly different from zero, while in Democratic states they are negative. This is explained by the fact that investors in Democratic states are willing to pay a higher price than what is motivated by financial factors if a company is attentive to social and environmental aspects. The same is not true in Republican states, since investors from these states do not value these issues as much as their Democrat counterparts. A possible weakness of our analysis could be that the

industrial clusters within the states differentiate. We have subsequently taken this issue into account by examining if the effect persists when controlling for excess industry returns, which it does. As a corollary, we also divided states according to their views on environmental issues, using a Yale survey providing the percentage of people in each state that "support regulating CO2 as a pollutant" and "think global warming will harm future generations". As expected, the most environmentally skeptical states (brown states) are Republican and the most convinced (green states) are Democrat. In these extreme states we performed the same analysis we did based on political views, and found that socially and environmentally responsible investments have abnormal negative excess returns in green states, while they are not significantly different from zero in brown states.

Our paper contributes to the financial literature by providing an interpretation of why returns from ESG investments differ across geographical regions and how investor preferences can be approximated in a home bias context. Furthermore, the results of our empirical analysis provide empirical support for what one would expect from the theory. That is, when investors have a strong preference for socially and environmentally responsible investments (Democrats), the abnormal excess returns on these investments are negative. Since ESG-motivated investors gain additional utility by holding green assets, they are willing to sacrifice a portion of their returns to incorporate the ESG factor into their portfolio. Conversely, when investors do not value ESG factors to the same extent (Republicans), abnormal excess returns are not significantly different from zero.

The remainder of this paper is organized as follows. Section 2 outlines the literature related to our research question, as well as the theory supporting our empirical models. Section 3 presents the data set. Section 4 develops the methodology used in our analysis, while Section 5 discusses the results and implications. Finally, Section 6 concludes our thesis and provides suggestions for further research.

2. Literature review

This chapter contains a review of the literature related to our research question and outlines the theory supporting our empirical models. The first section contains an overview of ESG investments, and the relevant results obtained in the theoretical and empirical research analyzing ESG investments, preferences and returns. The second section presents research on how political affiliation in the U.S., as well as geographic and demographic components, affect the way companies view and invest in CSR and ESG activities. The last section presents a review of the home bias puzzle, focusing on domestic home bias in the United States.

2.1 ESG

In this section, we provide a background about the emergence of ESG and ESG investments. We will present a brief explanation about ESG as a concept and how different investors may perceive ESG and ESG investments. Based on our findings, along with additional studies, we will present evidence that investors who prefer green assets gain additional utility by holding them and are willing to sacrifice a portion of their returns to incorporate green assets into their portfolio.

Background

The notion of socially beneficial investments from a business point of view originates from the late eighteen century. During these times, socially beneficial (responsible) investments (SRI) were conducted in the form of philanthropy (Carroll, 2008). After the 1950s, Patrick Murphy (1978) classified an "awareness" era in which corporations gained more recognition regarding their social impact on the community. After the mid-60s, corporations became more specific on their focus areas regarding social impact, shifting the focus from the community as a whole to specific areas. Ten years later, the "responsiveness" era began, and companies started caring about CSR (Corporate social responsibility) related issues.

From this point on, the evolvement of CSR within companies continued and included procedures such as legislations, international events influencing the view on CSR and later, during the 2000s, recognition and practical implementation of CSR to what later became ESG (environmental, social, and governance) (Agudelo et. al. 2019). The practical implementations became a reality with the help of former UN Secretary – General Kofi Annan when he in 2000 launched the "UN Global Compact". The initiative aimed to encourage global corporations and businesses to implement sustainable and

socially beneficial policies, and to report on the performance of these policies. The UN Global Compact addresses principles in the areas of human rights, labor, environmental and anti-corruption[1]. In 2004, UN Secretary – General Kofi Annan invited 55 CEOs of the world's leading financial firms to take part of the initiative in the "UN Global Compact". This led to a report, involving 18 financial institutions with a total of 6$ trillion in assets under management, titled "Who Cares Win", authored by Ivo Knoepfel. The report emphasizes the relationship between ESG and investment decisions and highlights how the ESG factor can be incorporated in investment decisions to, by extension, increase shareholder value (Knoepfel, 2004).

ESG investment

Environmental, social, and governance (ESG)[2] investing encompasses three pillars into the selection, analysis, and later purchase of equity investments. These three factors are used to measure the sustainability and social impact of an investment in a company. The environmental criteria refer to how the company performs in contrast to its effect on nature and issues related to the environment, the social criteria assess how the company manages its relations towards their suppliers, employees, and the community where it operates, and the governance criteria address the company leadership, its audit function, and shareholder rights to name a few[3] (Inderst & Stewart, 2018).

According to Inderst and Stewart (2018), institutional investors must be able to justify their socially responsible investments with that of their members, clients, employees, and policymakers. The authors state that the main objective for investors are financial results, but that some investors also have a non-financial preference that can vary from ethical to religious or political. Beside these preferences lie the reputational/brand motives which usually surrounds the ESG concept. In an article by Lins, Servaes and Tamayo (2017) the authors demonstrate that firms with high social capital, as measured by the intensity of their corporate social responsibility, were not as affected by the financial crisis of 2008-2009 as their peers. Their theory is that firms that invested relatively more into CSR created a better reputation, allowing them to become more trustworthy in the eyes of credit rating agencies, lenders, and investors. The excess trust, or positive karma if one will, allowed these firms to have better crisis period returns than the average company during the stressful period. The author's theory extends to the notion that when overall trust in the market is low, corporate social responsibility helps mitigate some of the negative movements in the market. To broaden the risk perspective, we

[1] See https://citiesprogramme.org/.
[2] May also be called socially responsible investing (SRI), sustainable investing and mission-related investing.
[3] Under the three pillars there exists a wide range of assessments, we provide a few of them in the text.

can make the argument that good CSR companies (and in extension, ESG companies) lower the risk of the portfolio since they act as a hedge against future climate risk (Pastor et. al. 2020), (Inderst & Stewart, 2018).

An increasing amount of literature has studied the outfall of socially responsible investing. Dorfleitner and Halbritter (2015) investigate the link between CSR and financial performance based on three different ESG ratings: ASSET4, Bloomberg ESG and KLD ESG on the U.S. market between 1991 and 2012. The authors adopt a Carhart (1997) four-factor model and a cross-sectional Fama and MacBeth (1973) regression to test whether a portfolio based on a high-minus-low strategy in ESG over-, and underperformers could generate abnormal returns. Their times-series results indicate that the ESG portfolios do not show significant return differences between companies featuring high and low levels of ESG rating. This applies both to the overall scores and to the partial ones. Conversely, Fama and Macbeth (1973) cross-sectional regression revealed that some of the ESG indicators had a significant influence, but that investors hardly could exploit any of these to achieve abnormal returns. They continue by making the argument that the level of impact that the ESG indicators have is dependent on which rating provider is used and what subperiod is examined, making a portfolio strategy based on anything other than theory close to impossible.

Although the research above examines how investors can benefit from ESG investments, some researchers believe that ESG should be considered a part of the investor's utility, as a consequence, green assets[4] will provide utility both by being green and by generating returns. This theory stems from the methodology presented by Merton (1978) which states that there exists a fraction of the investing population who is more ESG-oriented and will refuse to invest in non-green assets. Since ESG-orientated investors have an extra preference, and their choices of investments are limited by their criteria, it follows that green assets have a lower expected return compared to brown assets[5]. According to Luo and Balvers (2017) and Zerbib (2020), the market segmentation of green- and brown assets strengthens this assumption. To give an optional view of the segmentation problem, Pastor et. al. (2020) offers an addition to this theory. They model the investors' utility function with the addition of their ESG preferences, assuming all investors have mean-variance preferences but with the supplement that some investors have an additional preference for ESG assets. The authors then demonstrate that the expected return of green assets ought to be lower than that of brown assets when investors like holding them, since they add additional utility. Conversely, investors that are

[4] Green assets refer to ESG friendly assets which are assets that have a positive impact on the pillars within ESG.
[5] Brown assets refer to ESG unfriendly assets which are assets that have a negative impact on the pillars within ESG.

indifferent to the ESG factors do not gain additional utility by holding green assets. The authors' results indicate that investors' taste matters when choosing which assets to hold, and that these assets later will affect the alpha of the portfolio. Therefore, investors with stronger ESG preferences earn lower expected returns, especially when risk aversion is low and the average ESG taste is high. Their theory is an extension of Fama and French (2007), where the two economists provide a framework for viewing disagreement and tastes in assets as consumption goods. If one were to view assets in this manner, making green and brown assets the subject of preferences, this will in extension affect their prices and their returns.

Pedersen et. al. (2020) examines two of the above-mentioned ways for investors to incorporate ESG information into their process. The investors are allowed to use ESG scores to estimate the risk and return of the asset but also to have a preference over different ESG measures. In other words, investors can choose how much they care about the different ESG pillars. Through this, Pedersen et. al. (2020) proposes three different types of investors, all having mean-variance preferences but different attitudes towards ESG. The ESG-unaware (Type-U) investors are unaware of the ESG scores and only seek to maximize their unconditional mean-variance utility. Like Type-U, ESG-aware (Type-A) investors have mean-variance preferences, but they use the ESG scores of the assets in their risk estimations. The ESG-motivated (Type-M) investor uses ESG information in their risk estimations and they also prefer assets with high ESG scores. The Type-M investor seeks to balance their portfolio regarding high returns, low risk and high ESG scores. The authors also present an intuitive explanation as to why the investor type has a crucial effect on the return of ESG assets. They make the argument that if the economy inhabits many type-A investors, these investors will acquire ESG assets to lower their risk, consequently increasing the price of ESG assets, "thus eliminating the connection between ESG and expected returns"[6]. But if the economy inhabits many type-M investors, then assets with high ESG-scores will deliver lower expected returns, since these investors are willing to accept lower returns to incorporate these assets into their portfolio as they provide utility to type-M investors. With the help of these three types of investors, Pedersen et. al. (2020) introduces the "ESG-Sharpe Ratio frontier" to help determine the portfolio selection problem that ESG-oriented investors face. This frontier helps derive security prices and returns in equilibrium by creating a CAPM model that is adjusted for ESG.

To make a cross-country comparison, Meskinimood (2021) demonstrates in his thesis the costs that are related to shifting one's portfolio from "regular" to green. Meskinimood analyzes the progress

[6] Pedersen et. al. (2020)

when transitioning from an ESG-unaware investor to an ESG-aware and lastly to an ESG-motivated investor, and how this, in turn, affects the Sharpe ratio of the investor's portfolio. This transition translates to an investor going from mean-variance optimizer to having preferences for green assets. This shift in preferences prompts the investor to re-evaluate her portfolio and change her investment strategy towards that of a green ESG portfolio strategy. Meskinimood is the first author to test the theories of Pedersen et. al. (2020) in a cross-country analysis, and his results indicate that investors within different countries have various views and preferences regarding ESG investments. According to the author, Sweden and the United Kingdom pay a higher cost for being ESG-motivated than other European countries in his study, indicating that investors within those two countries have a higher preference for ESG assets and receive greater utility by holding them, prompting them to forego some return to hold the assets.

The work of Pedersen et. al. (2020), Pastor et. al. (2020) and Fama and French (2007) help to provide a map of the costs associated with ESG investments. The authors suggest that one should view it as ESG investments provide additional utility for the investor, and hence they are willing to sacrifice a portion of their returns in order to incorporate the ESG factor into their portfolio. The work of Meskinimood (2021) offers valuable insight into the cross-country effect of ESG investments and ESG preferences, together with the work of Coval and Markowitz (1999) (reviewed later in this chapter), reinforces our hypothesis that ESG returns across borders variates based on preferences. What the above papers do not include is a framework to approximate preferences in an empirical analysis, since what they offer is only a clarification as to what different theoretical preferences lead to. What we hope to provide, with the help of these articles and our empirical tests, is an interpretation of what type of investors have preferences for ESG investments and if it is possible to obtain significant results by producing an investment strategy based on it. In fact, our research is the first attempt at dividing states (countries) according to their indirect preferences for social and environmental issues (using election results and surveys). Once the separation is complete, we look at the ESG portfolio returns and see if they confirm the theory.

2.2 The effect of political affiliation in conjunction with ESG and CSR

Below we outline the theory that supports our empirical models. We present research within the field of CSR and ESG and how political affiliation in the United States, as well as geographic and demographic components, affect the way different companies view and invest in CSR and ESG.

Previous studies show that where the headquarter of a company is located and what culture the company incorporates, have an influence on the decisions regarding the amount of investment and resources used towards CSR and ESG. Di Giuli and Kostovetsky (2013) show that whether the company has a democratic or republican CEO and board of directors and if the company is located in a Republican or Democratic state have a significant effect on how much money the company spends to tackle CSR related issues. In their article, the authors test the hypothesis that Democratic-leaning firms[7] are correlated with more sustainable and socially responsible policies than Republican-leaning firms[8]. The authors emphasize the natural measure of preferences among social responsibility and the ability to measure this through political affiliation in the United States. The Democratic party are believed to emphasize more on CSR-related issues like environmental protection, anti-discrimination laws, employee protection and helping of the less fortunate. This statement is backed by a survey conducted by the National Consumer League which found that "96% of Democrats believe Congress should ensure that companies address social issues, compared to 65% of Republicans"[9]. Di Giuli and Kostovetsky (2013) found that Democratic-leaning firms spend on average $20 million more on CSR activities in relation to SG&A expenses than their Republican counterparts. These companies do not recover the $20 million in increased sales or revenue, making their argument that Democratic-leaning firms have a stronger preference for CSR activities valid. Likewise, Rubin (2008) supports this argument. In his article, where he analyzes the results of the 2004 U.S. presidential election in the communities where company headquarters are located, he observe a correlation between the political beliefs of stakeholders and the companies CSR ratings. His results show that companies within Democratic areas tend to have higher CSR ratings than companies located in Republican areas. Research within the same field has been conducted by Hong and Kostovetsky (2012). They examine the difference between fund managers who made political contributions to Democratic candidates or Republican candidates. Their results state that the Democratic[10] fund managers invest less in brown

[7] A Democratic-leaning firm is a firm which has a higher proportion of democratic stakeholders.
[8] A Republican-leaning firm is a firm which has a higher proportion of republican stakeholders.
[9] Fleishman-Hillard Inc. and the National Consumers League survey, http://www.marketingcharts.com/?attachment_id=400
[10] After controlling for self-interest and other variables, the authors sample consisted of fund managers who solely donated to a political candidate because of their political affiliation.

assets. Even though the authors outline that SRI funds are more likely to be managed by Democratic fund managers, their results hold for non-SRI funds and after controlling for other characteristics.

To expand on this notion, Jiraporn, et. al. (2014) show that in the U.S. a firm's CSR policy is significantly influenced by the CSR policies of firms which are in close proximity, and that more socially responsible firms obtain better credit ratings. According to Jiraporn, et. al. (2014, p.508) the explanation is that "local investors in different geographical locations likely exhibit different preferences for CSR. For instance, in an area where environmental problems are more severe, local investors probably expect the local firms to be more environmentally conscious". The idea that companies within the same market and with similar beliefs attract each other can be seen in places like Silicon Valley, Hollywood, or Las Vegas. Michael E. Porter (1998) wrote about this in his article "Clusters and the New Economics of Competition" where he discusses the implications of cluster economics. One of the great advantages is that similar companies can co-exist in the same geographical location, giving them economic advantages in production, sales, and exchange of ideas. Additionally, Porter (1998) states that it attracts equal talent and equal thinkers, since these workers often are interested in the same companies. This view of demographics along both companies and its talent (workers) strengthens the idea of Republican or Democratic-leaning companies attracting Republican or Democratic-leaning talent, hence making the separation of CSR activity even greater.

The outline of the research presented above gives us confidence that we can validate our research question. There is a documented partition between Republican and Democratic firms in regard to their spending on CSR activities. The studies also show that Democrats are less inclined to invest in brown assets as well as that the geographical location of companies within clusters reinforces their beliefs and attracts talents that have the same views.

2.3 Home bias

In the following section, we give a review of the literature regarding the home bias puzzle and, especially, the home bias puzzle within the United States. We focus on how investors perceive their domestic and the international market and what causes them to over-invest domestically. Furthermore, we give a brief review of what promotes the home bias issue, even though this is yet to be determined. With the help of the previous studies presented, we strengthen our argument that American investors tend to invest in the state that they are in.

International Home Bias

It is common knowledge that diversification is one of the best approaches to reducing the risk of one's investment portfolio. According to the capital asset pricing model (CAPM), the risk-reducing measure of diversification means that every investor will hold the same mean-variance portfolio (Bodie, Kane & Marcus, 2014). Even though investors could earn superior risk-adjusted returns by investing both foreign and domestic according to the diversification approach of the CAPM, research show that investors heavily invest in their own country despite being aware of the benefits of foreign diversification (Lütje & Menkhoff, 2007). This phenomenon is called home bias and was highlighted by French and Poterba (1991) by showing that investors hold nearly all their wealth in domestic assets. Through a simple benchmark model derived through the CAPM, they could demonstrate that for five large markets: U.S., Japan, U.K., Germany, and France, the domestic ownership of shares is 92.2, 95.7, 92, 79 and 89.4 percent, respectively.

Shiller et. al. (1991) believe that return expectations greatly vary across different investor groups. They employ a study asking portfolio managers in the U.S. and Japan about the 12-month outlook on the Dow Jones Industrial Average and the Nikkei index so test whether the managers perceived outlook would differentiate. Their results show that Japanese managers had a more positive outlook on both indices than the U.S. managers, but both parties favored their domestic index and believed it would outperform the other. In an article written by French and Poterba (1991) they state that the above-mentioned phenomenon can be due to the perception of risk. The investors may associate foreign equity investments with additional risk, since their knowledge about the foreign market is usually inferior in relation to their knowledge about the domestic market. The perceived, or very real, risk related to foreign investments is an issue for the investor. In the article, "Information Immobility and the Home Bias Puzzle", authors Nieuwerburgh and Veldkamp (2009) acknowledge the problem of home bias to information asymmetry. The authors create a scenario where investors have equally

available information about their domestic market and a foreign one, though a small advantage of knowing a bit more about the economic condition of their home market. Even though the information in front of them is equally available, the investors choose to further their information advantage about their domestic market by choosing the domestic information. This behavior, the authors state, mitigates the risk of someone knowing more than you do, and the investors can enhance their comparative advantage on the home field. Nieuwerburgh and Veldkamp (2009) conclude that investors favor specialization to retain their comparative advantage, hence the information immobility persists.

Domestic home bias

Given the above arguments and the vast literature about home bias, Obstfeld and Rogoff (2000) recognize the home bias puzzle as one of the six major puzzles in international macroeconomics. Since home bias affects domestic and foreign investments, Coval and Moskowits (1999) wanted to test whether the home bias issue is present between domestic regions as well, and they found that it is. In their paper "Home Bias at Home: Local Equity Preference in Domestic Portfolios", they give comparable explanations to the home bias puzzle as the authors previously mentioned in this chapter. Coval and Moskowitz also give an intuitive explanation that some of the difficulties that exist in international equity trades, also exist domestically. They claim that a portion of these issues arises because of the geographical distance between the investor and the potential investments. The authors illustrate some examples, for instance that companies may have easier access to information about companies that are located in close proximity to the investor, which in turn gives the investor an information advantage. If an investor is able to talk and visit local producers, managers, and suppliers they can more easily acquire valuable information that can help them in their investment decision. Likewise, a local investor that has a good understanding of the local environment and its financial operations may be able to better hedge against its risks. Alongside the economic motives, Coval and Moskowitz give examples of personal reasons to invest at home. The investor may have a close relationship with the local executive, the investor might prefer keeping the money local in order to further the growth of the community, or she could feel more comfortable about the local companies.

Coval and Moskowitz (2001) acquired data on each fund manager investing primarily on the U.S. equity market and analyzed the geographical distance between the fund manager and the top 10 holdings in their fund. What they derived is that the fund manager, on average, invests in companies that are 1,654 to 1,663 kilometers away from themselves while their benchmark portfolio is 1,814 to 1,847 kilometers away. In percentage terms, the fund managers invest in companies that are

approximately 9.32 to 11.20 percent closer to them. In a more recent study by Baik, Kang and Kim (2010) the authors revisit the theory of domestic home bias. The research follows the work of Coval and Moskowitz ((1999) & (2001)) in the field of domestic home bias and their results show that domestic home bias persists.

The impact of the home bias puzzle leads investors to a sub-optimal investment strategy. Investors chose to invest heavily in their domestic market when they could receive better risk-adjusted returns by international diversification. In extension, the home bias puzzle and the lack of foreign and domestic diversification imply that investors in the U.S. tend to invest within the state they are operating.

3. Data and variables

In the following section, we describe the process of collecting the data and motivate the choices of data sources. The chapter contains the following subsections: Financial and Sustainability Data, Political Data, Yale Climate Opinion Maps Data, and Complete Dataset.

As stated in previous parts, our research question requires datasets of different nature (financial, ESG ratings, political data, and environmental surveys), hence we believe it is necessary to detail their descriptions separately. The reference period of our research covers approximately 10 years (from September 2009 to July 2019) and uses data from US-listed companies. The chosen period lies between two important events that strongly impacted the markets, both of which are not connected to our research question: the financial crisis of 2008 and the imposition of tariffs on Chinese products by the U.S. government, led by former president Donald Trump.

3.1 Financial and Sustainability Data

Our dataset includes companies listed on the New York Stock Exchange and Nasdaq for which the ESG score was available on Bloomberg. We choose to use Bloomberg's ESG score since the data are estimated monthly, rather than annually like other datasets. The ESG scores can range between 1 and 100. In our dataset the minimum value found for ESG is 33, the maximum is 91. The financial data are gathered from Datastream where we also obtain the state in which each company is headquartered, the share price, the number of shares available, the book value of the company's equity, and the sector of the company. The number of companies at the beginning of the period (September 2009) for which we have been able to obtain the necessary data are 394, while at the end of the period (July 2019) there are 914 companies in our sample. This increase may be due to both the increase in listed companies, as well as the availability of ESG scores which has increased during recent years. Company returns are computed as follows:

$$(1) \qquad r_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1})$$

where $P_{i,t}$ indicates the price of stock i = 1,2, … , N at time t = 1,2, … , T.

The measurement of risk-adjusted market returns, monthly size, value, and momentum risk factors are collected for the U.S. market from Kenneth R. French Data Library. From the Kenneth R. French

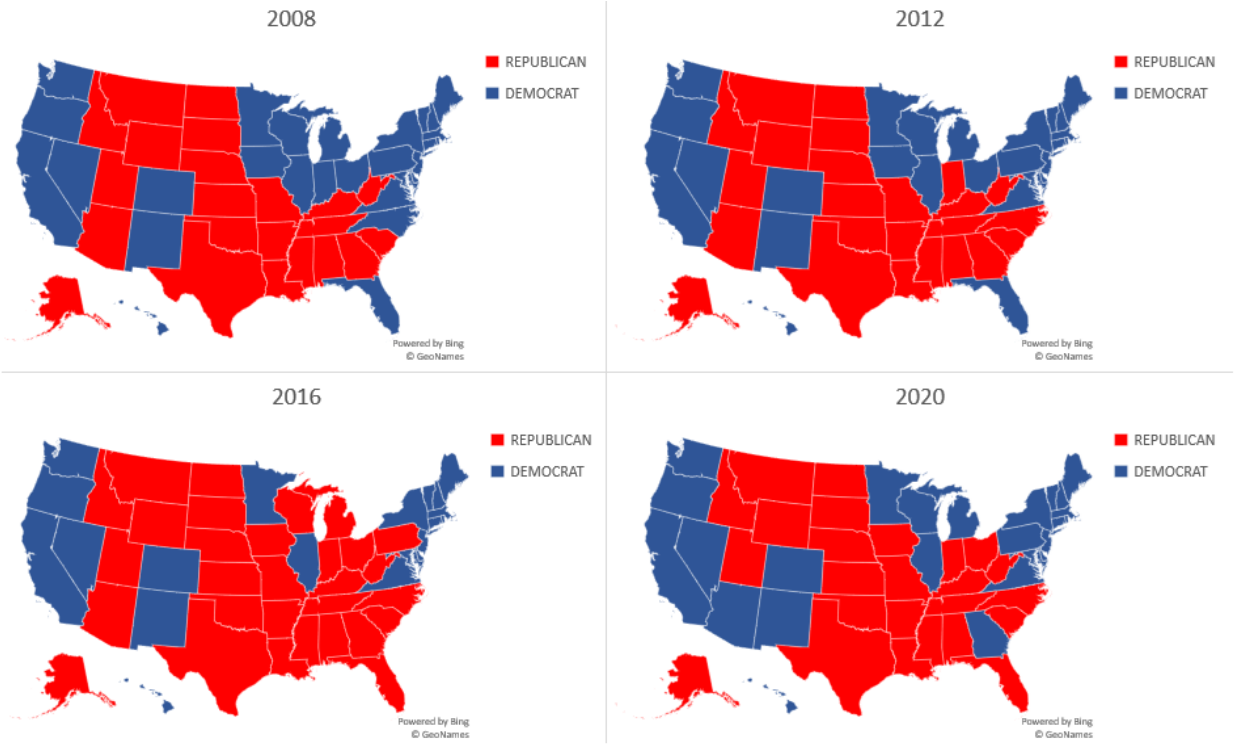
Data Library, we also obtained the returns for each industry sector that are used in our robustness analysis.

3.2 Political Data

For each state in our analysis, we use the political party that got a majority in that state during the presidential election as a proxy for preferences regarding ESG investments. We believe this to be a good approach since, as we discussed in the review of the literature, Di Giuli and Kostovetsky (2014) found that in the U.S. firms tend to score higher in CSR when the headquarter of the company is in a Democratic State, rather than a Republican. An explanation is that political affiliation is a natural measure of preferences for social and environmental responsibility. For instance, the Democrats emphasize more on CSR-related issues than that of the Republicans. Hence, we expect that investors in Republican states care generally less about the ESG-component when choosing which companies to invest in relative to investors located in Democratic states. As a result, we have decided to approximate political preferences using the results of the presidential elections in the period under consideration. The dataset used is the MIT Election Data and Science Lab, which is freely available. The presidential elections that we have considered are those of 2008, 2012, 2016, and 2020. Each state was labelled with "Republican" or "Democratic" depending on the party that had obtained the most votes in the electoral round, respectively.[11] These maps summarize how the states have been classified according to the party that obtained the most votes.

[11] In subsequent robustness analysis a state will be labelled Republican or Democrat if the gap between the two parties is at least 5%. A higher gap was not chosen because it is our intention to obtain a different sample than that linked to the environmental survey, given that the states where the Democrats are highly favored are also the most convinced environmentalists (highest quartile), and vice versa for the Republican favored states are also those least interested in environmental issues (lowest quartile).

Figure 1: Political Maps. Parties who won the most votes in each state in each Presidential election.



3.3 Yale Climate Opinion Data

To have another possible proxy for preferences regarding ESG investments, and to verify if the results are in line with those obtained using political opinions, we also divide states according to their views on environmental issues. This is done by applying Yale Climate Opinion Maps, which is a survey carried out by the Yale Program on Climate Change Communication, a research center within the Yale School of Forestry & Environmental Studies. It provides estimates of U.S. climate change beliefs, risk perceptions, and policy preferences, both at the state and the local level. The most recent surveys carried out are from 2014, 2016, and 2020 and are freely available. The estimates are derived from a statistical model using multilevel regression with post-stratification (MRP) on a large national survey dataset (n> 25,000), together with demographic and geographic population characteristics (Howe et. al. 2015). For our research question, the dataset is necessary as it provides an estimation of the local sentiment about environmental issues, which can be used to approximate the ESG interest of the local investors. The number of questions in the conducted surveys that are recurring in all years are few. Among these, the most relevant questions that we have decided to use as proxies for local environmental sentiment are the following two:

- How much do you support or oppose the following policies? Regulate carbon dioxide (C02, the primary greenhouse gas) as a pollutant.
- How much do you think global warming will harm future generations of people?

The datasets give the "Estimated percentage who somewhat/strongly support regulating CO2 as a pollutant" and "Estimated percentage who think global warming will harm future generations a moderate amount/a great deal" for each state. To simplify, we call the first variable "Regulate" and the second variable "Futuregen". In each question, each state can take a value between 1 (minimum) and 100 (maximum). To have a clear distinction between "environmentally friendly" and "non-environmentally friendly" states, we divide the states into quartiles based on the percentage of people who agreed with the questions asked. We will focus particularly on comparing the states belonging to the first quartile of the distribution with the states belonging to the fourth quartile, as they are the two extremes and therefore can be the most representative. The table shows the quantiles in the three surveys for both questions. It is worth mentioning that Regulate remains roughly constant over time, while Futuregen increases significantly[12], especially for the most skeptical states.

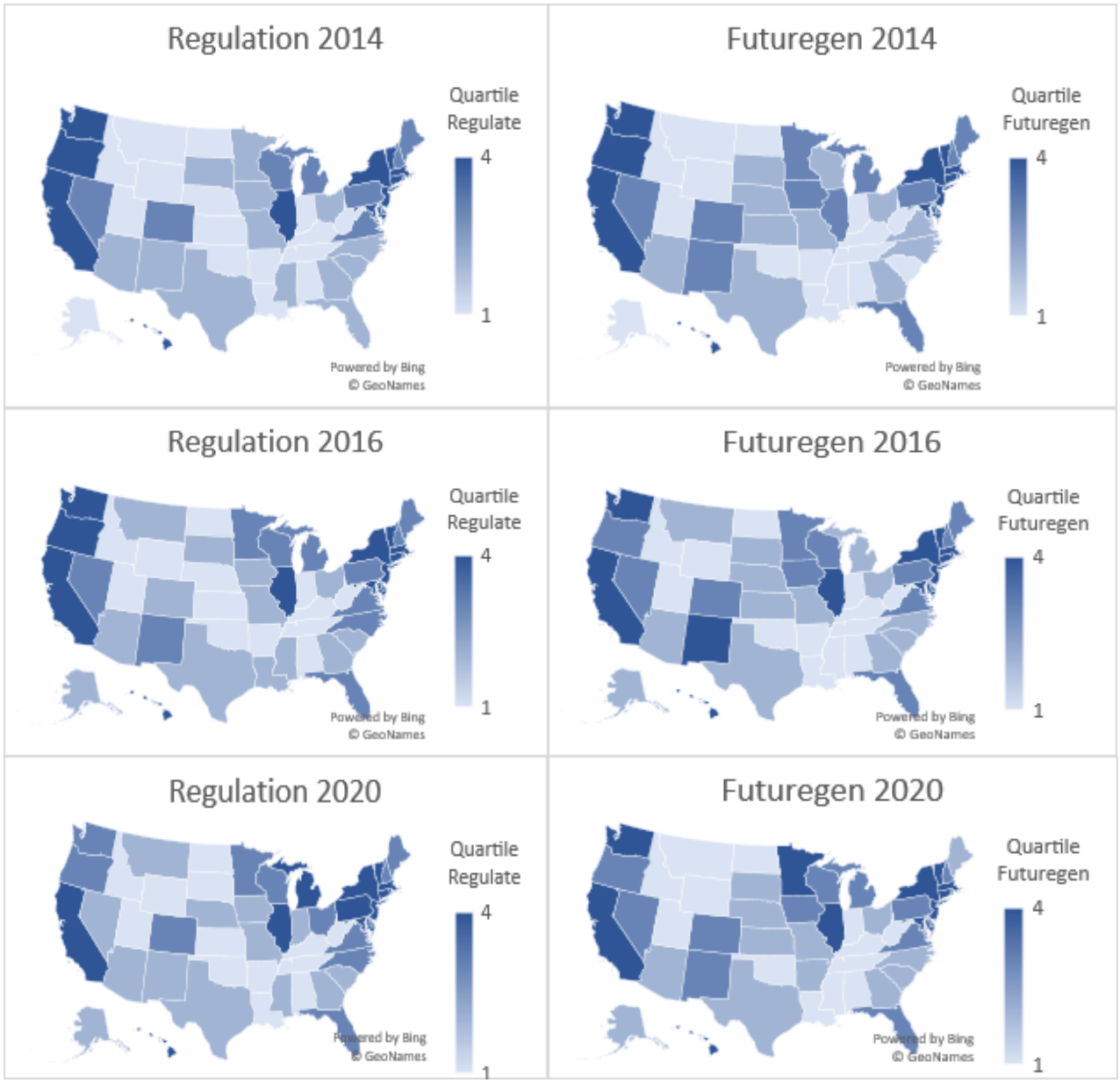
Table 1: Yale Survey. Quartiles for Regulate and Futuregen in 2014, 2016 and 2020 surveys.

Quartile	Regulate (2014)	Futuregen (2014)	Regulate (2016)	Futuregen (2016)	Regulate (2020)	Futuregen (2020)
1st	72	57	71	64	71	65
2nd	75	61	74	69	73	69
3rd	78	65	76	72	75	73
4th	86	80	86	85	81	81

According to the theoretical framework of Pedersen et. al (2020), we assume that investors in the states in the first quartile can approximate ESG-aware (Type-A) investors, whereas the investors in the fourth quartile can approximate ESG-motivated (Type-M) investors. The reason is that, even in the most climate-skeptical states, the majority of people are aware of the problem. However, the interest in the issue, and consequently the motivations, are much greater in the states of the fourth quartile as the table above shows. This is why we consider the investors in the states in the fourth quartile as ESG-motivated (Type-M). We have created maps to illustrate which quartiles the states belong to in each year for each of the two questions.

[12] See also table A.4 in the appendix for more details.

Figure 2: Yale Survey Maps. These maps show to which quartile the states belong in 2014, 2016 and 2020 for each of the two questions.



Not surprisingly, the states colored in darker blue (more concerned about environmental issues) in these maps are all Democratic states[13], while the states which are the least concerned are almost all Republicans[14]. Therefore, we still believe that political views can offer the best reliable proxy for the general attitude of a state towards ESG activities. Nonetheless, these surveys and their extreme quartiles are useful for verifying the results obtained by using simple political majorities.

[13] See the maps in the previous section.

[14] These states are mostly in the Interior West and the Southeast and Republicans have always won there with very large majorities. The only exception is Indiana, which is Democratic.

3.4 Complete Dataset

For each US company in our dataset, we searched for the state in which the company headquarter is located, associating each listed company with a state. We made the pairing between headquarter and state whether it was Republican or Democratic at a certain time, as well as the quartile in which the state was placed in according to the Yale environmental survey. Obviously, we do not have accurate data for each year, as presidential elections take place every four years and the Yale surveys are available only for 2014, 2016, and 2020. To solve this problem, we have decided to associate each state in a certain year to the election and questionnaire closest in time (see table A.3 of the appendix). In our opinion, this approximation is reasonable for the following two reasons:

i. If a state changes political rule from one election to another, it is likely that people in this state will not suddenly change values and opinions, but these changes were probably already present the year before the election.
ii. It is plausible that between 2009 and 2013, before important and divisive events such as the Paris agreement and the Trump presidency, opinions on climate change were quite stable. Therefore, we believe it is reasonable to approximate environmental opinions in this period with the survey of 2014.

At this point, we perform a descriptive analysis of our complete dataset. The number of companies in July 2019 in states where Futuregen is equal to 1 (lowest quartile) is 61, while it is 444 in states where Futuregen is 4 (highest quartile). 55 are companies in states where Regulate is 1 (lowest quartile, while 468 are companies in states where Regulate is 4 (highest quartile). 274 are companies in Republican states, while 641 are companies in Democratic states. Given the data, we believe that the number of companies is large enough in each subsample to conduct empirical analysis. We observe an interesting and noteworthy result concerning the average ESG score and the average E score in the different states, given a certain industry sector. As table A.5 in the appendix illustrates, companies based in less environmentalist and more conservative states usually have a lower score for the same sector in both ESG score and E score only. Our thesis is not within the field of corporate finance so we will not delve further into this topic, but we believe that it confirms the intuition that the local culture has an impact on companies' ESG investments. To conclude, our final dataset starts in September 2009 and ends in July 2019 and it contains 83,172 observations. For simplicity, during the paper, we will label the states which have one of these features as "Brown": Regulate=1, Futuregen=1, Republican. The states with Regulate=4, Futuregen=4, Democratic will be called "Green".

4. Methodology and Portfolio Construction

Our methodology is inspired by Halbritter and Gregor (2015) and previous literature that analyses excess returns in ESG investments. It should be emphasized that the research question we want to investigate, i.e., whether excess returns in ESG investments vary according to the political and environmental culture of the place (used as a proxy for investment preferences in a context where there is home bias), has never been analyzed before. Consequently, we had to draw inspiration from the literature on the subject and adapt it for our research purposes. In particular, the four-factor Fama-French time series regression model is often used in the literature. Therefore, a summary of the most important features of the model is necessary.

Using a regression analysis of the average returns of US stocks, Fama and French (1993) investigated a series of alternative variables to CAPM market beta, able to better explain the returns of companies. The three-factor time-series model they used is the following:

$$(2) \quad R_{i,t} - R_{F,t} = \alpha_i + \beta_i(R_{M,t} - R_{F,t}) + \mu_i SMB_t + \Theta_i HML_t + \varepsilon_{i,t}$$

where $R_{i,t} - RF_t$ represents the excess return of a certain stock and $RM_t - RF_t$ the market excess return. SMB stands for "Small Minus Big" market capitalization and HML for "High Minus Low" book-to-market ratio. They measure the excess returns of small market capitalization companies return versus large market capitalization companies and of value stocks over growth stocks. The reason why they considered SMB as a factor is that, in the long run, small-cap companies tend to achieve higher returns than large-cap companies. The HML factor reveals that, in the long run, value stocks (high book-to-market ratio) enjoy higher returns than growth stocks (low book-to-market ratio). These higher realized returns are supposed to be compensations for risk and therefore they are used as risk factors in the model. To use an even more precise model, following the literature on ESG investments, we have included a fourth factor in our analysis, Carhart's (1997) momentum. Momentum is described as the tendency for a stock to continue moving in the direction it moved last period. The Momentum factor was created by subtracting the equal-weighted average of highest performing firms from the lowest-performing firms, lagged one month. The model then becomes:

$$(3) \quad R_{i,t} - R_{F,t} = \alpha_i + \beta_i(R_{M,t} - R_{F,t}) + \mu_i SMB_t + \Theta_i HML_t + \gamma_i MOM_t + \varepsilon_{i,t}$$

In general, if asset pricing models are sufficient to explain expected asset returns, α must be zero. Therefore, α is also called the abnormal excess return of the portfolio (over the theoretical expected

return). In the context of ESG investments, most of the empirical research use the following version of the Four-Factor model:

$$(4) \quad ESG_{i,t} - R_{F.t} = \alpha_i + \beta_i\left(R_{M,t} - R_{F,t}\right) + \mu_i SMB_t + \Theta_i HML_t + \gamma_i MOM_t + \varepsilon_{i,t}$$

where $ESG_{i,t} - RF_t$ represents the monthly excess return of a portfolio following a socially responsible investment strategy. The ESG portfolio is built on the same methodology as Fama and French (1993) to construct their HML risk factor. That is, we sort the stocks according to their ESG score[15] and calculate the percentile. In our thesis we have always used two percentile cut-offs to divide stocks into High ESG and Low ESG, respectively: a 50-50 (median) and a 70-30 (as used by Fama and French). That is, a company ends up in the "High ESG" group if it has an ESG score higher than the median (70th percentile in the 70-30 portfolio). Conversely, if it has an ESG score less than the median (30th percentile in the 70-30 portfolio), it ends up in the "Low ESG Portfolio". The portfolio we are most interested in, as it balances a high cut-off for the ESG score and a fairly diversified portfolio, is 70-30. These cut-offs are chosen since we observed that there are usually fewer companies in the brown states than in the green states, therefore these cut-offs allow for a diversified and numerous equity portfolio in both groups[16]. In the appendix, we repeated the same analyzes with an 80-20 cut-off to verify if the results are substantially the same as with the 70-30 strategy, and so it was. In this setup, a zero-sum investment strategy is constructed investing in high ESG assets, and short selling low ESG assets. The return of each sub-portfolio is calculated as the market value-weighted return of all assets included:

$$(5) \quad Low = \sum_{i \in Low} \frac{MV_{i,t-1}}{\sum_{j \in Low} MV_{j,t-1}} R_{i,t}$$

$$(6) \quad High = \sum_{i \in High} \frac{MV_{i,t-1}}{\sum_{j \in High} MV_{j,t-1}} R_{i,t}$$

The HML portfolio return is therefore obtained by subtracting the return of the low portfolio from the return of the high portfolio. If the alpha of the estimated model is significantly different from zero, it means that the ESG portfolio has abnormal excess returns which cannot be explained by the exposition to the factors.

[15] In the appendix we also create portfolios based on E, S and G scores by themselves and repeat the analysis.

[16] It is worth mentioning that the difference in the ESG scores between companies in Republican and Democratic states is not that big. On average, a company in a Democratic state has an overall ESG score that is only 1.01 points higher than a company in a Republican state (1.46 given a certain industry). This allows us to argue that ESG-based high and low portfolios are relatively comparable between republican and democratic states, as both states have socially (ir)responsible companies.

As already mentioned in the data section, states are defined as “Brown” (indifferent to ESG issues) or “Green” (concerned about ESG issues) according to different criteria. Respectively, a state is:

i. Brown when the Republicans have the majority and Green when the Democrats have the majority.
ii. Brown when "Regulate = 1" and Green when "Regulate = 4”.
iii. Brown when "Futuregen = 1" and Green when "Futuregen = 4”.

Our aim is to verify if there are differences in the abnormal excess return between ESG investments in different states, depending on the political views or the environmental concerns of the inhabitants of those states. Therefore, the models used will be of the type:

$$(7) \qquad ESG^{j}{}_{i,t} - R_{F.t} = \alpha^{j}{}_{i} + \beta^{j}{}_{i}\left(R_{M,t} - R_{F,t}\right) + \mu^{j}{}_{i}SMB_t + \Theta^{j}{}_{i}HML_t + \gamma^{j}{}_{i}MOM_t + \varepsilon^{j}{}_{i,t}$$

Where j can represent either a brown or a green state and $ESG^{j}{}_{i,t} - RF_t$ represents the monthly excess return of an HML portfolio following a socially responsible investment strategy in brown or green states. Our hypothesis, justified in the theoretical section of our research, is that there are no abnormal excess returns in the brown states, while the abnormal excess returns in green states are negative. Since in brown states, responsible (ESG) financial investments are not priced by investors (we are in a context of home bias and we assume that investors reflect the culture of the state they live in), while in green states investors are willing to accept a lower return than the market if a company is attentive to social and environmental aspects. This is true since ESG investments provide additional utility for ESG-motivated investors, hence they are willing to sacrifice a portion of their returns to incorporate the ESG factor into their portfolio. We will compare alpha in the green and brown states on a case-by-case basis, to see if any pattern emerges that can confirm our starting hypothesis and if this pattern is consistent and robust.

A possible weakness in our methodology may be that more companies operating in polluting sectors are concentrated in the brown states, and that the differences in unexplained excess returns may be due to differences between returns in the sectors. For this reason, in the following sections we will control for this possible bias, using a dependent variable called "excess industry return", defined as "industry adjusted returns - the risk-free rate". The industry adjusted returns will be obtained as "return of the company - return of its industry". The average monthly return for each industrial sector is always obtained from the Kenneth R. French Data Library. Each company has been associated by us with its respective sector in this dataset.

5. Empirical Section

In the following section, based on the data review in section 3 and the methodology explained in section 4, we present the empirical results for the abnormal excess returns, computed as the intercept of a Fama and French (1993) times series regression for the excess return of high minus low ESG portfolios. This section also presents tables stating the six different proxies used for estimating ESG preferences and if portfolios based on these proxies generate different abnormal excess returns. Additionally, robustness tests are examined to strengthen the analysis. Lastly, we discuss how the empirical results are related to the theoretical literature reviewed in section 2.

5.1 Times series regression

Table 2 shows the results of Fama and French (1993) times series regressions plus momentum performed with the method described in section 4. Standard errors are calculated using the Newey and West (1987) procedure, as it is in Halbritter and Gregor (2015). The estimator is used to overcome autocorrelation, and heteroskedasticity in the error terms in the time series models.

Table 2: Abnormal Excess Returns. The table shows the estimated alphas from the Fama and French four factor models. The dependent variable is the monthly excess return of an HML portfolio following a socially responsible investment strategy in a green or brown State. 50-50 means that the 50% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

	50-50 split	**70-30 split**
Brown (Republican)	-0,043	-0,044
	(0,148)	(0,223)
Green (Democratic)	-0,30**	-0,586***
	(0,155)	(0,224)
Brown (Regulate)	0,569*	0,464
	(0,334)	(0,387)
Green (Regulate)	-0,384**	-0,522**
	(0,169)	(0,203)
Brown (Futuregen)	0,021	-0,146
	(0,331)	(0,353)
Green (Futuregen)	-0,427***	-0,529**
	(0,178)	(0,212)

As mentioned in the previous section, our focus is on the sign and significance of the intercept (alpha, the abnormal excess return), which is the excess return that cannot be explained by the exposition of the portfolio to the financial factors. In the performed regressions, the high ESG minus low ESG portfolios present an alpha that is not significantly different from zero in the Republican states, while they present an alpha that is significantly negative in the Democratic states[17]. This occurs both when the 50% and 30% best (worst) performing firms are assigned to the high (low) portfolio. In the appendix, we have verified that this is confirmed even when the cut-off is at 20%. The results can be viewed in table A.10 of the appendix and are of similar nature as the previous portfolios tested, with a negative alpha for high minus low ESG portfolios in green states and non-significant alpha for high minus low ESG portfolios in brown states, indicating that more extreme portfolios do not make the distinction better. The explanation, according to the literature presented in section 2.1, is the following: when investors have a strong preference for socially and environmentally responsible investments (investors in Democratic states), the abnormal excess returns on these investments are negative. As a result of ESG investments providing additional utility for ESG-motivated investors, they are willing to sacrifice a portion of their returns to incorporate the ESG factor into their portfolio. Conversely, when investors do not value ESG factors to the same extent (investors in Republican states), abnormal excess returns are not significantly different from zero.

As discussed in the previous sections, we also divide states according to their views on environmental issues using the percentage of people in each state that "support regulating CO2 as a pollutant" (Regulate) and "think global warming will harm future generations" (Futuregen). As already mentioned, we concentrate on comparing the abnormal excess returns in the states in the first and the fourth quartile. The reason is that we want to observe if, by approximating "green" and "brown" states using an alternative method based on two significantly different views, we get the same empirical results as when we approximated ESG-motivated investors by using political preferences. We found that to be true. When dividing the states according to their answers in the Yale Survey, the abnormal excess returns in the brown state of the high ESG minus low ESG portfolios are not significantly different from zero, while they are significantly negative in the green states. By creating high (low) portfolios consisting of the best (worst) performing 30% of the companies, the abnormal excess returns in the green states and indeed negative by at least 0.52% per month.

[17]In the appendix (tables A.11, A.12 & A.13) we carried out portfolio strategy also by looking at the E, S and G partial scores, but not significantly results emerged.

It is worth noting that the significance level of the alpha coefficient in the 30% strategy, which is the most relevant strategy for our research, is greater when the states are divided into brown and green according to political affiliation, rather than the answers given in the Yale survey. One possible interpretation is that socially responsible investors are interested in socially responsible companies on a broader level (not just environmentally), and the interest in social and environmental issues overall is more directly approximated through political influence, as we discussed in the previous sections. To conclude, as a further robustness test, we repeated the same analysis using the six-factor Fama and French model (table A.9 in the appendix). The results remain substantially unchanged.

5.2 Robust analysis: Excess industry return

As previously discussed, the economic advantage of cluster economics may lead to a concentration of companies in brown states that operate in polluting sectors. This effect may produce a weakness in our methodology since the difference in abnormal excess returns may be due to differences between returns within the sectors. For this reason, we also performed the same times series regressions but using "excess industry return" ("industry adjusted returns - the risk-free rate") as dependent variable in our Fama and French (1993) times series regressions described previously. The industry adjusted returns are obtained as "the return of the company - the return of its industry". Table 3 shows the estimated alpha of the regression. This robustness analysis substantially confirms the results of the previous section. In most ESG portfolios, alpha is not significantly different from zero in brown states, while it is significantly negative in green states, especially when the 30%[18] best (worst) performing firms are assigned to the high (low) portfolio. In Democratic states, using a top and bottom 30% strategy, the abnormal excess industry monthly return amounts roughly to -0,53%. As a further robustness test, we repeated the same analysis using the six-factor Fama and French model (table A.9 in the appendix). The results in the green states are even more significant but they still tell the same story.

[18] And 20%, see the table A.10 in the Appendix.

Table 3: Abnormal Excess Industry Returns. The table shows the estimated alphas from the Fama and French four factor models. The dependent variable is the monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green or brown State. 50-50 means that the 50% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

	50-50 split	**70-30 split**
Brown (Republican)	0,066	0,139
	(0,168)	(0,300)
Green (Democratic)	-0,221*	-0,532***
	(0,135)	(0,188)
Brown (Regulate)	0,844*	0,789
	(0,459)	(0,606)
Green (Regulate)	-0,23	-0,453**
	(0,174)	(0,204)
Brown (Futuregen)	0,048	−0,254
	(0,355)	(0,440)
Green (Futuregen)	-0,419**	-0,500**
	(0,179)	(0,212)

Table 4 reports the results of a regression that uses HML portfolio of industry excess returns as a dependent variable where the states have been classified as “Democratic” or “Republican” only if the percentage difference in the election results between the two parties is at least 5%. This robustness analysis is performed to remove states in which one side’s victory over the other was less clear-cut and to better capture the dominant view in a certain state. This improves the significance of the coefficients in the 50-50 strategy and the magnitude in 70-30 strategy, but the results are substantially the same as before. This analysis confirms the validity of our starting hypothesis, since the results in the previous section do not depend on a bias due to the different returns of the sectors present in the states.

Table 4: Abnormal Excess Industry Returns. The table shows the estimated alphas from the Fama and French 4 factors time-series regressions. The states are categorized as "Republican" or "Democratic" if the respective party won by a margin of at least 5%. The dependent variable is the monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green (Democratic) or brown (Republican) State. The dependent variable is the monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green or brown State. 50-50 means that the 50% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

	50-50 split	**70-30 split**
Brown (Republican)	0,199	0,155
	(0,216)	(0,359)
Green (Democratic)	−0,299**	−0,616***
	(0,144)	(0,204)

To sum up, using the Fama and French (1993) times series four-factor model, we found that abnormal excess returns in Republican states are never significantly different from zero, while in Democratic states they are significantly negative. The results can be explained seeing that investors in Democratic states are willing to accept lower returns than the one priced by pure financial factors, if a company is attentive to social and environmental issues. The same is not true in Republican states, since investors from these states do not value these issues as much as their Democratic counterparts. The reason is, according to the literature (e.g. Di Giuli and Kostovetsky (2013)), Democrats have a predisposition for ESG-related issues. Consequently, in our research we used political views to approximate ESG investment preferences. Our methodology gains validity since we are in a context of home bias and as a result, people will tend to invest more in their home state, and the returns will reflect their preferences.

Alongside the above-mentioned empirical tests, we constructed high minus low portfolios with the top and bottom 30% quartiles based only on a specific partial score (E, S or G) (see tables A.11, A.12 & A.13 in the appendix). None of these have an abnormal excess industry return (alpha) significantly different from zero. The straightforward explanation of this is that ethical (ESG motivated) investors care about the overall ESG score rather than partial scores. For instance, if one company is highly environmentally friendly (high E) but treats their employees badly (low S) and is involved in controversies, ethical investors will not accept a lower return to hold the shares of this company, since it will not add additional utility for the investor. Similarly, if a company treats its employees very well and is active in charities (high S) but is

environmentally unfriendly (low E), the ESG motivated investor is not willing to sacrifice returns to incorporate the company into her portfolio. Furthermore, the typical preferences of a Republican or Democrat is associated with all dimensions of ESG, not just a particular one. Hence the insignificant abnormal returns obtained through partial scores are not surprising as we believe that the portfolio most representative of ESG motivated preferences is the one that bases the investment strategy on the overall ESG score, which produces negative abnormal excess returns. As a corollary, we divide states according to their views on environmental issues. In the two groups of states which have the most extreme views (first and fourth quartile in the Yale Environmental Survey) we perform the same analysis as we did on the data of political affiliation, and the results are that socially and environmentally responsible (ESG) investments have abnormal negative excess industry returns in green states, while they are not significantly different from zero in brown states.

5.3 Discussion of our results in relation to the previous literature

As it is explained in the literature review and the methodology section, we aim to combine the theories of ESG investments, political affiliation, and home bias to examine if there exists a variation in the abnormal excess returns of ESG assets in Republican and Democratic states and if so, what causes the variation to occur. As previously discussed, our empirical results show indeed that there exists a significant difference between abnormal excess returns in ESG portfolios across various proxies for ESG preferences such as state political affiliation and Yale environmental survey data. These results are similar to that of previous research by Luo and Balvers (2017) and Zerbib (2020): that ESG investments can lower the expected return of the portfolio. However, newer research within the field of ESG investments by Pastor et. al. (2020) and Pedersen et. al. (2020) suggests that investors have different preferences for ESG (green) assets. Only if an investor has strong preferences (type-M investor) for ESG assets she is willing to accept lower expected returns to improve the ESG score of her portfolio, since holding green assets provide additional utility for the investor. Our results indicate that there exists a clear distinction between the portfolio returns across the various proxies we have used to measure ESG preferences. Investors within Democratic states have stronger preferences for green assets, i.e., they receive utility by holding them, hence the alpha of the portfolios within Democratic states are negative and statistically significant. Conversely, when investors do not value ESG factors to the same extent (Republicans), abnormal excess returns are not significantly different from zero. Alongside political affiliation, the other proxies used are the

two questions from the Yale Environmental Survey. By creating portfolios based on the answers from the two questions and utilizing the Carhart four-factor model to examine the alphas, similar results are obtained as by dividing the sample according to the political data. Based on the findings from our tested portfolios (50% and 30% quantile), which show a significantly negative alpha for the high minus low ESG portfolios in green states and a not significant alpha in brown states, we also estimate the same regressions but opting for a more extreme portfolio using the top and bottom 20%, confirming our results.

Based on our empirical findings, and by the work of Pedersen et. al. (2020), we are able to categorize investor-collectives within Democratic and Republican states as type-M and type-A investors, respectively. Pedersen et. al. (2020) states that type-A investors invest in green assets to lower their risk, increasing the price of these assets until they reach an equilibrium price, resulting in a non-significant alpha. Conversely, if the economy (i.e., state) inhabits many type-M investors, it will increase the price of green assets "above the equilibrium price"[19] since type-M investors like holding them as they provide additional utility, resulting in a negative alpha. To assume that the ESG preferences within each state are not affected by the preferences of the whole economy, the home bias theory is taken into consideration. According to Coval and Moskowitz (1999), investors tend to focus their investments towards their home state, making the assumption of "inside state economies" more plausible and retaining the idea of investor types skewing the expected returns of green assets according to the arguments by Pedersen. et. al (2020). Furthermore, one can observe from table 1 in the data section that most of the people, even in the first quartile of the survey, cares about the two questions that were asked, and the difference between the first and fourth quartile is not like night and day. This gives us confidence to categorize the investors as type-A and type-M rather than type-U and type-M since there exists an awareness about ESG issues and their implications in all of the states. By making the above categorization, we can create proxies for ESG preferences which, based on our empirical results, are valuable when examining ESG investments. Our results indicate that dividing companies based on the state where their headquarters is located, together with the theory of cluster economies by Michael E. Porter (1998), is sufficient in explaining the observed difference in returns between green and brown assets.

[19] In this context, the equilibrium price is the price of a green asset without the additional utility gain by type-M investors. Without the utility gain, the prices of the green assets would be lower.

Conclusion

This study aims to examine whether different preferences towards Environmental, social, and governance (ESG) assets affect portfolio performance when investing in green assets across different states in the United States. In this paper, we use two different proxies to model ESG preferences, one being political affiliation and the other being survey data from Yale regarding environmental issues. Moreover, we employ the framework proposed by Pedersen et. al. (2020) and Pastor et. al. (2020) to categorize investors according to their preferences and to explain what causes the portfolios to have different expected abnormal returns. Given that in the U.S., according to Coval and Moskowitz (1999), people tend to invest more in their home state, our assumption is that the excess abnormal returns of a company located in a certain state will reflect the local preferences concerning environmental and social issues.

By considering a sample of U.S. stocks and their total ESG scores over the period from September 2009 to July 2019, portfolios are constructed based on the state where the headquarter of the company is located and the political orientation of that state[20]. Through these separations, high minus low ESG portfolios are created and their excess abnormal return (alpha) are examined through time-series regressions using the Fama and French (1993) three factor model plus momentum[22]. By examining the sign of the alpha, and by employing recent academic theories stating that ESG-motivated investors are willing to accept lower excess abnormal returns from ESG investments, we can confirm that investors in Democratic states have higher preferences for green assets. The higher preference towards green assets causes them to have a lower expected abnormal return compared to "normal" assets. In Republican states, there exists no significant alpha for a high minus low ESG portfolio, since these investors hold no preferences for green assets. The explanation, according to the work by Pastor et. al. (2020) and Pedersen et. al. (2020), is the following: when investors have a strong preference for socially and environmentally responsible investments, green assets provide additional utility for them and they are then willing to sacrifice a portion of their returns to incorporate the ESG factor into their portfolio. Conversely, when investors are aware of the ESG factors, but they do not value them to the same extent, abnormal excess returns are not significantly different from zero. Furthermore, portfolios are also constructed by reviewing the

[20] Based on the political party who gained most votes in the nearest presidential election in each state
[22] The same analysis has also been performed by using the Fama and French (2007) six factor model and the results are substantially unchanged.

answers from the Yale environmental survey which declares if a state is “environmentally friendly” or not[23]. Unsurprisingly, we found that socially and environmentally responsible investments have abnormal negative excess returns in green states, while they are not significantly different from zero in brown states. Considering that the economic advantage of cluster economics may lead to a concentration of companies in brown states that operate in polluting sectors, this effect may produce a weakness in our methodology since the difference in abnormal excess returns may be due to differences between returns within the sectors. We have taken this weakness into account by examining if the results discussed above persist when controlling for excess industry returns[24], which they do.

Given the continued growing concern of U.S. citizens about the consequences of climate change for future generations[25], we believe that green financial investments will receive growing interest in the coming years. Consequently, the aim of this research, to analyze how local sentiment for environmental and social issues can approximate investment preferences, and how returns reflect these preferences, will be a subject undergoing intense study. For future research, our suggestions start from the limitations of our work. The period considered by us was voluntarily chosen as "calm" as it is not affected by any negative financial shock of a memorable size (such as the financial crisis of 2008 or the tariffs imposed on China by the United States), therefore our results may be influenced by the choice of time period. Furthermore, the investment strategy based solely on partial scores did not yield significant results. We believe that our justification for motivating these results is reasonable, but this may still be questionable and worthy of further study. In addition, a cross-sectional analysis is likely to provide further insights. Finally, the political proxy used in our analysis is difficult to replicate in, for example, the northern European countries, since the differences between environmental and social views between the important competing parties (usually center-right and center-left) are less drastic than between Democrats and Republicans. Moreover, in many countries outside the United States the political situation is more fragmented, therefore less manageable to classify. Conversely, the analysis carried out could be replicated using a similar survey as the one provided by Yale, instead of using political orientation.

Despite these limitations, we still believe that the results obtained in our research are relevant. Our paper contributes to the financial literature by providing an interpretation of why returns

[23] Based on if the state is in the first or fourth quartile of the answer-range.
[24] See table 3 in section 5.
[25] See section 3.3.

from ESG investments vary across geographical regions and how investor preferences can be approximated in a home bias context. In addition, the results of our analysis provide empirical support for what one would expect from the theory.

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Appendix

Table A.1: Average ESG and E score in different industry sectors. The table below summarizes the average ESG and E score of the companies in our dataset, given a certain industry.

Sector	Average ESG score	Average E score	Sector	Average ESG score	Average E score	Sector	Average ESG score	Average E score
Pharmaceuticals	56	60	Oil & Gas Producers	56	47	Telecommunication Services	52	53
Software & Services	53	51	Household Products	62	60	Traders & Distributors	55	52
Semiconductors	64	62	Utilities	62	53	Construction & Engineering	56	49
Retailing	53	46	Food Retailers	58	57	Containers & Packaging	61	59
Diversified Financials	55	50	Industrial Conglomerates	58	54	Electrical Equipment	53	46
Insurance	51	43	Media	53	50	Steel	50	44
Real Estate	53	51	Consumer Durables	55	50	Auto Components	62	63
Technology Hardware	58	56	Transportation	57	53	Building Products	57	54
Food Products	61	61	Homebuilders	48	41	Automobiles	58	52
Commercial Services	54	49	Aerospace & Defense	58	55	Refiners & Pipelines	57	48
Healthcare	55	56	Consumer Services	54	47	Paper & Forestry	62	59
Machinery	56	54	Banks	51	40	Transportation Infrastructure	54	47
Chemicals	56	50	Textiles & Apparel	60	54	Diversified Metals	56	49

Table A.2: Number of companies in each state at the end of the sample period. The list below present each state and the number of companies in our sample that have a headquarter within each of the states.

State	Companies at time T	State	Companies at time T	State	Companies at time T
Alabama	6	Kentucky	5	New York	2
Alaska	0	Louisiana	4	Ohio	38
Arkansas	19	Massachusetts	2	Oklahoma	11
Arizona	5	Maryland	17	Oregon	5
California	130	Maine	46	Pennsylvania	39
Colorado	22	Michigan	23	Rhode Island	5
Connecticut	23	Minnesota	21	South Carolina	2
Washington	7	Missouri	0	South Dakota	0
Delaware	3	Mississippi	17	Tennessee	13
Florida	36	Montana	0	Texas	82
Georgia	31	North Carolina	3	Utah	3
Hawaii	3	North Dakota	5	Virginia	0
Iowa	3	Nebraska	1	Vermont	27
Idaho	63	New Hampshire	26	Washington	17
Illinois	14	New Jersey	0	Wisconsin	0
Indiana	2	New Mexico	90	West Virginia	16
Kansas	3	Nevada	25	Wyoming	0

Table A.3: How election, financial and political data are matched. The presidential election occurs every fourth year, and the survey from Yale was done 2014, 2016 and 2020. In the table below we outline what political year and what survey year is used for each financial year. We have chosen the closest year which we think best represents the preferences.

Financial Year	Political Year	Survey Year
2009	2008	2014
2010	2008	2014
2011	2012	2014
2012	2012	2014
2013	2012	2014
2014	2012	2014
2015	2016	2016
2016	2016	2016
2017	2016	2016
2018	2016	2016
2019	2020	2020

Table A.4: The following table descripts how the answers to the survey questions differ between the years 2014 and 2020 for each state. With the questions being: "How much do you support or oppose the following policies? Regulate carbon dioxide (C02, the primary greenhouse gas) as a pollutant." And "How much do you think global warming will harm future generations of people?". In each question, each state can take a value between 1 (minimum) and 100 (maximum).

State	Diff in time Regulate 2014-2020	Diff in time Futuregen 2014-2020	State	Diff in time Regulate 2014-2020	Diff in time Futuregen 2014-2020	State	Diff in time Regulate 2014-2020	Diff in time Futuregen 2014-2020
Alabama	1	8	Kentucky	-1	7	New York	0	7
Alaska	5	13	Louisiana	3	10	Ohio	0	8
Arkansas	-1	10	Massachusetts	0	8	Oklahoma	0	7
Arizona	-1	7	Maryland	-1	10	Oregon	-4	6
California	-3	6	Maine	-2	4	Pennsylvania	0	8
Colorado	-2	7	Michigan	0	8	Rhode Island	-3	6
Connecticut	0	9	Minnesota	-1	9	South Carolina	-1	10
Washington	-5	1	Missouri	-2	8	South Dakota	-2	7
Delaware	-3	5	Mississippi	-1	6	Tennessee	-1	6
Florida	-1	8	Montana	-1	8	Texas	-1	8
Georgia	-1	6	North Carolina	-1	8	Utah	1	10
Hawaii	-3	5	North Dakota	1	6	Virginia	-1	11
Iowa	-3	8	Nebraska	0	8	Vermont	-1	5
Idaho	-1	10	New Hampshire	-1	9	Washington	-3	8
Illinois	0	8	New Jersey	1	9	Wisconsin	-1	9
Indiana	0	6	New Mexico	-2	5	West Virginia	0	6
Kansas	0	9	Nevada	-3	6	Wyoming	3	9

Table A.5: The table below displays a relative comparison of ESG and E score between the different proxies. That is, given a sector, how many times (in percentage) ESG score (or E score) was higher in brown states and how many times it was higher in green states. For instance, assume that "brown" states on average have a higher ESG score in the banking sector relative to "green" states, but in the other 47 sectors they have a lower ESG average scores. Hence, “brown” states have a higher ESG 2.08% (1/48) of the times, while “green” states 97.92%.

	ESG Score	**E-Score**
Democratic	61%	61%
Republican	39%	39%
Regulate = 4	70%	77%
Regulate = 1	30%	23%
Futuregen = 4	76%	72%
Futuregen = 1	24%	28%

Table A.6: Fama and French 4 factors time-series regressions using excess returns as dependent variable. The dependent variable is the monthly excess return of a HML portfolio following a socially responsible investment strategy in green or brown states. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

	Regulate=1 ESG 50-50	**Regulate=4 ESG 50-50**	**Regulate=1 ESG 70-30**	**Regulate=4 ESG 70-30**
Alpha	0,569*	-0,384**	0,464	−0,522**
	(0,334)	(0,169)	(0,387)	(0,203)
Market Premium	-0,245**	0,027	−0,202	0,02
	(0,101)	(0,051)	(0,127)	(0,066)
Small minus Big	0,153	-0,075	0,245	−0,114
	(0,171)	(0,074)	(0,210)	(0,097)
High minus Low	-0,339***	0,173***	−0,397**	0,208***
	(0,115)	(0,074)	(0,175)	(0,076)
Momentum	-0,160*	0,06	−0,357***	−0,019
	(0,097)	(0,065)	(0,128)	(0,088)
	Republican ESG 50-50	**Democratic ESG 50-50**	**Republican ESG 70-30**	**Democratic ESG 70-30**
Alpha	-0,043	-0,300**	-0,044	-0,586***
	(0,148)	(0,155)	(0,223)	(0,224)
Market Premium	-0,078*	0,019	-0,077	0,013
	(0,043)	(0,046)	(0,068)	(0,070)
Small minus Big	-0,062	-0,082	-0,079	-0,115
	(0,076)	(0,065)	(0,117)	(0,096)
High minus Low	-0,061	0,129**	-0,078	0,130*
	(0,067)	(0,072)	(0,084)	(0,095)
Momentum	-0,061	0,045	-0,128**	-0,018
	(0,046)	(0,065)	(0,062)	(0,093)
	Futuregen=1 ESG 50-50	**Futuregen=4 ESG 50-50**	**Futuregen=1 ESG 70-30**	**Futuregen=4 ESG 70-30**
Alpha	0,021	-0,427***	−0,146	−0,529**
	(0,331)	(0,178)	(0,353)	(0,212)
Market Premium	-0,183**	0,028	0,066	0,021
	(0,088)	(0,053)	(0,098)	(0,068)
Small minus Big	-0,038	-0,036	−0,194	−0,080
	(0,145)	(0,075)	(0,184)	(0,096)
High minus Low	-0,283*	0,169***	−0,260	0,198**
	(0,149)	(0,073)	(0,168)	(0,076)
Momentum	0,066	0,054	−0,047	−0,021
	(0,105)	(0,068)	(0,100)	(0,092)

Table A.7: Fama and French 4 factors time-series regressions using excess industry returns as dependent variable. The dependent variable is the monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green or brown State. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

Dependent variable	**Excess industry returns**			
	Regulate=1 ESG 50-50	**Regulate=4 ESG 50-50**	**Regulate=1 ESG 70-30**	**Regulate=4 ESG 70-30**
Alpha	0,844*	−0,230	0,789	−0,453**
	(0,459)	(0,174)	(0,606)	(0,204)
Market Premium	−0,289**	0,101	−0,231	0,107
	(0,137)	(0,064)	(0,195)	(0,079)
Small minus Big	0,311	−0,073	0,472	−0,047
	(0,260)	(0,094)	(0,354)	(0,096)
High minus Low	−0,065	0,227***	−0,014	0,260***
	(0,132)	(0,072)	(0,192)	(0,074)
Momentum	−0,279**	0,126	−0,468***	0,041
	(0,115)	(0,077)	(0,176)	(0,087)
	Republican ESG 50-50	**Democratic ESG 50-50**	**Republican ESG 70-30**	**Democratic ESG 70-30**
Alpha	0,048	−0,419**	−0,254	−0,500**
	(0,355)	(0,179)	(0,440)	(0,212)
Market Premium	−0,228**	0,060	0,024	0,096
	(0,090)	(0,056)	(0,174)	(0,079)
Small minus Big	−0,026	−0,021	−0,242	−0,003
	(0,174)	(0,084)	(0,206)	(0,099)
High minus Low	−0,161	0,173**	−0,062	0,252***
	(0,173)	(0,068)	(0,179)	(0,079)
Momentum	−0,067	0,002	−0,149	0,044
	(0,107)	(0,068)	(0,127)	(0,096)
	Futuregen=1 ESG 50-50	**Futuregen=4 ESG 50-50**	**Futuregen=1 ESG 70-30**	**Futuregen=4 ESG 70-30**
Alpha	0,066	−0,221*	0,139	−0,532***
	(0,168)	(0,135)	(0,300)	(0,188)
Market Premium	−0,026	0,108**	−0,016	0,133*
	(0,047)	(0,054)	(0,090)	(0,077)
Small minus Big	0,064	−0,044	0,125	−0,022
	(0,092)	(0,059)	(0,169)	(0,081)
High minus Low	−0,008	0,186***	−0,033	0,219***
	(0,071)	(0,055)	(0,093)	(0,080)
Momentum	−0,086*	0,087	−0,136*	0,039
	(0,048)	(0,058)	(0,075)	(0,086)

Table A.8: French 4 factors time-series regression using excess returns as dependent variable and excluding states with close election results. The states are categorized as "Republican" or "Democratic" if the respective party won by a margin of at least 5%. The dependent variable is the monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green (Democratic) or brown (Republican) State. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

Dependent variable	**Excess returns**			
	Republican ESG 50-50	**Democratic ESG 50-50**	**Republican ESG 70-30**	**Democratic ESG 70-30**
Alpha	0,199	−0,299**	0,155	−0,616***
	(0,216)	(0,144)	(0,359)	(0,204)
Market Premium	−0,083	0,109*	−0,070	0,129
	(0,068)	(0,062)	(0,113)	(0,081)
Small minus Big	0,092	−0,013	0,190	−0,013
	(0,127)	(0,068)	(0,211)	(0,095)
High minus Low	0,007	0,189***	−0,036	0,240***
	(0,081)	(0,059)	(0,100)	(0,081)
Momentum	−0,082	0,088	−0,159*	0,050
	(0,059)	(0,065)	(0,092)	(0,093)

Table A.9: Fama and French 6 factors time-series regression using excess returns and excess industry returns as dependent variable. The dependent variable are the monthly excess return and monthly excess industry return of an HML portfolio following a socially responsible investment strategy in a green or brown State. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively. The two new factors are profitability and investment. Profitability is the difference between the returns of firms with robust (high) and weak (low) operating profitability; the investment factor (CMA) is the difference between the returns of firms that invest conservatively and firms that invest aggressively.

	Dependent variable		**Excess returns**			
	Republican HML ESG 50-50	**Democratic HML ESG 50-50**	**Regulate=1 HML ESG 50-50**	**Regulate=4 HML ESG 50-50**	**Futuregen=1 HML ESG 50-50**	**Futuregen=4 HML ESG 50-50**
Alpha	−0,054	−0,325***	0,542*	−0,410***	−0,0006	−0,462***
	(0,137)	(0,123)	(0,316)	(0,141)	(0,318)	(0,146)
	Republican HML ESG 70-30	**Democratic HML ESG 70-30**	**Regulate=1 HML ESG 70-30**	**Regulate=4 HML ESG 70-30**	**Futuregen=1 HML ESG 70-30**	**Futuregen=4 HML ESG 70-30**
Alpha	−0,069	−0,649***	0,456	−0,621***	−0,010	−0,636***
	(0,198)	(0,177)	(0,394)	(0,188)	(0,355)	(0,194)
	Republican HML ESG 80-20	**Democratic HML ESG 80-20**	**Regulate=1 HML ESG 80-20**	**Regulate=4 HML ESG 80-20**	**Futuregen=1 HML ESG 80-20**	**Futuregen=4 HML ESG 80-20**
Alpha	−0,066	−0,473**	0,618	−0,555***	−0,010	−0,636***
	(0,279)	(0,186)	(0,486)	(0,203)	(0,355)	(0,194)

	Dependent variable		**Excess industry returns**			
	Republican HML ESG 50-50	**Democratic HML ESG 50-50**	**Regulate=1 HML ESG 50-50**	**Regulate=4 HML ESG 50-50**	**Futuregen=1 HML ESG 50-50**	**Futuregen=4 HML ESG 50-50**
Alpha	0,187	−0,367***	0,893*	−0,293*	0,005	−0,485***
	(0,216)	(0,124)	(0,454)	(0,163)	(0,361)	(0,168)
	Republican HML ESG 70-30	**Democratic HML ESG 70-30**	**Regulate=1 HML ESG 70-30**	**Regulate=4 HML ESG 70-30**	**Futuregen=1 HML ESG 70-30**	**Futuregen=4 HML ESG 70-30**
Alpha	0,178	−0,721***	0,899	−0,554***	−0,197	−0,614***
	(0,356)	(0,185)	(0,585)	(0,183)	(0,414)	(0,191)
	Republican HML ESG 80-20	**Democratic HML ESG 80-20**	**Regulate=1 HML ESG 80-20**	**Regulate=4 HML ESG 80-20**	**Futuregen=1 HML ESG 80-20**	**Futuregen=4 HML ESG 80-20**
Alpha	0,476	−0,574***	1,026	−0,462**	0,186	−0,731***
	(0,522)	(0,206)	(0,689)	(0,209)	(0,400)	(0,270)

Table A.10: Two different alpha outputs from a more extreme high-minus-low portfolio using the top and bottom 20% and by using excess returns and excess industry returns as dependent variable. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively.

	Republican HML ESG 80-20	**Democratic HML ESG 80-20**	**Regulate=1 HML ESG 80-20**	**Regulate=4 HML ESG 80-20**	**Futuregen=1 HML ESG 80-20**	**Futuregen=4 HML ESG 80-20**
Alpha - Excess returns as dependent variable	−0,013	−0,382**	0,579	−0,470**	−0,060	−0,497**
	(0,281)	(0,160)	(0,494)	(0,222)	(0,375)	(0,233)
	Republican HML ESG 80-20	**Democratic HML ESG 80-20**	**Regulate=1 HML ESG 80-20**	**Regulate=4 HML ESG 80-20**	**Futuregen=1 HML ESG 80-20**	**Futuregen=4 HML ESG 80-20**
Alpha - Excess industry returns as dependent variable	0,441	−0,471**	0,868	−0,447**	0,093	−0,667**
	(0,528)	(0,234)	(0,718)	(0,209)	(0,436)	(0,280)

Table A.11: Two different alpha outputs from HML portfolios based only on the environmental score (E) and by using excess returns and excess industry returns as dependent variable. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively. The alphas are relatively similar to that of the alphas of ESG but none of them is significant.

	Republican HML E 70-30	**Democratic HML E 70-30**	**Regulate=1 HML E 70-30**	**Regulate=4 HML E 70-30**	**Futuregen=1 HML E 70-30**	**Futuregen=4 HML E 70-30**
Alpha - Excess returns as dependent variable	-0,012 (0,221)	-0,157 (0,178)	0,287 (0,426)	-0,226 (0,193)	-0,337 (0,379)	-0,185 (0,208)
	Republican HML E 70-30	**Democratic HML E 70-30**	**Regulate=1 HML E 70-30**	**Regulate=4 HML E 70-30**	**Futuregen=1 HML E 70-30**	**Futuregen=4 HML E 70-30**
Alpha - Excess industry returns as dependent variable	0,175 (0,273)	−0,155 (0,18)	0,754 (0,571)	−0,161 (0,187)	−0,097 (0,400)	−0,141 (0,192)

Table A.12: Two different alpha outputs from HML portfolios based only on the social score (S) and by using excess returns and excess industry returns as dependent variable. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively. Although initially it seems that in the "green" states alpha is negative, the significance disappears when the returns of the industrial sectors are considered.

	Republican HML S 70-30	**Democratic HML S 70-30**	**Regulate=1 HML S 70-30**	**Regulate=4 HML S 70-30**	**Futuregen=1 HML S 70-30**	**Futuregen=4 HML S 70-30**
Alpha - Excess returns as dependent variable	−0,158	−0,417**	0,197	−0,456*	0,012	−0,4838**
	(0,204)	(0,204)	(0,412)	(0,231)	(0,446)	(0,237)
	Republican HML S 70-30	**Democratic HML S 70-30**	**Regulate=1 HML S 70-30**	**Regulate=4 HML S 70-30**	**Futuregen=1 HML S 70-30**	**Futuregen=4 HML S 70-30**
Alpha - Excess industry returns as dependent variable	−0,149	−0,385	0,091	−0,295	−0,007	−0,697
	(0,222)	(0,244)	(0,477)	(0,282)	(0,484)	(0,215)

Table A.13: Two different alpha outputs from HML portfolios based only on the governance score (G) and by using excess returns and excess industry returns as dependent variable. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively. Although in "brown" states alpha is always positive and in "green" states alpha is always negative, all coefficients are almost always insignificant.

	Republican HML G 70-30	**Democratic HML G 70-30**	**Regulate=1 HML G 70-30**	**Regulate=4 HML G 70-30**	**Futuregen=1 HML G 70-30**	**Futuregen=4 HML G 70-30**
Alpha - Excess returns as dependent variable	0,419**	−0,161	0,498	−0,176	0,282	−0,186
	(0,182)	(0,176)	(0,456)	(0,185)	(0,383)	(0,195)
	Republican HML G 70-30	**Democratic HML G 70-30**	**Regulate=1 HML G 70-30**	**Regulate=4 HML G 70-30**	**Futuregen=1 HML G 70-30**	**Futuregen=4 HML G 70-30**
Alpha - Excess industry returns as dependent variable	0,405	−0,231*	0,474	−0,171	0,007	−0,176
	(0,261)	(0,136)	(0,660)	(0,141)	(0,416)	(0,192)

Table A.14: Regression output for different high and low portfolios. The portfolios presented are both high and low portfolios using excess returns and excess industry returns as dependent variable. Top (bottom) 30% means that the best (worst) performing firms are assigned to the high (low) portfolios. The tables present alpha for these portfolios. The data are monthly and in percentage. Standard errors are calculated using the Newey and West (1987) procedure. *, **, and *** represent the significance level of 10%, 5%, and 1%, respectively. What we notice is that excess abnormal returns and excess industry abnormal returns are mostly driven by relatively high alpha in low portfolios in green states. This is due to the fact that socially responsible investors want a higher yield to compensate for the loss of utility in buying non-environmentally and non-socially sustainable stocks.

High Portfolio	**Dependent variable**		**Excess returns**			
	Republican Top 30% ESG	**Democratic Top 30% ESG**	**Regulate=1 Top 30% ESG**	**Regulate=4 Top 30% ESG**	**Futuregen=1 Top 30% ESG**	**Futuregen=4 Top 30% ESG**
Alpha	0,216	0,477**	0,588**	0,533**	0,509**	0,474**
	(0,202)	(0,198)	(0,251)	(0,204)	(0,270)	(0,202)
Low Portfolio	**Dependent variable**		**Excess returns**			
	Republican Bottom 30% ESG	**Democratic Bottom 30% ESG**	**Regulate=1 Bottom 30% ESG**	**Regulate=4 Bottom 30% ESG**	**Futuregen=1 Bottom 30% ESG**	**Futuregen=4 Bottom 30% ESG**
Alpha	0,577**	1,006***	0,086	1,005**	0,618*	0,967***
	(0,231)	(0,294)	(0,415)	(0,307)	(0,324)	(0,306)
High Portfolio	**Dependent variable**		**Excess industry returns**			
	Republican Top 30% ESG	**Democratic Top 30% ESG**	**Regulate=1 Top 30% ESG**	**Regulate=4 Top 30% ESG**	**Futuregen=1 Top 30% ESG**	**Futuregen=4 Top 30% ESG**
Alpha	0,014	0,164	0,247	0,230	0,176	0,503**
	(0,197)	(0,201)	(0,235)	(0,208)	(0,277)	(0,211)
Low Portfolio	**Dependent variable**		**Excess industry returns**			
	Republican Bottom 30% ESG	**Democratic Bottom 30% ESG**	**Regulate=1 Bottom 30% ESG**	**Regulate=4 Bottom 30% ESG**	**Futuregen=1 Bottom 30% ESG**	**Futuregen=4 Bottom 30% ESG**
Alpha	−0,178	0,696**	−0,579	0,646**	0,176	1,215***
	(0,424)	(0,287)	(0,641)	(0,298)	(0,277)	(0,327)

Table A.15: Descriptive statistics of the 10 different high-minus-low portfolios. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. From the table we notice that the average returns of ESG portfolios are higher in "brown" states than ESG portfolios in "green" states, although they are also more volatile.

	Regulate=1 ESG 50-50	**Regulate=4 ESG 50-50**	**Regulate=1 ESG 70-30**	**Regulate=4 ESG 70-30**	**Republican ESG 50-50**	**Democratic ESG 50-50**
Monthly average return	0,47%	-0,09%	0,39%	-0,34%	0,11%	-0,15%
Yearly average return	5,64%	-1,05%	4,72%	-4,13%	1,34%	-1,84%
Monthly average excess return	0,43%	-0,12%	0,36%	-0,38%	0,07%	-0,19%
Yearly average excess return	5,19%	-1,49%	4,28%	-4,58%	0,89%	-2,29%
Monthly standard deviation	3,96%	2,36%	5,54%	2,55%	2,12%	1,90%
Yearly standard deviation	13,73%	8,18%	19,19%	8,83%	7,33%	6,57%
Max	32,00%	14,85%	43,70%	7,11%	14,17%	5,97%
Min	-10,63%	-4,90%	-15,24%	-8,04%	-4,31%	-4,89%
Skewness	4,11	2,3	3,83	0,14	2,49	0,52
Kurtosis	33,94	13	31,67	0,96	15,77	1,39
	Republican ESG 70-30	**Democratic ESG 70-30**	**Futuregen=1 E 50-50**	**Futuregen=4 E 50-50**	**Futuregen=1 E 70-30**	**Futuregen=4 E 70-30**
Monthly average return	0,06%	-0,47%	-0,15%	-0,36%	-0,23%	-0,40%
Yearly average return	0,73%	-5,70%	-1,82%	-4,27%	-2,76%	-4,81%
Monthly average excess return	0,02%	-0,51%	-0,19%	-0,39%	-0,27%	-0,44%
Yearly average excess return	0,29%	-6,14%	-2,27%	-4,72%	-3,21%	-5,25%
Monthly standard deviation	3,13%	2,64%	3,69%	2,01%	4,35%	2,66%
Yearly standard deviation	10,83%	9,15%	12,77%	6,95%	15,09%	9,22%
Max	25,53%	7,63%	9,64%	8,61%	12,55%	7,01%
Min	-6,16%	-7,37%	-21,09%	-5,92%	-20,65%	-8,22%
Skewness	4,64	0,06	-1,5	0,48	-0,78	0,01
Kurtosis	37,29	0,93	8,01	3,02	4,12	0,71

Figure A.1: Graphs including the cumulative returns over time of the most important HML portfolios considered in our analysis. 70-30 means that the 30% best (worst) performing firms are assigned to the high (low) portfolio. From the table we notice that the cumulative returns of ESG portfolios are higher in "brown" states than ESG portfolios in "green" states, as we expected.