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**Class Project Part I - Team Rocket Desk**

**Team Members:**

| **Member Name** | **Member roles** |
| --- | --- |
| Caleb Dimenstein | Python coder, data cleaning |
| Ariel Azria | Academic research, writing, model developer |
| John Fitzgerald | Model development, design, and requirements |
| Lea Wu | Model development and data engineering |

Team meetings: 20 minutes before class on Wednesday, Sunday afternoons (3pm CT). In addition to their duties, all team members should conduct general research to facilitate knowledge sharing among the group.

**Research Driver**

President Biden used the first veto of his presidency in March 2023 to halt legislation that would prevent investment managers from considering a company’s environmental, social, and corporate governance (ESG) practices in their investment decisions.[[1]](#footnote-0)

The showdown between the Republican Congress and Democratic President highlighted a relatively new financial practice, commonly known as sustainable investing, wherein fund managers take ESG into account when making investment decisions.[[2]](#footnote-1)

ESG funds’ performance lagged in 2023,[[3]](#footnote-2) but some investors insist that companies which incorporate these considerations into their strategies are more adapted to long-term economic shifts. Therefore, these companies will generate better returns for investors over the long run.[[4]](#footnote-3)

**Research Question**

Although past scholars have attempted to isolate the effects of environmental, social, and corporate governance practices on investment returns, the large amount of data and difficulty of isolating variables has prevented academics from definitively concluding whether funds that account for ESG variables out-perform their more traditional peers.[[5]](#footnote-4)

We therefore seek to *determine if investing in the traditionally perceived “non-ESG” compliant industries, such as fossil fuels and arms manufacturing, impacts fund performance.* For this topic, we hypothesize that Explainable Boosting Machines and SHapley Additive exPlanations can be applied. Through these and other possible methods, we hope to explain the importance of each factor on the target dependent value, the return of the fund.

We will also determine *the extent to which a funds’ investment percentage in the non-ESG industries influences their performance.* With this research question, we hope to apply the difference-in-difference method to exclude the effect of environmental/macro factors and monitor how an increase in the investment percentage will impact investment performance. We aim to isolate the impact of target variables, thereby enabling a more precise measurement of how shifts in investment proportions towards non-ESG industries affect overall fund returns.

**Data Description**

Fund level data comes from As You Sow, a non-profit that tracks the non-ESG and ESG investments of various funds at an industry level. The data focus on the following non-ESG and ESG industries:

* Fossil fuels
* Deforestation
* Guns
* Weapons
* Prison
* Tobacco
* Gender equality

Yearly data for each fund is recorded. For our analysis, we will capture data from 2020 to the end of 2023.To track how consistent funds are at investing in ESG initiatives we will engineer the data to show, for instance, how consistent Fund X has been in regards to investing in tobacco free companies from 2020 to 2023.

We will analyze 9,000+ data. Each industry that the fund invests in is further broken into sub industries. For example, Fossil fuel holdings are broken up into oil/gas industries, macroclimate coal-fired utilities, coal, and carbon underground. Our independent variable will be the fund net performance over a certain period of time (the exact period of time will be determined in the future).

**References**

[Chiacu, Doina. “Biden Uses First Veto to Defend Rule on ESG Investing.” *Reuters*, March 20, 2023, sec. Sustainable Business.](https://www.zotero.org/google-docs/?JpslAb) <https://www.reuters.com/business/sustainable-business/biden-vetoes-resolution-block-labor-dept-rule-esg-investing-2023-03-20/>[.](https://www.zotero.org/google-docs/?JpslAb)

[Foster, Lauren. “ESG Funds Set a Dismal Record. Yet Performance Was a Drag.” barrons. Accessed January 21, 2024.](https://www.zotero.org/google-docs/?JpslAb) <https://www.barrons.com/articles/esg-funds-etfs-stocks-blackrock-e517a15c>[.](https://www.zotero.org/google-docs/?JpslAb)

[“Quantitative Methods for ESG Finance.” Accessed January 21, 2024.](https://www.zotero.org/google-docs/?JpslAb) <https://eds-p-ebscohost-com.proxy.uchicago.edu/eds/ebookviewer/ebook?sid=198181b3-cfa8-404a-bb1f-c3db12db44e9%40redis&vid=0&format=EB>[.](https://www.zotero.org/google-docs/?JpslAb)

[Whelan, Tensie, Ulrich Atz, Tracy Van Holt, and Casey Clark. “ESG and Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015 – 2020,” n.d.](https://www.zotero.org/google-docs/?JpslAb)

**ESG and Responsible Institutional Investing Around the World**

* · Tens of trillions of dollars to pursue EST strategies
  + - o $12 trillion in 2016 for US investing in ESG
    - o $1 trillion in sustainable mutual funds and exchange traded funds
* · Driving force: societal changes of wealthier individuals wanting to allocate their wealth in more sustainable ways
  + One factor to look out for is a demographic shift in who hold wealth → going from older, more conservative men to women and younger generations, who are more likely to want to give back
* · Data has found that ESG factors can drive firm value or possibly reduce firm risk in the long run
* · Climate Change is the ESG initiative focused on the most by investors (more specifically carbon risk
* · Examples of risks associated with investing in environmental risky companies
  + - o 2001 Enron Corp accounting fraud
    - o 2010 Deepwater Horizon oil spill
    - o 2015 Volkswagen emissions test cheating
    - o 2018 Facebook data privacy scandal
* · CEO of BlackRock (largest fund manager) stated that climate change will lead to structural, long term crisis -> “stamp” that ESG is important
* · Movement towards lower-carbon economy -> mobilizing substantial amounts of capital to invest in climate change mitigation and adaptation to be accomplished in a short window of time
* · In the Krueger, Sautner, and Starks (2020) study surveying 400 large institutional investors on matters related to climate change found that the most common motive provided by the investors surveyed is to protect reputational risk over the belief of climate risks
  + - o Not a good sign for ESG investing
* · EU has an ambitious regulatory agenda backed by strong political support for a strnasition to a **low-carbon economy**
  + - o US however the regulatory environment is not yet settled.

**Evaluating Fund Performance**

<https://www.finra.org/investors/investing/investing-basics/evaluating-performance>

**Yield**: Yield is typically expressed as a percentage. It's a measure of the income an investment pays during a specific period, typically a year, divided by the investment's price.

**Returns compared to a benchmark**: evaluate compared to a benchmark index to see how fund has performed relative to the market.

**Expense Ratio:** divide a fund’s total annual operating expenses by the average value of its total assets managed

**Sector Weights**: much better to compare within industries/concentrations than without, as different sectors have different growth rates, etc.

**ESG Investing: Theory Evidence and Fiduciary Principles**

· In 2019 ESG themed mutual funds experienced $20 Billion in net inflows increasing further during the first few months of the COVID-19 pandemic

· **ESG Investing**

* Began in the 1980’s as part of divestment campaign aimed at South Africa’s apartheid regime (not for financial gain but social responsibility)
* Some posed that it could improve risk-adjusted returns -> providing a direct benefit to investors
  + Ex. Divesting the fossil fuel industry because financial markets underestimate its litigation and regulatory risks

o Investing in ESG initiatives for 2 reasons

1) moral or ethical reasons or to benefit a third party

2) investing for risk and return benefits

o When evaluating a firm how are the ESG factors balanced, for example if Company A has strong “E” initiatives but treats their workers poorly, “S”, how is this firm evaluated? -> inherent subjectivity of the ESG rubric

· **ESG factors and firm value**

o Corporate governance factors have straightforward theoretical relationships to firm performance -> extent to which varies

o Social factors may help identify specific risks -> Firms with weak internal controls and poor compliance records may face greater political regulatory and litigations risks

o Environmental factors can lead to non-quantifiable benefits such as attracting better managers and workers

o ESG factors may not be reflected in the price of publicly traded securities

§ Supporters of ESG investing point to general disagreement about the extent of capital market efficiency, and therefor the possibility of a profitable active trading strategy

§ Market inefficiency is more likely in respect to ESG factors. I.E not properly priced due to low-probability but high impact of risk

o Most empirical studies find that employing ESG screens lead to performance about the same or worse than their benchmark indices

1. [Doina Chiacu, “Biden Uses First Veto to Defend Rule on ESG Investing,” *Reuters*, March 20, 2023, sec. Sustainable Business, https://www.reuters.com/business/sustainable-business/biden-vetoes-resolution-block-labor-dept-rule-esg-investing-2023-03-20/.](https://www.zotero.org/google-docs/?kV9uto) [↑](#footnote-ref-0)
2. [“Quantitative Methods for ESG Finance,” accessed January 21, 2024, https://eds-p-ebscohost-com.proxy.uchicago.edu/eds/ebookviewer/ebook?sid=198181b3-cfa8-404a-bb1f-c3db12db44e9%40redis&vid=0&format=EB.](https://www.zotero.org/google-docs/?m4LHgs) [↑](#footnote-ref-1)
3. [Lauren Foster, “ESG Funds Set a Dismal Record. Yet Performance Was a Drag.,” barrons, accessed January 21, 2024, https://www.barrons.com/articles/esg-funds-etfs-stocks-blackrock-e517a15c.](https://www.zotero.org/google-docs/?nFJdWk) [↑](#footnote-ref-2)
4. [Tensie Whelan et al., “ESG and Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015 – 2020,” n.d.](https://www.zotero.org/google-docs/?J1BKpA) [↑](#footnote-ref-3)
5. [“Quantitative Methods for ESG Finance.”](https://www.zotero.org/google-docs/?q5raVQ) [↑](#footnote-ref-4)