



Socially Responsible Investing

CARLOS GATTORNO

KRISTINA VALENZUELA

SEBASTIAN RAMIREZ

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Objective

The focus of the project is to integrate Environmental, Social and Corporate Governance (ESG) into equity investment analysis and use Key Performance Indicators (KPI's) to evaluate their ratings. We will summarize the stock pricing data, annual reports, and corporate governance policies as they align with global environmental goals for environmental and social sustainability in our analysis.



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Summary

What is ESG?

ESG stands for Environmental, Social and Corporate Governance,

(ESG) is a criteria and set of standards for a company's operations that socially conscious investors use to screen potential investments.

Environmental criteria consider how a company performs as a steward of nature. Social criteria examine how it manages relationships with employees, suppliers, customers, and the communities where it operates. Governance deals with a company's leadership, executive pay, audits, internal controls, and shareholder rights.

The practice of ESG investing began in the 1960s as socially responsible investing, with investors excluding stocks or entire industries from their portfolios based on business activities such as tobacco production or involvement in the South African apartheid regime.

Today, ethical considerations and alignment with values remain common motivations of many ESG investors, but the field is rapidly growing and evolving, as many investors look to incorporate ESG factors into the investment process alongside traditional financial analysis.

ESG scores are based on relative ESG performance.

Newer more recent studies suggest that companies with robust ESG practices displayed a lower cost of capital, lower volatility, and fewer instances of bribery, corruption and fraud over certain time periods. Conversely, studies have shown that companies that performed poorly on ESG have had a higher cost of capital, higher volatility due to controversies and other incidences such as spills, labor strikes and fraud, and accounting and other governance irregularities.

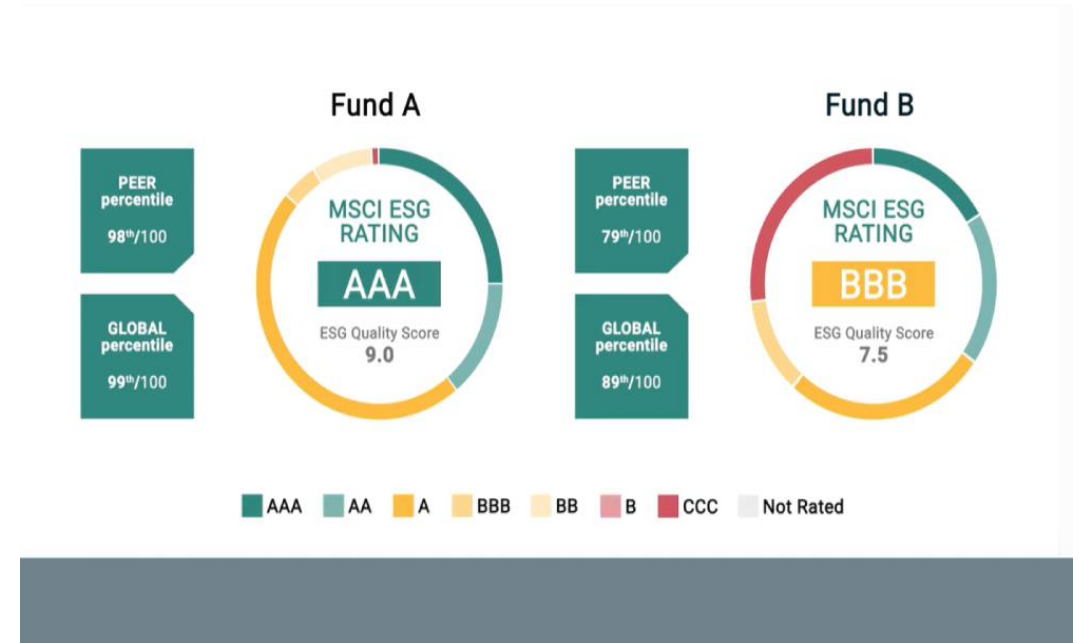
In fact, numerous academic and investor studies in recent years have found historically lower risk and even outperformance over the medium to long term for portfolios that integrated key ESG factors alongside rigorous financial analysis.

Ask the data

- What issues do research companies consider in their ESG ratings methodology?
- What is the method used to obtain ESG scores, and company financials?
- What does a good ESG rating and look like compared to a poor rating?
- How can we incorporate ESG or sustainability scores in a programmatic way, for fundamental analysis?
- What type of data will be required to perform the analysis?
- How can we find this data?
- What problems are we solving using the tool created?
- Who would benefit from using a tool like this?

What is an ESG Rating?

An ESG Rating is designed to measure a company's resilience to long-term, industry material environmental, social and governance (ESG) risks. We use a rules-based methodology to identify industry leaders and laggards according to their exposure to ESG risks and how well they manage those risks relative to peers. ESG Ratings range from leader (AAA, AA), average (A, BBB, BB) to laggard (B, CCC). We also rate equity and fixed income securities, loans, mutual funds, ETFs and countries.



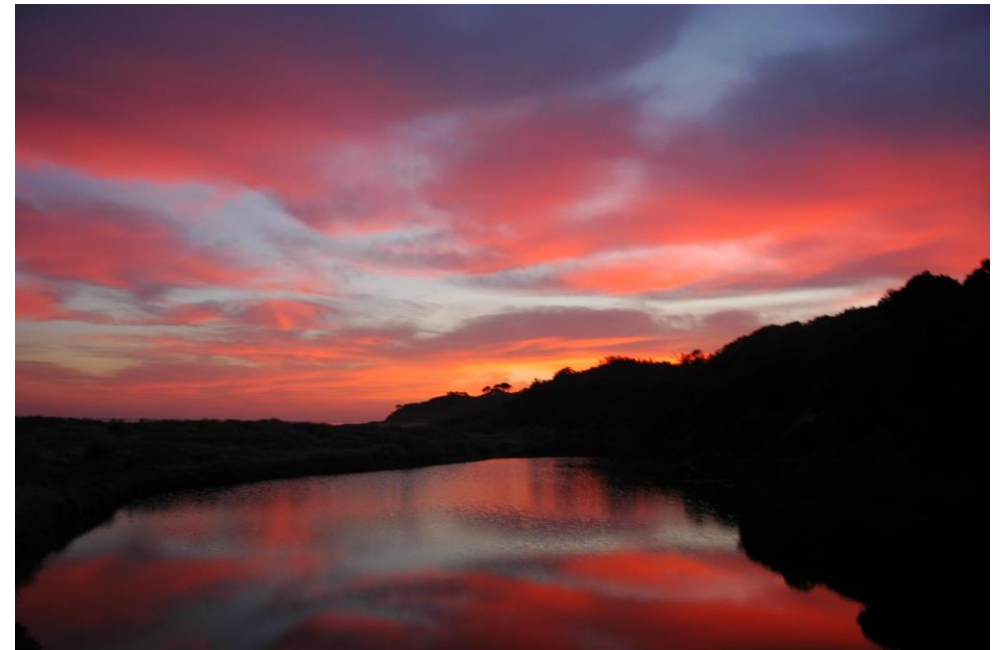
Key Indicators

Key issues that ESG companies may consider when determining ratings include:

Environment - Carbon emission(product carbon footprint), Water Stress Biodiversity & Land Use, Toxic Emissions & Waste Packaging Material & Waste, Opportunities in Clean Tech Opportunities in Green Building.

Social - Labor Management Health & Safety, Product Safety & Quality Chemical Safety Financial Product Safety, Controversial Sourcing, Access to Communications Access to Finance,

Governance - Board Pay, Ownership / Accounting, Business Ethics Anti-Competitive Practices Tax Transparency Corruption & Instability (Financial System Instability).



Approach

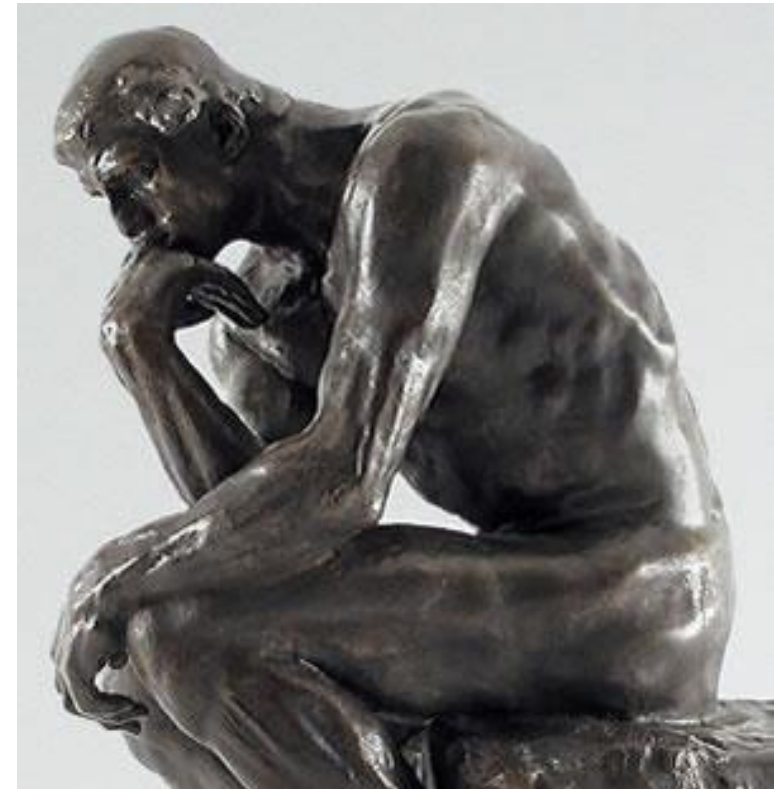
We looked for API codes and programs we could use to pull ESG scores for companies and compare them to the financial data. We found a couple of starter files for this data and began to manipulate it for our own analysis

Methodology

We collect the most relevant, publicly available data (web scraping) to get sustainability data (ESG scores) from yahoo finance and other API's like IEX Cloud to integrate into our analysis in order to compare a companies score with that of its peer group.

The metrics that we use are the ESG scores plus Revenue, Net income, Earning per share growth, and EBITDA growth, and discounted cash flow (DCF)

These are the KPI's we use to measure a companies financial performance.



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Programming

```
from bs4 import BeautifulSoup
import pandas as pd
import requests
import ipywidgets as widgets
from ipywidgets import interact
```

[8:42](#)

```
import yfinance as yf
import pandas as pd
import os
```

[8:43](#)

```
from pathlib import Path
from datetime import datetime
from iexfinance.stocks import get_historical_data
import pandas as pd
import streamlit as st
import plotly.express as px
import plotly.graph_objects as go
import yfinance as yf
from plotly.subplots import make_subplots
```

Types of Data Used

- Quantitative analysis,
- Financial Modeling,
- Stock Pricing Data,
- API Data,
- Data Analytics,
- Adjusted discounted cashflow models



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Analysis

We've attempted to analyze the ESG data in conjunction with the financial performance of the company.

Unfortunately, there were numerous issues with the project.

We had our code ready for dashboarding and accidentally erased it in a merge mistake that removed a week of work. Attempts to resolve this were unfruitful and ultimately we do not have a dashboard to display, nor do we have a final analysis resolution.

Problem Solving

We've created an analysis tool that searches the web for data, and measures a particular characteristic of a company's performance or efficiency based on Key Performance Indicators(KPI's), financial data, and sustainability scores, outputs data, and compares it to companies relative to it's sector.

The result being an aggregated response with score and rating system based on how well a company did in complying with ESG standards, and meeting it's financial obligations, simultaneously, utilizing quantitative analysis, financial modeling, stock pricing, and data analytics, to quantify annualized returns on stock prices, revenue growth, net income growth, Earnings per share (EPS), Earnings Before Interest, Taxes, Depreciation, Amortization (EBITDA) , which may offer investors potential long-term performance advantages, in a growing market

Who would benefit from using this?

Fundamentally this analysis tool would be used by individuals or DIY investors, the average person who wants explore investment opportunities through an ESG company that reflects the morals, and ideals of the individual, along with being a part of an environmentally conscious group of people who want to take part in more sustainable and socially responsible investing stratagem, while also having the option for a more diversified balanced portfolio that is current with economic, social, and environmental trends in developing industries.



Data Cleaning & exploration

We used the inspect function on the web to identify font size, font weight, and the right margin of the sustainability scores.

SEC company filings were deleted from the csv file columns to remove from the data analysis.

We had taken the ticker symbols and concatenated it with the web scraping used in beautiful soup esg file, but the data was not presenting correctly. Additional attempts to fix created more errors.

Beautiful Soup is a library that makes it easy to scrape information from web pages

```
    return data

[9]: def get_tickers():
      wiki_page = requests.get('https://en.wikipedia.org/wiki/List_
      sp_data = pd.read_html(wiki_page)
      ticker_df = sp_data[0]
      ticker_options = ticker_df['Symbol']
      return ticker_options

[11]: esg_data = pd.read_csv('Resources/ticker_data.csv')
      ticker = esg_data['Symbol']
      ticker

[11]: 0      MMM
      1      AOS
      2      ABT
      3      ABBV
      4      ACN
      5      ATVI
      6      AYI
      7      ADBE
      8      AAP
      9      AMD
     10      AES
     11      AET
     12      AMG
     13      AFL
     14      A
     15      APD
     16      AKAM
     17      ALK
     18      ALB
     19      ARE
     20      ALXN
     21      ALGN
```

The screenshot shows a Jupyter Notebook environment. On the left, a code editor displays a function `get_esg` decorated with `@interact`. The function takes a `Ticker` argument. A dropdown menu is open, showing a list of stock tickers: FIS, FITB, FE, FRC, FISV, FLT, FLIR, FLS, FMC, and F. The `F` option is highlighted. Below the dropdown, a table displays ESG data for the selected ticker `MSFT`.

	Total ESG Score	Environment Score	Social Score	Governance Score	Controversy Score	Controversy Assessment
MSFT	15.0	0.5	9.4	5.1	3.0	Severe Controversy

Below the table, there is an empty input field for the next code cell.

Desired output: one dataframe with the information for all tickers, instead of having them in an interactive dropdown display

Sources

Mediums.com,

yahoofinance.com,

Kaggle.com, iexCloud.com,

financialmodelingprep.com