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What is ESG Investing?

Environmental, Social, and corporate Governance (ESG) describes standards for company operations that socially-conscious investors use to evaluate potential investments. By using these standards to inform investment decisions, investments can become a powerful tool in impacting business and governmental policy decisions to support social equity and protect the environment.

In other words, ESG investing - the action of considering ESG concerns when investing - allows investors to harness the power of business to better our environment and society in addition to making monetary gains. For example, ESG can support clean energy versus fossil fuels or fair treatment of employees and can still make money.

ESG investing is also making increasingly more sense from a financial materiality perspective. Investing in companies who score highly on ESG standards or are on the right track to scoring higher seems to help mitigate risk in a portfolio. ESG investing has been proven to be an as effective form of investing as compared to traditional investing. As a matter of fact, Morningstar's 2020 Sustainable Funds US Landscape Report found that “sustainable funds, on average, outperformed conventional funds and indexes in 2020” (2).

If you want to contribute to better societal outcomes and make sound investments, ESG investing is well-worth considering.

Why Should We Invest with ESG Principles?

Business and industry are the primary producers of the greenhouse gas emissions that are warming our climate to a tipping point. Our current economic system is reliant on a model that assumes infinite growth, which is reliant on infinite resources. As we begin to witness the consequences of climate change, our system will need to adapt to increasingly scarce resources and learn how to function in tandem with natural processes. Those businesses that adopt a sustainable mindset early will be at the forefront of this transition. As investors, we have the ability to encourage those businesses and shift the common mindset.

Shifting our economic mindset is necessary and can be further explained by the concept of systems thinking which is used widely in the field of sustainable business. The Iceberg Model of Systems Thinking analogizes a method of analysis with an iceberg: essentially, any event that happens is the visible tip of the iceberg, but the explanation goes much deeper. The subsequent levels can be progressively broken down from patterns of behavior (trends over time) to underlying structures (the cause of the trends) to the mental models (beliefs
upholding the system). If you want to make a real change to a system, you have to approach it from the bottom up.

Applying this model to climate change, we can break it down like this: The “event,” or what’s happening right now on the global scale, is ongoing destruction of the environment and rapid climate change. Every day, hundreds of species go extinct, glaciers melt even further, and rainforests are cut down. The “patterns of behavior” causing this are human-caused carbon emissions and pollution. The “underlying structures” supporting these patterns of behavior are manifold, but the primary culprits are industry, agriculture, and other economic structures. Finally, the “mental models” that uphold these structures are the beliefs that humans are removed from nature and that the earth is owned by humans and is ours to do whatever we want with.

Let’s zoom in further and apply this thinking process specifically to our current economic system. Starting at the top, we can say the event is broadly the same as the first example - ongoing environmental destruction and global warming. The economic patterns of behavior that cause this event are the systems of production that create waste and discard it into ecosystems. The underlying structure is the current economic system that uses a circular flow between resources, businesses, and consumers without factoring in waste management and the general use of a short-term ~2-year profit timeline broken down into quarters. The mental models that support this structure are the idea that the economy can keep growing infinitely with this non-stop circle of business to public to business and that profit needs to happen on a rapid time scale.

Beyond that, there are intersectional consequences; for example, in environmental justice. Consuming resources and producing waste creates “sacrifice zones” - areas seen as “disposable” and are thus areas of concentrated environmental destruction. Sacrifice zones are areas like those around coal power plants, or chemical treatment facilities - toxic areas where people would not live if given the choice. Yet, people have to live in these areas for them to exist, and these people often are minorities and/or working-class. To quote a Sierra Club article by Hop Hopkins: “You can’t have climate change without sacrifice zones, and you can’t have sacrifice zones without disposable people, and you can’t have disposable people without racism.”

The issue with this system is that the mental model is infeasible in the long term. As much as humans like to believe we have managed to completely separate from and even dominate nature, we have not, and our short-term mindsets allow us to stay blind to natural processes that happen on a longer-term scale. Nothing in nature can grow infinitely, so how is the economy supposed to grow infinitely when it relies on resources originating in nature? This infinite-growth
idea creates room for the economic cycle to ignore negative externalities - diminishing resources as we continue to extract from nature, and the waste and byproducts created by the production processes. Furthermore, because negative externalities are ignored and the economy operates on a short-term timeline, making sustainable choices is seen as too costly to justify the results, which happen on a longer-term scale and as such can be overlooked.

The Circular Economy is an alternate economic structure that accounts for negative externalities by factoring in waste disposal and resource scarcity. From a financial perspective, this has long-term benefits because companies with this model can avoid repercussions of negative externalities. Furthermore, the system improves the company image by supporting environmental, social, and governance issues.

Changing systems takes transforming the mental models; doing this successfully will have a ripple effect up the subsequent levels of the system. The economy follows profits, so financially supporting companies whose processes support the mental model you support is a means to drive the economy in that direction. Our money has power; essentially, we “vote with our dollars.” Of course, businesses are adaptable and can have the capability to pivot in response to the impacts of climate change. However, focusing on the “events” is reactive, whereas focusing on mental models is proactive, and proactive, innovative companies will be better prepared to succeed.

How Should I Think About Being an ESG Investor?

*Should I find companies who already satisfy my ESG standards or companies who are working towards bettering their internal and external practices?*

A question that many consider on their ESG investing journey is “should I put money into companies who are the solution or invest in companies who may not be perfect ESG investments now, but are moving in the right direction?” This is an important question to consider as an investor.

Shareholder advocacy lays at the crux of this issue. Both kinds of investments can be financially sound, but investments must align with your advocacy behavior in order to make desired societal impact. If you, or the fund you are putting money in, uses proxy votes and your “seat at the table” to push forward resolutions and initiatives to better a company’s ESG scores, then investing in companies to push them in the right direction makes a lot of sense. If you, or the fund you are putting money in, aren’t active ESG advocates, then putting money into sustainable and responsible companies with already high ESG scores is most effective to make the world a better place.
In other words, if you are an “active ESG investor” you can invest in order to better companies who need a push and if you are a “passive ESG investor” you should invest in companies actively pursuing the solutions to societal problems.

ESG Rating Systems Analysis

Introduction to ESG scoring:

Although ESG scores are extremely powerful tools to promote high ethical standards and transparency in the business world, they present various inconsistencies and are difficult to compare across industries. Today, there are several hundred ESG rating agencies, all with their own respective scoring formulation. This is due to the arbitrary nature of an ESG score. While it might be simple to measure a company’s carbon footprint, it is much more difficult to calculate their social or governance scores consistently. Moreover, there are no uniform rules or regulations regarding ESG transparency, and different companies are held to different standards when it comes to reporting. Simon MacMahon, the head of ESG research at Sustainalytics, explains that “the data inputs that we start with are fundamentally less structured, less complete, and of lower quality than financial data, which companies are required to present in a standardized form and have audited by accountants. The lack of rules and robust metrics makes our job more difficult.” However, ESG rating agencies are still extremely valuable due to their access to company information not available to the average investor. Researchers worldwide are working intensively to find any uniformity or parallels in ESG data.

ESG Investing:

From an investment perspective, ESG scoring faces another major hurdle: How do you make the average investor care about ESG in the first place. A common misconception in sustainable investing is that it requires a premium, or higher cost to invest. In other words, those who invest in higher ESG rated companies will have a lower return on investment because it costs more to compensate for higher ethical standards. However, our research shows the contrary and that there are ways to invest responsibly and still outperform the market. A recent report from RBC Asset Management not only confirmed our results but found that there are

KEY FINDINGS INCLUDE:
- There is a positive relationship between strong governance practices and stock price performance.
- There is a positive relationship between strong environmental performance and stock price performance.
- There is a positive relationship between high employee satisfaction and stock price performance.
- The use of aggregated sustainability scores to determine the impact on performance has demonstrated evidence of a positive impact.
- Companies with high ESG ratings outperform the market in the medium (three to five years) and long term (five to 10 years).
- Companies with high ESG ratings have a lower cost of debt and equity.
- Strong ESG practices improve operational performance of firms.
- CSR considerations in stock market portfolios do not result in financial weakness.
- Companies that prioritize sustainability manage environmental, financial and reputational risks better, which decreases likelihood of reduced volatility of cash flows.

several other positive relationships with high ESG scores and improved stock performance. Convincing the average investor to invest responsibly becomes significantly easier when supported by these results. However, the ESG world is still very complex, and investors are not accustomed to analyzing hundreds of different scoring systems. Thus, I made it a goal to find one overall ESG score that outperforms the rest.

Research Methods:

To find the best overall ESG score, I decided to compare a company’s ESG score with 3-year returns and P/E ratio across five major ESG rating agencies using Bloomberg Terminals. Those with the highest correlation would be deemed the better score. Although it likely does not reflect which rating agency’s score is the most accurate, these results could potentially provide investors with a better score connected to stock performance. Unfortunately, I was limited in the scope of my project due to a lack of resources and could only compare five of the significant scoring agencies. Furthermore, I could not access historical ESG data and only compared April 18th ESG scores with 3-year returns and P/E ratios. Nevertheless, I still found this information valuable as I could rank each agency’s correlation and track their performance over time. The rating agencies included in my research were RobecoSam, ISS Quality Score, CDP Performance Score, CSRHub, and Sustainalytics. Moreover, I compared correlations between the S&P 500, Russel 2000, and Russel 3000 to find if there were consistencies among large, mid, and small-cap stocks.

Results

My results found a minimal correlation between ESG scores, 3-year stock returns, and P/E ratio. Although positive correlations did exist, the highest correlation coefficient found was 14%. Admittedly, I did not expect very high correlations, to begin with, considering the aforementioned inconsistencies in ESG scoring and lack of historical data. However, it is worth noting that among large-cap companies, Sustainalytics had the only positive correlation with 3-year returns (7%) and the highest correlation with P/E ratio (-1.4%). Moreover, Mid and small-cap stocks provided nearly identical results due to the fact that the many small-caps stocks do not offer ESG scores. Therefore, the number of companies compared in the Russel 2000 and Russel 3000 were very similar. It is also worth noting that certain rating agencies provided scores for mid and small-cap companies while others did not, which caused inconsistencies in the data. Still, we found that CSRhub had the highest correlation with 3-year returns for mid and small-cap companies (14%) and a positive correlation with P/E ratio (4%). CSRhub was also the only rating agency to positively correlate with P/E ratio; all other rating agencies had an inverse relationship across large, mid, and small-cap stocks.

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Case Study: Materials and Supply Chain

Introduction

What does a sustainable supply chain look like?

In recent years, many multinational companies have been pledging to source from suppliers who follow social and environmental standards and request that those suppliers also ask the same of their second-tier suppliers. Ideally, this results in a supply chain with sustainable practices throughout the network. Some steps that model companies have taken to improve sustainability in their supply network are as follows:

- They have established long-term sustainability goals.
- They require first-tier suppliers to set their own long-term sustainability goals.
- They include lower-tier suppliers in their overall sustainability strategy.
- They task a point person or staff with extending the firm’s sustainability program to first- and lower-tier suppliers.

Some additional steps that example companies have taken are:

- They create preferred-supplier programs to give priority to suppliers who meet their social and environmental standards.

This method rewards suppliers who make a conscious effort to improve sustainability and encourages suppliers to adopt more sustainable processes in order to become a preferred supplier.

- They work with competitors and other major suppliers to develop industry-wide sustainability standards.

These cross-checks allow sustainability requirements to be balanced and consistent and help businesses hold each other accountable (e.g. the Responsible Business Alliance, or RBA).

- They collaborate with international organizations and NGOs to develop common goals and standards and improve open climate disclosure.

This method helps improve transparency and encourage corporate social responsibility by volunteering to comply with international standards (e.g. participating in the Carbon Disclosure Project’s Supply Chain Program). Compliance with the standards can even be further encouraged through sustainability awards.

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They periodically check on how their first-tier suppliers are complying with the set standards. It is one step to require suppliers to adhere to a set of sustainability standards, but it is another to make sure those standards are enforced. Regular checks allow companies to ensure compliance and minimize the risk of any scandals that could arise if suppliers are found to deviate from the standards after claiming to follow them.

- They involve third-party auditing systems to ensure their own and their suppliers’ compliance with the standards.

By bringing in impartial third-parties, companies and their suppliers can ensure accurate assessments and communication of their own sustainable progress.

What are the challenges?

One major challenge with maintaining a sustainable supply chain is the lack of transparency\(^4\). Many major companies have struggled with requiring their first-tier suppliers to adhere to their standards and then discovering that the standards are being violated regardless. Furthermore, it is difficult for businesses to ensure that direct suppliers are also asking their own suppliers to comply with the same standards, let alone that those second-tier suppliers are following the standards at all.

Apple v.s. Tesla

**Tesla**

Because Tesla builds electric vehicles with the aim to reduce greenhouse gas emissions from automobiles, the company is seen as a model for sustainability. The company is highly innovative and has developed batteries with extremely long life-spans designed to be collected and re-used in vehicles\(^5\). Half of the materials used in the batteries are metals and infinitely recyclable, so Tesla has a system of reclaiming old batteries and recycling the materials to produce new ones as can be seen in their battery lifecycle diagram.

However, with a Sustainalytics score of 31.3, indicating high risk, Tesla clearly has room for improvement when it comes to sustainability. A major reason for their sustainability score is that Tesla’s vehicles are powered by lithium ion batteries, which are energy-intensive to produce and require a bulk of rare metals and elements that are difficult to source. In particular, the batteries use cobalt, which Tesla sources from a variety of locations including the Democratic Republic of Congo (DRC). It is known that sourcing materials

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from countries with limited or loose social and environmental policies, particularly the DRC, can come with difficulties in ensuring suppliers adhere to a company’s own policies.

To address this, Tesla holds their suppliers to a Human Rights and Conflict Minerals policy\(^6\), which is based on the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals\(^7\). The policy explains that suppliers are “expected to use reasonable efforts to ensure that parts and products supplied to Tesla are DRC "conflict-free," meaning that such conflict minerals do not benefit armed groups in the Democratic Republic of the Congo.” This language is still quite limited, as “reasonable efforts” can be interpreted quite loosely and “conflict-free” applies only to the DRC. In order to ensure compliance, Tesla regularly audits its suppliers and is making efforts to train its suppliers on incorporating sustainability standards and additionally is working to transition away from purchasing goods and services from suppliers who do not adhere to the standards.

Despite their shortcomings, Tesla has made significant commitments to improvement which will likely improve their already-rising returns and stock prices. Adherence to these commitments can be encouraged further by supporting the company through investment.

**Apple**

Apple is a leading innovator in the technology field and has been making progress in recent years towards a more sustainable product life cycle. As communicated in their 2019 Environmental Progress Report, Apple recovers their old batteries and is now using 100% recycled rare earth elements in the iPhone 11 series Taptic Engine and 40% recycled content in the 13-inch 2019 MacBook Air.

Apple has faced criticism in the past for sourcing from suppliers with significant human rights violations, but as of 2019, Apple has released a statement\(^8\) detailing their efforts to combat human trafficking in their supply chain. Along with other companies such as IBM and Intel, Apple has formed the Responsible Business Alliance (RBA) to design standards for sustainable operations. They have successfully gotten over 70 of their suppliers to commit to 100% renewable energy and list openly who their primary suppliers are. Because of their transparency and progress in making their supply chain more environmentally friendly and socially equitable, Apple’s Sustainalytics score is 16.9, indicating low risk.

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\(^7\) OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. OECD, Nov. 2013.

Interface v.s. The Tile Shop

Interface is a flooring company which produces carpets and tiling for commercial buildings. The company began its sustainable transition in 1994 and has since made significant progress, with all of their flooring made carbon-neutral by offsetting the carbon emissions of their production\(^9\). Following the establishment of their Carbon Neutral Floors program in 2018, Interface now sources 60% of its materials from recycled and bio-based sources.

Interface has also implemented environmental and social governance policies\(^10\) for their supplies to ensure humane working conditions and environmental compliance which involves regular monitoring through audits and inspections. Interface also actively works with its suppliers to help them become more sustainable through several programs\(^11\). In partnership with Manufacture 2030, Interface’s Suppliers to Zero program supports suppliers in going net-zero with their carbon emissions and additionally gives preference to recycled-material suppliers. Beyond these programs, Interface has also created Net-Works, which recovers used fishing nets from rural coastal villages in developing countries in order to recycle the plastic, reduce pollution in the ocean, and provide impoverished areas with additional income that can help improve their quality of life. Interface’s Sustainalytics score is very low-risk, at 10.2.

There are additional insights here when comparing Interface with a more traditional flooring manufacturing company, The Tile Shop. The Tile Shop does not release climate disclosures and additionally does not have policies or standards for its suppliers, let alone transparency around who those suppliers are. They source the majority of their materials from the United States and China, and make it very clear that their priority is profit and cost efficiency. Comparing the growth of both Interface (left chart) and The Tile Shop (right chart) over time via Yahoo, Interface is on a clear upswing since the impact of the pandemic, whereas The Tile Shop has been recovering far more slowly and with a negative trend over time.

Why a Sustainable Supply Chain is Important

Not only is sustainability in the supply chain an ethical goal for companies to pursue, which bolsters their reputation in the public eye and can thus influence stocks, involving sustainable practices in a supply chain has long-term economic benefits as well. As businesses are less

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\(^11\) LESSONS for the FUTURE. Interface, Inc.
reliant on rare or diminishing resources by transitioning to recycled resources, they are positioned to become even more stable and earn higher returns in the long run. Furthermore, they can avoid risks of instability that can come with questionable human rights policies. ESG investing is a tool to further encourage companies to adopt sustainable supply chain standards.

Case Study: Plastic Packaging

The Plastic Pollution Issue

Plastic pollution is a rapidly growing environmental problem across the world. The fact that plastic can be found everywhere - from in our clothes and our food, to the bottom of our oceans and the tops of our mountains - illustrates how we currently can’t control the flow of plastics we produce. 70% of plastic is not recycled, put in landfills or left in the natural environment, and then remains there indefinitely because the material doesn’t decompose. Plus, plastic production, which now sits around 380 million tons per year, is set to quadruple by 2050.

A particularly poignant example of the pervasiveness of plastic pollution lies in the Great Pacific Garbage Patch. It spans 270,000 miles and is made up by 1.8 trillion pieces of plastic. This kind of plastic pollution adversely affects the ocean and a wide variety of creatures within it. We need to address this issue in order to avoid the detrimental effects plastic has on our ecosystems and wildlife!

In addition to environmental impacts like that of the Great Pacific Garbage Patch, plastic production and waste also contribute to climate change and global warming. Specifically, plastic production necessitates the use of fossil fuels and is responsible for an exorbitant, and growing, amount of carbon emissions every year.

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Plastic pollution can also severely affect human health.\textsuperscript{19} Plastics that need to be burned when communities can’t contain waste emit toxic chemicals that can cause skin and eye disease, cancer, and respiratory ailments. Furthermore, plastic found in our food or clothes, for example, can further affect our health when consumed.

Plastic packaging and single-use plastics play a particularly large role in creating this problem, making up a quarter of the plastics that we currently use.\textsuperscript{20} Because of the prevalence of plastic packaging, I have focused my report on ESG investing and plastic packaging specifically.

In summary, plastic production and packaging hurts our planet, its wildlife, and humans. It exists as a pressing issue that needs to be addressed.

Why Investing Can Make an Impact on the Plastic Problem

By investing in progress and solutions and using shareholder and investor power to influence leaders’ decisions, business policy can be moved to change drastically. Consumer goods companies play a massive role in our world wide plastic pollution with their packaging and, in turn, have an opportunity to help change the tides on our plastic problem.

As You Sow’s Plastic Solutions Investor Alliance - an international coalition of investors worth nearly $2 trillion that engages publicly traded CPG companies on the threat posed by plastic waste and pollution - provides particularly strong evidence that big changes can be brought on by active investors. In my conversation with Kelly McBee, a manager of the Plastic Solutions Investor Alliance, she relayed that the alliance and the power that its investors bestow it encourages companies to listen and helps provide financial arguments to business leaders to reduce their plastic waste and do their part to mitigate the plastic problem. Specific success includes companies such as Keurig Dr. Pepper and Mondelez International committing to cut virgin plastics from their packages after conversations with As You Sow.\textsuperscript{21}

Why ESG Investing into Plastics Can Be Lucrative

Not only does ESG investing provide a method to make incredible change on an important global issue, it can help investors put together a high-performing portfolio. Specifically, investing in companies who efficiently use plastic, or plan to become more efficient, can mitigate risk, spur innovation, and capitalize on consumer behavior.

Plastic packaging worth up to $120 billion per year is used once and thrown away; it represents a massive waste of resources.\textsuperscript{22} Plastic and carbon regulations can and do represent hurdles

\begin{footnotes}
\item[22] See Footnote 9.
\end{footnotes}
companies who don’t currently abide by regulation standards have to overcome.\textsuperscript{23} The plastic production industry is shrinking across the board, from plastic packaging to bottles to plastic bags.\textsuperscript{24} \textsuperscript{25} \textsuperscript{26}

Consumers are also asking for more sustainable packaging. For example, US consumers are more concerned about bans of single-use plastics and their impact on our oceans than climate change.\textsuperscript{27} These kinds of preferences elucidate that harmful use of plastic can cause reputational damage.\textsuperscript{28} And, this kind of reputational damage can have material impact.

All of this is to say, companies who have or are working towards sustainable plastic use will be more successful down the line.

There is evidence, too, that consumers and investors can push companies to innovate and create more sustainable packaging.\textsuperscript{29} Simple shifts to other materials like paper to wholly new packaging like casein-made films show us that innovation is possible and can be more efficient than plastic packaging. It does seem as though creative alternatives to plastic packaging will start to popularize going forward and companies on top of these innovations will have the opportunity to avoid risks associated with the factors outlined above.

Case Study: Coca Cola vs PepsiCo

To illustrate the process of ESG investing for plastic waste and pollution, I looked specifically at the question of whether investors should put money into Coca Cola or PepsiCo. I chose Coke and Pepsi because the companies currently exist as the two largest plastic wasters in the world, respectively, yet have initiatives in place to drastically reduce their environmental footprint. My research aimed at answering the questions: Does it make sense to invest in such big contributors to the problem? Is one of these companies a better plastics investment than the other?


The most influential information in my research came from the 2020 As You Sow Waste & Opportunity report. As You Sow is “the non-profit leader in shareholder advocacy” and the Waste & Opportunity report is a “study that measures the progress of 50 large companies in the beverage, quick-service restaurant, consumer packaged goods, and retail sectors on six core pillars where swift action is needed to reduce plastic pollution.” The report, for our purposes, extensively outlines initiatives Coca Cola and PespiCo have aimed at plastic reduction and collection, as well as downfalls of the two beverage giants plastic packaging. The study also provides a direct comparison between Coca Cola and PespiCo on six facets of plastic packaging (see image below).

These grades provide clear evidence that Coke stands just ahead of Pepsi with their packaging. Coca Cola proved to be one of the highest ranked companies of the 50 studied, despite a measly C+ rating, with many companies falling after them before PespiCo. Of note, Coke’s transparency and ambitious goals as a result of their World Without Waste initiatives prove to be a differentiator between the two companies. These kinds of behaviors are actions that investments into Coke could spur onto Pepsi.

This kind of transparency and Coca Cola’s ambitious goals were evident in conversation with Matthew Walker, the Senior Procurement Manager at Coke who works directly with the company’s World Without Waste Sustainable Packaging projects. Walker outlined the extent to which Coca Cola is centered on this issue and emphasized three of the four pillars World Without Waste is based on:

- Collect one bottle for every bottle sold by 2030
- Have packaging 100% recyclable by 2025
- Have 50% recycled content in make up their packaging by 2030

He explained that Coca Cola’s worldwide reach and education efforts separates them from their competitors and allows them to work productively towards these goals.

Does that mean Coke should be invested in over Pepsi? Not necessarily. Although Coke seems to be a better plastics investment, Pepsi seems to be a better holistic ESG investment based on metrics discussed in the ESG Rating Systems Analysis. As a result, investors must weigh their priorities; these kinds of investments need to be informed personal decisions. Are you investing for plastic specifically or ESG issues generally? From my personal perspective after my research, interviews, and looking at the problem purely from a plastics perspective, active investors should choose Coca Cola and passive investors should choose neither.
Case Study: Meat Production

Background

The meat and dairy industry have come under scrutiny in recent years due to a number of negative environmental, health, and safety issues being linked to standard industrial animal feed operations’ practices. The industry accounts for approximately 14% of greenhouse gas emissions globally, uses hundreds of gallons of freshwater to produce a pound of food, has been cited as a major cause of deforestation and ocean dead zones, and is linked to human rights abuses towards indigenous people\(^30\). Additionally, consumption of animal products have been linked to a number of diseases such as various cancers and heart diseases. Workers are also at risk of illness or injury due to a number of sanitation and safety concerns within the industry. These issues and more have led to increased calls for healthier, socially responsible, environmentally friendly meat.

For some, this has meant a switch to plant based meat, as it is often promoted as a healthier, more sustainable alternative. Plant based meats use 47%–99% less land, emit 30%–90% less greenhouse gases, and use 72%–99% less water than conventional meat\(^31\). These attributes have caused the market to expand in recent years. The plant-based meat market is estimated to be valued at USD 4.3 billion in 2020 and is projected to reach USD 8.3 billion by 2025\(^32\). While this is significant to investors, this isn't to say that investing in plant based meats are the way to ensure returns on investments in ESG aligned meat product companies. Industry valuation alone does not equate to returns for investors and sustainability alone does not equate to a high ESG score. There are a number of other criteria that must be considered on both fronts.

Industry Analysis

Some companies in the meat industry, in response to criticism of recent years, have made a number of changes in attempts to be more ESG aligned, through policies as well as improved transparency.

BRF SA especially has been under scrutiny in recent years. In 2017 BRF’s offices were raided by Brazilian Authorities following a multi-year investigation called “Operation Weak Flesh.” The investigation concluded that between 2012 and 2017, BRF bribed food regulators, inspectors and politicians to avoid food safety checks, unsanitary food practices and to falsify test results for safety practices in its industrial processes which led to an over 50% decline in stock price\(^33\). Since this incident they have been attempting to improve their image through


\(^{31}\) The Good Food Institute. “Plant Based Meat for a Growing World.”


improvements in community development, worker safety and sustainability, including, but not
limited to, water and energy use and greenhouse gas emissions, all of which is well cataloged in
their extensive annual report. Some significant achievements include joining the UN Global
Compact Water Group and creating the Projects Fund\textsuperscript{34}.

Pilgrims Pride does not have information on ESG criteria in their annual report, however
there is a significant amount of information on such criteria on their website. On the website
improvements on the safety index, greenhouse gas emissions and energy and water use and
their coinciding policies are all documented. They have seen a 10-15\% improvement on all
environmental and safety measures\textsuperscript{35}.

Sanderson Farms’ does not have measurements of ESG criteria on their website or
within their annual report. They do have documentation of charitable initiatives on their website,
however, such as donating $12 million to various charities since 2011\textsuperscript{36}. They also use
anecdotes to convey their orientation to the community.

Beyond Meat is one of few publicly traded plant based meat companies. While
presumably more sustainable than standard meat products, Beyond Meat doesn’t document
progress of ESG criteria on their annual report. They do however, cite multiple reports on the
sustainability of plant based meats on their website.

Investment analysis

To understand how alignment with ESG criteria in the meat product industry relates to
whether or not a stock is worth investing in, we reviewed the annual report, ESG score and
relevant financial information of 4 mid cap meat companies: BRF SA, Sanderson Farms,
Pilgrim’s Pride, and Beyond Meat. In comparing these companies across the relevant metrics,
BRF SA performed the best. It had the highest ESG score, most extensive annual report,
highest return on investment and the highest profit margin of all the selected companies (see
chart below)\textsuperscript{37}. Beyond meat performed to worst across all metrics, including ESG score, despite
plant based meats being a more sustainable meat option. Beyond meat is a relatively new
company, founded in 2009, which may have been part of the reason it performed so low across
the metrics. CSRhub uses the transparency of the company, based on disclosure of information
on policies and procedures in each ESG area, as one of the criteria for calculating scores\textsuperscript{38}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{Comparison of ESG performance and financial metrics of BRF SA, Sanderson Farms,
Pilgrim’s Pride, and Beyond Meat.}
\end{figure}

\textsuperscript{34} 2020, \textit{Integrated Report Evolution That Feeds the Future},
api.mziq.com/mzfilemanager/v2/d/4d44a134-36cc-4f7a-b520-393c4aceabb2/cb20b7fe-ce41-93d9-2d6f-2
4f3a24b8d2d?origin=1.

\textsuperscript{35} \textit{Pilgrim’s Sustainability Report}, 2019, sustainability.pilgrims.com/.


\textsuperscript{37} https://www.google.com/finance/quote/SAFM:NASDAQ?sa=X&ved=2ahUKEwi-xMK5_L7wAhV2B50JH
SPvBAQQ3ecFMA6BAgNEBo&comparison=NYSE%3ABRFS%2CNASDAQ%3ABYND%2CNASDAQ%3APPC

\textsuperscript{38} \textit{CSRHub ESG and CSR Ratings Methodology}, 2021,
Beyond Meat being a new company has had less time to conduct environmental or social impact assessments, significantly lowering their score\(^{39}\). Setting aside Beyond Meat however, it is still evident that higher ESG score has a positive relationship with return on investment. As it relates to profit margins, ESG score does not have a directly positive relationship among the remaining companies, with Pilgrim’s Pride having the second highest score, but slightly lower profit margins than Sanderson Farms. However, it still stands that the company with the highest ESG score, BRF SA, has the highest profit margins. For ESG investors interested in investing in meat product companies, this shows how alignment with ESG criteria within the industry can correlate to positive returns. It doesn’t have to be a tradeoff of positive impact investment or positive returns.

<table>
<thead>
<tr>
<th>Company</th>
<th>ESG score (CSRHub)</th>
<th>Return on Investment (TTM)</th>
<th>Profit margins</th>
</tr>
</thead>
<tbody>
<tr>
<td>brf</td>
<td>55</td>
<td>4.48%</td>
<td>3.51%</td>
</tr>
<tr>
<td>Pilgrim’s Pride</td>
<td>49</td>
<td>2.23%</td>
<td>.78%</td>
</tr>
<tr>
<td>Sanderson Farms</td>
<td>47</td>
<td>1.57%</td>
<td>.79%</td>
</tr>
<tr>
<td>Beyond Meat</td>
<td>42</td>
<td>-13.47%</td>
<td>-12.97%</td>
</tr>
</tbody>
</table>

Case Study: Beer Industry

Background and Problem Identification

Experts estimate that the water demand will exceed supply by 40% in 2030, when nearly half of the world's population lives in areas of severe water stress, according to the International Resource Panel (a partner with the UN). Water shortage is a severe problem for breweries that rely on water for production. Not only does

beer consist of 95% water\textsuperscript{40}, but the manufacturing process uses the liquid in other ways to achieve the final canned product. Water usage in breweries can be seen in the chart to the right\textsuperscript{41}

\textit{Brewing water} (45\%) must be treated for the correct chemical composition based upon the beer being brewed.

\textit{Process water} (35\%) is imperative in washing tanks, pipes, and refrigeration (water + glycol).

\textit{General-purpose water} (16\%) is necessary for maintaining the overall sterility of the site.

\textit{Service water} (4\%) must be demineralized before use in the boilers.

Water efficiency in breweries is measured in KPI (barrels of water per barrel of beer). Inside the average brewhouse, production hovers around 7KPI, with less efficient breweries reaching up to 10KPI. It is also essential to consider the water footprint of materials used, such as barley. When taking into account the water used in agriculture, KPI can be as high as 291\textsuperscript{42}.

The beer industry must also consider their impact on ecosystems when they take water from rivers and lakes. Water is heavy and difficult to transport in large quantities, forcing breweries to rely on local sources. It is also important to note that brewery wastewater can be too high in particulates and have an improper pH for municipal treatment facilities to handle. This means that breweries cannot plug water in the process back into the local system without additional treatment.

Industry Analysis

It is clear that every company in the beer brewing industry has taken steps to remain sustainable because water will become more scarce. Some, however, have done more than others. I analyzed four publicly traded companies to assess their water conservation strategies to ensure an investor would choose smart, stable stocks.

AB InBev: The American-Belgian conglomerate has made water-shed stability a core value in their water sustainability mission. In an interview with the Global Director of Energy & Fluids at Anheuser-Busch InBev, I found that AB InBev has set bold targets (seperate from their company-wide goals) of 2.0kpi for their water-stressed breweries. The Global Director also told

\begin{footnotesize}
\begin{itemize}
\item\textsuperscript{40} “Craft Brewers Push For Water Conservation, Innovation.” \textit{Sustainable Water}, sustainablewater.com/craft-brewers-force-water-conservation/.
\end{itemize}
\end{footnotesize}
me about their community programs that work to help residents near the brewery through water donation programs.

Heineken: Heineken completed their Brewing a Better World strategy in 2020, a 10 year sustainability program that aligned with the UN's SDGs. They've committed to internal water efficiency as well as community conservation efforts in their 2030 goals. The company boasted their program that anticipates water-stress communities so that their breweries are prepared 43.

Molson-Coors: Molson-Coors set a target to improve water-use efficiency in their breweries by 22% to achieve a 2.8kpi. The company also committed to reducing their water footprint by directly working with barley farmers as opposed to malt sellers 44. By making this change, Molson-Coors will have a greater influence on water efficiency in the agricultural process.

Carlsberg: The Danish brewer has invested in water efficiency, treatment, and recycling. The company launched their new beer Purist which is from water taken from municipal waste centers. They also plan to reduce their current 2.8KPI to 2.5KPI by 2022 and 1.7KPI by 2030 45. In their Fredericia brewery in Denmark, the company is installing new recycling technologies that will produce beer at only 1.4KPI.

Investment Analysis

The best way to compare AB InBev, Heineken, Molson-Coors, and Carlsberg’s sustainability strategies was through factors such as ESG Risk Rating, KPI Achieved, KPI Goals, and 5 Year Growth. The numbers found were from 2020 Annual Reports put out by each company. Each factor can be seen in the chart listed below.


Carlsberg was the best in all categories except for KPI Achieved. However, their growth over the past 5 years and bold 2030 goals point to continued success in the market and with water conservation. They also had a low Sustainalytics ESG Risk Rating indicating success in environmental, social, and governance sustainability. For this reason, Carlsberg is a better investment as opposed to the other three competitors.

AB InBev was significantly worse in ESG Risk than competition, a concern for investors relying on stable companies. They also had the lowest 5 Year Growth with a decrease by 42.7% which may be indicative of future performance. Although they currently have the lowest KPI, a goal of 2.5 for 2025 demonstrates a lack of commitment to efficiency as opposed to others in the industry. For this reason, it is difficult to say with confidence that AB InBev will tackle water scarcity and remain a good investment. Therefore, I would not recommend putting the company in an ESG portfolio.

Heineken and Molson-Coors fall in between but not in any particular order due to conflicting strengths and weaknesses. I put them ahead of AB InBev because their risk rating was closer to Carlsberg and would be considered a low-risk investment by MorningStar.

<table>
<thead>
<tr>
<th>Company</th>
<th>ESG Risk Rating</th>
<th>KPI Achieved</th>
<th>KPI Goals</th>
<th>5 Year Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB InBev</td>
<td>25.8</td>
<td>2.7</td>
<td>2.5 (2025)</td>
<td>-42.70%</td>
</tr>
<tr>
<td>Heineken</td>
<td>20.2</td>
<td>3.1</td>
<td>2.8 (2030)</td>
<td>19.21%</td>
</tr>
<tr>
<td>Molson-Coors</td>
<td>18.9</td>
<td>3.4</td>
<td>2.8 (2025)</td>
<td>-41.87%</td>
</tr>
<tr>
<td>Carlsberg</td>
<td>18.5</td>
<td>2.8</td>
<td>1.7 (2030)</td>
<td>74.52%</td>
</tr>
</tbody>
</table>

Case Study: Oil and Gas

Potential Environmental and Health Effects of Fracking

Hydraulic fracturing, or fracking, is a stimulation process that injects large quantities of water, chemicals, and sand at high pressure to create small fractures within tight shale formations to extract natural gas or oil from deep reserves. The process was discovered in 1866 by Edward Roberts. It has significantly boosted oil production in the United States. Over 1.7 million U.S. wells have been completed from fracking. More than 7 billion barrels of oil and 600
trillion cubic feet of natural gas have been produced by the fracking process.\textsuperscript{46} However, fracking has been viewed as controversial in the past decade. Environmental issues related to fracking include water supply depletion, drinking water contamination, methane and other greenhouse gas emissions, exposure to toxic chemicals, infrastructure degradation, and fracking induced earthquakes. Consequently, fracking can threaten public health and negatively impact the economy in the long term.

How ESG Investing into Fracking Reduce Risks and Make Profit

Strong financial performance is no longer the only criteria of interest to today’s investors. Instead, investors have become more aware that the ESG performance of a company has a strong connection to its operational performance and financial returns. Therefore, ESG metrics become increasingly important to understand a company’s sustainability in the long term. As investors are increasingly interested in low-carbon productions, fracking companies need to show their actions or policies to address related issues. In 2003, Boston Common Asset Management created a new model for action-focused, relationship-based, long-term shareholder interaction with Apache Corporation. Boston Common financially supports Apache’s chemical expertise and encourages programs to reduce the use of toxic chemicals and control emissions of volatile organic compounds. Boston Common and Apache annually schedule a meeting for Apache’s executives and professionals to share environmental and social issues. In addition to the expert’s meeting, Apache’s CEO holds several discussions with shareholders focusing on related ESG issues.\textsuperscript{47} With such benign ESG investment, Boston Common and Apache achieve the goal of reducing toxic chemicals and continue working on mitigating other issues. As investors emphasize on sustainable practices, fracking companies tend to provide more disclosure on ESG factors.

Case Study: Pioneer Natural Resources vs EOG Resources

Two medium-sized fracking companies, Pioneer Natural Resources and EOG Resources, were selected as a case study. In order to invest in a more valuable company, we analyzed several key components from their annual sustainability reports. In comparison with EOG, Pioneer is the better fracking company to invest in. Pioneer committed to two industry partnerships, Advance Methane Science (CAMS) and The American Petroleum Institute’s Environmental Partnership (TEP), designed to reduce greenhouse emissions and improve air quality. Similar to Boston Common’s and Apache’s collaboration, CAMS hosts meetings and gathers a diverse group of experts to conduct studies focusing on methane emissions. As a result, Pioneer successfully achieved emission reduction through their research, industry partnerships, operational practices, and strategic planning (see image below).\textsuperscript{48} Since 2016, Pioneer has achieved a 24% reduction in total greenhouse gas emissions,

\begin{itemize}
\item \textsuperscript{46} "Fracking: What Is Fracking?: Shale Oil and Natural Gas: IPAA." \textit{IPAA}. https://www.ipaa.org/fracking/
\item \textsuperscript{47} James, Gemma. "Engage with Oil and Gas Companies on Fracking." Ed. Heidi Aho and Ruth Wallis. \textit{PRI}. https://www.unpri.org/download?ac=4158
\end{itemize}
a 38% reduction in total greenhouse gas emissions intensity, a 41% reduction in methane intensity, and 23% reduction in the methane leakage rate.49

In addition, Pioneer initiated several innovative projects to reduce freshwater withdrawal and consumption. Since the millions of gallons of fracking fluid are required for each hydraulic well and the fluid is made up of more than 90 percent water50, the water supply has become a serious concern. In 2018, Pioneer invested $134 million in Midland’s critical infrastructure to upgrade the city’s wastewater treatment facility51. The project was designed to increase the volume of plants up to 357,000 barrels of treated municipal wastewater daily52. The project benefits both Pioneer and the city of Midland by increasing the amount of recycling water and reducing demand for freshwater (see image below).

The President and CEO of Pioneer, Scott D. Sheffield, also stated their target setting based on Task Force on Climate-related Financial Disclosures (TCFD’s) criteria including reduce greenhouse gas emissions intensity by 25% by 2030, reduce methane emissions


intensity by 40% by 2030, and zero routine flaring by 2025. Altogether, the case study demonstrated how cost-efficient operations and sustainable business practices result in real value.

Findings + Mock Portfolio Comparison

In an effort to combine the findings of each group member’s individual research, we decided to construct and compare a portfolio of “good” performing ESG companies versus “bad” performing ESG companies within each group member’s respective industry. We sought to compare the total 5-year returns of each portfolio. To maintain consistency, we required each good and bad company to have similar market-caps. Ideally, this would filter out companies within the same industry that also contained several different business functions. For example, it would not make sense to compare a good ESG scoring energy company, like Pioneer Resources, to a bad scoring ESG energy company, like Chevron, considering Chevron is a massive corporation involved in aspects of the energy industry that extend far beyond fracking. The total market cap of the good portfolio was 403.95 billion, while the total market cap of the bad portfolio was 399.3 billion. Moreover, we incorporated our rating agency research results and applied Sustainalytics scores when comparing large-cap stocks and CSRhub scores when comparing mid and small-cap stocks. Regardless, the average Sustainalytics and CSRHub score for the entire good portfolio was 23.28 (lower is better) and 56.4 (higher is better). The average Sustainalytics and CSRHub score for the entire bad portfolio was 32.83 and 52.8, respectively. In summary, we found that the good portfolio produced total returns of 12.29%, which significantly better than the bad portfolio’s total returns of -9.56%. Outside of the meat production industry, each good stock pick outperformed their rival bad stock. We find that these results support research suggesting that companies striving for higher ESG scores can also outperform those who don’t. It is inspiring to find that when comparing several niche industries within the world economy, ESG continues to display overall better investment characteristics.
