SUMMIT
GLOBAL INVESTMENTS

2019 ESG REPORT

360° of ESG Integration


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"ESG investing is allocating capital in such a way that will help create a better world for our children."

David Harden, Founder and CEO

Thank you for letting us share our story

Matt Hanna, CFA, FRM, CAIA

Portfolio Manager, Managing Director of ESG Investing

I am honored to present to you Summit Global Investments' (SGI) inaugural annual ESG Report. This report is designed to present to you how ESG (Environmental, Social, Governance) considerations are integrated into the investment process, reveal SGI's ESG research, and give you a look into the ESG friendly culture of the firm.

SGI was founded in 2010 in order to bring institutional quality investment management to the masses. A core goal of our portfolios is to produce a lower risk experience, as defined by volatility, while upholding a high standard for the companies that we own. It is one of our core beliefs that companies that are ESG violators will be punished in the marketplace through high volatility.

SGI has always considered there to be a connection between acute ESG issues and near-term equity returns. For example, we consider companies that may have caused an environmental disaster as unsuitable investments. We have always restricted what may be considered SIN stocks from SGI portfolios, such as tobacco stocks. Over the years SGI has committed additional personnel and resources in order to identify and act upon those acute ESG concerns.

We have also committed to influencing the companies that we own through ESG friendly proxy voting. Over the last year we have voted for positive change in areas such as sustainable packaging, greenhouse gas emissions, drug pricing, child exploitation, gender equality, and many more.

SGI strongly believes that an ESG mindset must begin at home. Over the last year SGI has made major investments in the health and well-being of its employees as well as in its technology infrastructure. In this short time our improved technology has reduced our paper consumption as well as our carbon footprint through reduced travel.

One of my roles is to conduct research in order to maintain SGI at the forefront of ESG investing. Given that we believe that positive ESG characteristics will be rewarded in the marketplace, and that negative ESG characteristics will be punished, it makes the investment possibilities robust throughout our investment process. We are fully committed to spreading our ESG message to both clients and colleagues.

SGI at a Glance

SGI was founded by Dave Harden in October 2010 with a clear mission to deliver superior long-term investment results through experience, leadership, commitment, passion, and above all, high moral character. The firm is privately held, and all stakeholders are committed to providing solutions that can help achieve clients financial and ESG related goals. SGI utilizes a managed risk approach to investing, which focuses on limiting risk in all phases of the investment process: traditional risk management, quantitative investing, portfolio construction, and fundamental analysis. This style has proven to deliver excellent long term returns with significantly lower risk.

SGI's first product was the U.S. Large Cap Equity strategy, launched in January 2011. In March 2012, SGI launched the Global Equity strategy. In January 2014, SGI launched the U.S. Small Cap Equity strategy. In addition, SGI provides customized risk tailored full asset allocation solutions to clients. The three equity strategies are available in mutual fund format, and all strategies are available in SMA/UMA form.

SGI has been committed to managing all assets with ESG considerations since founding. SGI has strong ESG methodologies in multiple stages of its process; an innovative strict fundamental guideline for all holdings, restrictions of certain negative ESG industries, and quantitative tools. SGI has fully engrained ESG into the ongoing research process and expects any serious ESG investor to have innovative implementations of ESG investing to always be in the pipeline.

$1.04 billion — **SGI AUM as of 9/30/2019**

100% — **SGI GIPS AUM Managed with ESG Considerations**

Experienced — **Portfolio Managers Average 17 Years of Experience**

3 Equity Strategies — **U.S. Large Cap, U.S. Small Cap, Global**

Complete Portfolio Solutions — **Asset Allocation Portfolios Tailored to Risk Tolerance**

Innovative — **Unique Blend of Quantitative, Fundamental, and Risk Based Investing**

“We should hold ourselves to the same standards that we hold our investments.”

-Dave Harden

CEO Dave Harden researching with portfolio manager Richard Thawley II.

ESG Discussion with the CEO and Founder of SGI

Dave Harden

What does ESG mean to you?

It is part of the American dream to help create a better world, a world where our children have it better than we do. ESG investing is allocating capital in such a way that will help create a better world for our children. At SGI, we strive to be a responsible steward of capital while upholding standards of high moral character. This requires us to manage assets in a prudent manner which includes ESG considerations.

The definition of ESG can vary client to client, and manager to manager. At SGI, all our investment decisions have to pass through in-depth research and firm accountability with environmental, social, and governance issues. We are believers that companies that have a poor ESG profile, or perhaps one negative dominating ESG factor, will typically produce poor returns with elevated risks. ESG considerations are a critical portion of risk management.

The line is often blurry trying to delineate between the ESG strengths and weaknesses of companies. This means it is critical for managers to be actively involved. We can do our part by molding company policy to be more ESG friendly via voting our proxies in an ESG consistent manner and other forms of shareholder engagement.

Ultimately, we intend to make a difference through our votes and by not owning ESG offenders and rewarding ESG responsible companies by allocating capital to them.

Why is it important for clients to invest with an ESG mindset?

From an altruistic standpoint, people should want to make the world a better place. Investing with an ESG mindset is a great way to do that. It is also important to know that your hard-earned money is influencing and impacting not only your return and risk but the world at large through the companies you own.

SGI believes ESG investing will be rewarded in the marketplace by producing increased returns with lower risk versus non-ESG investment styles. This may take some time as society becomes more ESG aware, but the marketplace will ultimately place a premium on companies that take corporate responsibility seriously.

What is the biggest challenge facing SGI as an ESG investor?

A key challenge is the amount of impact one may have on company management. Management will not always listen. However, collectively, we will make a difference. As we grow, and ESG continues to grow, the ability to make direct change through company engagement will continue to increase. We have been ESG conscious from day one. You can say it’s in our DNA and been with us long before it was “cool” to be ESG. We are very happy to see others join in creating even more impact.

Where do you see ESG investing in the next 5 or 10 years?

The ESG awareness gap between U.S. investors versus European investors gives us a pretty good indication where ESG investing is heading. In Europe, it is expected that your investment strategy account for ESG issues and that you are an active steward of capital. In the U.S., being ESG aware is more the exception than the norm. We expect the U.S. to catch up to our European counterparts over the next decade.

Another challenge for ESG investing is a lack of clean, reliable, and transparent data including disclosures. We expect this to continue to improve.

Beyond investing, how is SGI ESG friendly?

As asset managers we should hold ourselves to the same standards that we hold our investments.

There are two clear 2019 initiatives that come to mind. First, SGI revamped our entire health package for our employees with improved coverage, less out of pocket expenses, and annual funding of a HSA account. Secondly, we've made a large investment in technology at SGI. Through improved technological processes we have been able to dramatically reduce our paper consumption at SGI, particularly in the new account process. This has also led to improved connectivity, allowing us to be more productive and reduce out of state travel.

What type of future ESG innovations do you see with SGI in the future?

SGI believes that continuous is research is critical in investment management as well as ESG investing. For example, as ESG data improves, there may be additional ESG factors utilized in our models. Currently we are testing additional ESG factors and different portfolio construction techniques.

One big change at SGI is how we intend to 'spread the word' on ESG investing. As a smaller firm we were once content to simply allow our strategies to speak for themselves. It is our responsibility to persuade people that ESG investing is in their own best interest and the best interest of future generations. This report is a great example of that.

What makes SGI different from others that invest with ESG considerations?

We are happy to report that our strategies are fully ESG integrated and have been since inception. We are not just the latest flavor of the month. Again, this is our DNA, and we have completely dispelled the myth that ESG means lower returns. Though there is always room for improvement, ESG and Risk Management are integrated in all parts of our investment processes; whether it is quantitative, fundamental, or during portfolio construction.

One truly unique implementation is how we identify acute ESG issues in our companies. These are companies that are otherwise in good ESG standing but have a sudden major red flag. Our job is to quickly identify the issue and remove the stock, entirely, from our portfolios. We do this by monitoring multiple sources of research in real time focusing on red flags, e.g., an oil spill, wildfire, data breach, food contamination, misconduct, violations and many others.

We are happy to report that our strategies are fully ESG integrated and have been since inception.

David Harden

Founder and CEO of Summit Global Investments

SGI Becomes a Signatory to the UN PRI Six Principles of Responsible Investment

In May 2019 Summit Global Investments officially became a signatory to the UN PRI Principles for Responsible Investment. SGI has always included responsible investment as part of our mission and becoming a part of this group will allow us to make a greater impact on these critical issues.

The PRI's Mission

"We believe that an economically efficient, sustainable global financial system is a necessity for long-term value creation. Such a system will reward long-term, responsible investment and benefit the environment and society as a whole."

Portfolio Manager and Managing Director of ESG Investing Matt Hanna signing the six UN PRI Principles for Responsible Investment during the PRI in Person 2019 conference

The Six Principles for Responsible Investment

1. **We will incorporate ESG issues into investment analysis and decision-making process**
2. **We will be active owners and incorporate ESG issues into our ownership policies and practices**
3. **We will seek appropriate disclosure on ESG issues by the entities in which we invest**
4. **We will promote acceptance and implementation of the Principles within the investment industry**
5. **We will work together to enhance our effectiveness in implementing the principles**
6. **We will each report on our activities and progress toward implementing the Principles**

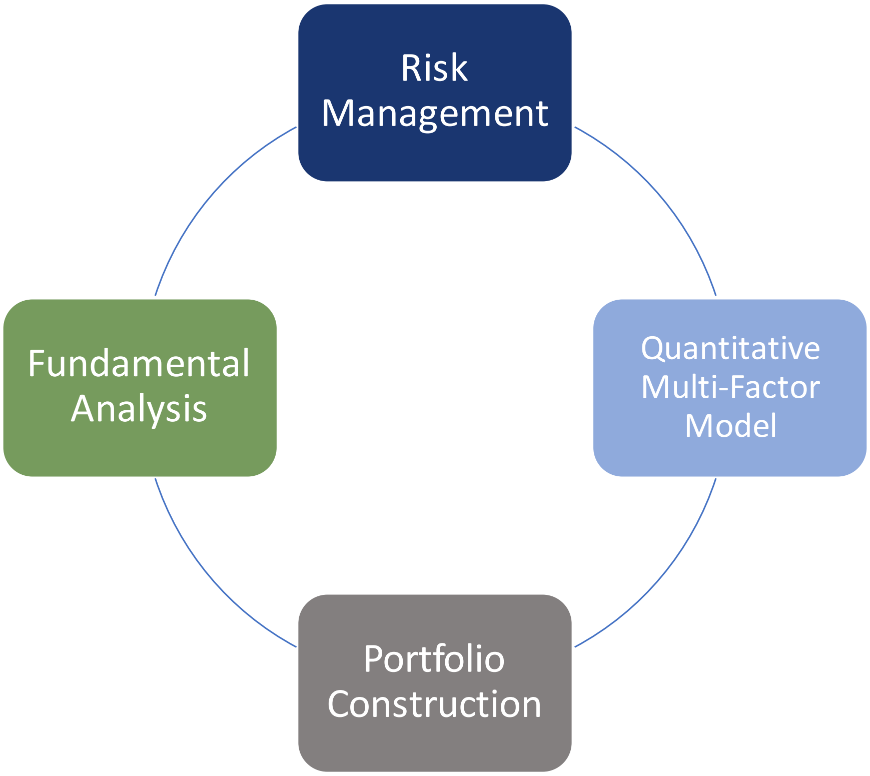
The SGI Investment Process

360° of ESG Integration

A key focus for SGI's investment process is risk management; volatility, downside, and ESG risk.

Since inception SGI strategies have been constructed via a blend of quantitative and fundamental methods with a defensive and ESG tilt. SGI has implemented ESG considerations through various stages of its investment process.

SGI believes strongly that there is a high degree of overlap between high volatility companies and poor ESG offenders. SGI restricts companies that score poorly via composite ESG rankings. In addition, SGI has incorporated a process to exclude all stocks from industries that do not meet our ESG standards. The next stage of process includes a deep fundamental dive on any potential company that SGI may own by building a mosaic that includes positive and negative ESG impacts. This ultimately determines whether such a company may be owned. However, there has always been a recognition that quantitative models have a severe blind spot; sudden or large company specific risk. To combat that SGI uses an additional fundamental overlay to help eliminate companies with major, particularly sudden, problems. Through daily portfolio management, it was clear to SGI that companies that experienced a sudden negative ESG event had elevated volatility, extreme drawdowns, and negative ESG exposure. These companies are now immediately sold from our portfolios.



SGI Investment Principles

Safety and Outperformance

SGI believes that providing multi factor quantitative lower volatility portfolios will lead to portfolios with reduced risk and increased returns. SGI believes there is a strong link between the most volatile companies and the worst ESG offenders, and SGI explicitly quantitatively avoids both.

Avoidance

Avoiding industries such as alcohol, tobacco pornography, and gambling is a long-term social investment. These industries have had limited risk and return impact on potential portfolios. SGI believes that over time companies in certain industries will underperform with increased risk.

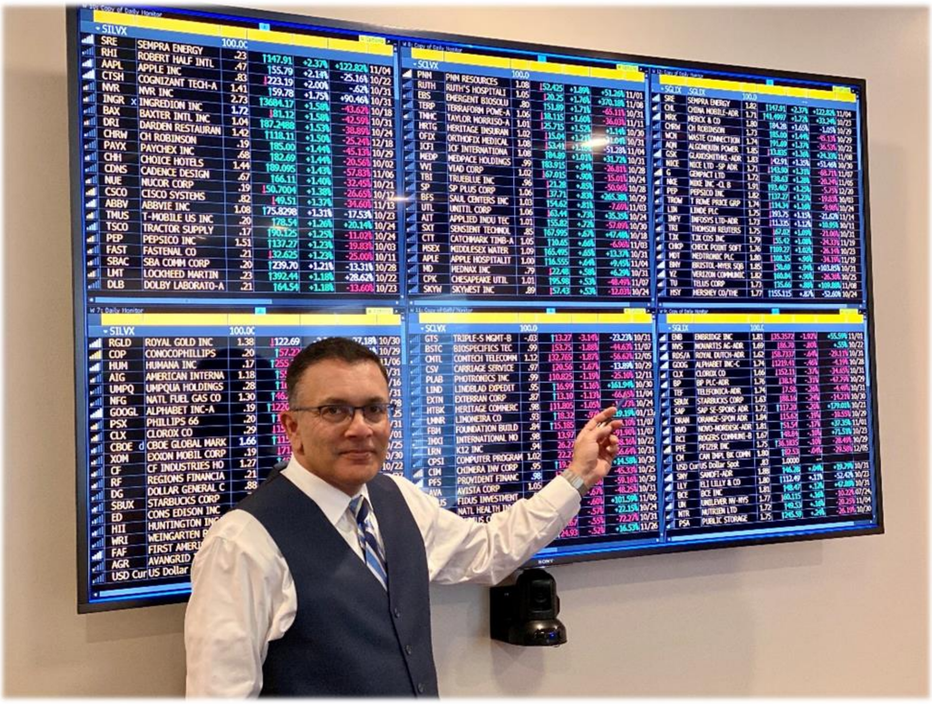
Fundamental Analysis

Rigorous fundamental analysis is required to discover sudden changes of potential downside risks. These changes are often ESG oriented such as unexpected management changes, environmental disasters, human rights issues, predatory pricing, and others.

Shareholder Engagement

SGI promotes ESG initiatives via proxy voting. SGI has a legacy of voting in favor on initiatives such as gender equality, clean water, child exploitation, executive compensation, and many others.

The SGI ESG Fundamental Investment Process



Discussion with Senior Portfolio Manager Aash Shah, CFA

Are ESG considerations detrimental to a company's financial performance?

Extensive research seems to indicate that the answer is no. A meta-analysis of ESG research by Friede, Busch, and Bassen was published in the Journal of Sustainable Finance & Investment (October 2015). Their exhaustive research collated and examined 2,200 research papers published by academic scholars and investment professionals going back to the 1970s. The results show that the business case for ESG investing is empirically very well founded. Roughly ninety percent of studies found a positive or neutral relationship between ESG criteria and corporate financial performance. Only ten percent of the papers showed a negative relationship.

How is ESG incorporated into the SGI fundamental process?

An examination of ESG factors are an integral part of our fundamental research process from the outset. First, we exclude all so called "sin" stocks. Companies that are substantially involved with tobacco, alcohol, pornography, gambling, cannabis, and weapons manufacturing are immediately excluded for investment. Then prior to purchase, each candidate company is subject to an extensive review of "red flags". This streamlined review cross-references our companies with over fifty ESG related search criteria. All citations of the company are reviewed for significance. If the company is determined to be in violation of any of the ESG considerations it is excluded from purchase.

Finally, all companies that are purchased are monitored daily across multiple media sources for new ESG violations. If an alert appears and is deemed to be a significant violation of sound ESG principles, then the stock is sold and placed on a restricted list regardless of its potential return.

Which potential ESG issues are most detrimental to the risk and return of a portfolio?

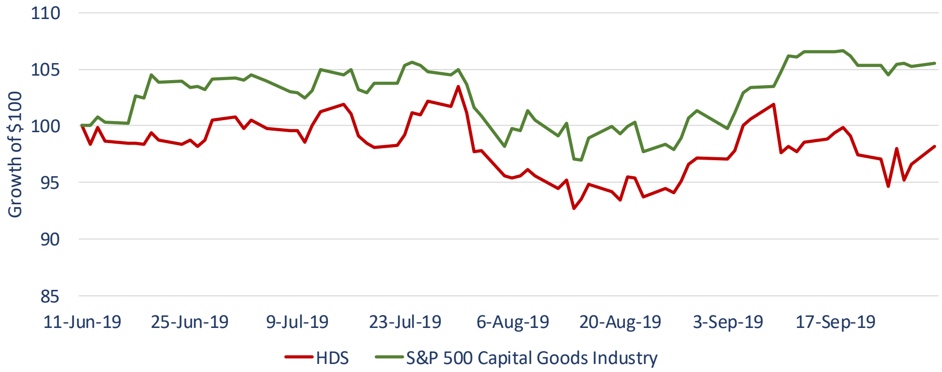
It really depends on the specific situation. A stock may drop significantly with the sudden discovery of additional company liabilities whether they be environmental, social, or governance related. We have sold companies based solely upon discovery of any one of the three categories.

Fundamental Analysis in Action

One of the largest industrial distributors in North America, HDS provides building materials, tools, and installation services to professionals in the specialty construction; maintenance, repair, and operations; and infrastructure markets in ~500 locations across 48 U.S. states and six Canadian provinces.

The team voted to sell HD Supply Holdings (HDS) out of the SGI U.S. Large Cap portfolio in June 2019 due to governance issues.

A securities class action lawsuit was filed in June 2019 stating that HDS CEO Joseph DeAngelo made false and misleading statements and/or failed to disclose that: (1) HD Supply's full year 2017 growth and operational leverage targets were unattainable; (2) the operational recovery of its Facilities Maintenance supply chain was not going according to plan; (3) Defendant Joseph DeAngelo, with full knowledge of the undisclosed materially adverse facts alleged herein, embarked on a selling spree of personal holdings of HD Supply stock that netted him over $54 million in proceeds; and (4) as a result of the foregoing, Defendants' statements about HD Supply's business, operations, and prospects were false and misleading and/or lacked a reasonable basis. When the true details entered the market, the lawsuit claims that investors suffered damages.



Company Spotlight

HD Supply Holdings

Ticker

HDS

Portfolio

SGI U.S. Large Cap

Sector

Industrials

Purchase Month

January 2019

Voted Fail (Sell) Month

June 2019

Key ESG Issue

Governance: False, misleading, or failed disclosures

David Harden

Mr. Harden is the founder, CEO, and CIO of SGI. He is the developer of the SGI investment process. Since founding SGI, Mr. Harden has been a driving force of integrating ESG considerations in investments, operations, and company culture.

Fundamental Analysis in Action

Company Spotlight

CenturyLink

Ticker

CTL

Portfolio

ESG fail prior to purchase

Sector

Telecommunications

Purchase Month

ESG fail prior to purchase

Voted Fail (Sell) Month

March 2019

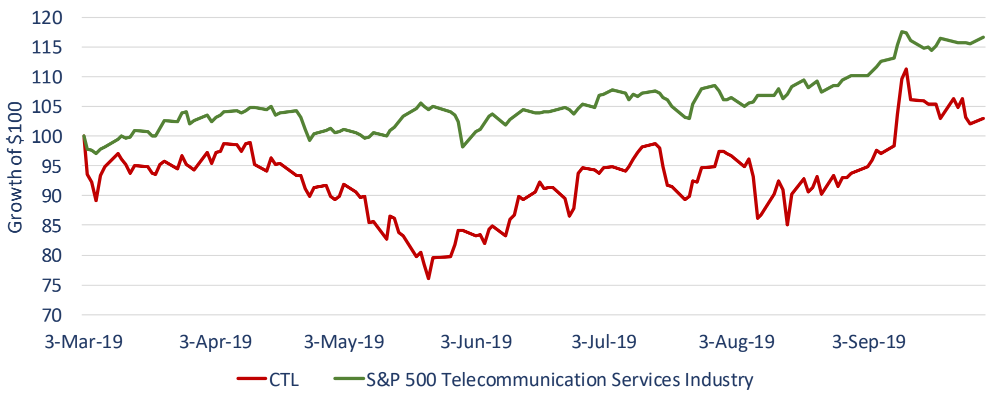
Key ESG Issue

Governance: Material weakness of internal controls

CenturyLink is the one of the largest U.S. wireline telecom companies, with ~450,000 route miles of fiber optic cable globally, and it's the incumbent local carrier in 35 states. It provides communications services, including voice, local and long-distance, network access, private line including special access, public access, broadband, data, managed hosting including cloud hosting, colocation, wireless and video services.

The team voted to place CenturyLink on the restricted list in March 2019 due to governance issues. This company was identified for purchase via our quantitative process but failed the fundamental review.

External auditor KPMG identified material weaknesses in the company's internal controls of its revenue recording processes and the procedures for measuring fair value of assets and liabilities assumed in connection with the Level 3 Communications Inc acquisition. Investors question whether the data that they have used from prior filings is even correct.



Aash Shah, CFA

Aash is a senior portfolio manager and the chairman of the Investment Committee. Aash is focused on all areas of the investment process but has primary oversight of fundamental analysis.

Company Spotlight

Valero Energy

Ticker

VLO

Portfolio

SGI U.S. Large Cap, SGI Global

Sector

Energy

Purchase Month

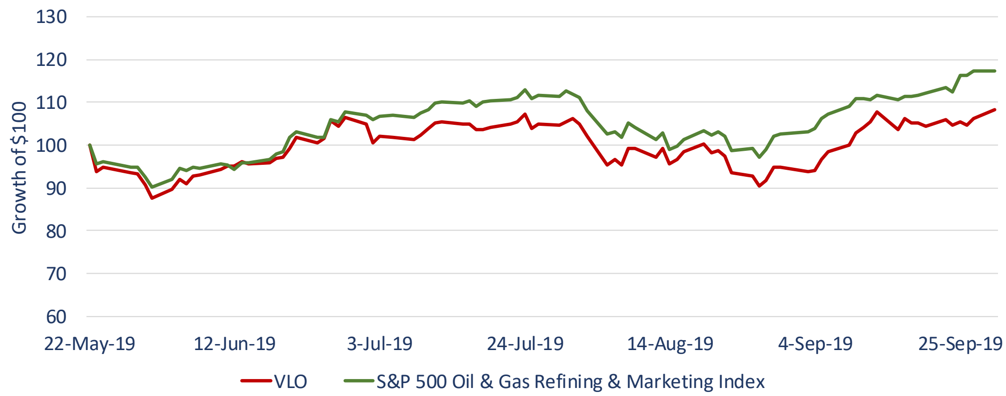
April 2017

Voted Fail (Sell) Month

May 2019

Key ESG Issue

Environmental: Hazardous air emissions violating the Clean Air Act



Valero Energy Corporation is a petroleum refining and marketing company that owns and operates refineries in the United States, Canada, and Aruba. The Company produces conventional gasolines, distillates, jet fuel, asphalt, petrochemicals, lubricants, and other refined products, as well as offers diesel fuel, low-sulfur and ultra-low-sulfur diesel fuel and oxygenates.

The team voted to place Valero Energy on the restricted list in May 2019 due to environmental issues.

Three Texas environmental groups announced their intention to sue Valero Energy in federal court for violating the Clean Air Act in a bid to recover damages for hazardous air emissions originating at the company's Port Arthur, Texas refinery. The environmental groups' May 22 "notice of intent to sue" alleges over 600 violations of emissions limits for various pollutants over the last five years.

Matt Hanna, CFA, FRM, CAIA

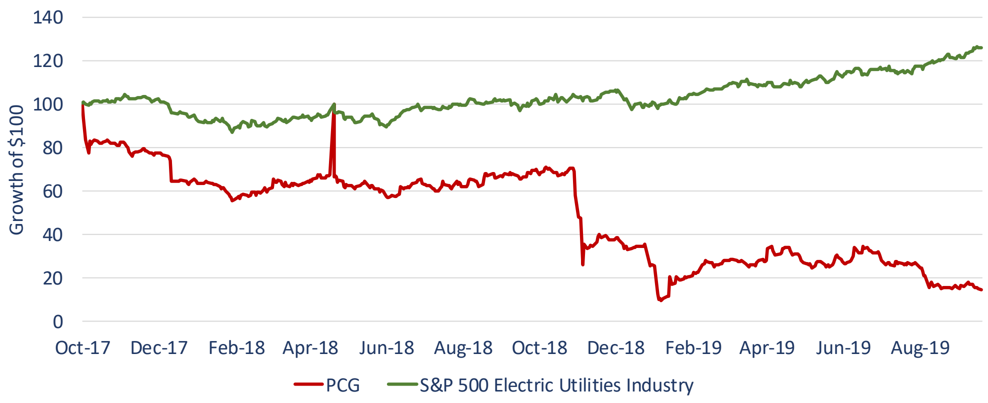
Matt is a portfolio manager and Managing Director of ESG Investing at Summit Global Investments. His primary investment responsibilities are quantitative processes, risk management, and ESG oriented research. Matt is a major ESG proponent and represents SGI at most ESG related events.

Fundamental Analysis in Action

PG&E is California's largest energy utility, serving millions of consumers and businesses. The company's operating subsidiary, Pacific Gas and Electric, serves more than 5.4 million electricity customers and 4.5 million natural gas customers. It operates ~125,000 miles of power lines and ~50,000 miles of natural gas pipelines. PG&E annually delivers about 80,000 GWh of electricity to its millions of end users from its 135 power generation facilities.

The team voted to place PG&E Corporation on the restricted list in October 2017 due to environmental issues.

The California Public Utilities Commission sent a letter to PG&E reminding them to preserve all evidence with respect to the Northern California wildfires. The commission was investigating whether electrical lines that were knocked down by a windstorm played a role in sparking the most lethal wildfire event in the state's history. Facing massive wildfire liabilities, PG&E and Pacific Gas and Electric filed for Chapter 11 bankruptcy in January 2019.



Company Spotlight

PG&E Corporation

Ticker

PCG

Portfolio

SGI U.S. Large Cap

Sector

Utilities

Purchase Month

December 2013

Voted Fail (Sell) Month

October 2017

Key ESG Issue

Environmental: Negligence resulting in wildfire

The deadliest, most destructive wildfire in California's history which killed at least 85 people, destroyed 14,000 residences and charred an area the size of Chicago as it raged across Northern California.

Company Spotlight

Boeing

Ticker

BA

Portfolio

ESG fail prior to purchase

Sector

Aviation

Purchase Month

ESG fail prior to purchase

Voted Fail (Sell) Month

March 2019

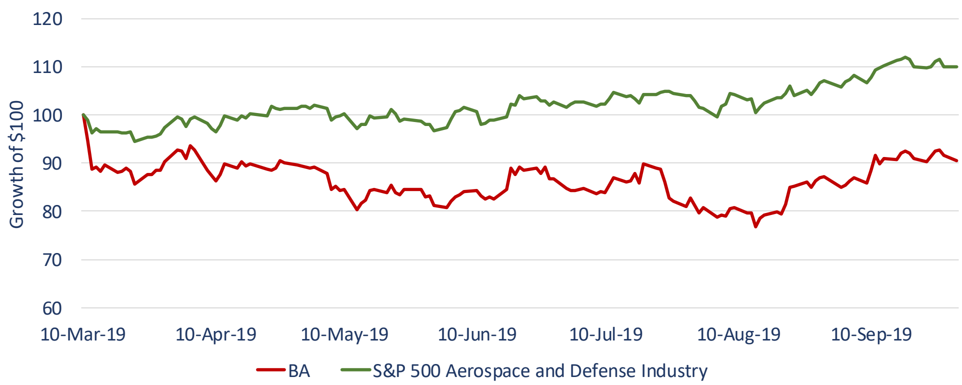
Key ESG Issue

Social, Governance: neglectful design resulting in deaths

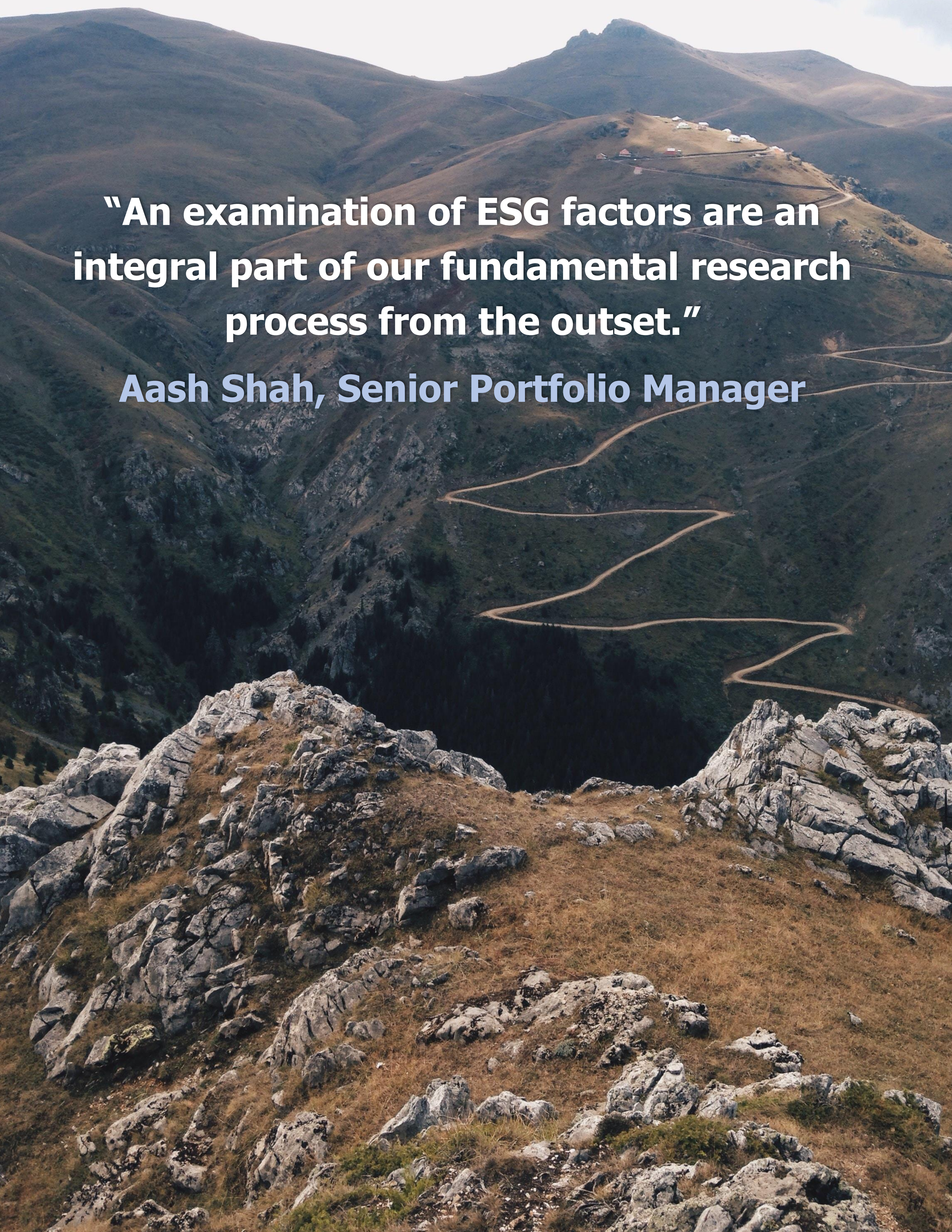
Boeing is the world's largest aerospace company and one of only two major manufacturers of 100-plus seat airplanes for the commercial airline industry. Major customers include the US Department of Defense and NASA. Additionally, Boeing provides aftermarket support, as well as airplane financing and leasing services to both commercial and military customers.

The team voted to place Boeing on the restricted list in March 2019 due to social governance issues. This company was identified for purchase via our quantitative process but failed the fundamental review.

On 10 March 2019, an Ethiopian Airlines Boeing 737 MAX 8 crashed shortly after takeoff and killed all 157 people on board. The incident was the second fatal crash of Boeing’s best-selling aircraft in less than five months and prompted two of the company’s biggest customers, China and Indonesia, to ground the aircraft.



Many countries around the world, from Europe and China, all banned the 737 Max from their airspace until a thorough investigation can be completed.


"An examination of ESG factors are an integral part of our fundamental research process from the outset."
Aash Shah, Senior Portfolio Manager

Proxy Voting Discussion

VP of Custody & Operations: R. Scott Nielsen

What is the SGI proxy voting process?

Our management team and our clients are concerned with Environmental, Social, and Governance (ESG) issues, which is why we have been complying with these standards from the inception of the firm. Early on we were receiving physical ballots, reading each description, and voting based on the core ESG values of the company, which was before a formal ESG standard was in place.

We established a relationship with Broadridge to vote our proxies electronically. This gave us the flexibility needed to vote all securities, with various custodians, at one central repository, collectively without losing control on how we vote.

Broadridge now has created a voting template on how other industry leaders are voting ESG related ballots. Utilizing this template, we, by default, have setup within the portal to vote all ESG related proxies with this standard. SGI tracks and monitors all votes to make sure that our standards are being upheld. We still have absolute control on how we vote, so if there are philosophical differences, we may override a vote to comply with our own company policy.

How does Broadridge ensure that proxies are being voted in an ESG manner?

This template was created by using the voting trends of sustainable funds in the US, selected by assets under management. Broadridge has extracted these meeting proposals, categorized and linked all voting records from each fund. These voting records are run on a rule-based algorithm to determine these standards. The template is reviewed on a regular basis and new rules and categories are created as needed. SGI does a periodic review to ensure compliance and that we agree with these standards.

What are the plans for further corporate engagement?

SGI is committed to following ESG standards, as part of our corporate values. Our plan includes, purchasing companies and voting proxies that follow these standards, as well as speaking at conferences and within our community on the need for such standards. As our assets under management grows our influence with the companies that we own should increase. We expect to utilize this influence with expanded corporate engagement. We hope that by so doing we may influence corporate culture to do what is right for our community, the country, and our industry.

2019 SGI Proxy Votes

Environmental Issues

There was a shareholder proposal on Greenhouse Gas Emissions Goals. SGI voted in favor.

SGI voted in favor for disclosure of pesticide management data.

2019 SGI Proxy Votes

Environmental Issues Continued

SGI voted in favor that PNM Resources publish a report on coal combustion residual matters at the San Juan Generating Station

A shareholder proposal was voted on to have Exxon report on risks of their gulf coast petrochemical investments. SGI voted in favor.

SGI voted in favor for C.H. Robinson to adopt greenhouse gas emissions reduction targets.

SGI voted in favor for Starbucks to report on sustainable packaging.

2019 SGI Proxy Votes

Social Issues

AMERICAN EXPRESS

SGI voted in favor of a shareholder proposal relating to gender pay equity.

MERCK

There was a proposal concerning drug pricing, SGI voted in favor.

Coca-Cola

SGI voted in favor of a proposal on sugar and public health.

THE HOME DEPOT

There was a shareholder proposal for a report on prison labor in the supply chain. SGI voted in favor.

2019 SGI Proxy Votes

Social Issues Continued

SGI voted for a shareholder proposal for a report on compensation disparities based on race, gender, or ethnicity.

SGI voted in favor for a report on online child exploitation.

SGI voted to request that Walmart strengthen the prevention of workplace sexual harassment.

There was a resolution to consider a shareholder proposal about indigenous relations disclosure. SGI voted in favor.

2019 SGI Proxy Votes

Governance Issues

SGI voted in favor of a shareholder proposal entitled "True Diversity Board Policy".

SGI voted for a proposal related to diversity reporting.

There was a shareholder request that the board of directors adopt a policy and amend the company's governing documents to require the chairman of the board be an independent director. SGI agreed.

SGI voted in favor of a shareholder proposal that would integrate drug pricing into executive compensation policies and programs.

In 2015 the Sustainable Development Goals (SDGs) were adopted by all 193 members of the United Nations.

The SDGs are a call to action to the private sector, including SGI. SGI is in agreeance with the SDGs, and would like to highlight some of the equities owned that have made progress towards a SDG.

SGI believes that financial returns go hand in hand with these sustainable development goals. Some of these goals may be more difficult to achieve than others, but in aggregate they should be a major source for global economic growth. For example, as a society becomes better educated with longer lifespans, they will have a more qualified and larger workforce. This will then lead to economic growth, and such a phenomenon has been witnessed in many developing nations. It is our opportunity to bring this prosperity across the globe to those who need it most.

Each individual company can contribute in their own ways. For an investment company the discussion is usually centered around the companies owned, but SGI would like to note our internal progress towards the SDGs. In the last year the company has made major investments in employee health and well-being through expanded health insurance and HSA offers. Also, the company has dramatically reduced its paper consumption due to implementation of technology.

SGI believes companies that adopt the SDGs will be at the forefront of new products and services over the next generation. SGI believes that companies that harm one of these goals would represent a highly risky and non-suitable investment.

At its essence, sustainability means ensuring prosperity and environmental protection without compromising the ability of future generations to meet their needs.

Ban Ki-Moon

Secretary General, United Nations

Company Example

SUSTAINABLE DEVELOPMENT GOALS

Company Spotlight

Apple

Ticker

AAPL

Portfolio

SGI U.S. Large Cap

Sector

Consumer Electronics

Purchase Month

June 2014

Months Held

69

SDG

Climate Action and Responsible Consumption and Production

SGI bought Apple for the SGI U.S. Large Cap portfolio in June 2014.

Apple designs, manufactures, and markets personal computers and related personal computing and mobile communication devices along with a variety of related software, services, peripherals, and networking solutions. Apple sells its products worldwide through its online stores, its retail stores, its direct sales force, third-party wholesalers, and resellers.

Climate action and responsible consumption & production highlights (FY2018):

1) 100% of its global facilities are powered by renewable electricity
2) 70% decrease in average product energy use in 10 years
3) 35% reduction in overall carbon footprint compared to 2015
4) 100% recycled aluminum enclosures in Macbook Air and Mac Mini
5) 100% responsibly sourced wood fiber in all retail packaging
6) 14 priority materials for transitioning to 100% recycled content

Company Example

SGI bought Walmart for the SGI U.S. Large Cap portfolio in March 2016.

Walmart operates discount stores, supercenters, and neighborhood markets. It is the world's #1 retailer, as well as the world's largest company by revenue and largest employer with 2.2 million associates. Walmart sells groceries and general merchandise, operating some 5,400 stores in the US, including about 4,800 Walmart stores and 600 Sam's Club membership-only warehouse clubs.

Gender equality and decent work & economic growth highlights (FY2019):

1) 55% of total U.S. workforce and 43% of U.S. management is female
2) 100% of its U.S. associates earn above the federal minimum wage (which is currently $7.25/hour); newly hired associates start at $11 per hour or more, while average total compensation and benefits for a full-time, hourly field U.S. associate is $19.31 per hour
3) Company raised its starting wages in the U.S. by more than 50% over the past three years

Company Spotlight

Walmart

Ticker

WMT

Portfolio

SGI U.S. Large Cap

Sector

Retail

Purchase Month

March 2016

Months Held

42

SDG

Gender equality and decent work & economic growth

Industry Thought Leadership

Portfolio Manager and Managing Director of ESG Investing Matt Hanna attended the PRI in Person 2019 conference in September 2019. This is the preeminent ESG event with an attendance of over 1,700. This was a fantastic event to collaborate with other like-minded ESG investors. A common theme throughout the conference was climate change and the need for urgent action. The final session of the conference consisted of two survivors of human slavery and trafficking, and their pleas to the financial industry on our responsibility. Here are some highlights from the conference!

Keynote from SEC Commissioner Rob Jackson

The SEC recently proposed new disclosure rules and are asking for feedback via comments. Commissioner Jackson also wishes to have dialogue in terms of what types of disclosures and data investors need in order to make responsible decisions. He also brought up a couple facts that SGI found particularly shocking. He said there was a 50% chance that an ESG related U.S. mutual fund will vote their proxies in an ESG related manner. It is also 3 times more likely versus a decade ago that a company will have repeated language on their 10k as other companies. There is major concern about U.S. funds misleading investors by stating they are something that they are not, such as ESG focused.

Will Martindale, Director of Policy and Research, PRI

The focus on policy changes has seen a shift over recent times. Previously changes were more sporadic, but there has been a shift to national and multi-national changes. Policy proposals are now much more technical and specific which will increase the probability of meaningful change.

Data Concerns

One common theme across many sessions was data challenges. This can range from improper or lack of disclosures, inconsistencies amongst third party rating providers, the cost of data, and the breadth of the data. However, SGI was encouraged by the discussion by both policy leaders and providers. In fact, there were many data providers in attendance offering interesting data such as carbon scores, total ESG ratings, country ratings, ESG credit ratings and many more. SGI remains engaged with these providers to continue to further our research.

PRI in Person 2019 Continued

Shareholder Engagement

Asset Owners at the conference emphasized the need for shareholder engagement. ESG investing has transcended beyond the actual investment process, and now has a key role to play in shaping policy of the companies themselves. Engagement includes proxy voting as well as other means of influence. Shareholder Engagement is one of SGI's core investment principles, and we will continue to work with the UN PRI to improve our engagement as we grow.

PRI in the U.S.

SGI attended a lunch for U.S. based signatories. At this lunch SGI was able to meet senior PRI members responsible for the United States. There was excitement to learn that the amount of U.S. based signatories is growing at a remarkable rate. The U.S. policy team gave an update on their engagement and proposals. At this point a key focus for them are improving financial disclosures.

ESG in Quantitative Investing

There was a panel on artificial intelligence (quantitative investing) and ESG that included members from leading firms such as AQR, Man Group, G Squared Capital as well as the OECD and World Economic Forum. A common theme arose here in the need for better data. One interesting comment that SGI agrees with is that ESG risk is nonlinear. Many rating firms use a linear method to determine composite scores, but nonlinearity implies that one particularly awful ESG factor should be able to trump all. They called it a "sleeper factor". At SGI this is precisely how we approach our idiosyncratic ESG fundamental work. There is still disagreement on whether ESG factors can add alpha (excess return) at the current time, but the expectation is that the market will eventually begin to price it in. However, there was more consensus that ESG risk is also related to company specific risk. Improved data will allow investors to create an optimized tilt towards certain ESG factors which should improve portfolio sustainability without materially impacting risk and return.

The EU Taxonomy

The EU has recently developed a tool called the EU Sustainable Finance Taxonomy. This tool will allow investors and asset owners to easily determine whether an economic activity is considered sustainable. SGI is currently reviewing how we can incorporate the taxonomy into our investment process. Currently SGI has a process that can cause all stocks in an industry to be restricted. The taxonomy may allow SGI to use a common framework and language to improve this process.

Industry Thought Leadership

The PRI Academic Network Conference is a tremendous opportunity to learn about the forefront of ESG research. At SGI we are fully committed to research in order to improve our ESG integration into our firm. For example, please see our white paper titled "Impact of Excluding Negative ESG Industries in Minimum Volatility Portfolios".

ESG rating disagreement and stock returns

The authors are focused on identifying ESG rating disagreement and its impact on stock returns. They analyzed ratings from 6 providers over 5 years for companies in the S&P 500. The overall correlation amongst the 6 providers was a surprisingly low .45, with the weakest correlation found in governance scores. The largest companies, companies with no credit rating, and less profitable companies tended to have the highest disagreement. They found evidence supporting their hypothesis that disagreement about social ratings among providers with a civil law origin is more meaningful to stock returns while governance disagreement amongst providers with a common law original is more impactful.

Hacking Corporate Reputations

The authors are seeking to identify how firms respond to data breaches, which the authors claim can erode 10-20% of company value. The authors find that companies will respond to this negative reputation shock by increasing their investment in "corporate social responsibility" by an average of 0.4-0.5 standard deviations after the data breach.

ESG Shareholder Engagement and Downside Risk

The authors investigated whether increased shareholder engagements to companies resulted in lower investment downside risk. They analyzed 1,712 engagements across 573 firms over a 13-year period. Their conclusion was that increased engagement does meaningfully reduce downside risk, and this effect was measured at about 38% of the firm's pre-engagement standard deviation.

Impact of Excluding Negative ESG Industries in Minimum Volatility Portfolios

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Portfolio Manager and Managing Director of ESG Investing

Summit Global Investments

Introduction

If you want to try to make a difference in the world through ESG investing, do you face any increased investment risk? Specifically, what additional investment risk would you encounter if you wanted to be an ESG yet defensive investor?

The implication of this paper is that investors face no statistically significant loss of investment return or increased risk by imposing ESG industry exclusions on minimum volatility portfolios. It also finds that minimum volatility portfolios ranging from no industry restrictions to 25 ESG related industry restrictions produces a statistically significant higher Sharpe ratio than its U.S. all-cap benchmark.

The original methodology to incorporate environmental, social, and governance (ESG) considerations was to restrict "sin" stocks, or to exclude certain industries. This style of ESG investing is termed negative exclusionary and is the primary ESG investment methodology of interest in this paper.

ESG investing has grown over the years to include additional forms of investing besides industry exclusions. A more advanced form of negative exclusion would consist of investors utilizing fundamental or quantitative methodologies to identify stocks with negative ESG tendencies. The investor would then exclude the stock from their portfolio. The overlap of this style with industry exclusions is high, but in theory there could be an ESG friendly option in an otherwise unfriendly industry.

Another form of ESG investing is often termed impact investing. This requires utilizing fundamental analysis to seek out companies that are making a positive ESG impact. For example, instead of restricting a coal company out a portfolio an investor may invest in a green energy company.

Furthermore, asset owners now expect investors to be actively engaged with the companies that they own. This includes voting proxies in an ESG friendly manner as well as actively engaging companies where appropriate. This engagement is independent of the ESG investment style chosen.

Each ESG investment style mentioned has its pros and cons. The key portfolio construction goal that all ESG investment styles achieve is that they tilt the portfolio towards a more friendly ESG posture than their respective benchmark. By restricting negative ESG industries the remaining pool of stocks, by definition, has an overall stronger ESG profile than the entire pool of stocks. Likewise, if an investor actively seeks positive ESG stocks, such as green energy companies, the overall portfolio will also tilt towards ESG investment relative to the benchmark.

Despite the simplicity of restricting industries, it holds some advantages over its counterparts. First, it is dramatically cheaper to execute. No fundamental or quantitative analysis is required. Secondly, it is easier to execute. All one must do is identify the industry a stock is in versus some form of a deeper research dive. Third, the process is easier to understand and explain. Fourth, it is not a strategy that must be outsourced to investment firms with potentially high fees. ESG industry exclusion investing is something that any investor large or small, sophisticated or unsophisticated, can do on their own with virtually no cost.

However, research must be done to analyze the implications of such a strategy. For example, how does it change the risk and return profile of the portfolio? Is there any hidden investment cost to the investor? Some research has been conducted in this field, but this paper expands on this by analyzing exclusionary industry restrictions in minimum volatility portfolios.

Minimum Volatility Portfolios (MVPs)

Historically, minimum volatility portfolios (MVPs) were portfolio constructed via quantitative methods that had the sole characteristic of the lowest volatility, or standard deviation, possible. Volatility is defined as standard deviation, or risk. At its purest form a minimum volatility portfolio includes all assets globally.

In order to build such a portfolio an investor had to have assumptions on both the volatility and correlation amongst stocks. This data would then be optimized in order to find the lowest volatility possible. An investor can utilize historical price action data to build these assumptions, current fundamental data, or other methods. The methods were rooted in research, but there was certainly subjectivity in selecting the forecasting method.

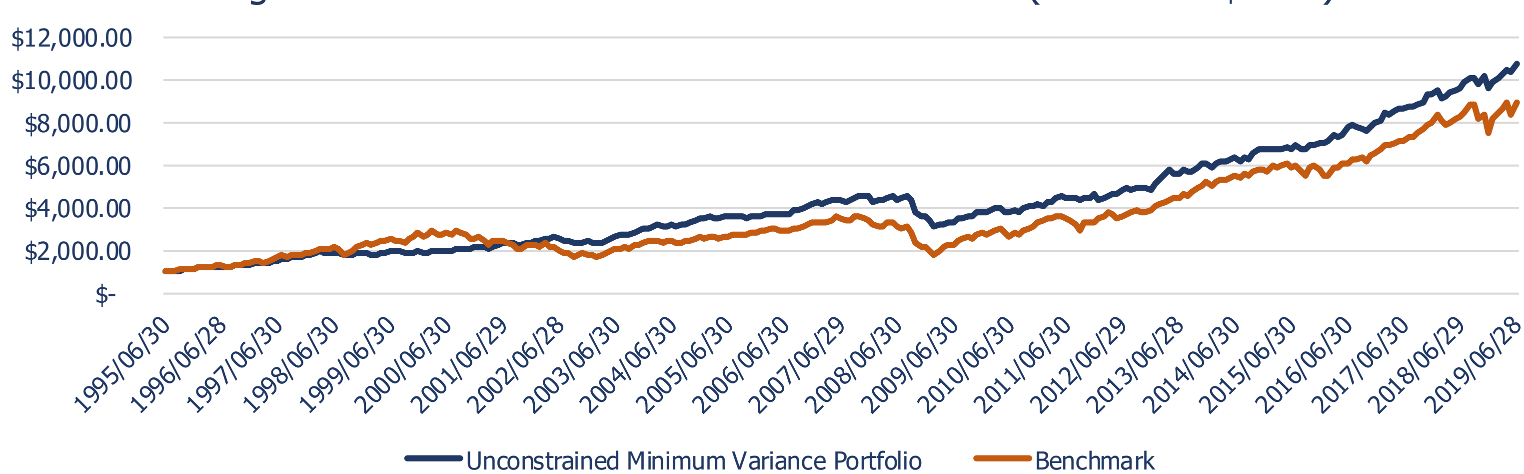
Over time this pure definition has morphed to what we see today. These sorts of portfolios can now be termed minimum volatility, defensive, low volatility, and more. No longer does minimum volatility portfolios include all assets globally. Investors want to create minimum volatility portfolios in select asset classes. For example, a minimum volatility U.S. large-cap portfolio, or a minimum volatility European portfolio. In fact, these portfolios can now be constructed in a myriad of ways.

One form of low volatility investing simply takes the lowest volatile stocks, chosen by a subjective method, ranks them, and purchases them. Recently there has been research identifying low volatility as an investment factor. This means that low, or minimum, volatility investing has been shown to produce excess risk adjusted returns than its benchmark. There is a myriad of reasons why this low volatility factor adds value. Lower volatility stocks have the power of compounding on its side. Investors generally have high return targets, leaving lower volatility stocks as underappreciated. Similarly, there is a behavioral finance phenomenon called the lottery effect that impacts low volatility stocks. Humans often purchase lottery tickets with almost no hope of winning, investors are also willing to take flyers on potential grand slam stock picks at the expense of lower volatility stocks.

There are investors that now seek to combine multiple factors in what is now termed multi-factor investing. Besides low volatility, some other factor examples are value and momentum. These investors can implement these strategies quantitatively or fundamentally. In fact, these sort of multi-factor portfolios have some of the strongest risk adjusted return projections in the industry today.

Given the morphing definition of minimum volatility this paper will seek to analyze a blend of the pure and modern forms. The starting universe and

Figure 1: Unconstrained MVP vs. its Benchmark (Growth of $1000)



benchmark for this analysis is the Barra US Medium Total Market Equity Model (USMED model) and its Estimation Universe. This universe is U.S. all-cap and is constructed similarly to the MSCI USA IMI Index. This benchmark was chosen primarily due to its relationship with the challenge of constructing minimum volatility portfolios: the volatility and correlation assumptions. The USMED model is a fundamental equity risk model that forecasts risk and correlation in a more accurate way than extrapolating historical price data. This sort of risk model is how many minimum volatility portfolios are constructed today. The data range analyzed is 6/30/1995 through 6/30/2019. The unconstrained version of the minimum volatility portfolio utilizes a monthly optimization to minimize volatility as forecasted by the USMED Model, using only the assets in the USMED model.

Figure 1 shows that this version of the minimum volatility portfolio (MVP) has outperformed the USMED Estimation Universe from 6/30/1995 to 6/30/2019. The MVP has an annualized return of 10.41% and an annualized volatility of 8.53%. This contrasts to its benchmark which returned 9.58% with an annualized volatility of 15.12%. Combining the risk and return numbers you get an impressive Sharpe Ratio of 1.22, nearly doubling up the benchmark's 0.63.

Given the various construction methodologies it is critical that multiple forms of minimum volatility portfolios were tested. This research chose three, and further research should analyze additional methodologies. All three methodologies utilize the USMED Estimation Universe as its selection universe and as the tool for forecasted volatility and correlation. All three also require cash to be fully invested and are rebalanced monthly. The "Unconstrained" version represents the pure minimum volatility approach. No other constraints are imposed on this methodology. The next two approaches are "Active" and "Passive Diversified". They begin to impose various constraints found in Table 1, which loosely represents what an active or passive investment strategy may impose.

ESG Excluded Industries

The next step in this research was determining which industries to exclude. One challenge in the ESG community is that there is no clear consensus on what constitutes an ESG investment. Individuals may value something like climate change over human rights, or there could even be disagreement on whether something like alcohol consumption is a social issue.

This paper takes no moral stand on those questions, but rather attempts to take a broad view of ESG restrictions. If a liberal amount of restrictions does not impact the investment profile of a minimum volatility portfolio then a narrow view should not either.

Industries in this paper are defined as GICS (Global Industry Classification Standard) sub-industries. As of this writing there consists 158 sub-industries which may be called industries subsequently. Within this paper 25 of those sub-industries are identified for exclusion for ESG reasons. This selection was ultimately subjective but utilized multiple sources. For example, industries that directly conflicted with UN PRI Sustainable Development Goals were excluded. Some examples would be excluding the Coal and Consumable Fuel and Soft Drinks sub-

Table 1: Minimum Variance Portfolio Methodologies Tested

	Unconstrained	Active	Passive Diversified
Universe	USMED Estimation Universe	USMED Estimation Universe	USMED Estimation Universe
Benchmark	None	USMED Estimation Universe	USMED Estimation Universe
Cash	Fully Invested	Fully Invested	Fully Invested
# of Names	No Restriction	80-120	>200
Maximum Holding Weight	No Restriction	3.0%	2%
Sector Constraints	No Restriction	+/- 10% to Benchmark	+/- 5% to Benchmark
Factor Constraints	No Restriction	No Restriction	+/- .25 Benchmark*
Rebalance Frequency	Monthly	Monthly	Monthly
Max Turnover	No Restriction	10% per month	3% per month

*Standard Deviations. Beta and Residual Volatiltiy left unconstrained industries due to the sustainable development goals of clean energy and good health. Another source used was overall ESG ratings in the sub-industries. There can be debate on the exclusion of certain industries and the exclusion of others.

Each sub-industry was excluded in the minimum volatility portfolio individually as one test. Realistically, most ESG investors would prefer to exclude multiple sub-industries rather than one. Therefore, all sub-industries were grouped whether they violated ESG principles on an environmental or social concern. The final test was all 25 exclusions together, or a combination of both environmental and social exclusions. For this research no sub-industry was excluded for governance concerns.

Hypothesis

The goal of this research is to determine whether investors in MVPs face a penalty due to ESG industry exclusions. All three MVP methodologies were tested, and within each there were 25 individual industry exclusions, no industry exclusion, environmental industry exclusions, social industry exclusions, and all 25 industry exclusions. This results in 29 different portfolios per methodology, and 28 include exclusions. This research found significant differences between the different methodologies, which will be outlined in another paper. This paper is focused on the differences within each methodology and versus the benchmark of the USMED Estimation Universe.

Table 2: GICS sub-industries restricted (individually and in groups)

	Environmental	Social	All
Coal & Consumable Fuels	✓		✓
Commodity Chemicals	✓		✓
Construction Machinery & Heavy Trucks	✓		✓
Construction Materials	✓		✓
Electric Utilities	✓		✓
Industrial Gases	✓		✓
Integrated Oil & Gas	✓		✓
Marine	✓		✓
Oil & Gas Drilling	✓		✓
Oil & Gas Equipment & Services	✓		✓
Oil & Gas Exploration & Production	✓		✓
Oil & Gas Refining & Marketing	✓		✓
Oil & Gas Storage & Transportation	✓		✓
Specialty Chemicals	✓		✓
Steel	✓		✓
Trucking	✓		✓
Diversified Metals & Mining	✓		✓
Packaged Foods & Meats	✓	✓	✓
Aerospace & Defense	✓	✓	✓
Fertilizers & Agricultural Chemicals	✓	✓	✓
Brewers		✓	✓
Casinos & Gaming		✓	✓
Distillers & Vintners		✓	✓
Soft Drinks		✓	✓
Tobacco		✓	✓

The first hypothesis tested whether the variance of the 28 portfolios that include industry exclusions is statistically significantly different than the portfolio with no industry exclusions. This is conducted within each construction methodology. In addition, the USMED Estimation Universe portfolio was also tested to determine if it had a statistically significant different variance than the three non-industry restricted MVPs. Variance is a form of risk, and its square is standard deviation. This was conducted via a F-Test.

The second hypothesis tested whether there were statistically different Sharpe ratios between the portfolios. This was conducted similarly to the first hypothesis with all 28 industry excluded portfolios and the USMED Estimation Universe being compared to the non-industry restricted MVP for all three methodologies. This was tested via Steven E. Pav's R package titled SharpeR through the Sharpe Ratio Equality test designed by Wright, Yam, and Yung in "A test for the equality of multiple Sharpe ratios".

Additional analysis was also conducted in order to determine whether there was a detriment to ESG industry exclusions in minimum volatility portfolios. Firstly, annualized returns were studied across the test period. Diving deeper the R-Squared, Mean Absolute Error (MAE), and Root Mean Squared Error (RMSE) were studied. Similarly, to the two formal hypothesis tests these were conducted against the non-industry restricted MVP for each methodology. The R-Squared is a measure that represents the portion of the industry excluded MVP, or the USMED Estimation Universe, is explained by the non-industry restricted MVP. The MAE and RMSE analyze the monthly differences of

Table 3: Annualized Return: 06/30/1995-06/30/2019			
	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	10.41%	11.05%	10.97%
Coal & Consumable Fuels	10.41%	11.05%	10.94%
Commodity Chemicals	10.43%	10.99%	10.86%
Construction Machinery & Heavy Trucks	10.40%	11.04%	10.87%
Construction Materials	10.40%	11.00%	10.80%
Electric Utilities	10.42%	11.07%	10.95%
Industrial Gases	10.41%	11.01%	10.80%
Integrated Oil & Gas	10.38%	10.94%	10.79%
Marine	10.40%	10.96%	10.90%
Oil & Gas Drilling	10.40%	11.05%	10.99%
Oil & Gas Equipment & Services	10.42%	11.07%	10.85%
Oil & Gas Exploration & Production	10.41%	11.04%	10.80%
Oil & Gas Refining & Marketing	10.47%	11.03%	10.86%
Oil & Gas Storage & Transportation	10.38%	10.94%	10.76%
Specialty Chemicals	10.37%	10.98%	10.88%
Steel	10.45%	11.03%	10.87%
Trucking	10.41%	11.01%	10.97%
Diversified Metals & Mining	10.41%	10.97%	10.82%
Packaged Foods & Meats	10.11%	10.92%	10.71%
Aerospace & Defense	10.40%	10.94%	11.00%
Fertilizers & Agricultural Chemicals	10.44%	11.10%	10.96%
Brewers	10.42%	10.99%	10.64%
Casinos & Gaming	10.40%	10.98%	10.71%
Distillers & Vintners	10.40%	11.00%	10.92%
Soft Drinks	10.49%	11.10%	10.86%
Tobacco	10.52%	11.12%	10.82%
Environmental	10.29%	11.13%	11.04%
Social	10.23%	10.92%	10.65%
Both E and S Industry Restrictions	10.33%	11.09%	10.94%
USMED Estimation Universe Index	9.58%	9.58%	9.58%

returns. Similar portfolios should have a higher R-Squared and lower MAE and RMSE.

Annualized return analysis

Over the 24-year test period the annualized returns (Table 3) for all forms of industry excluded MVP were similar to the non-industry restricted MVP for each methodology. The "Unconstrained" non-industry restricted MVP returned 10.41% annualized versus 10.33% of the full industry restricted MVP. These results were 11.05% versus 11.09% for the "Active" methodology and 10.97% versus 10.94% for the "Passive" methodology. The benchmark annualized return was 9.58% which compounded over 24 years produced a substantially lower cumulative return.

Testing for differences in variance

There were no statistically significant differences in variances (Table 4) of any of the industry restricted MVPs versus the non-industry restricted MVPs across all three methodologies. This includes all the individually sub-industry restricted portfolios and the portfolio that excluded all 25 sub-industries. This implies that an investor should not expect any difference in long-term variance, or volatility, by restricting any, or all, ESG violating sub-industries. An ESG industry restricted MVP should have similar risk to a MVP with no industry restrictions. For example, the "Unconstrained" MVP that restricted all 25 sub-industries had an annualized volatility of 8.77% versus 8.53% for the non-industry restricted MVP.

Table 4: Annualized Ex Post Standard Deviation: 06/30/1995-06/30/2019

	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	8.53%	8.80%	10.19%
Coal & Consumable Fuels	8.54%	8.80%	10.19%
Commodity Chemicals	8.54%	8.79%	10.16%
Construction Machinery & Heavy Trucks	8.54%	8.80%	10.12%
Construction Materials	8.53%	8.78%	10.21%
Electric Utilities	8.62%	8.85%	10.22%
Industrial Gases	8.53%	8.79%	10.22%
Integrated Oil & Gas	8.57%	8.85%	10.26%
Marine	8.53%	8.79%	10.14%
Oil & Gas Drilling	8.53%	8.79%	10.16%
Oil & Gas Equipment & Services	8.53%	8.79%	10.14%
Oil & Gas Exploration & Production	8.54%	8.80%	10.16%
Oil & Gas Refining & Marketing	8.53%	8.78%	10.18%
Oil & Gas Storage & Transportation	8.54%	8.80%	10.29%
Specialty Chemicals	8.55%	8.80%	10.18%
Steel	8.53%	8.79%	10.18%
Trucking	8.54%	8.79%	10.18%
Diversified Metals & Mining	8.53%	8.79%	10.12%
Packaged Foods & Meats	8.73%	8.88%	10.21%
Aerospace & Defense	8.54%	8.80%	10.13%
Fertilizers & Agricultural Chemicals	8.55%	8.81%	10.13%
Brewers	8.56%	8.80%	10.25%
Casinos & Gaming	8.54%	8.79%	10.11%
Distillers & Vintners	8.54%	8.80%	10.21%
Soft Drinks	8.47%	8.73%	10.15%
Tobacco	8.49%	8.77%	10.24%
Environmental	8.89%	8.96%	10.87%
Social	8.66%	8.78%	10.25%
Both E and S Industry Restrictions	8.77%	8.92%	10.96%
USMED Estimation Universe Index	15.12%*	15.12%*	15.12%*

*Significantly different at a 99% confidence level

In contrast the USMED Estimation Universe, the benchmark, experienced an annualized volatility of 15.12%. The difference in variance between the benchmark and the non-industry restricted MVP is statistically different at a 99% confidence level for all three construction methodologies.

Testing for differences in Sharpe Ratios

All forms of industry restricted MVPs had no statistically significant different Sharpe ratios to its non-industry restricted MVP. The benchmark tested at a statistically significant difference at a 99% confidence level across all methodologies.

Likewise, all forms of the MVP, industry restricted and non-industry restricted, were tested for Sharpe ratio equality versus the benchmark. In all cases the hypothesis test had 99% confidence. This implies that during the test period that the MVPs had a statistically significant higher Sharpe ratio than the benchmark. This is unsurprising after looking at the raw numbers. The benchmark had a Sharpe ratio of 0.63 while there was not a single MVP with a Sharpe ratio below 1.00. The non-industry restricted MVP and its fully restricted counterpart all had similar Sharpe ratios, with the maximum difference being only 0.08 units.

Table 5: Sharpe Ratios: 6/30/1995-6/30/2019
Are the Sharpe Ratios equivalent to the no industry restricted minimum variance portfolio?

	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	1.22	1.26	1.08
Coal & Consumable Fuels	1.22	1.26	1.07
Commodity Chemicals	1.22	1.25	1.07
Construction Machinery & Heavy Trucks	1.22	1.26	1.07
Construction Materials	1.22	1.25	1.06
Electric Utilities	1.21	1.25	1.07
Industrial Gases	1.22	1.25	1.06
Integrated Oil & Gas	1.21	1.24	1.05
Marine	1.22	1.25	1.07
Oil & Gas Drilling	1.22	1.26	1.08
Oil & Gas Equipment & Services	1.22	1.26	1.07
Oil & Gas Exploration & Production	1.22	1.25	1.06
Oil & Gas Refining & Marketing	1.23	1.26	1.07
Oil & Gas Storage & Transportation	1.22	1.24	1.05
Specialty Chemicals	1.21	1.25	1.07
Steel	1.23	1.26	1.07
Trucking	1.22	1.25	1.08
Diversified Metals & Mining	1.22	1.25	1.07
Packaged Foods & Meats	1.16	1.23	1.05
Aerospace & Defense	1.22	1.24	1.09
Fertilizers & Agricultural Chemicals	1.22	1.26	1.08
Brewers	1.22	1.25	1.04
Casinos & Gaming	1.22	1.25	1.06
Distillers & Vintners	1.22	1.25	1.07
Soft Drinks	1.24	1.27	1.07
Tobacco	1.24	1.27	1.06
Environmental	1.16	1.24	1.02
Social	1.18	1.24	1.04
Both E and S Industry Restrictions	1.18	1.24	1.00
USMED Estimation Universe Index	0.63*	0.63*	0.63*

*Significantly different at a 99% confidence level
Sharpe Ratio is defined as annualized return divided by annualized volatility

R-Squared (Correlation) Analysis

R-squared is a statistical measure of how much the variation a dependent variable, the industry restricted MVPs or benchmark, is explained by the independent variable, the non-industry restricted MVP. The square root of R-squared is the correlation coefficient. A value of 100% for the R-squared means all the variation is explained, and this would correspond to a correlation coefficient of 1.00 (or -1.00). All tested portfolios are positively correlated so the closer the R-squared is to 100% the more positively related the portfolios are.

All the portfolios with a single industry restriction measured a R-squared above 99%. Virtually all of the monthly return variation is explained by the non-industry restricted MVP. As the number of industry restrictions grows the R-squared declines. When all 25 industries are restricted the R-squared drops to 94.7% for "Unconstrained", 96.6% for "Active", and 95.6% for "Passive". These numbers are still extremely high. Compare that to the benchmark, the USMED Estimation Universe, which has a R-squared of 53.0%, 61.5%, and 84.8% to the non-industry restriction portfolio of the MVP. Interestingly, the "Passive" comparison was higher than expected, but can be explained by the higher number of assets and benchmark relative constraints of the methodology.

Table 6: R Squared: 6/30/1995-6/30/2019 R-Squared to the no industry restricted minimum variance portfolio			
	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	NA	NA	NA
Coal & Consumable Fuels	100.00%	100.00%	99.95%
Commodity Chemicals	99.99%	99.94%	99.83%
Construction Machinery & Heavy Trucks	100.00%	99.96%	99.73%
Construction Materials	100.00%	99.94%	99.77%
Electric Utilities	99.38%	99.23%	99.23%
Industrial Gases	100.00%	99.94%	99.78%
Integrated Oil & Gas	99.60%	99.47%	99.09%
Marine	100.00%	99.96%	99.80%
Oil & Gas Drilling	100.00%	99.98%	99.76%
Oil & Gas Equipment & Services	99.99%	99.98%	99.77%
Oil & Gas Exploration & Production	99.99%	99.95%	99.68%
Oil & Gas Refining & Marketing	99.89%	99.84%	99.66%
Oil & Gas Storage & Transportation	99.85%	99.71%	99.75%
Specialty Chemicals	99.95%	99.92%	99.74%
Steel	99.98%	99.94%	99.76%
Trucking	100.00%	99.95%	99.79%
Diversified Metals & Mining	99.96%	99.92%	99.73%
Packaged Foods & Meats	97.22%	98.83%	99.12%
Aerospace & Defense	99.93%	99.77%	99.53%
Fertilizers & Agricultural Chemicals	99.95%	99.97%	99.75%
Brewers	99.96%	99.93%	99.69%
Casinos & Gaming	100.00%	99.95%	99.73%
Distillers & Vintners	99.99%	99.98%	99.75%
Soft Drinks	99.67%	99.74%	99.57%
Tobacco	99.87%	99.91%	99.69%
Environmental	95.41%	96.76%	96.17%
Social	96.20%	98.16%	98.59%
Both E and S Industry Restrictions	94.72%	96.59%	95.57%
USMED Estimation Universe Index	52.97%	61.46%	84.70%

Monthly Return Error Analysis (MAE, RMSE)

Monthly return error analysis is a way to compare the monthly return differences across these portfolios. This requires subtracting each month's return for the non-industry restricted MVP by each industry restricted portfolio and the benchmark. The result is a monthly excess return stream for 29 portfolios, the 28 industries restricted and the benchmark for each portfolio construction methodology.

The Mean Absolute Error (MAE) is the average of the absolute value of the excess returns. The interpretation is the MAE is the average monthly difference, disregarding positive or negative, between the non-restricted MVP and comparison portfolio. A MAE of 0 would only result if the return streams of both portfolios are identical every single month. The average MAE for all the single industry restricted MVPs is 0.08%. On average the monthly difference between a non-industry restricted MVP and a single industry restricted MVP is merely 8 basis points.

The MAE for the benchmark compared to the non-industry restricted MVPs is much higher. For the "Unconstrained" methodology the MAE is 2.29%. This means the average absolute monthly excess return for the last 24 years is a well over 2%.

The Root Mean Squared Error (RMSE) is more

Mean Absolute Error (MAE): 6/30/1995-6/30/2019 MAE (monthly returns) to the no industry restricted minimum variance portfolio			
	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	NA	NA	NA
Coal & Consumable Fuels	0.00%	0.00%	0.04%
Commodity Chemicals	0.01%	0.03%	0.09%
Construction Machinery & Heavy Trucks	0.00%	0.03%	0.12%
Construction Materials	0.00%	0.03%	0.10%
Electric Utilities	0.13%	0.16%	0.19%
Industrial Gases	0.00%	0.03%	0.11%
Integrated Oil & Gas	0.08%	0.11%	0.20%
Marine	0.00%	0.02%	0.10%
Oil & Gas Drilling	0.00%	0.01%	0.10%
Oil & Gas Equipment & Services	0.01%	0.02%	0.10%
Oil & Gas Exploration & Production	0.01%	0.03%	0.12%
Oil & Gas Refining & Marketing	0.03%	0.06%	0.12%
Oil & Gas Storage & Transportation	0.03%	0.07%	0.08%
Specialty Chemicals	0.02%	0.04%	0.11%
Steel	0.01%	0.03%	0.10%
Trucking	0.00%	0.03%	0.09%
Diversified Metals & Mining	0.02%	0.04%	0.11%
Packaged Foods & Meats	0.28%	0.21%	0.20%
Aerospace & Defense	0.03%	0.08%	0.15%
Fertilizers & Agricultural Chemicals	0.01%	0.02%	0.11%
Brewers	0.02%	0.04%	0.12%
Casinos & Gaming	0.00%	0.03%	0.11%
Distillers & Vintners	0.01%	0.02%	0.10%
Soft Drinks	0.09%	0.10%	0.15%
Tobacco	0.04%	0.05%	0.12%
Environmental	0.40%	0.35%	0.48%
Social	0.35%	0.27%	0.27%
Both E and S Industry Restrictions	0.44%	0.37%	0.51%
USMED Estimation Universe Index	2.29%	2.12%	1.52%

Root Mean Squared Error (RMSE): 6/30/1995-6/30/2019 RMSE (monthly returns) to the no industry restricted minimum variance portfolio			
	Unconstrained	Active	Passive
No Restriction (Minimum Volatility Portfolio)	NA	NA	NA
Coal & Consumable Fuels	0.00%	0.00%	0.07%
Commodity Chemicals	0.03%	0.06%	0.12%
Construction Machinery & Heavy Trucks	0.01%	0.05%	0.15%
Construction Materials	0.02%	0.06%	0.14%
Electric Utilities	0.20%	0.22%	0.26%
Industrial Gases	0.02%	0.06%	0.14%
Integrated Oil & Gas	0.16%	0.19%	0.28%
Marine	0.01%	0.05%	0.13%
Oil & Gas Drilling	0.01%	0.03%	0.14%
Oil & Gas Equipment & Services	0.02%	0.04%	0.14%
Oil & Gas Exploration & Production	0.02%	0.05%	0.17%
Oil & Gas Refining & Marketing	0.08%	0.10%	0.17%
Oil & Gas Storage & Transportation	0.10%	0.14%	0.15%
Specialty Chemicals	0.06%	0.07%	0.15%
Steel	0.03%	0.06%	0.14%
Trucking	0.01%	0.06%	0.13%
Diversified Metals & Mining	0.05%	0.07%	0.15%
Packaged Foods & Meats	0.42%	0.28%	0.28%
Aerospace & Defense	0.06%	0.12%	0.20%
Fertilizers & Agricultural Chemicals	0.06%	0.05%	0.15%
Brewers	0.05%	0.07%	0.17%
Casinos & Gaming	0.02%	0.06%	0.15%
Distillers & Vintners	0.02%	0.04%	0.15%
Soft Drinks	0.14%	0.13%	0.19%
Tobacco	0.09%	0.08%	0.17%
Environmental	0.55%	0.46%	0.63%
Social	0.49%	0.34%	0.35%
Both E and S Industry Restrictions	0.58%	0.47%	0.68%
USMED Estimation Universe Index	3.07%	2.84%	2.01%

difficult to interpret but also highly valuable. This metric has the added benefit of punishing more extreme excess returns, or outliers. Instead of finding the absolute value of each monthly return difference, the RMSE requires that the excess return is squared. Then this new vector is averaged, and then square rooted.

The pattern is similar as the MAE results. The individual industry restrictions have very low RMSE values, the portfolios with more industry restrictions slightly higher, and the benchmark is much higher. In this case the RMSE punishes the benchmark more than the MAE due to the presence of extreme outliers. For example, in August 1998 the "Unconstrained" non-industry restricted MVP outperformed the benchmark by over 10%.

The sheer scale difference between the RMSE of the industry restricted MVPs compared to the benchmark emphasizes how little impact the industry restrictions has on the excess returns.

Conclusion and Next Steps

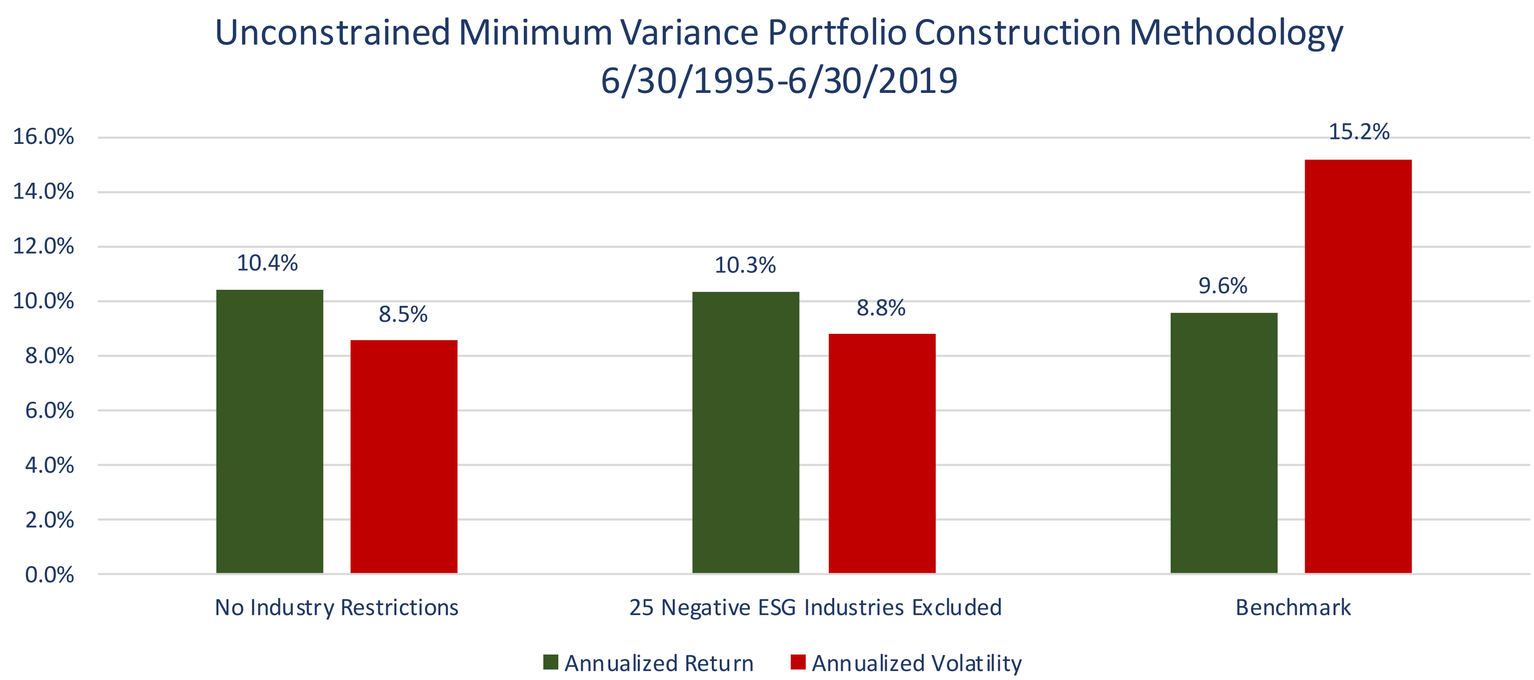
This paper clearly identifies that single and multiple ESG related industry restrictions on minimum volatility (MVP) portfolios have no statistically significant impact on variance and Sharpe ratios. In addition, the ESG industry restrictions show no meaningful change of how much the monthly return variation can be explained by the the non-industry restricted MVP. Diving into the individual monthly return differences the result is the same, no major change in excess returns.

The limitations of this analysis may be the portfolio construction methods, the benchmark chosen, and the GICS sub-industries restricted. Next steps may be to test different construction methods primarily utilizing different forms of forecasting volatility and correlation. This change is not expected to materially change the result. Benchmarks with a small number of holdings should also be tested. Due to index concentration the expectation is increased dispersion for all industry restricted portfolios and the benchmark compared to the non-industry restricted MVP. This research utilized a liberal definition for industry exclusions, and any minor additions to the industry restricted list would be expected not to materially impact the results.

Investors that wish to invest in a defensive yet ESG friendly manner can feel confident that industry restrictions will not materially change portfolio returns as compared to the minimum volatility portfolio.

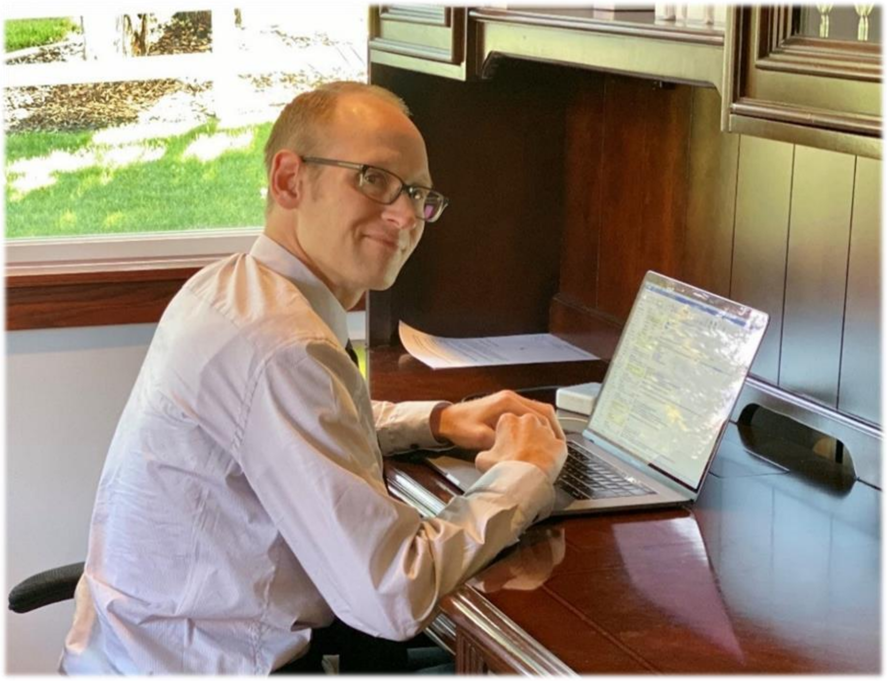
Current minimum volatility index providers can also develop a strategy that excludes ESG violating industries. This new index would have high similarity to the parent index.

Ultimately ESG and defensive equity investors can have their cake and eat it too. They can maintain a minimum volatility experience while also improving the ESG profile of their portfolio.



This represents a summary of the research paper titled "Impact of Excluding Negative ESG Industries in Minimum Volatility Portfolios". Please contact Summit Global Investments to request a full copy of the research paper that includes citations. Thank you.

ESG Beyond Investing



Discussion with Chief Technology Officer Spencer Nielsen

You recently completed a project that would dramatically reduce paper use in the new account process, can you talk about that?

To open an account with us, clients need to fill out various sets of forms depending on their situation. Traditionally these were completed by printing them on paper, filling them out by hand and archiving the physical copy. We recently debuted a new way for clients and advisors to fill out and sign all the necessary forms digitally online. The custodians we interface with are now set up to receive and process these digitally signed forms automatically. This has resulted in a quicker, easier, less error-prone and more environmentally friendly way of bringing a new client onboard. A win all around.

SGI has renovated its conference room; how may this reduce SGI's carbon footprint?

We feel that one of the great promises of the internet is that people should more easily be able to work and collaborate with people around the world from where they already are. Our new conference room is built with display, microphone and camera technology meant to accommodate virtual meetings for both groups large and small.

Reducing the need for travel helps us keep focused and lessens our carbon emissions.

Any potential SGI initiatives that you are thinking about that overlap with ESG?

We've been gradually taking more of our tech responsibilities in-house which has enabled us to start development of tools that give our clients more information and insight into their investments. As these tools grow, we want to allow the client more involvement and control in specifically shaping their portfolio to also meet their own personal ESG needs and concerns. Together with our clients, we feel we can build something that is more than the sum of its parts.

In general, where do you believe technology can make a large impact on the Sustainable Development Goals over the next few years?

I believe that data is what makes the world go around. Having the right data and interpreting it correctly can make all the difference for both algorithm and human decisions. The right conclusions drawn from good data is how we make processes more efficient, how we avoid catastrophic pitfalls and is often what leads us to the next innovation that we couldn't see before.

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Shortlisted

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We are honored to be amongst the finalists, and we look forward to the announcement of the winners on November 6, 2019.

Our shortlisted entries

Active U.S. Large Cap Strategy of the Year

SGI U.S. Large Cap Equity

Active U.S. Small Cap Strategy of the Year

SGI U.S. Small Cap Equity

Active Global Equity Strategy of the Year

SGI Global Equity

ESG Strategy of the Year

SGI U.S. Large Cap Equity

SGI Global Equity

Active U.S. Equity Strategy of the Year

SGI U.S. Large Cap Equity

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"We are fully committed to spreading our ESG message to our clients and colleagues."
Matt Hanna, Portfolio Manager and Managing Director of ESG Investing

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