

**THE STOCK PERFORMANCE OF LOW-EMITTING CORPORATIONS:
Investigating the Resilience of “Green” Stocks during Times of Market Downturn**

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Abstract

The American stock market relies upon external investors to inject capital into corporations in order to generate returns from their profits. Investors have historically chosen which corporations to invest in based upon their profitability, liquidity, and solvency, but these indicators do not account for environmental impacts produced by the corporations. As the impacts of anthropogenically-induced climate change amplify, it becomes increasingly relevant to consider corporate metrics such as tons of greenhouse gas emitted into the atmosphere when choosing where to invest. Such “green” investing has not been definitively proven to produce comparable returns on investment as traditional methods have, but literature suggests that it may hold unique advantages during times of economic downturn. This study observes the stock performances of the 10 lowest Scope 1 greenhouse gas emitters of 2022 in comparison with the S&P 500 Index during two control periods and four instances of economic volatility: the 2021-2022 year, the five-year span of 2018-2022, the 2000 dotcom bubble burst, the 2008 financial crisis, the 2015-2016 market selloff, and the COVID-19 pandemic from 2020-2022 was demonstrated. The results do not indicate definitive evidence that green stocks generate higher-magnitude portfolio returns, but there is observational evidence that they provide resilience to market downturns. Furthermore, green stocks have historically demonstrated rapid adaptability to market conditions, allowing for temporary bouts of explosive growth.

Plain Language

Fund managers and investors worldwide are turning their attention to sustainable investing. However, there remains uncertainty on whether sustainable companies will generate the same returns as the broader stock market indexes, especially in periods of economic downturn. Furthermore, an increasing number of companies are actively engaging in greenwashing in order to appear more environmentally friendly and capitalize on sustainable marketing strategies. To address these issues, this study attempts to produce a list of rigidly characterized high-performing “green” companies and compare these companies' returns to the S&P 500 (overall stock performance) during four periods of economic volatility: the 2000 dotcom bubble burst, the 2008 financial crisis, the 2015 to 2016 market selloff, and the COVID-19 pandemic from 2020 to 2022. The purpose of this study is to determine if “green” stocks can provide stability in investment portfolios. An increase in green investment can in turn inject more money into environmentally-progressive companies.

Introduction

General Background

Investment into companies is a key driver of economic growth in the United States and other capitalist nations with a market economy. Thus, corporations have historically been evaluated for their investment worthiness based on three general indicators of strength: profitability, liquidity, and solvency (Baraja and Yosya, 2018). The downside of these metrics are that they often ignore environmentally harmful production practices and outcomes. This results in mega-corporations that generate large greenhouse gas footprints, or companies that produce the majority of the world's plastic waste, wielding billions of dollars of wealth based on their capital returns to investors. Completely transitioning away from this model is not predicted to occur within the immediate future, but the escalating impacts of the modern climate crisis demand at least an attempt to show that investing with more than just immediate returns in mind can be worthwhile, and reap preferred financial benefits.

Sustainable investing (often termed “green” investing) is a form of financial investment that prioritizes positive environmental, social, and governance (ESG) indicators of the companies receiving the investment (Inderst, 2012). The field of sustainable investment is important because investment drives the productive capacity of companies, and companies that are creating sustainable technologies cannot scale up their work without financial support. Further, private and public investing are major parts of the global economy, and advocating for corporations to be more proactive about sustainability can lead to meaningful and profound change, given that they are deeply intertwined in the future of environmental and human well-being.

Greenwashing

The concept of socially responsible investing (SRI) has been present in discussion circles since at least the 1980s, but a common theme of disconnect between the expectation of investors and the realities of corporate practices has persisted into the present (Berry and Junkus, 2012). Whether it be the ethics of overseas manufacturing, the types of items being produced, or the greenhouse gasses emitted by the industry, defining the “good” and “bad” of company behavior is a complex process without a strict scale. Unfortunately, to capitalize on consumers’ desire for sustainably-sourced products, companies attempt to elevate their brands with sustainability-focused marketing and ideals; however, this effort to encourage investment and social support of the businesses oftentimes allows deceptive greenwashing practices to confuse consumer decision-making (Martinez et al., 2020, and Laufer, 2003).

In literature, greenwashing is defined as “behavior or activities that make people believe that a company is doing more to protect the environment than it really is” (*Cambridge Dictionary*, 2022). Corporate greenwashing practices have increased in response to the growth of the environmental movement in the 1970s, so it is imperative that analysis of companies from an environmental perspective is both clear in metrics, and rooted in concrete data.

The S&P 500

The S&P 500, otherwise known as Standard & Poor’s 500, is an index that broadly ranks 500 companies at a time and serves as an overarching view of the stock market. A widely accessed equity index, the S&P 500 specifically tracks stock performance of “the 500 largest public companies [in the United States]” (“The S&P 500”, 2022). For the purposes of this study, the S&P 500 was utilized as a control metric.

Scope 1, 2, and 3 Emissions

In accordance with developing corporate standards for greenhouse gas measurements (World Resources Institute and World Business Council for Sustainable Development, 2022), companies can currently measure and report their emissions into three distinct categories: Scope 1 (mandatory reporting), Scope 2 (mandatory reporting), and Scope 3 (optional) emissions. “Scope 1 emissions are direct emissions from company-owned and controlled resources...Scope 2 emissions are indirect emissions from the generation of purchased energy, from a utility provider... [and] Scope 3 emissions are all indirect emissions - not included in Scope 2 - that occur in the value chain of the reporting company, including both upstream and downstream emissions” (Bernoville, 2022). The methodology in this study will pull from Scope 1 emissions data, as it draws the most direct connection with individual business practices, with most companies regularly reporting these emissions.

Literature Review

Prior work in this field has included examinations of the history of sustainable investments at its origins (Schueth, 2003), as well as in relation to market crashes—like the 2008 foreclosure crisis. Researchers and investment analysts have also examined the performance and characteristics of various sustainable investment groups or mutual funds to see how they perform in comparison to conventional investments (Climent, Francisco, and Soriano, 2011). The results of these examinations do not paint a clear picture of whether sustainable investing is worthwhile, in a general sense. Some studies have found that green funds are not competitive with conventional funds on longer time scales, but that in more recent years they have equalized (Climent, Francisco, and Soriano, 2011). In terms of portfolio risk mitigation, researchers have

found that investors can minimize their equity investments' total, systematic, and idiosyncratic risk by investing in sustainable companies (Maxfield & Wang, 2021). Sustainable investing has become more popular, so prior research has also investigated what has led to those changes or increases in investors considering a sustainable investment or including it in their portfolio (Schueth, 2003). Additionally, more diverse portfolios with sustainable or green bonds perform better than less diverse and weaker portfolios, specifically when comparing a variety of socially responsible investment (SRI) funds (Ivanisevic, 2019).

With notable relevance to this study, Yousaf, Sulemam, and Demirer investigated the resilience of green bonds, concluding that sustainable portfolios protected investors from market fluctuations during the COVID-19 pandemic (2022). Investigating the stability of “green” investments appeared to be a method in which to show their value as personal assets.

Current Investigation

Our study aims to expand on current literature by investigating financial trends during and after historical times of disaster and instability in the United States and examining whether “green” public equities, in particular, have provided a strong hedge against stock market downturns. We will use reported Scope 1 emissions data for a standard, rigid characterization of environmental sustainability. The following economic downturns will be reviewed: the 2000 dot-com bubble pop, the financial crisis of 2008-2009, the 2015-2016 market selloff, and lastly, the 2020 COVID-19 pandemic. This examination of the patterns of high-performing, but low-emitting corporations during past periods of uncertainty will indicate the stability and potential capabilities of sustainable portfolios.

Methods

Data Collection

To produce a list of rigidly characterized high-performing “green” companies, we aggregated the 500 companies from the S&P 500 index onto an excel sheet and found each respective company's 2022 “GHG (greenhouse gas) Scope 1” emissions through a Bloomberg Terminal - a computer system that provides aggregated financial data. We then sorted the companies by their 2022 GHG Scope 1 emissions and found the ten companies that produced the least amount of Scope 1 greenhouse gas emissions. These 10 green companies were as follows: Nasdaq, Realty Income Corporation, Akamai Technologies, Match Group, MSCI, CME Group, Synchrony Financial, Etsy, F5, Gartner (Table 1 and Table 2). However, some of the companies on the S&P 500 did not report GHG Scope 1 emissions, or any ESG data at all. To deal with this, we labeled the GHG Scope 1 emissions for these companies as “NA” and did not include the companies on the list for the ten companies that reported the fewest tons of Scope 1 emissions.

Using a Bloomberg Terminal, we then compared these 10 low-emitting companies' performance to the S&P 500 index by creating line charts for specific time frames. Each line chart was normalized with a starting value of 100 at the beginning of the specified time frame. By normalizing the line charts, the performance of the S&P 500 and each of the ten companies could be tracked and compared more clearly against each other. The first two graphs created show the general performance of the S&P 500 and the ten companies over more recent time frames. The first graph shows the one year return of the S&P 500 versus the 10 low-emitting companies from December 2021 to December 2022 (Figure 1), and the second graph created shows the five year return of the S&P 500 versus the 10 low-emitting companies from December 2017 to December 2022 (Figure 2).

Next, in order to look more specifically at how the S&P 500 performed compared to the 10 green companies during times of financial crisis in the United States, we narrowed our data to more specific time periods. Specifically, we looked at the performances of the S&P 500 and the 10 companies during the 2000 dot com bubble crash, the 2008 Financial Crisis, the 2015-2016 Market Sell-off, and the COVID-19 pandemic. By examining the performances during these specific time periods, important conclusions could be drawn about how the performance of green companies compare to the S&P performance during times of financial crisis.

First, to illustrate the performances of the S&P 500 and the 10 companies during the 2000 dot com bubble crash, we used data from March 2000 to October 2002 (Figure 3). This crash was the result of rapid growth of the internet during the late 1990s. This growth was not sustainable, resulted in a “bubble,” and ultimately led to the broader stock market index falling by 78% from its peak in March 2000 (Griffin et al., 2011). However, only four of the ten green companies existed in the 2000s, which is why there are only five lines on the graph for this downturn (including the S&P 500 line).

The following graph shows the performance of the S&P 500 and the ten companies during the 2008 Financial Crisis from December 2007 to June 2009 (Figure 4). Similar to the 2000 dotcom bubble crash, the 2008 Financial Crisis was a result of a rapid increase and growth of asset prices. In this case, the 2008 Financial Crisis was fueled by an unsustainable increase in housing prices, which formed a housing bubble. When the bubble burst in 2007, banks were holding worthless investments, and this resulted in one of the worst economic disasters in United States history.

Next, the 2015-2016 market sell-off from June 2015 to June 2016 was analyzed (Figure 5). During this time, stock prices globally decreased by over 50% due to global macroeconomic conditions including the Chinese stock market turbulence and a fall in petroleum prices.

Finally, we compared the performances of the S&P 500 and the 10 companies during the COVID-19 pandemic from February 2020 to July 2022. The pandemic resulted in massive economic turmoil, causing the stock market to plummet. The Dow Jones index experienced its biggest one-day drop since 1987 and the S&P also dropped by 20% since its peak (“Understanding COVID-19’s Impact”, 2022).

Tables and Figures

Company	Industry	GHG Scope 1 (tCO ₂ e)
Nasdaq	Technology	0.001
Realty Income Corporation	Real Estate	0.014
Akamai Technologies	Information Technology	0.062
Match Group	Internet Media & Services	0.077
MSCI	Financials	0.16
CME Group	Financials	0.161
Synchrony Financial	Financials	0.242
Etsy	E-commerce	0.35
F5 Networks	Information Technology	0.49
Gartner	Information Technology	0.586

Table 1. 10 Companies from the S&P 500 that Produced the Least Amount of Scope 1 Emissions (Based on GHG Scope 1 emissions reported through the Bloomberg Terminal)

Company	Description
Nasdaq	The Nasdaq stock market is based in New York and ranked second beyond the New York Stock Exchange, and the first electronic trading system. Nasdaq is in the financial industry.
Realty Income Corporation	Realty Income Corporation is a real estate conglomerate, with over 11,700 long term lease properties in 79 industries and providing opportunities for people to invest in real estate.
Akamai Technologies	Akamai Technologies is an information technology company that delivers and ensures adequate tech security measures around the world, and more recently, commercial services for major networks like ESPN and Yahoo.
Match Group	Match Group is a company that provides and creates dating platforms. A few of the most popular ones under their leadership include Tinder and Hinge.
MSCI	MSCI is a finance company that manages investments of all kinds, and also has a particular focus on ESG indices with the goal of “powering better investment decisions”.
CME Group	CME Group is one of the more popular worldwide risk management firms. It’s the world’s largest derivatives exchange with many trades from agricultural products to crypto futures.
Synchrony Financial	Synchrony Financial is a financial company offering many consumer related services such as credit and credit cards, investments and lending to specific industries, and FICO scores.
Etsy	Etsy is an e-commerce company where sellers- many times small business owners- can create, sell, and buy vintage and personalized goods of all sorts. The site sells fashion, art, purses, jewelry, and other secondhand or handmade items.
F5 Networks	F5 specializes in application security, multi-cloud management, online fraud prevention, application delivery services, availability, and performance, as well as network security.
Gartner	Gartner is a consulting firm and technological research center based in the US that focuses on doing the research and sharing that information with other private or corporate entities for their own purposes.

Table 2. Description of the 10 Companies from the S&P 500 that Produced the Least Amount of Scope 1 Emissions (Based on GHG Scope 1 emissions found on the Bloomberg Terminal)

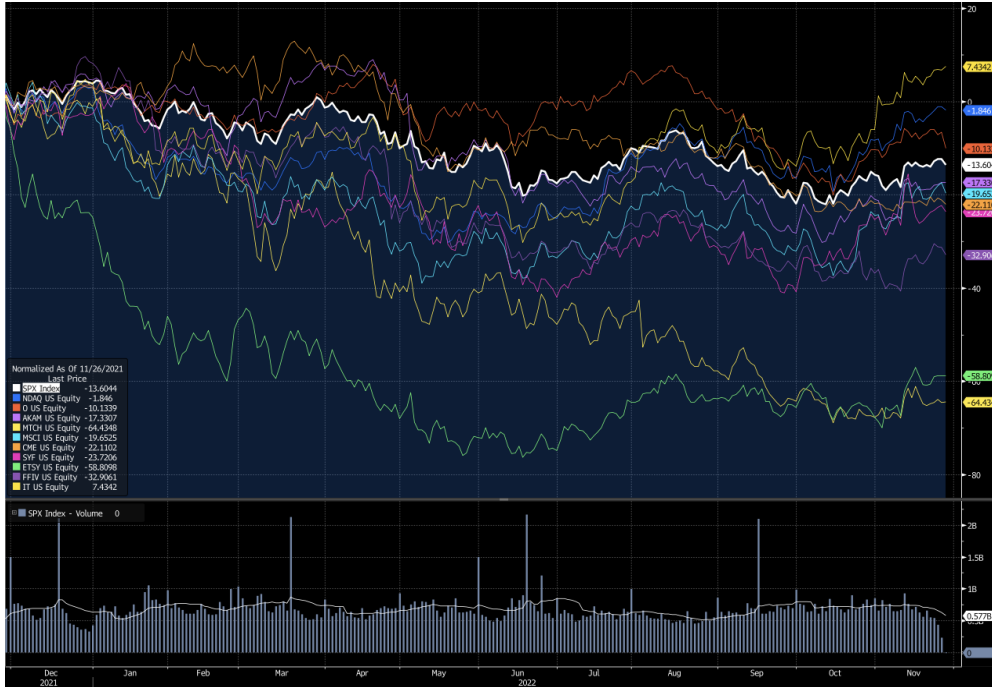


Figure 1. One year return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).



Figure 2. Five year return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).

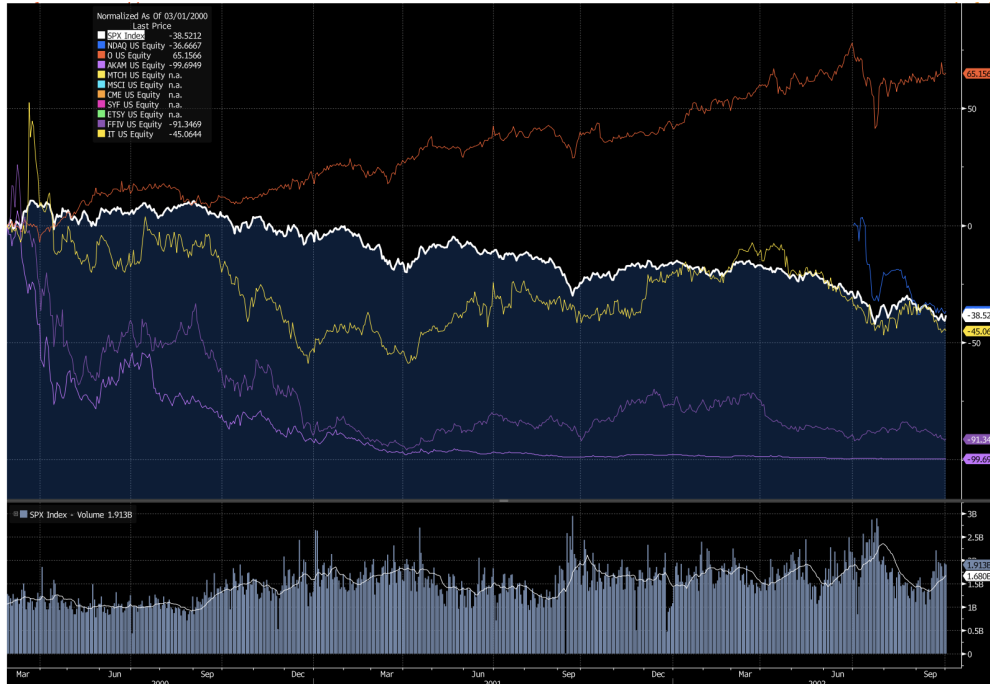


Figure 3. 2000 Dot Com Bubble Crash return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).

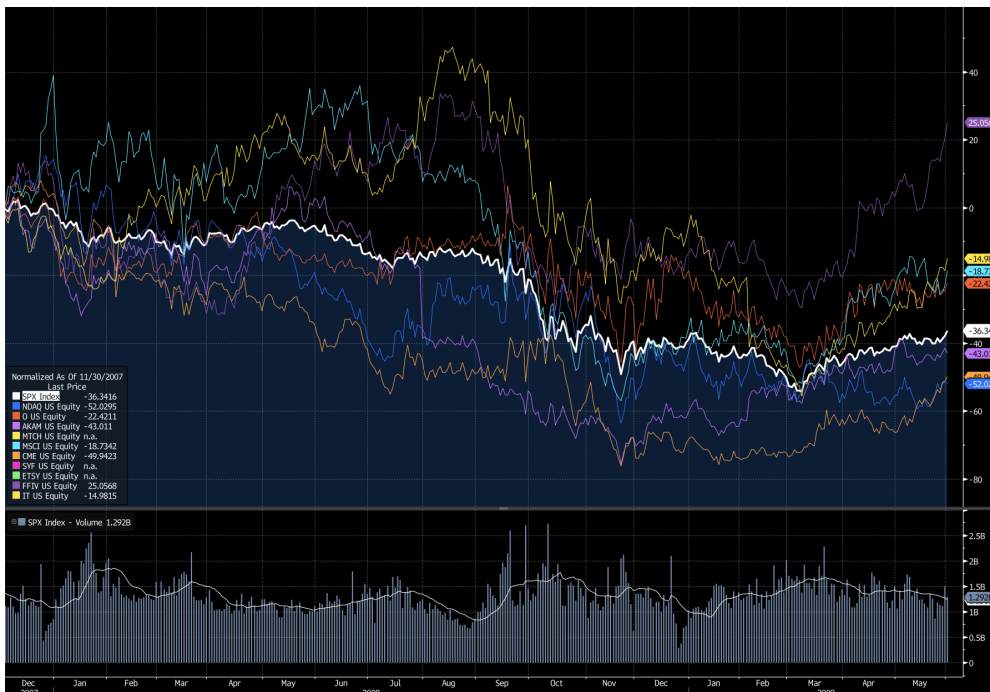


Figure 4. 2008 Financial Crisis return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).

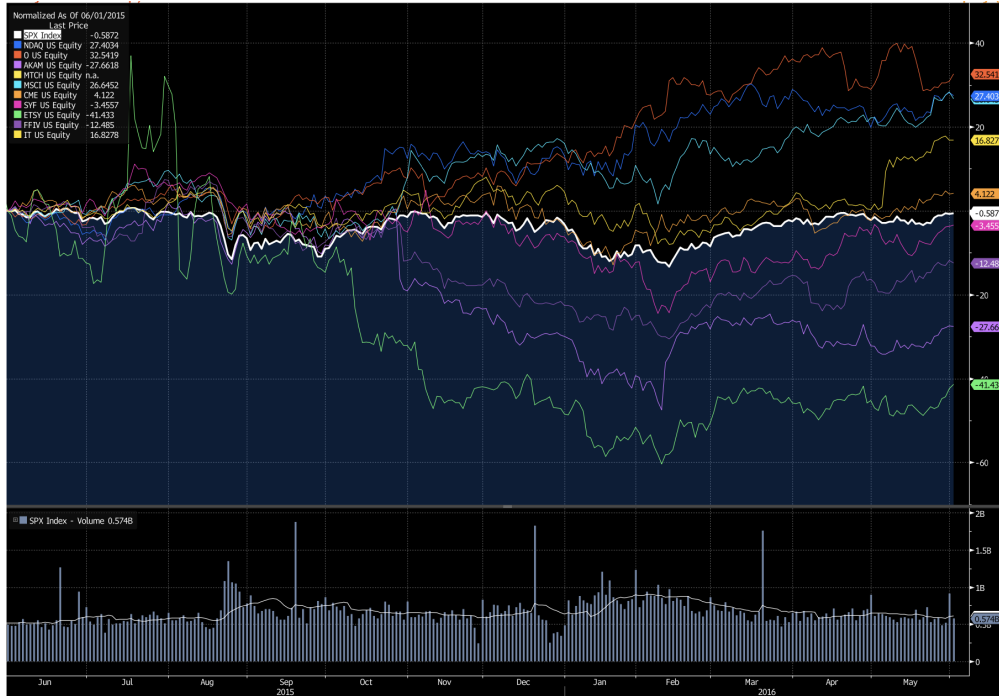


Figure 5. 2015-2016 Market Sell-off return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).

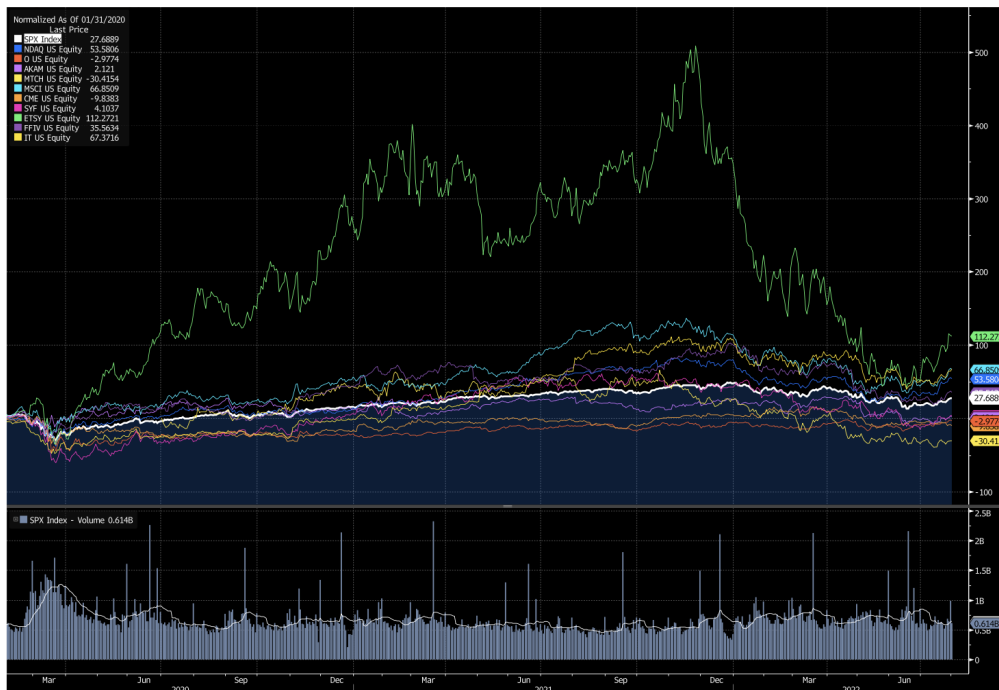


Figure 6. COVID-19 return of the S&P (white) vs the Nasdaq (dark blue), Realty Income Corporation (amber), Akamai Technologies (light purple), Match Group (yellow), MSCI (bright blue), CME Group (orange), Synchrony Financial (pink), Etsy (green), F5 (Dark purple), Gartner (bright yellow).

Discussion

Results

This investigation sought out answers about the performance of individual low-emission corporations compared to the total basket of corporations comprising the S&P 500 during times of economic crisis. To that end, the 10 corporations with the lowest Scope 1 greenhouse gas emissions from the December 2021 through December 2022 timespan have been used as the basis for analysis. These corporations provide a generalized reflection of how strongly the lower-end emissions basket performs during times of economic downturn relative to the entire S&P 500, which was done to assess their individual profitability potential and ability to withstand market collapses.

Figure 1 provides graphical representation of stock performance from December 2021 into December 2022. This span of time is characterized by slow GDP growth (<3.0%), moderated by a transition of the baby-boom generation into retirement and slowing job growth (Woodward, 2013). September 18 was notably detrimental for the stock market, seeing it fall 1,200 points to the levels of June 2020 in reaction to reports of continued high inflation rates (Pound & Reinicke, 2022). Amid these conditions, the S&P 500 outperformed 7 of this investigation's 10 comparison corporations, demonstrating their weak resilience to economic turbulence. The benefit of a market index fund is that it inherently hedges the strong and weak performers against each other, providing more cushioning against economic downturns. Individual stocks have more inherent risk but have the opportunity to beat the market, which the S&P 500 represents (Brockman, 2022).

For investors entering the market in the past year, there is good news for individual stocks in the green energy market. During periods of economic downturn, interest rates tend to

fall, leading to cheaper borrowing rates. As a result, projects that develop clean energy are cheaper to fund. Additionally, government stimulus tends to increase, which has recently led to wind and solar tax credits being made more readily available (Hoiium, 2021). This evidence indicates that being patient with individual companies during initial downturns can pay off in the long-run for investors, as buying into their stocks while the prices are low can position them for strong returns when the aforementioned financial factors occur. The chosen companies from this are not dedicated green energy companies, but choosing to participate in the aforementioned programs for their own energy use appears economically beneficial, regardless of industry.

Figure 2 provides a 5-year range of performance for the 10 chosen corporations and the S&P 500. In this case, the S&P 500 was the middle performer, outperforming 5 corporations while being outperformed by the other 5. This span of time encapsulates the COVID-19 pandemic and the preceding two years. Prior to the pandemic, 2018 was declared to be the worst year for the stock market since the collapse in 2008, with the S&P 500 down 6.2% on the year and fluctuating up and down over 1% nine times in December alone, which is extremely volatile compared with the norm (Isidore, 2018). Half of the chosen corporations performing better than the S&P 500 through December 2018 and into the next few years provides evidence that low-emission corporations are still competitive. A deeper look at the COVID-19 pandemic with Figure 6 will provide more specific insight into this outcome.

Figure 3 displays the dotcom bubble burst that occurred at the onset of the 21st century. This collapse occurred as a result of over-speculation into the burgeoning internet technology sector. Furthermore, the internet startup companies were quick to burn through investor capital without financial strategies in place, leading to downturns in the stock market (Hayes, 2019). Of the companies that existed at this point in time, the Realty Income Group was the only company

to outperform the S&P 500. While reports about their emissions activities during the dotcom bubble burst are not readily available online, the Realty Income Group is currently very transparent with their Scope 1 and 2 emissions on their website. Additionally, they have a written pledge to environmental responsibility for themselves and their clients (Realty Income, 2022). Beyond this, the company actively promotes clients to incorporate energy efficiency projects on their properties like LED lights and electric vehicle charging (Realty Income, 2022).

It is important to qualify this instance with the rest of the figure, where the S&P 500 performed second best. While the Realty Income Corporation illustrates that low-emissions companies can succeed, it is evident that times of financial crisis are tumultuous for individual companies. Thus far, this investigation has not found definitive evidence that low-emissions companies are extra resilient to economic downturn. However, it is important to note that the 2000 dot com bubble crisis disproportionately impacted technology companies and six of the ten companies that emitted the lowest greenhouse emissions are related to the technology industry. Due to this, companies that emitted low amounts of greenhouse gasses during this time also generally underperformed compared to the S&P 500. This is evident on the graph, where the individual companies begin to dip around December 2000 while the S&P 500 remains relatively stable. As such, the benefits of a diversified portfolio become apparent.

Figure 4 spans the duration of the 2008 financial crisis, which occurred under similar circumstances as the dotcom bubble burst: interest rates on loans were low and a bubble formed in which homes were worth less than homeowners paid for them (Singh, 2022). Four of the chosen corporations finished ahead of the S&P 500, which is a much stronger performance for the companies than in prior instances. As the lines on Figure 4 depict, the companies perform with the same pattern of upturns and downturns as the total S&P 500, but at greater magnitudes,

leading to stronger returns. This indicates that the individual corporations are equally susceptible to market fluctuations. As it happens, the percentage of stocks from within the total market that move together, tracked by what is known as a stock's beta value, has decreased over time in the United States, peaking close to 90% in the 1930s while sitting at just 60% after 1994 (Morck et al., 2000). It is important to note that the study found that volume of stocks being traded does not account for the decrease in stock synchronicity, which decreases the importance of the year being examined.

Figure 5 covers the 2015-2016 market selloff. A unique aspect of this event is that an international stock scare in the Shanghai Composite Index increased fears on the U.S. market before the market even opened, which demonstrates the globalized nature of modern stock market fluctuations (Mitchell, 2021). To this end, it becomes increasingly difficult to hedge stock purchases in order to mitigate risk. Figure 6 shows that five out of the chosen ten companies outperformed the S&P 500 during this time period. While these companies tended to follow the same fluctuations as the S&P 500, Etsy's equity uniquely spiked in July 2015 as a result of Google announcing strong internet traffic for the crafts company (Oyedele, 2015). Etsy's equity went on to drop below market averages in October 2015, demonstrating the variability of the market. Additionally, this illuminates that stock investors are not asking questions about emissions or environmental impact policies, as their investments are instead being based upon market-share and potential to turn a profit.

Figure 6 covers the COVID-19 pandemic, showing how the S&P 500 hovered around the middle of the group for normalized returns. Etsy again showed itself to be an outlier, performing well above the average as a result of leveraging the e-commerce format to thrive during the lockdown conditions of the pandemic (Richter, 2020). Etsy has pledged to offset 100% of the

carbon emissions generated from the packaging and shipping of products and that they will produce net zero emissions by 2030 (Etsy, 2022). The pandemic generated extraordinary economic circumstances that allowed Etsy to perform well, but increasing climate uncertainty only increases the need for companies to respond to year-by-year conditions in order to thrive. Given their success through the COVID-19 pandemic and a promise to negate their emissions impact within the next decade, Etsy is a promising company to observe as the merit of green companies continues to be assessed in the future.

Limitations

A limitation of this study is that the research was based on United States stock market data and indices. With regards to climate change and other environmental sustainability concerns, it is important to include a global perspective for a more accurate picture of return trends around the world. While this limitation is not relevant to the specific purpose of this investigation, addressing global sustainable index returns would be more all-encompassing.

Further, only the ten lowest emitting companies were analyzed, whereas a typical index is composed of upwards of thirty stocks. This was done for two reasons: not all of the S&P 500 companies reported 2022 GHG Scope 1 emissions, and those that did had an expansive range of emissions tonnage past the lowest ten-emitters. However, the use of only ten stocks limited the types of industries that were examined and decreased the diversity of the index.

A glance at Table 1 reveals that the industries of the bottom 10 Scope 1 emitters are information technology, financials, consumer discretionary, real estate, and communication services. Emissions data segmented by industry, let alone individual companies, does not widely

exist for free public access, which is a hindrance to this investigation and those that seek to expand upon it.

Finally, this project relies on qualitative and description-based analysis. However, previous research used regression-based comparisons to determine which investments are most profitable over time.

Future Research

Future investigations related to the profitability of sustainable investments should look at a broader range of industries, rather than the limited scope included above. Further, other studies should perform regression based analyses with the most recent stock data to provide a more quantitative comparison between sustainable and traditional investments. It would be worthwhile to examine data beyond simply Scope 1 greenhouse gas emissions and move to Scope 2 and 3 as reporting becomes more standard. As previously mentioned, climate change and environmental issues encompass more than simply whether a company reduces their emissions now or at a certain pace in the past few years. Rather, interventions that address multiple aspects of climate and environmental issues promote sustainability on a more holistic scale and can contribute compounding effects. Additionally, future research should look at a larger time period of instabilities than was included in this investigation - limitations in the paper and in data accessibility prevented this project from delving more into the nuance of specific periods of instability. Finally, researchers should examine the benefits of creating a personalized index with a smaller range of companies to guide research and narrow down the playing field, rather than further highlight large indices like the Dow Jones.

Conclusion

This investigation expands on current literature regarding the performance of sustainable investments to the broader US stock market during periods of economic stability. The ten green companies that outperformed the S&P 500 during times of economic downturn were not characterized by stable growth, but instead demonstrated high variability. Etsy was the most visible example of this, as it leveraged its e-commerce model during the COVID-19 pandemic in order to attain explosive growth. That being said, the basket of 10 companies chosen for this investigation had diverse performances, which aggregates into a more stable growth index, similar to the S&P 500. The graphical data trends illustrate the importance of a company's ability to adapt to macroeconomic conditions in real time and not simply rely upon prior planning.

Companies that are transparent about their emissions and prioritize including environmental responsibility measures in their corporate goals concurrently avoid being culprits of greenwashing and position themselves to reap the benefits of government-funded initiatives meant to incentivize eco-conscious energy and business practices (Hoium, 2021). The study of supply chains and broad corporate policies would necessitate examining more than just Scope 1 emissions, but it is a valuable lead for future research about the relationship between business, government, and profitability.

Another finding of this investigation is that the degree of resilience that a given stock achieved to total market volatility appeared to relate to the industry of the company. For example, the Realty Income Corporation, a real estate firm, was uniquely successful during the 2000 bubble burst while technology companies suffered. Likewise, Realty Income Corporation stock suffered during the 2008 Financial Crisis, which centered around the collapse of the housing market. For investors, it is imperative to diversify the industries represented in their

portfolios, as this provides coverage for any potential industry-specific collapses. This also follows a general rule of investing: increased portfolio diversity reduces risk. The ability of green stocks to occasionally outperform the market by a significant margin is further impetus to include them in a portfolio.

In this sense, portfolios built with green stocks as stabilizers appear to be viable options for investors. Thus, the average investor should consider adding low-emitting (or otherwise “green”) stocks as a means of hedging against general market volatility and downturn. Further bodies of research that compound the results shown could lead to increased investments of capital in this type of stock, potentially initiating a paradigm shift in investor priorities.

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Declaration of Conflicting Interests

There are no known conflicts of interest with regard to any of the researchers cited or the authors of this investigation.

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