Environmental, Social, and Governance (ESG) Investing: How Adopting ESG Criteria Affects Performance and Risk

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***Abstract*—As the investment using environmental, social, and governance (ESG) characteristics become increasingly popular in recent years, the discussion of whether or not ESG investing is profitable for asset managers has received much attention. This paper provides a detailed analysis of ESG investing by examining the returns of ESG funds compared to the broad stock market and the volatility of returns. The paper concludes that ESG investing will result in higher returns for investors as historical data indicates that ESG funds outperform the S&P 500 both in the short and long term. The paper also finds that ESG investing can produce a lower volatility of returns compared to that of the market. The paper discusses other benefits of ESG investment. The conclusion is that adopting ESG criteria in investing is a valuable approach in terms of risk and return as well as the environmental and societal merits.**

***Index Terms*—Environmental, Social, and Corporate Governance (ESG), sustainable investment, ESG mutual funds, sustainable investment volatility.**

I. Introduction

Recently, there has been a meteoric rise in the field of ESG investing. In 2019, total global sustainable investment increased to 30 billion dollars. This number has grown 64% since 2014 and tenfold since 2004 [1]. ESG investing is an approach for investors to select companies based on three components: environmental consciousness, social responsibility, and governance. The environmental component of ESG describes how a company performs as a steward of nature; the social factor measures how a company manages relationships with employees, suppliers, customers, and the communities where it operates; and the governance factor examines a company's leadership, executive pay, audits, internal controls, board diversity, and shareholder rights [2]. The popularity of this strategy demonstrates investor's interest in owning companies that adopt the ESG approach. Some asset managers doubt that ESG investment can outperform the market. A study done by RBC Global Asset Management showed that nearly half of institutional investors did not believe ESG-integrated portfolios were likely to perform as well as or better than non-ESG-integrated portfolios [3]. The tension between the popularity of ESG investing and the doubt surrounding it generates a debate: should investors integrate ESG as criteria in their stock selection process of constructing their portfolios? This paper will investigate the question by comparing ESG funds and benchmarks in terms of performance, short-term risk in terms of volatility, and long-term risk caused by potential government interventions. The conclusion is that using ESG criteria for stock screening is advantageous for investors.

Before the ESG approach was introduced in 2005, another type of sustainable investing, Socially Responsible Investment (SRI), was developed. Originating in the 1960s, the methodology faced criticism for violating its fiduciary responsibilities because a third party's interest - namely, environmental concerns - were considered at the expense of shareholders. As a result, it was rebranded with the addition of a governance factor, allowing the proponents of ESG investing to argue that, by prioritizing higher returns, ESG investing was aligned with the interest of shareholders [4]. Such historical information underscores the importance of validating the performance of ESG investing. If ESG funds outperform non-compliant funds, then fiduciary concerns are negated and ESG investing can be regarded as valuable to asset managers. Otherwise, ESG investing will only follow in the footsteps of SRI.

II. Performance

The most direct method for assessing the performance of ESG funds is to compare them with the market. Recently, many articles have been written on this topic. The results have been conflicting regarding the performance of ESG funds reported by various organizations. For instance, a Financial Times article found that 6 out of 10 sustainable funds delivered higher returns than equivalent conventional funds over the past decade [5]. On the other hand, a Pacific Research Institution article claimed that only one or two ESG funds beat the S&P 500 benchmark over the 5-year and 10-year investment horizons [6]. Both articles offer empirical evidence and acknowledge some limitations. However, a concern is that these studies might have purposefully chosen statistics that support their argument instead of the most representative ones. To avoid such pitfalls, the author has decided to adopt an objective approach, focusing on the three largest ESG funds and comparing their performance to the S&P 500 benchmark. The thought process is that these funds have a significant history of investing and are available to new investors. Using Morningstar's data, this paper found that the three ESG funds with the highest asset under management are Polen Growth Fund Institutional Class (POLIX), Akre Focus Fund Institutional Class (AKRIX), and Parnassus Core Equity Fund (PRBLX), which have 8.91 billion dollars, 15.1 billion dollars, and 21.93 billion dollars

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in assets under management, respectively. The recorded performances of the three funds were compared against the S&P 500 Index, a reasonable representation of the market, on a 1-year, 5-years, and 9-years (AKRIX was only introduced 9 years ago) basis [7]. Here are the results updated until January 26th, 2021:

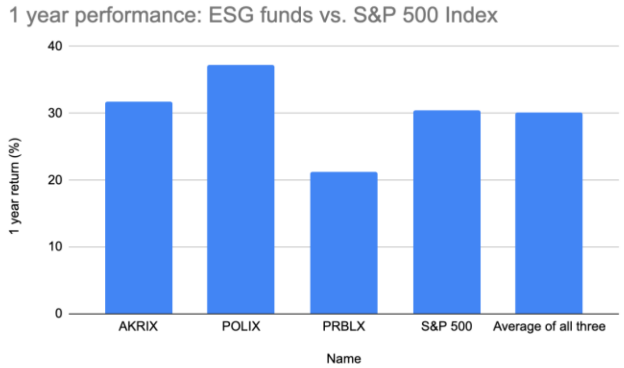

Fig. 1. 1 year performance: ESG funds vs. S&P 500 Index.

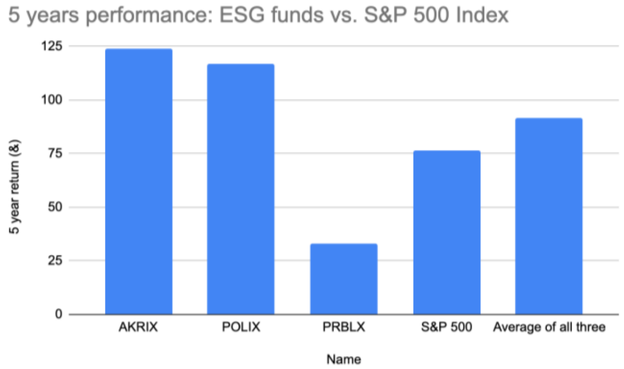

Fig. 2. 5 years performance: ESG funds vs. S&P 500 Index.

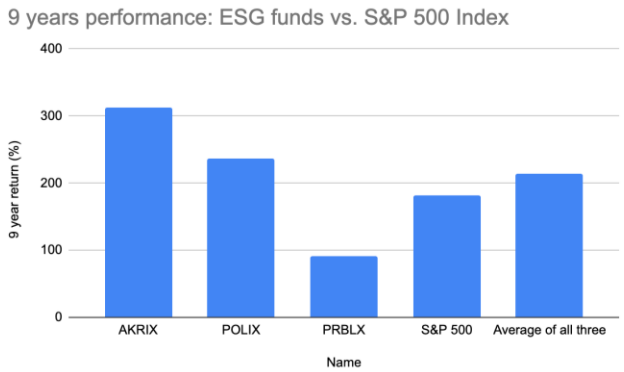

Fig. 3. 9 years performance: ESG funds vs. S&P 500 Index.

In Fig. 1, the three biggest ESG funds are compared with the S&P 500 in a 1-year frame. Results show that AKRIX and POLIX outperformed, while PRBLX underperformed. The average is nearly equal. In Fig. 2, the time frame changed to 5 years. Again, PRBLX underperformed, while the other two funds outperformed. The only change is that the average of the three funds generated a higher return than the S&P 500. Figure 3 shows the 9-year return comparison, and the results are similar to the ones in Fig. 2. Although PRBLX consistently underperforms in comparison to other funds, a key difference is that PRBLX is categorized as Large Blend instead of Large Growth, meaning that its portfolio contains a value component. As value stocks have underperformed in comparison to growth stocks in recent years, it is understandable that PRBLX shows lower performance. If compared to its category, we observe that PRBLX outperforms other Large Blend funds and has a lower standard deviation of returns according to Morningstar. These data provide sufficient evidence to suggest that ESG criteria are positively correlated with returns. Another important note is that these ESG funds also hold various companies that are in the S&P 500 index, indicating that the performance gap is greater than what is shown on the graphs. Here are the top ten holdings of the three funds on January 26th, 2021:

TABLE I: TOP 10 HOLDINGS OF POLIX

Top 10 Holdings (58.94% of Total Assets) — Get Quotes for Top Holdings

Name	Symbol	% Assets
Facebook Inc A	FB	8.67%
Microsoft Corp	MSFT	7.99%
Alphabet Inc Class C	GOOG	7.06%
Adobe Inc	ADBE	6.94%
Abbott Laboratories	ABT	5.66%
Zoetis Inc Class A	ZTS	4.77%
Salesforce.com Inc	CRM	4.51%
ServiceNow Inc	NOW	4.51%
Visa Inc Class A	V	4.51%
Mastercard Inc A	MA	4.32%

TABLE II: TOP 10 HOLDINGS OF AKRIX

Top 10 Holdings (68.23% of Total Assets) — Get Quotes for Top Holdings

Name	Symbol	% Assets
American Tower Corp	AMT	10.87%
Mastercard Inc A	MA	10.48%
Moody's Corporation	MCO	9.93%
Visa Inc Class A	V	6.72%
CoStar Group Inc	CSGP	5.40%
SBA Communications Corp	SBAC	5.19%
CarMax Inc	KMX	5.08%
O'Reilly Automotive Inc	ORLY	4.98%
Constellation Software Inc	CSU.TO	4.90%
Roper Technologies Inc	ROP	4.68%

TABLE III: TOP 10 HOLDINGS OF PRBLX

Top 10 Holdings (40.94% of Total Assets) — Get Quotes for Top Holdings

Name	Symbol	% Assets
Microsoft Corp	MSFT	5.64%
Amazon.com Inc	AMZN	5.16%
Comcast Corp Class A	CMCSA	4.28%
Danaher Corp	DHR	4.20%
Deere & Co	DE	3.92%
Verizon Communications Inc	VZ	3.85%
Applied Materials Inc	AMAT	3.80%
FedEx Corp	FDX	3.65%
CME Group Inc Class A	CME	3.23%
Linde PLC	LIN.L	3.21%

As shown, these three funds hold numerous S&P 500 companies, such as Microsoft, Alphabet, Amazon, which occupy a substantial proportion of the entire portfolio. If statistics show that the portfolio of ESG funds, or the average performance of ESG funds, outperforms the S&P 500, it reveals that non-ESG compliant companies in the S&P 500 are hampering performance, indicating a greater difference between performances of ESG funds and non-ESG funds. Ergo, it is fair to argue that ESG funds provide higher returns compared to the market.

III. ANALYSIS

Besides the statistics, many experts have produced logical justifications that support the previous phenomenon.

Mckinsey, a famous American management consulting firm, opines that the merits of ESG investing fall into four main categories: top-line growth, cost reduction, reduced legal interventions, and employee productivity [8]. The Cornerstone Capital Group has also found that ESG integration can improve a company's reaction to extreme circumstances [9]. Although these benefits are discussed from the perspective of firms, they are always related to investors. If ESG compliant companies outperform their competitors, investors who invested in these companies will also outperform other investors. Thus, analyzing whether ESG is successful in companies is closely correlated with its impact on return for investors.

The foremost benefit is that integrating ESG can engender top-line growth for a company. Such revenue growth can be explained by the attraction of new customers with sustainable products. As the awareness of environmental issues spreads among the public, many people have begun favoring sustainable products as a way to contribute to resolving ecological problems. According to another Mckinsey study, up to 70 percent of consumers surveyed about purchases in the automotive, building, electronics, furniture, and packaging categories said they would pay an additional 5 percent for green products if they met the same performance standards as non-green alternatives [10]. This indicates that a company producing sustainable products has a comparative advantage over other competitors, which could generate more gross-sales and higher profits. Such merit demonstrates how ESG criteria can improve the performance of a company.

Another potential merit that comes with the integration of ESG is cost reduction. When firms promote environmentally friendly criteria, they no longer need to worry about the rising operating costs of raw materials, such as fuel. For example, the delivery company FedEx has been renovating its vehicles to employ electric engines. Despite the short-term cost of purchasing new technologies, such renovation can decrease FedEx's operating cost in the long term as electricity costs far less than fuel [11]. The company that provides electric vehicles for FedEx, General Motors, has claimed that their trucks "are designed to help businesses lower costs" [12]. So far, 20 percent have been converted, and fuel consumption has already been reduced by more than 50 million gallons. Eventually, there will be a positive influence on the firm's performance and elevate investor returns. Another influential company in the US, Walmart, revealed that a 5% reduction in packaging would translate into $11 billion of cost savings, $4.3 billion of which the company would capture [13]. Both companies have reduced long-term costs by promoting a more sustainable way of operation.

A strong ESG rating also enables companies to achieve strategic freedom. While many have ignored the importance of governmental regulation, another Mckinsey report suggests that typically one-third of corporate profits are often at stake. In some industries, such as Banking, where capital requirements and consumer protection is crucial, up to 60% of a firm's profit depends on legal interventions. Furthermore, a company that promotes ESG criteria can gain access to valuable resources. For example, adopting strong governance policies can assist in promoting a company's reputation. When authorities trust a company's managers, officials are more likely to grant access or licenses. A University of Pennsylvania research provides an example from the industry of gold mining, where firms need various approvals [13]. Firms that are perceived to be environmentally and socially responsible by the public tend to have fewer restrictions from the government when extracting resources. In contrast, companies that have a weaker relationship with the public are required to plan extensively and expect operational delays. Therefore, adopting ESG practices can relieve regulatory pressures and increase a firm's profit in most industries. As Ashwin Kumar, professor of Social Policy at Manchester Metropolitan University, wrote in 2016 " the integration of Environmental, Social and Fair Governance practices make a company less vulnerable to reputation, political and regulatory risk and thus leading to profitability" [14].

ESG integrations also encourage firms to improve employee productivity. One of the most important measures of the social criteria in ESG is employee satisfaction. To improve its ESG rating, an ESG compliant company will try to enhance its relationships with employees, which will lead to higher employee satisfaction and productivity, thereby increasing the firm's efficiency compared to its competitors. The London Business School's Alex Edmans found that the Fortune's "100 Best Companies to Work For" list generated 2.3 percent to 3.8 percent higher stock returns per year than their peers over a 25-year horizon, demonstrating the relationship between employee satisfaction, firm productivity, and investment return. Further, with a reputation for great employee management, firms can attract talented employees, allowing them to improve performance [15].

Companies with a high ESG score also have superior performances during extreme situations. ESG requires high ratings in governance, meaning that there will be a more reliable management group that can react to situations, especially during difficult times. An article of Cornerstone Capital Group commented that the managers of a sustainable business will likely have given plenty of thought to contingencies. While even the best-governed companies likely will not have prepared sufficiently for a crisis, ESG compliant companies, given their strong leadership, are still in a relatively strong position to act decisively.

These five advantages of ESG compliant companies support the results found regarding the performance comparison between ESG funds and the S&P 500 Index by showing how individual elements in ESG can measure and improve the performance of companies. They reveal that integrating ESG enhances the performance of a company, resulting in higher returns for asset managers who use ESG as a key element in stock selection.

IV. Concerns

People who are critical of ESG have proposed several potential concerns regarding whether ESG investing generates higher returns. One of the widespread apprehensions is that, instead of improving the wellness of a company, ESG criteria add costs to firms' operations and act in the form of a tax. Simply taking employee satisfaction as an example, to improve the rating, a company ought to increase its spending on employee benefits. Moreover, the requirement to be environmentally conscious can negatively affect firms' profits in sectors that rely on natural resources, such as the vehicle industry. To fulfill the environmental criteria of ESG, some vehicle companies have produced cars that disallow cheaper gas to reduce carbon emissions which lead to higher costs for consumers and lower demand for private cars, creating a lower profit for firms. But, as demonstrated in studies done by Edmans and Henisz, in the long term, the benefit will offset and overcome the initial costs.

Another potential concern is that the higher returns are not outcomes of ESG criteria. As observed in the top 10 holdings of the three biggest ESG funds, each ESG fund holds a lot of successful companies. In terms of POLIX, Facebook, Google, Adobe, and Microsoft take up 30.37% of the entire portfolio. For AKRIX, Mastercard Inc takes up 10.32% of the total portfolio. For PRBLX, Microsoft and Amazon take up 10.8% of its portfolio. These companies have outstanding ESG ratings, but their stock performance could be a result of popular products. For example, Apple has a high ESG score, but its profits are mainly based on its electronic designs, not ESG criteria. Such a complicated relationship of whether companies are outperforming due to ESG adoption or these companies just happen to be ESG compliant can incur a whole new debate. For investors, the most important information is that a positive correlation between the ESG approach and return is observed. It does not matter which comes first, because as long as ESG criteria are effective indicators of higher returns, investors should utilize the approach.

V. Volatility Risk

Aside from the stronger performances by ESG funds, another perspective that assesses if ESG criteria correlate with superior portfolios is risk, which every asset manager has to consider. A common understanding is that risk needs to be proportional to returns. In other words, if the risk is high, then the expectation of return will also be high (and vice versa). Such an idea eventually led to the creation of risk-adjusted return, a calculation of the profit from an investment that takes into account the degree of risk that must be accepted to achieve it [2]. To be more simple, risk-adjusted return adjusts the nominal return of a stock according to investors' expectations, providing a more accurate understanding of ESG stocks and helps evaluate whether the outperformance is due to higher risk or consequences of ESG criteria. Thus, risk is a crucial aspect that needs to be measured before asserting the advantages of incorporating ESG criteria in investments.

While there are many ways to measure risk, this paper decides to focus on the volatility of ESG stocks compared with that of others. More specifically, volatility is a measure of the investments' standard deviation of returns over the average return for a certain period. Different from other risks, the stability of a stock's return can be measured with objective numbers, such as standard deviation, and the required data is available to the public. If the volatility of a stock is low, it signifies a lower risk. In contrast, higher volatility indicates unstable returns, meaning a greater risk for investors. When it comes to the volatility of stocks of companies that adopt ESG criteria, recent studies have shown that companies that have adopted ESG have a lower risk. AQR Capital Management found a strong positive correlation between companies' exposure to ESG criteria and lower standard deviation of the changes in their stock price. The study first separated firms into five quintiles according to their ESG ratings from the MSCI database. Then, each stock's total risk, stock-specific risk, and beta were compared to the MSCI index using Barra's GEM2L risk model. Results showed that stocks in the worst quintile were 10-15% more volatile than those in the best quintile. The study presents strong evidence that sustainable firms provide a more stable return to investors than firms that don't pay attention to ESG [16]. However, the study has its limitations; for instance, its sample period was relatively short. Due to data availability, researchers could only collect data for five years, which limits the study's ability to assess the impact of different macroeconomic environments on the volatility of these stocks. Nevertheless, this study presents an objective fact that ESG stocks have lower standard deviations in the past five years. Another study done by MDPI reinforces the previous finding by analyzing the standard deviation of different types of funds. By comparing 30 ESG funds with 30 traditional funds and global indexes, the study found that in terms of return volatilities, sustainable funds are less risky than both traditional funds and benchmark indexes because the standard deviation of sustainable funds is the lowest in each year and the whole period [17]. MDPI's study adds to the previous one because it offers evidence that compares ESG funds to benchmarks that can represent the broader market. As a result, both results seem to provide empirical evidence that funds and stocks with higher ESG ratings bear a lower risk.

VI. Environmental Risk

Apart from the previous volatility risk, another important consideration of ESG is that it can help investors avoid long-term risks imposed by environmental concerns. In the foreseeable future, as more countries begin responding to the call to achieve environmental sustainability, government regulations that protect the environment seem inevitable, for example, the Paris Agreement that was signed in 2015. According to the United Nation, the implementation of the Paris Agreement requires economic and social transformation based on the best available science. The agreement works on a 5-year cycle of increasingly ambitious climate action carried out by countries. In 2020, countries have submitted their plans for climate action, known as nationally determined contributions (United Nations). As 197 countries, including major nations, such as China, Japan, and Britain, have already signed this agreement, there is an anticipated global movement towards a more responsible approach to promote environmental sustainability, which will significantly impact the economy. Even though the United States withdrew from the agreement under Trump's administration, Joe Biden, the new president has signed the instrument to bring the United States back into the Paris Agreement on January 20th, his first day in office. As a result, it seems reasonable to claim that there will be substantial effects on all walks of society, including the financial market and investment strategies as countries that represent a great part of the world economy have joined to promote environmental sustainability [18].

One of the major goals of the agreement is carbon neutrality. More specifically, to create a healthier atmosphere, the agreement aims to obtain net-zero emissions by reducing carbon dioxide emissions. Since the emission of carbon has been viewed as the prime culprit of climate change, decreasing the level of carbon seems to be one of the most effective solutions for world governments [19]. Many dominant nations have already established a goal for carbon neutrality: Britain's aim is 2050, China's is 2060, and Japan's is 2050. These dates are not in the distant future, and governments will start acting soon. Among all the strategies to reduce carbon emission, the most specific and effective one appears to be the carbon tax, which requires firms from all sectors to pay a certain amount of money for every ton of carbon they produce. An IMF report, which discovered that increasing the price of carbon is the most efficient and powerful method of combating global warming and reducing air pollution, supports this claim [20]. The carbon tax would certainly improve the environment, but at the same time, the economy will face great distress, especially in the energy and transportation sectors, engendering potential risk on companies that rely heavily on carbon emission. For example, one of the biggest energy companies in the United States, ExxonMobil, will encounter a massive increase in cost due to the increasing carbon tax. According to Bloomberg's data, ExxonMobil released up to 528 million metric tons of carbon in 2019. Currently, the market price of carbon per ton is around 20 dollars, but to achieve the Paris Agreement, the carbon tax is projected to increase to about 100 dollars per ton [21]. This would increase ExxonMobil's cost fivefold, causing severe damage to its profit and eventually hurt investor returns. Such forecast of the future of ExxonMobil has also affected its current stock price, which dropped from a high of 102.95 dollars per share in 2014 to only about 44.96 dollars in 2020, showing the direct effect on investors. In contrast, companies that already adopted sustainable technologies would be spared from such risk. One of the most successful companies is Tesla, which barely creates any carbon emissions because of its electronic engines. Furthermore, Tesla can even benefit from the rise in the carbon tax because it owns a lot of extra carbon allowance. Due to the high demand for carbon emission, Tesla can easily gain huge benefits from selling carbon allowances. Based on Tesla's 2019 annual report, Tesla made approximately $594 million, $419 million, and $360 million for the years 2019, 2018, and 2017, respectively, from selling regulatory credits alone [22]. These numbers are likely to grow significantly as the predicted carbon tax in the future will increase fivefold. As a result, investors should be aware that companies with high ESG scores will become more advantageous in the future when environmental sustainability is the top priority around the globe. The CEO of BlackRock, one of the biggest investment management companies in the world, claimed that "In the near future – and sooner than most anticipate – there will be a significant reallocation of capital". Indeed, the unpreventable regulations from the government will affect the decisions of investors. Although the risk of economic distress from protecting the environment might not occur in the short-run, it will become a necessary consideration for investors in the future. As of now, asset managers should start considering these sustainable criteria before the restrictions are imposed to prevent potential risk.

VII. Conclusion

To conclude, the findings of this research paper show that even if investors do not have a personal preference for responsible investment, they should at least start considering ESG integration in their portfolios due to a general trend of higher performance compared to the market, lower risk in terms of volatility, and long-term environmental regulations. Moreover, alongside the dramatic increase in the number of sustainable investments, many asset management companies have been promoting ESG investing and listed the advantages of integrating those criteria. The integration of ESG can be viewed as a way for both short-term and long-term risk control, and a strategy to increase investment returns. However, one hindsight that's worth noticing is that such investment doesn't have a strict rule regarding how companies should be rated according to ESG standards. As a result, this paper can only provide a view utilizing the current understanding and statistics of ESG companies and funds. Aside from all the analysis regarding performance and risk, the environmental and societal benefits of ESG investing cannot be more evident, so why not help the entire human race while gaining a higher return?

Conflict of Interest

The author declares no conflict of interest.

Author Contributions

Dongli Cao conducted research, analyzed data, and wrote the paper. Dr. Yusheng Bi is the research advisor.

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