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Asset allocation for an ESG world

Investors may have opportunities to capture excess returns as ESG assets increase in market value

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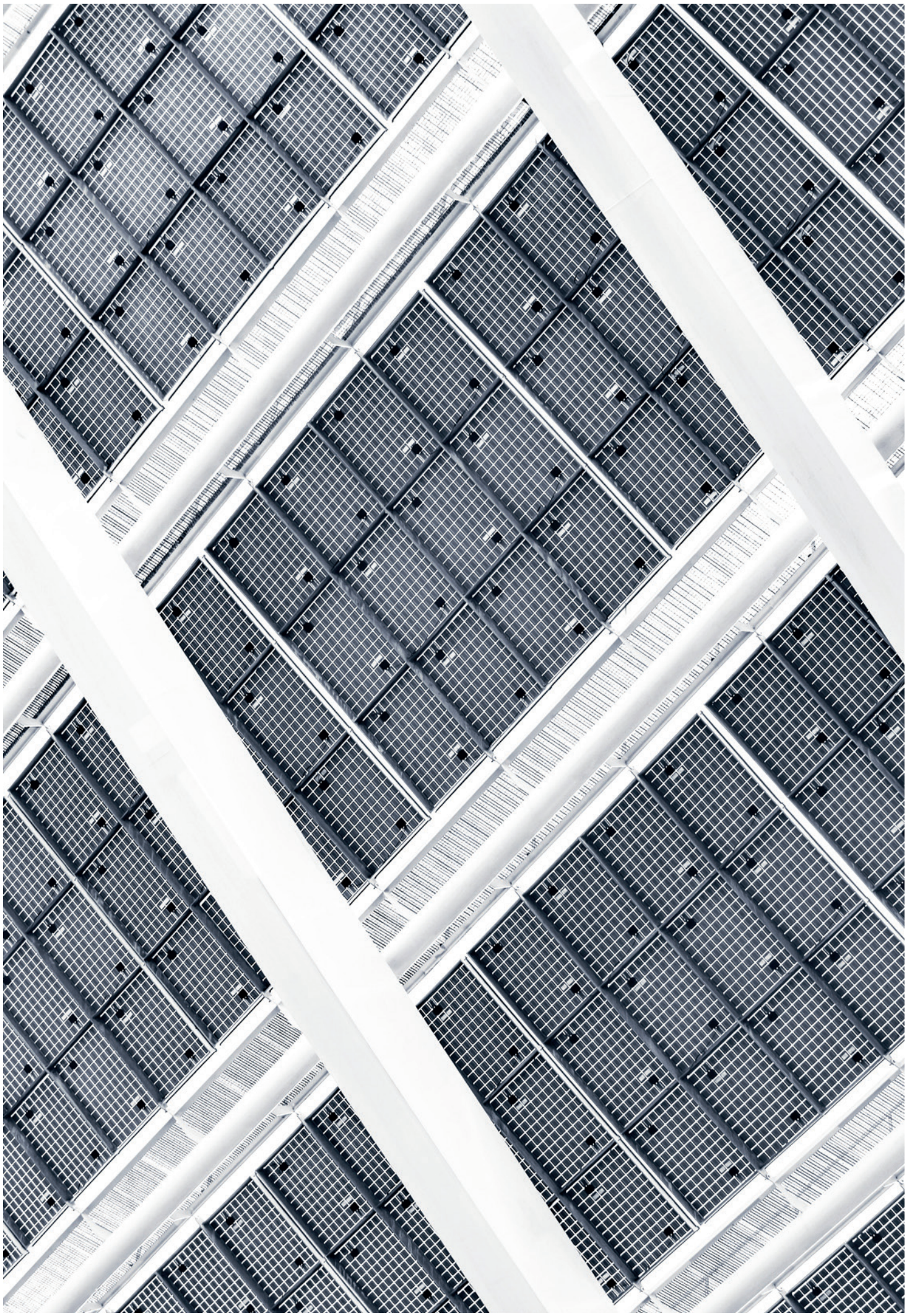

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Introduction

Investors are accustomed to considering risk and return as the two dimensions that guide asset allocation. As a result of our study, we find that two additional elements – time and preference – are needed to augment this process in an ESG world.

Asset allocators are increasingly facing a novel challenge when constructing portfolios: Striking a balance between environmental, social, and governance factors and traditional performance objectives to achieve success on both fronts. This paper provides an asset-allocation framework for investors incorporating these factors into their investment process. Having performed an exhaustive academic literature review and our original data analysis, we find no material negative trade-off in terms of risk and return for investors who utilize less restrictive ESG approaches. In fact, those investors may enjoy alpha opportunities in addition to producing positive externalities. Over a very long-term horizon, as companies become aligned with the 'net-zero' goal and other sustainable initiatives, we expect risk and returns of conventional ESG strategies to gradually parallel non-ESG strategies due to market efficiency as we expect ESG to become the norm and investors to properly discount the risks of non-compliance.

Investors are accustomed to considering risk and return as the two dimensions that guide asset allocation. As a result of our study, **we find that two additional elements – time and preference – are needed** to augment this process in an ESG world. These fresh considerations are poised to have a transformative impact on the traditional pillars of asset allocation.

Time

The **time** element refers to the duration of the ESG transition underway as governments and companies enact regulations, new technologies, and investments to reduce pollution in line with the principles of the Paris Agreement and fulfill sustainable development goals relating to social responsibility and governance.[1] During this transition period, ESG-oriented strategies are likely to be well-positioned to capture potential gains from new technologies compared to traditional benchmarks. Active investors that incorporate ESG analysis into their approach may disproportionately benefit, as we discuss below.

Preference

The **preference** element refers to the weight an investor places on prioritizing sustainability in an investment portfolio, either due to regulatory requirements or the objectives of the investor or organization and its board. For these investors, the issue is how to optimize portfolios to address risk and return in concert with ESG. The impact depends heavily on the magnitude of ESG constraints.

In short, if the constraints are very restrictive, shrinking the investable universe materially, then investors must accept portfolios that are less diversified and hence may have less favorable risk-adjusted returns. If the constraints are less binding and allow factor exposure in line with the main ESG benchmarks, we believe the long-term impact on investment performance is minimal. Specifically, the main ESG benchmarks are designed to match factor exposures with traditional benchmarks, so that the tracking error between ESG and traditional benchmarks is very small. In addition to positive and negative screening based on ESG characteristics, investors can express preferences through engagement and impact investing, as we will discuss later in the paper. Regulation, which we treat as a subset of preferences, also reshapes the investable universe.

Thus, the modified framework for incorporating ESG consists of the following:

– Return
– Risk
– Time
– Preferences

Little work has been done on the integration of asset allocation and ESG. Our contribution, informed by a review of the available literature and original empirical analysis, will hopefully help our clients clarify if and when a trade-off exists in including sustainability into their asset allocation. We aim to establish a framework that is sufficiently general in design that allows the inclusion of most key issues while also being parsimonious.

1 The UN Sustainable Development Goals (SDGs) consist of 17 sustainable development goals that are part of its 2030 Agenda for Sustainable Development. https://sdgs.un.org/goals

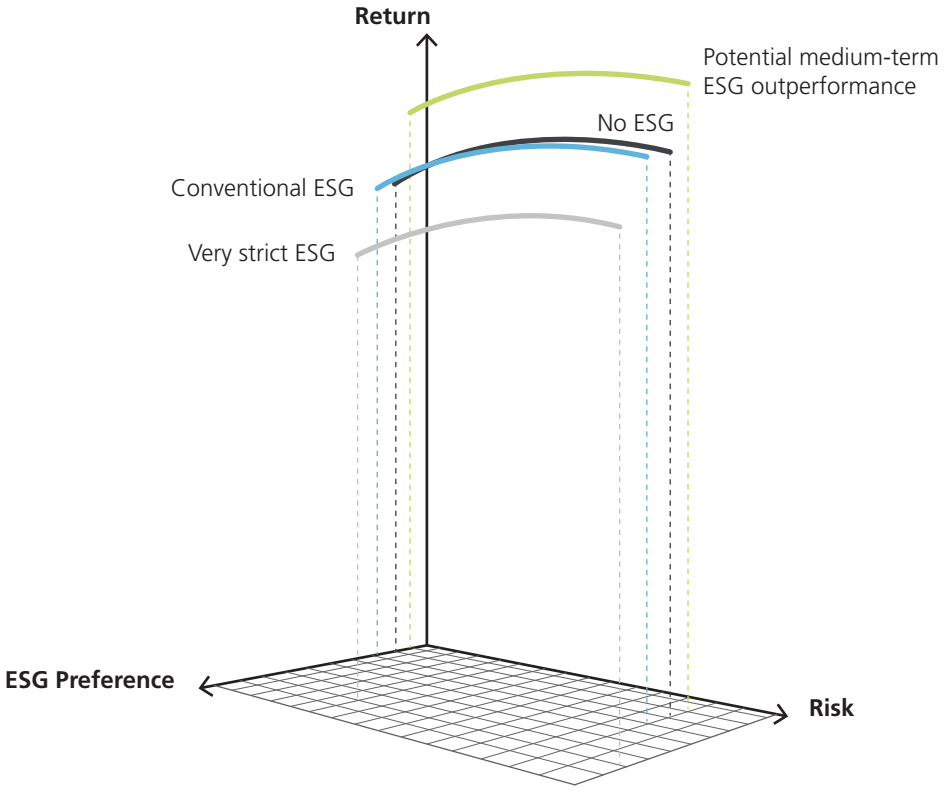
The four dimensions of asset allocation with ESG

The use of ESG scores to redefine the investment universe results in a four-dimensional problem with return, risk, time and ESG score as variables, rather than the classic two-dimensional risk/return frontier.

When optimizing an asset allocation, one can take ESG scores from a vendor to each asset class and then optimize across return, risk, time and ESG score. The weight in the optimization given to ESG proxies for the preference: if an investor is not interested in ESG, the weight will be zero and the optimization will be the traditional mean-variance; if the investor has great interest in ESG, the weight parameter in the objective function will be large and skew the allocation towards highly rated assets. Time relates to the focus the investor places on earning alpha from the ESG Transition period.

The use of ESG scores to redefine the investment universe results in a four-dimensional problem with return, risk, time and ESG score as variables, rather than the classic two-dimensional risk/return frontier.

Relatively light constraints (blue line) under this approach leave this new frontier close to the unconstrained efficient frontier (dark grey). Very strict ESG constraints (light grey) will reduce the investable universe, leading to less efficient portfolios and a lower efficient frontier. It is however possible that a conventional ESG investor, over the next few years, may enjoy early-adopter gains from owning assets that everyone wants, leading to a higher (green) efficient frontier for a limited time.



Source: UBS Asset Management

SECTION I

What is ESG?

ESG means Environment, Social responsibility and Governance. SRI means Socially Responsible Investing. The two terms are used synonymously by many investors, and indicate an approach to investing that, while still aiming to maximize risk-adjusted returns, also introduces considerations of the social impact that the investments will have. In this paper, we will use Sustainable Investing to encompass all facets of these material non-financial factors, namely, Environment, Social Responsibility and Governance:

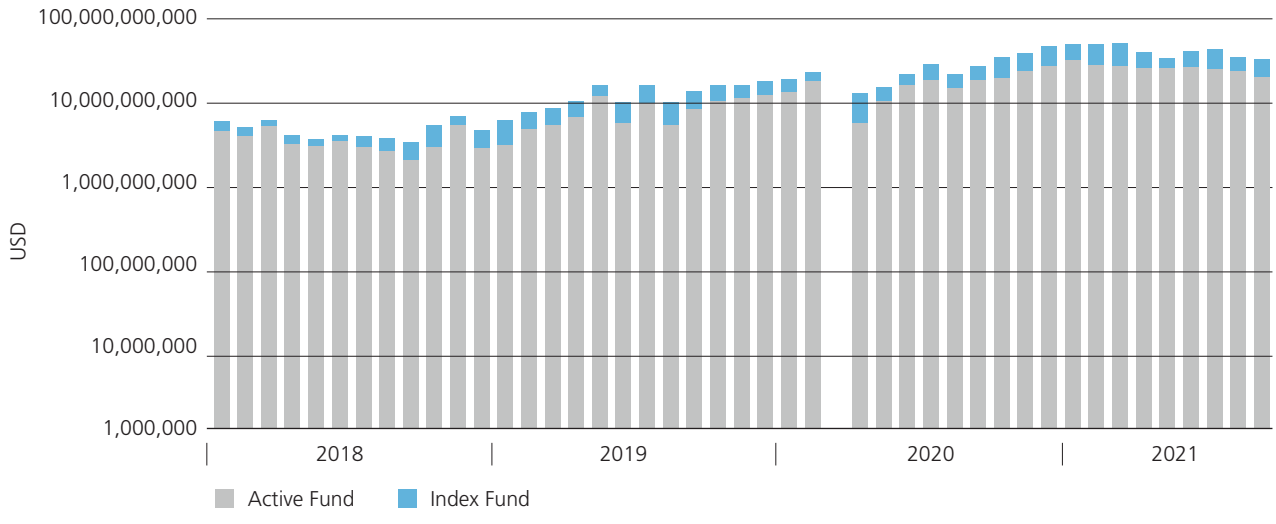
- Environment primarily focuses on global warming and the use of sustainable practices such as renewable energy and limiting pollution.
- Social responsibility aims to measure whether corporate actions emphasize diversity in the workforce, human rights such as child labor and work conditions through the production chain, particularly in case of outsourcing and subcontracting.
- Governance generally focuses on the structure of the company and compensation levels (e.g., separation of CEO and Chairman, independence of Board, existence of shares with different voting rights, comparison of management compensation vs. worker compensation).

Interest in ESG is growing among investors

Recent practitioner research in the financial planning world shows that there is a substantial interest in ESG among financial advisors, in part because younger clients are often more sensitive to issues of environmental and social justice. Sustainable investing may even be a key to retaining the assets of baby boomers as they are gradually transferred, via inheritance, to the younger generation.[2]

Overall, global sustainable equity fund flows accelerated in 2019 after years of steady growth, indicating growing interest and acceptance. These inflows have stayed intact in 2020 despite COVID-19 uncertainties. To date, the majority of ESG assets under management have been found in Europe. It's worth noting, however, the increasing momentum in global flows which reached USD 40 billion in 2020 (a new record) despite the broader market risk aversion and outflows.

Exhibit 1: Global Net New Money in ESG Mutual Funds, USD



Source: ISS Market Intelligence Simfund; UBS Asset Management. Data as of September 2021.

2 Tucker and Jones (2020)

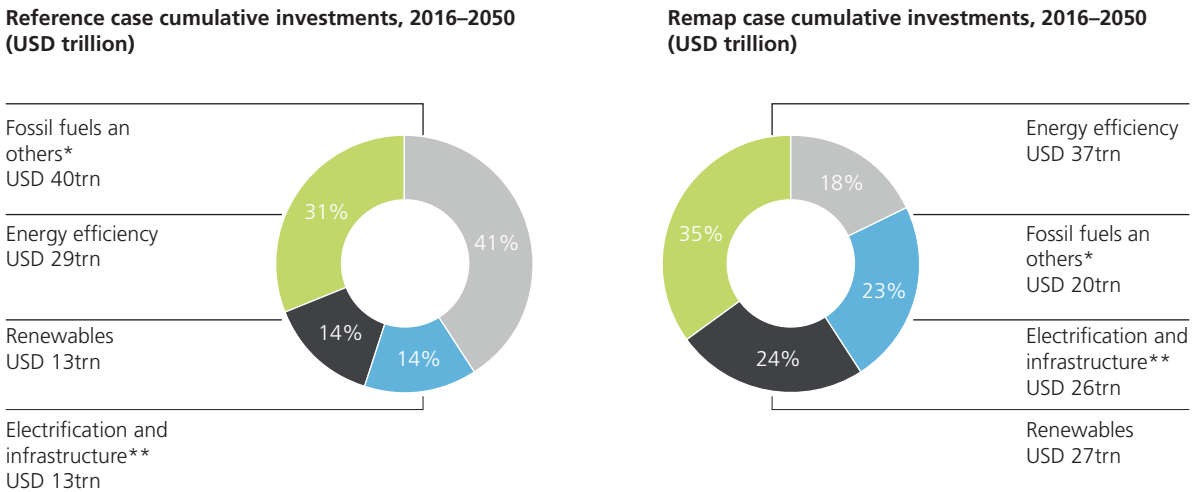
Global momentum towards sustainability brings ESG to the forefront

A global trend to de-carbonize our economies and create a more sustainable global emissions footprint is currently underway. Momentum is increasing as countries and companies pledge to decarbonize to meet consumer and government concern over rising global temperatures and to reduce emissions in alignment with the Paris Agreement. Meeting these pledges and emission targets will require trillions of dollars in capital expenditure, to be invested globally across a range of industries and technologies.[3]

But sustainability is not only about the environment: the Associated Press investigated shrimp producers in Asia who were using captive workers while other press articles covered producers of expensive skiing jackets in Europe, whose suppliers of goose down were treating geese very harshly. No firm wants to be the subject of these press reports, as beyond the reputational damage there are crucial moral and legal issues. Thanks to ESG, sourcing and supply chains are treated much more attentively and a transition to higher traceability of inputs is happening in agriculture and manufacturing.

At the same time, regulators in some countries have pushed companies to disclose information about how they are addressing sustainability risks. New EU regulations will require financial services firms to report on how sustainability risks are included in their processes, giving investors more knowledge to express their preference for sustainable investments. A new EU-wide classification system (the Taxonomy) aims to provide businesses and investors with a common language to identify economic activities which are considered environmentally sustainable in order to inform investment decisions.

Exhibit 2: The transition to a low-carbon economy will create investment opportunities for sustainable investors



Source: IRENA (2019) Global Energ Transformation, A Roadmap to 2050 (2019 edition), International Renewable Energy Agency, Abu Dhabi.

* Includes nuclear, carbon capture and storage (CCS)

** Includes investments in power grids, energy flexibility, electrification of heat and transport applications as well as renewable hydrogen. "Energy efficiency" includes efficiency measure deployed in end-use sectors (industry, buildings and transport) and investments needed for buildings renovations and structural changes (excluding modal shift in transport). Renewables include investments needed for deployment of reneable technologies and power generation as well as direct end-use applications (e.g. solar thermal, geothermal) USD throughout the report indicates the value in 2015.

3 UBS Asset Management (2020), https://www.ubs.com/global/en/asset-management/insights/sustainable-and-impact-investing/2020/investing-in-an-esg-world.html

The United Nations' Principles for Responsible Investment (PRI), a voluntary set of investment principles for incorporating ESG issues into investment practice, has been signed by over 3,000 large investors including UBS. The PRI offers six principles for responsible investment, including a commitment to incorporate ESG and promote corporate sustainability disclosures. Some investors focus on investing companies that help to solve the challenges facing the globe, as defined by the UN's 17 Sustainable Development Goals (SDGs).

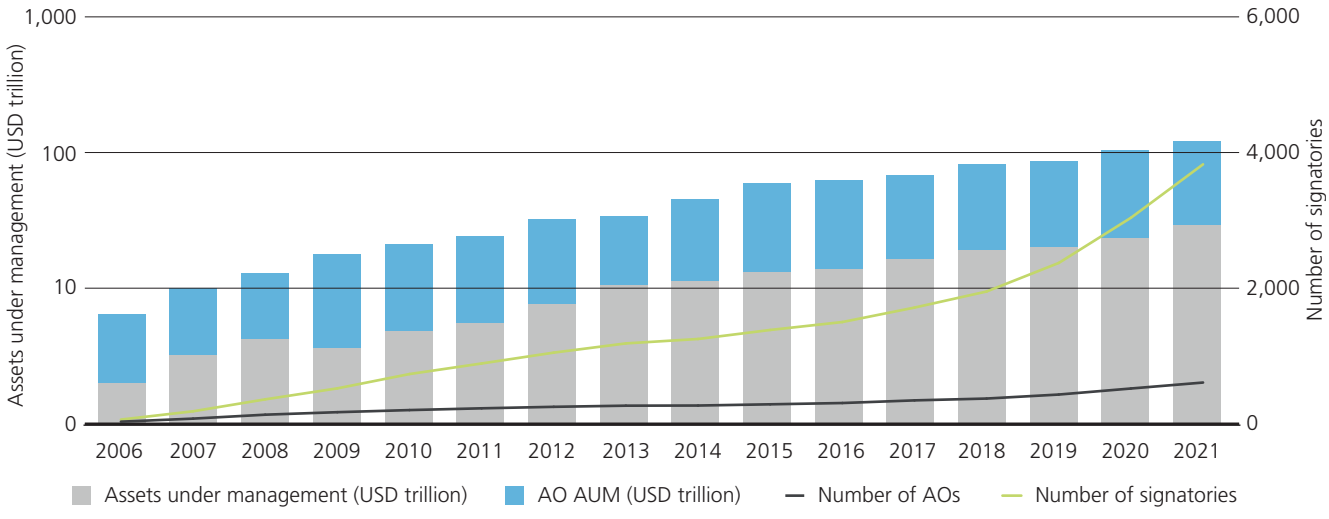
Altogether, the importance of ESG in investing is likely to keep growing at an increasing pace.

The ESG transition period and long-term equilibrium

What might happen if all or most companies around the world invested to achieve higher ESG compliance? Will this affect long-term economic growth and market returns? It is difficult to speculate in terms of a general equilibrium, where all variables affect one another, but there are several ways in which the ESG transition period could prove to have transformative impacts on financial markets and economic activity that we intend to monitor over time.

We could expect that some environmentally friendly technologies would become cheaper if there were more demand for them (this is what we have seen for computers, which have evolved according to Moore's Law). For example, a sudden and steady demand increase for solar panels would increase their cost in the very short run due to shortages, but may lead to investments and economies of scale that would make them cheaper pretty quickly.

Exhibit 3: Principles for Responsible Investment signatory growth



Total Assets under management (AUM) include reported AUM and AUM of new signatories provided in sign-up sheet that signed up by end of March of that year. Source: https://unpri.org. Data as of 31 March 2021.

The January 16, 2021 issue of *The Economist* posited that if green energy were less expensive than fossil fuels, then productivity growth might follow. More demand for carbon-free technology would reduce its cost and therefore accelerate the move away from the current reliance on oil and coal. Cheaper sustainable electricity could make water desalinization more affordable and provide clean drinking and farming water to many people in developing countries, thus increasing food supply. More water and food supply in emerging countries, expected to suffer from climate change, might prevent population displacement and refugees.

The scale of the capital expenditures required by the transition to higher ESG compliance and to achieve national and supranational objectives may also have ramifications for fixed income markets and equity markets. A green economy is poised to be more capital intensive than a tech-heavy economy, which could put upward pressure on the demand for capital and interest rates perhaps into the long term.

Transition window

The transition period between the current stage, where many investors and firms are interested in ESG, and the equilibrium stage, the time at which we expect investors will have fully discounted the impact of ESG, is substantially longer than the tactical asset allocation horizon (normally considered to be less than two years). We believe it will be shorter than the long-term time frame for strategic asset allocation of maybe 30 years. The most common target among developed economies for a shift to 'net zero' carbon emissions is 2050, with intermediate goals for 2030 (see Exhibit 4). Since markets are forward looking, we would expect the transition period in market performance to last a maximum of 10–15 years.

As the transition period will be governed by the speed at which the asset management industry aligns its holdings with ESG principles, this phase could be considerably shorter than 15 years, especially with regards to the relative performance of ESG and non-ESG passive indexes. We believe that early adopters are already seeing gains from being on the leading edge of this transition.

Exhibit 4: Sample country and corporate carbon transition goals

Sweden	Net zero emissions by 2045 (in law)
UK, France, Denmark, New Zealand, Hungary, Canada, European Union	Net zero emissions by 2050 (in law)
UBS, Nestle, Repsol, BP, Ford Motors, FoxConn, Qantas, American Airlines, Woolworths, Thyssenkrupp	Committed to net zero carbon emissions by 2050
China	Carbon neutral by 2060

Source: UBS Asset Management. Data as of 30 June 2021.

The impact of this transition will be very broad and touch many companies across a range of sectors, including agriculture, transportation, utilities, metals and mining and machineries and equipment. This means ESG is poised to assume a larger role driving not just flows, but also changes in corporate operating performance.

The transition from an industrial economy to a green economy will require significant capital investment in technology and infrastructure over the transition time horizon and possibly into the long term equilibrium period, which could put upward pressure on the demand for capital and interest rates.

What about social responsibility? We can expect productivity to increase if diversity and inclusion are embraced by firms more strongly. Moreover, if workers are treated better and paid reasonably, as Henry Ford argued over a century ago, besides the obvious human aspect they become consumers and increase GDP growth.

Finally, regarding governance, better governance means more transparency and less risk of malfeasance. Therefore, we can expect a positive contribution to GDP growth as well.

Altogether, while we are clearly speculating, higher ESG adoption might lead to higher GDP growth (note that cleaner air and more social justice are not measured by GDP growth).

Evolution, implementation and measurement of ESG

Sustainable investing has gone through several phases. It has long been common, for example among religious institutions, to have exclusion lists for so-calledsin stocks such as tobacco and gambling. Therefore, investing with a focus on material non-financial factors relied on removing entire industries from the investable universe due to business that is not consistent with the beliefs of the group.

Excluding entire industries is likely to reduce diversification; a less-diversified portfolio is likely to be riskier and, in a risk-return analysis, inefficient overall. Moreover, sin stocks may be cash cows. For example, the 2006 paper by Siegel and Schwartz shows that oil and tobacco companies outperformed the S&P 500 materially in the almost fifty years from 1957 to 2003.

The idea that companies should engage in socially responsible business practices and the concept of incorporating stakeholder interests in how they are run, emerged in the 1950s, with Bowen (1953). Another early example of prioritizing material non-financial factors in the investment process arose from objections to investing in firms involved with the South African apartheid regime.[4] Despite this conceptual lineage, Sustainable Investing and social responsibility are not synonyms. While the latter is often introduced in term of social obligations, embedding ethical or moral concerns, Sustainable Investing is generally discussed in term of risk management, nested within an investment framework. Gradually, ESG has become paramount in sustainable investing.

A recent survey found that most investors think of Sustainable Investing primarily as investing with an emphasis on the environment.[5]

4 Schanzenbach and Sitkoff (2020)
5 Hartzmark and Sussman (2018)

Pricing externalities and impact on long term returns

The growing attention to climate science has brought global warming to the forefront for many. Interestingly, Bolton and Kacperczyk (2019) find that companies producing more carbon emissions tend to have higher cost of capital, after controlling for a set of factors, than greener companies.

If a free market is the most efficient way to allocate resources, then Milton Friedman's (1970) view applies: a firm's social responsibility is to obey the law and maximize shareholder value. ESG instead suggests that the firm's responsibility is broader due to risk management issues and externalities. In a University of Chicago book collecting essays on this topic, titled "*Milton Friedman 50 Years Later*," Luigi Zingales (2020) writes that Friedman's view is more useful to point out the strict conditions under which it is true, rather than the consequences of when it is true. Friedman's dictum on firms only having to maximize profits is true in a textbook situation with perfect competition, no externalities or other violations to the basic microeconomic framework—which is not what we see in real life.

In a recent research paper (*The value of a green transition*, Bertocci and Gustafsson (2021), our colleagues from UBS Asset Management's Quantitative Evidence & Data Science (QED) team explain the new framework they developed in collaboration with the consultant Material Economics to capture the financial value of green transitions to companies in high-emissions industries, such as cement manufacturing. Their model incorporates not only carbon costs but also an innovative approach to modelling emission abatements in a systematic discounted-cash-flow model. Abatement potentials and costs are modelled as endogenous with sector-specific marginal abatement cost curves. The framework will allow for more evidence-based engagements with companies and provides meaningful investment insights for carbon-intensive sectors.

The findings of the UBS AM QED team study show that if there is no cost of emissions, investing in green technology is a loss-making endeavor. However, as soon as carbon taxes or cap-and-trade schemes are introduced (or proposed), green capital investments by the firm have potentially long-lasting savings. This may justify applying higher risk premia to firms that do not invest in greener technologies, as legal changes may substantially reduce their bottom line for a substantial amount of time. This is consistent with the study mentioned above and others, which found that stocks of firms with higher total CO_2 emissions (and changes in emissions) pay higher yields, controlling for size, book-to-market, and other return predictors—perhaps a sign that investors are demanding compensation for their exposure to carbon emission risk.[6]

6 Bolton and Kacperczyk (2019)

Measuring ESG characteristics

In practice, how do we measure if a company is high or low in sustainability besides the most obvious examples of polluters? And how do we measure social impact and governance quality?

Data providers such as MSCI, S&P and FTSE have started reporting data for a variety of measures of sustainability for listed equities in their global index families. Some data providers focus on specific issues to get the most precise information on each company, such as Trucost (acquired by S&P Global in 2016) regarding carbon footprints. Many data providers want an across-the-board coverage of ESG measures, as shown by the acquisition in 2020 of Sustainalytics by Morningstar, the investment analysis and rating company.

Since data providers grade companies based on voluntarily reported data, a lack of standardized ESG disclosures invites debate among market participants as to what constitutes a superior profile. Incorporating these scores into the investment process leads to more questions:

1. Data providers and other sources will use different criteria to establish their E, S and G grades and the weights to aggregate sub-scores
2. Portfolio managers will use different weights on these criteria to determine their personal 'ESG scores' for each name in their universes
3. Firms may decide to disclose or not disclose information to analysts and data providers, for example regarding their employment practices or carbon footprint

UBS Asset Management has been a pioneer in sustainable investing and has used a multi-dimensional approach to ESG ranking since the mid-2000s, beginning with our Global Sustainable Equity strategy.

Our integration of sustainability is oriented around the ESG Material Issues framework that the UBS AM Sustainable and Impact research team has developed to facilitate the integration process. Because sustainability encompasses many topics, financial analysts and portfolio managers need to focus their attention on a limited set of factors that have the potential to impact the company's financial performance. The ESG Material Issues framework identifies the 3 to 5 most financially relevant factors per sector that can impact the investment thesis across 32 different business sectors. This orientation toward financial materiality ensures that analysts focus on sustainability factors that can impact the bottom line and therefore investment returns.

Engagement and governance

An important characteristic of ESG, which is related to the data issue above, is engagement. Specifically, some ESG investors engage with firms to increase the data disclosure and to encourage the firm to follow more sustainable practices. The United Nations' Principles for Responsible Investment (PRI) promotes collaboration among investors (including investment management companies such as UBS Asset Management, which became a signatory of the Principles in 2009) to understand the implications of sustainable investing and to support incorporating sustainability factors into investment practice.

PRI signatories have two main areas of activity, namely, considering ESG issues when building a portfolio (e.g., screening companies for their sustainable practices) and engagement, that is, improving investees' ESG performance through discussions and proxy voting. Reputation may be a factor: Albuquerque, Koskinen, and Zhang (2019) suggest that firms with differentiated ('brand') products may have a higher incentive to engage in ESG activity.

Interestingly, Dimson, Karakas and Li (2015) show that stock prices outperform for companies that have recently had a successful ESG engagement of the kind promoted by PRI signatories. Instead, unsuccessful engagements tend to lead to stock underperformance. In a successive paper[7] the same authors study over 2,000 engagements that took place within the Collaboration Platform of the United Nations' PRI. The study confirms that successful engagements lead to higher stock prices (but finds that unsuccessful engagements have no effect on stock prices). Moreover, the authors dig deeper to see which types of company are targeted for these engagements.

The engagement approach is quite different from traditional investor behavior where activist hedge funds are among the few starting proxy-vote battles. Instead, sustainable investors play a larger role in decisions about elections for boards of directors, shareholder initiatives, and engagement with management, for the purpose of improving practices and disclosures of investee firms.

Board of director quality is not a novel measure of corporate value. Many classic investment books, starting from Berle and Means (1932) and Graham and Dodd (1933), see management incentives as a key part of security analysis. While initially this focused on the character of board members, it recently has started including more quantitative measures.

Are all markets equal in ESG rating?

The world as a whole is not moving towards sustainability at a homogeneous pace (see table). For example, the European Union has issued directives on disclosure and ESG investing, while other important regions have not.

This is likely to generate some asymmetry that, under the early adopter mechanism outlined above, might create extra alpha opportunities for investors in European assets as the world catches up with their regulatory regime. At the same time, markets with better disclosure become more efficient and may give active managers fewer opportunities to pick hidden gems.

Exhibit 5: Representative scores

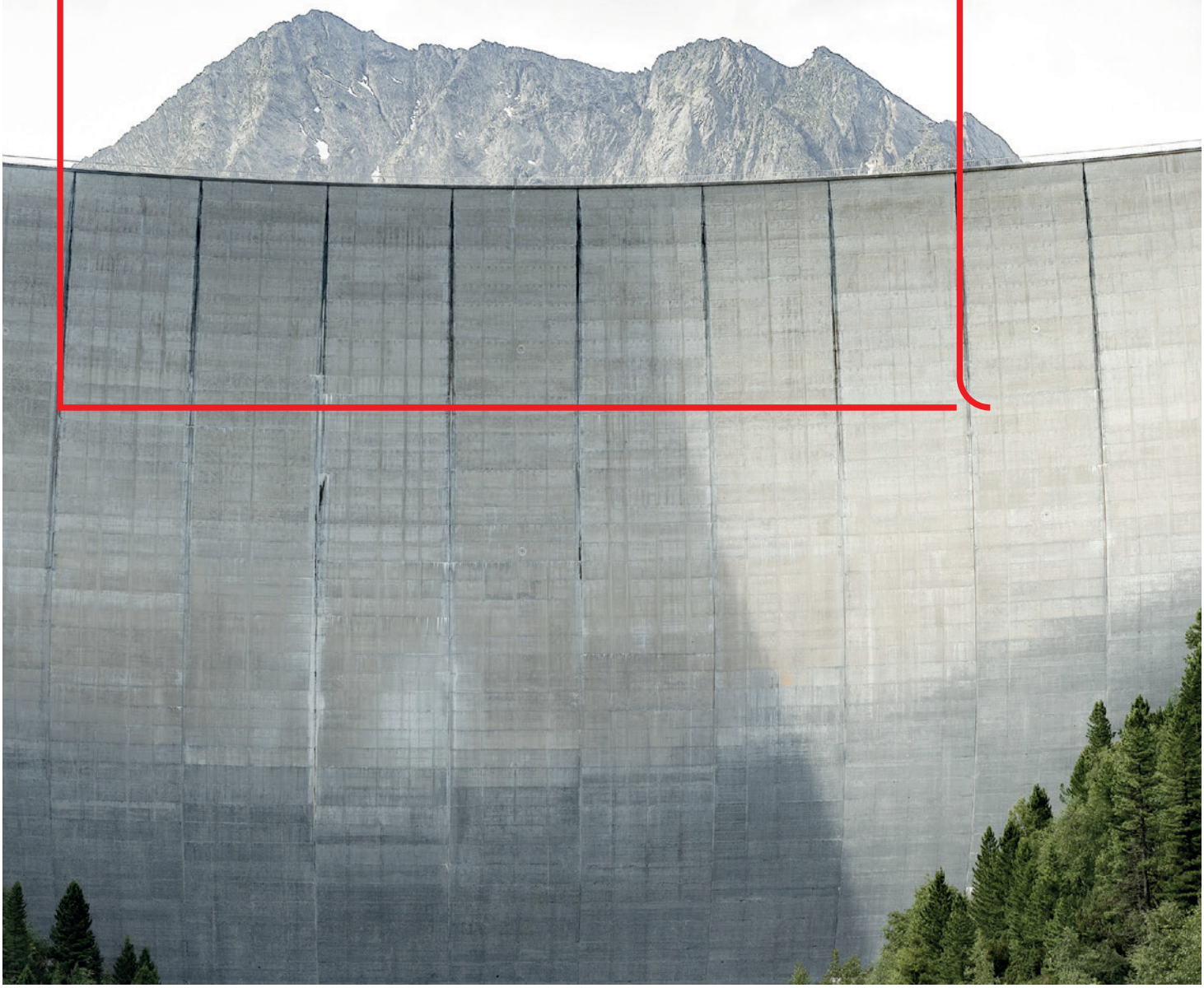
Asset class	MSCI Total ESG score
US Large Cap Equity	5.4
Dev Mkts ex US	7.5
Emerging Market Equity	5.0
Global Small Cap	5.0
European Equities	7.8
Global Aggregate	5.9
Global High Yield	4.2
Green Bonds	8.2
EMD Hard Currency	3.6
Cash	6.0
Swiss Equities	8.6
US Small Cap	4.1
China Equities	3.3

Source: MSCI, as of June 2021. For illustration only

7 Dimson, Karakas and Li (2020).

SECTION II

Risk and returns in ESG asset allocation – an academic review



In this section we will look at academic results on risk and return of ESG strategies. A key purpose of this paper is to ask whether investors using ESG strategies need to fine-tune traditional capital market expectations to build and test their asset allocations.

We will now discuss the basics of asset allocation, followed by academic studies asking how and why ESG investments may have different risk and returns from traditional ones.

A quick refresher on asset allocation

Investors have different types of investments at their disposal—for example, stocks and bonds. There are subclasses of stocks and bonds, such as European small-cap stocks, US long-term government bonds, or global REITs. Asset allocation consists of selecting the weight assigned to each investment sub-class.

This matters because different asset classes have had different levels of risk (measured for example by standard deviation or worst 12 consecutive months in returns) over the decades and are not perfectly correlated, so they can provide diversification benefits. Analysis of long-term data (e.g., Professor Roger Ibbotson's data set of US market data from 1926 to today) shows that riskier assets tend to have higher returns than more conservative assets over very long periods of time.

The growth of ESG investing adds an additional layer to the asset allocation question. For each type of asset, investors must choose whether, when, and how to incorporate ESG considerations into their portfolios.

Why does asset allocation matter?

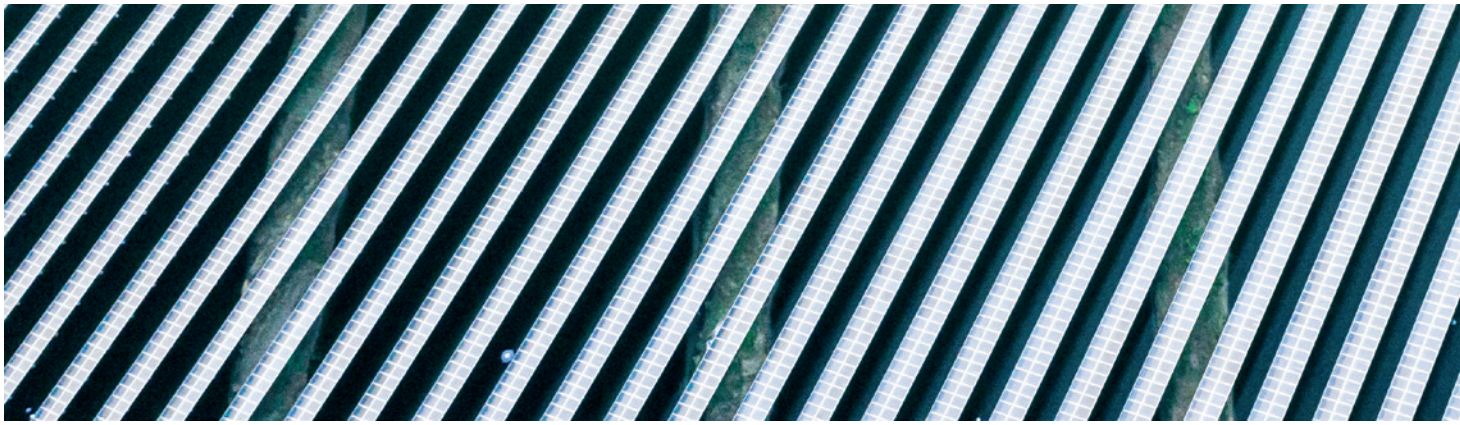
A pioneering study by Brinson, Hood and Beebower (1986) suggested that over 90% of the return variability for a sample of highly diversified US pension plans was explained by their strategic asset allocation. This study brought the importance of asset allocation to the attention of many investors who used to think about strategic allocation as something that one only needed to 'set and forget.' More recent studies based on a broader range of different portfolios, including concentrated ones, suggest that although asset allocation plans a key role in return variability, security selection is on average as important.[8]

Approaches to selecting asset allocation have evolved over time. Old-school approaches tended to focus more on personal tolerances for risk. Another traditional approach is average-based: if an investor does not have enough money set aside to have a good chance to meet their goals, the average approach suggests allocating to riskier assets, because on average such assets have higher returns.

A more contemporary approach is outcome-based: using tools like simulations and back-tests to determine the allocation that has the highest probability to meet or exceed the investor's goals. The objective is to use statistics to measure *risk capacity*, that is, the possibility of withstanding market volatility while still meeting the stated goals.

This last approach is the most logical and requires well-constructed capital market expectations, that is, projections of risk, correlation and returns for all asset classes in which the investor is allowed and willing to invest.

8 Xiong, Ibbotson, Idzorek, and Chen (2010)



Sustainability and asset allocation

UBS sees four ways to include sustainability when investing:

Exclusion
The more traditional way, in which undesirable companies or industries are simply avoided (negative screening).

ESG integration strategies
Sustainability is included in the research process as one of the inputs in order to improve the outlook for risk and return.

Sustainability focused strategies
The portfolio construction process leads to a better sustainability profile than the benchmark (positive screening).

Impact investing
The explicit goal is to have a positive ESG impact while generating competitive financial returns.

There is academic research that maps to these four methods of implementing ESG and sheds some light on them.

Many studies analyze simple exclusion strategies, while we would like to have more analysis about portfolios with positive screening, as this is the current trend in ESG. At the same time, sustainability focus has not been around for a long time, and therefore there are few data sources that can provide performance for this kind of strategy over several market cycles.

Negative screening or exclusion

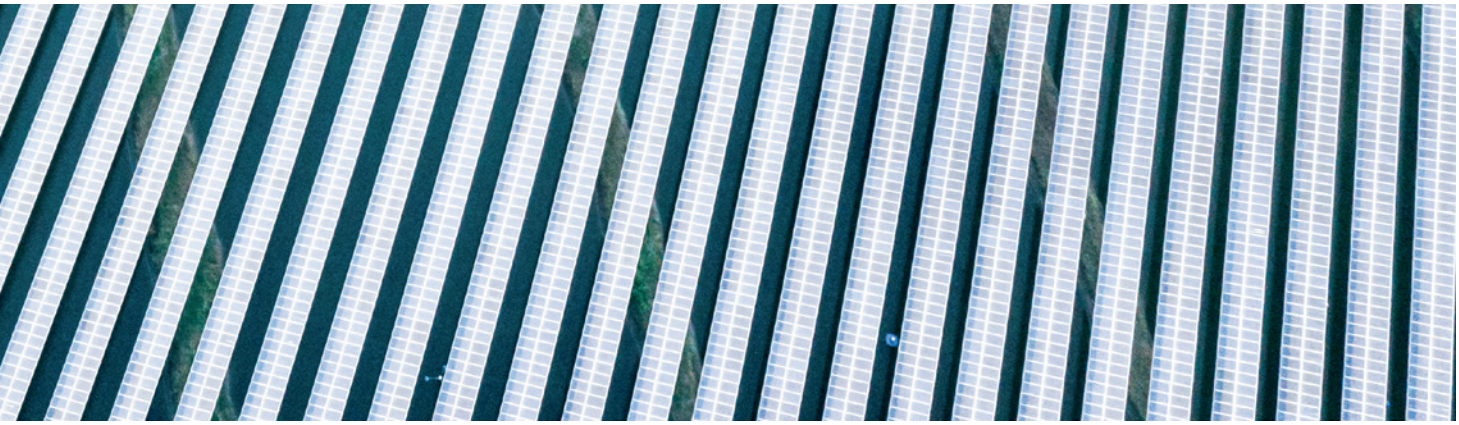
Older studies of ESG investing focus on negative screening. These are often papers written before ESG scores from index providers or other vendors were produced or became popular.

Removing entire segments of the market, as mentioned above, means giving up diversification and possible returns—which violates the tenets of textbook finance, because diversification attenuates the idiosyncratic (and uncompensated) risk of any single investment. However, a 2010 study used a matched sample of 180 US companies and compared the performance of 90 that adopted sustainability policies by 1993 and 90 that did not, showed that the 'high sustainability' stocks outperformed the 'low sustainability' stocks from the 1993 through 2009 test period.[9]

Since the definition of sustainability has evolved over time, it is not surprising that studies provide contrasting results. For example, Renneboog, Ter Horst and Zhang (2008) find that ESG funds lag their traditional counterparts, while Barnett and Salomon (2006) find a non-linear relationship so that initially ESG decreases value if people only use the most basic negative screens but increases if more sophisticated positive ESG screens are added.

Earlier, Hamilton, Jo and Statman (1993) analyzed a sample of socially responsible mutual funds in the US and found that they did not have significantly different risk and return performance from that of traditional funds; a similar result was obtained by Sauer (2002), whose sample included only one ESG mutual fund focused on Catholic values.

9 Eccles, Ioannou and Serafeim (2014)



ESG integration

ESG integration entails an expansion of the scope of information used in the research process to include environmental, social and governance factors, rather than a limitation of the investment universe. It is fundamentally an enhancement of the underlying research process to take better account of material sustainability risks that can negatively impact financial performance.

Integration is driven by a focus on taking better account of material risks and thereby enhancing investment returns, rather than being driven by ethical principles or norms.

This means that Integration is less stringent in terms of ESG criteria than Sustainability Focus.

Sustainability focus

Investments with a sustainability focus seek to choose companies that have a better sustainability profile than a benchmark. Our view is that ESG preferences are a key dimension in asset allocation with sustainability, so the difference between integration and focus is material.

Empirically, a comparison of ESG ratings from three different providers, including the KLD ratings with a notably long sample between 1990 and 2011, leads Halbritter and Dorfleitner (2015) to conclude that there is no significant return difference between portfolios with high and low ESG ratings. However, there are numerous empirical studies with contrasting results.

Numerous theoretical articles such as Pedersen, Fitzgibbons and Pomorski (2019) and Pastor, Stambaugh and Taylor (2020) wonder if an increase of interest in sustainability may lead investors to overbid ESG-friendly assets, thus reducing their long-term potential for returns. Pedersen et al. show that in a model with three types of investors (namely, ESG indifference, mild ESG preference and ESG enthusiasm) an abundance of ESG enthusiasts will lead sin stocks to outperform.

On the opposite side, Pastor *et al.* build a model inspired by the classic Fama and French framework with a market factor and an ESG factor, but with heterogeneous investors who have different levels of preference for ESG investing. Here, ESG assets are likely to outperform due to the Pedersen *et al.* explanation of higher popularity of sustainable investing leading highly-rated assets to higher multiples.

However, Pastor *et al.* show that a preference for sustainability will increase ESG adoption because it will motivate firms to be better sustainability actors and be rewarded by the stock market. Therefore, there will be no permanent reward to the more ESG-enthusiastic investors: they may outperform the market for extended periods of time, just like the growth factor outperformed in recent years and value lagged, while over very long periods of time value has tended to outperform. In this model, however, ESG does not appear to be a factor with a positive risk premium associated, such as small cap or value; instead, ESG has lower returns over the long term according to the assumptions of the model because people (by construction of the model) prefer to hold ESG assets, which are potentially safer, and therefore bid their prices up.

This latter finding by Pastor *et al.* motivates our view that over the short term (time dimension), ESG early adopters may be rewarded by the market.

More recent studies analyze the multi-dimensional approach to ESG that characterizes sustainability focus. The main issue here is the lack of data. For example, Pedersen et al. (2019) do not find firms with low multi-dimensional ESG scores from MSCI to have different expected returns than average. However, within their sample (2007–2019), high-score stocks tended to have higher valuation as they had significantly more presence in institutional portfolios. Therefore, it is possible that ESG-friendly stocks may become too expensive and have lower future returns. We need to point out that a sample of a dozen years is likely to be inconclusive on this matter as one should examine more market cycles, which is impossible as MSCI scores only go back to the mid-2000s.

An empirical study by Dunn, Fitzgibbons and Pomorski (2018) examines listed equities in the MSCI ESG World Index between 2007 and 2015. Stocks are ranked by MSCI ESG scores and analyzed using the BARRA risk system (also by MSCI, Inc.). The authors find that the bottom quintile stocks (for ESG score) have materially higher volatility during the eight years examined. Again, this is a relatively short period of time, but suggests that high ESG scores can be a predictor of lower risk, even after controlling for company characteristics such as market cap, price to book, profit variability and so on. Auer and Schuhmacher (2016), using a short sample of ESG ratings from Sustainalytics (2004–2012), found that companies with high ESG ratings provided superior risk-adjusted performance. Pastor, Stambaugh and Taylor (2021) find outperformance by highly rated stocks between 2012 and 2020 by 0.31% a month, but build a theoretical model to show why this is unlikely to continue forever.

This finding is not uniform in the literature. For example, Bruder, Cheikh, Deixonne and Zheng (2019) find that the governance factor in MSCI ESG scores between 2007 and 2018 (again, an unfortunately short period of time) is highly correlated with the quality factor as far as European listed companies are concerned, which means that ESG may bring along unexpected risk exposures. Consistently, Breedt et al. (2019) study a ten year period (2007–2017), finding that any benefits from incorporating all three MSCI ESG pillars were already captured by other well-defined equity factors. Interestingly, some authors have documented a transatlantic divide in ESG performances (see Drei *et al.* (2019) for an example).

Impact investing

Before 2000, impact investing primarily referred to philanthropic or mission-focused investments, typically in illiquid assets or private equity that sought to achieve a goal but did not necessarily produce competitive returns. This contrasts with sustainable investment strategies, which focus on integrating ESG factors into traditional financial analysis to identify companies with a sustainable competitive advantage that can improve returns over time.

Impact investing includes all sort of assets, from stocks to bonds to alternatives. The objective is to make a difference while not compromising on returns. The launch of the UN's Sustainable Development Goals (SDGs) has also given investors a roadmap for investing capital towards solutions to seemingly intractable problems. Assets in impact investing strategies more than doubled from 2018 to 2019, to USD 502 billion, targeting solutions for challenges including global poverty, water scarcity and climate change[10].

Impact is a very important approach and deserves its own treatment, which is beyond the scope of this paper.

Fixed income

In the academic literature, there is a scarcity of research on bonds and sustainability. We assume that the academic focus has been on the riskiest asset class first, and more research on fixed income securities will follow.

It seems however reasonable to expect that higher governance quality is likely to lead to lower risk of malfeasance, in particular accounting irregularities. This would be good news for bond investors, as more accurate and transparent accounting leads to fewer surprises when lending money to a firm.

For instance, Devalle *et al.* (2017) show how ESG performance had a meaningful impact on credit ratings of Spanish and Italian public companies. The impact of ESG practices on the cost of debt seems to suggest that higher-rated companies pay lower yields, but there is scarcity of empirical studies exploring this conceptual link. A few studies provide evidence that ESG performance negatively correlates with the cost of debt, such as Oikonomou *et al.* (2014) within the corporate bonds market, or Crifo *et al.* (2017) for sovereign issuers. Instead, studies such as Hoepner *et al.* (2016) show either a positive relationship or no conclusive evidence regarding the effects of sustainability characteristics on the cost of corporate loans.

Assuming that bonds are included in a portfolio for their low risk and for the diversification they introduce, we can expect that avoiding bad investments (likely to lead to losses) is a good enough reason for bond investors to adopt a sustainability approach.

Sustainable fixed income ETFs and mutual funds have started appearing. In a few years, once these investment vehicles have longer track records covering multiple market cycles, it will be possible to compute statistics and verify whether our hypothesis is correct.

There are bonds issued for specific ESG issues. G reen bonds are certified by specialized environmental rating agencies according to criteria including 100 percent of loaned money being used for environmental projects, so that bond portfolio managers can be better informed. Many of these bonds are issued by supranational organizations such as the World Bank and development banks, but also by large corporations in some cases.

A paper by Baker, Bergstresser, Serafeim and Wurgler (2018) studies pricing and ownership of 'green bonds' that incorporate non-monetary environmental benefits and find that they are priced at a premium (i.e., they have lower yields). Bonds that are certified as green command higher prices. This of course may be compatible both with investors charging risk premia to polluters, as seen in previous sections, and with investors preferring non-monetary environmental benefits. To complicate the picture, the two issues are not mutually exclusive, and it is difficult to identify which one prevails.

10 According to the Global Impact Investing Network's 2019 market study, the estimated size of the impact investing market reached USD 502 BN, more than double the USD 229 BN reported in 2018.

Discrepancies among data providers

Do methodology differences among ESG data providers matter?
A new paper by Berg, Koelbel and Rigobon (2020) analyzes how six of the main ESG scores differ (including MSCI, Sustainalytics, Asset4 and others) and painstakingly researches how the vendors assign sub-scores. For example, within Environmental scores we have sub-scores for water, carbon use and so on; each vendor has sub-sub-scores within water. Some are broad, e.g., water stress, while others measure whether the firm is helping local populations gain access to clean water.

The authors try to match all these very granular scores and identify three sources of mismatch: first, two firms have the same variable (e.g., carbon emissions) but measure it differently; second, two firms have different variables (e.g., a firm has a general measure for something while the other firm has a series of measures); finally, two firms have different weights to add up the sub-sub-scores to produce, say, the E component of the ESG score.

Note that Berg *et al*. only focus on data providers who use fundamental data (surveys, field visits) to determine ESG scores, because some firms use news analysis with artificial intelligence to assign scores without interacting with the firms.

The article finds that there is material difference among vendors, so that stocks that are great ESG leaders for some may be terrible for other vendors. We speculate that this is a major issue as the quality of the chosen ESG vendor, in the light of the US Department of Labor guidance[11], might cause employers to be sued by employees if the chosen ESG data vendor causes their retirement plans to underperform.

In an interesting twist, Ben Dor, Guan and Zeng (2020) compares rating discrepancies among ESG ratings issued by MSCI, Vigeo Eiris and Sustainalytics between 2009 and 2018. They find that firms with consistently high ratings from all firms tend to outperform, while firms with inconsistent ratings from the three providers tend to underperform the stock market. Billio *et al*. (2020) suggest instead that the discrepancies are so many that there is no effect on financial performance even when ESG ratings from different firms agree.

More research like the papers mentioned in this section is needed and probably increased standardization will be needed too, either by industry self-regulation or by government regulation, to have more certainty on whether a firm deserves a high or low ESG score. This is important for anyone who exercises fiduciary roles, from the mutual fund manager to the trustee of a minor's assets.

Schanzenbach and Sitkoff (2020) review interesting legal issues about ESG investment for retirement plans in the US. However, we also need to consider another legal issue: disclosures. One expects that professional investors prefer to receive lots of information about the firms in which they invest. Gradually, governments are legislating consistent disclosure requirements in the ESG field. Tornero (2020) discusses the evolution of European disclosure standards, which are becoming an EU directive. This may be in concert with international accounting standard organizations. The advantage of a concerted legislative approach would be to simplify requirements for firms (as the same disclosure would apply to many countries) and help ESG data providers harmonize their methodologies.

To summarize the review of the academic literature, two key challenges exist in any historical analysis. First, data providers lack a consistent common framework for categorizing ESG over time. Second, the time frame that most ESG performance analysis has been performed in the academic literature does not span multiple market cycles. Although these two issues lead to challenges in performing out of sample testing across time, we have found the results indicate that historical data shows there has been no trade-off between sustainability and investment performance for conventional ESG benchmarks.

11 The U.S. Department of Labor announced a proposed rule removing barriers to plan fiduciaries' ability to consider climate change and other environmental, social and governance factors when they select investments and exercise shareholder rights. https://www.dol.gov/newsroom/releases/ebsa/ebsa20211013

SECTION III

A fresh look at the data

The main limitation of the academic studies summarized in previous sections was the lack of long series of data. Specifically, ESG scores such as those from MSCI go back only to the mid-2000s, spanning a limited number of market cycles. Thus, this is not sufficient to argue that ESG focus has no material effects on investment performance.

We are therefore showing some simple tests we carried out without using ESG data. The idea is to check whether sin stocks such as those of oil or tobacco producers tend to outperform or underperform the market, and whether negative screening (which is an exaggeration of ESG positive screening,) causes substantial tracking error. We will adjust for some factor exposures, such as large cap and value, which could be biasing the results.

For this exercise, we use the data for a global index produced by Refinitiv DataStream from 1973 to 2020, which is a proxy for the MSCI World Index but has the advantage of having longer series for sectors and industries, so that we could carve out sin stocks. We then repeat the exercise using the S&P 500 Index for the same period.

Descriptive statistics

The basic descriptive statistics for the world aggregates (total returns in USD unhedged) using quarterly observations from January 1973 through December 2020 are the following:

Exhibit 6: Sin stock performance compared to the broad market, 1973-2020

Whole Sample	Refinitiv World Index	Oil, Gas & Coal	Tobacco
Arithmetic Mean	11.5%	12.1%	17.3%
Geometric Mean	9.9%	9.9%	14.9%
Standard Deviation	19.1%	21.6%	24.0%
Skewness	-0.36	-1.02	-0.09
Kurtosis	1.09	2.65	0.56
Min	-24.3%	-43.8%	-30.0%
Quartile 1	-0.7%	-1.8%	-2.7%
Median	3.5%	3.7%	4.1%
Quartile 3	7.4%	9.3%	10.8%
Max	26.0%	26.1%	31.1%
Observations Count	192	192	192
Sharpe Ratio	0.36	0.35	0.53
Serial Correlation	4%	-2%	-9%

Source: Refinitiv; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Let us start with a couple of simple observations. First, the two industries, namely, Oil & Gas and Tobacco, appear to have higher volatility than the aggregate. This is reasonable in the sense that these are less diversified indexes, even if oil products are highly cyclical while tobacco, at least to regular smokers, is a necessity and one might think that it is a more defensive stock with less volatility.

Skewness (representing the asymmetry of the distribution and therefore the size of the left tail compared to the right tail) shows that indeed while tobacco is more volatile, its skewness is close to zero (meaning that the left tail of catastrophic losses and the right tail of exceptional gains have about the same weight). Instead, the energy aggregate shows a sharply negative skewness, showing that the left tail of the distribution is much heavier than the right one; therefore, the index shows a predisposition to large losses with a certain frequency, not unlike an insurance company that collects premia every day but must pay a big amount of claims whenever a natural disaster (or a big fall in oil prices) occurs. Second, while the industries have a higher return in the sample, they also have materially higher variance, and therefore on a risk-adjusted basis they are not clear winners.

Therefore, comparing these results to the Shiller and Schwartz (2006) results mentioned above, we do not find that excluding Oil & Gas and Tobacco, which might be excluded in a basic screening approach to sustainability, are necessarily going to decisively influence the returns to a portfolio one way or another over long periods of time---even if Tobacco in this sample had a great Sharpe ratio.

In the short run, however, divergences may be significant, as shown below for the period where two major oil crises made energy prices shoot through the roof:

Exhibit 7: Sin stock performance compared to the broad market, 1973-1980

1973–1980	Refinitiv World Index	Oil, Gas & Coal	Tobacco
Arithmetic Mean	9.3%	19.7%	10.7%
Geometric Mean	7.5%	17.9%	8.4%
Standard Deviation	19.6%	21.4%	22.8%
Skewness	-0.28	-0.36	-0.47
Kurtosis	2.23	0.05	2.08
Min	-24.3%	-18.4%	-30.0%
Quartile 1	-2.0%	-1.8%	-3.9%
Median	1.9%	4.2%	2.3%
Quartile 3	7.9%	13.2%	8.0%
Max	25.9%	22.8%	23.8%
Observations Count	32	32	32
Sharpe Ratio	0.09	0.57	0.14

Source: Refinitiv, UBS Asset Management. Data as of 31 December 1980.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

In the eight years covered by this table, standard deviation was about the same for the three composites, but the return to the energy carve-out was over twice that to the aggregate index. Altogether, this is not conclusive evidence, but suggests that a mechanical screen that simply excludes entire industries may hinder performance over the medium term (5–10 years) while it does not over very long periods of time like the about 45 years we consider.

In some other periods of course the result can be the opposite, as in this case from January 2011 through end of 2020:

Exhibit 8: Sin stock performance compared to the broad stock market, 2011-2020

Whole Sample	Refinitiv World Index	Oil, Gas & Coal	Tobacco
Arithmetic Mean	10.1%	1.6%	8.3%
Geometric Mean	8.8%	-1.7%	6.8%
Standard Deviation	16.9%	24.7%	18.1%
Skewness	-1.04	-1.46	-0.47
Kurtosis	2.54	3.46	0.45
Min	-22.3%	-43.8%	-19.4%
Quartile 1	-0.4%	-4.8%	-1.1%
Median	3.6%	1.3%	2.3%
Quartile 3	6.5%	8.5%	7.8%
Max	19.1%	21.6%	20.5%
Observations Count	40	40	40
Sharpe Ratio	0.56	0.04	0.42

Source: Refinitiv; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Let us now repeat the exercise using the S&P 500 index for the same period of 1973 through 2020. Given that all securities in the index are US stocks, there are no risks of confusion due to currency fluctuation, so we expect that the following analysis be more precise, albeit only focusing on one market (which is the largest market in the MSCI World Index, however).

In addition, we also have returns for two representative stocks: Exxon Mobil for Oil & Gas and Altria (formerly Philip Morris) for Tobacco. The function of these representative stocks is to proxy for the respective industries when the industry indexes are not available from S&P. Accounting for mergers and splits is done by DataStream (Refinitiv); we do not notice any jumps in the series.

This table shows that Philip Morris / Altria indeed has had a great run also from 1973 to today but did not exceed the S&P 500. However, we note the significantly higher standard deviation of the tobacco stock.

We also computed statistics by decade, which we do not report here for reasons of space. Looking at the statistics for the shorter time periods, we see that Altria is generally at the highest end of standard deviation. This is in line with what we found with the DataStream world composite for Tobacco.

Comparing to the world aggregate, clearly Altria's average returns stand out. Our question here is whether Altria has had exceptional returns because it is a sin stock or because it was successful at its business. Given that the rest of the world tobacco companies (see previous tables) had results more in line with the market, we lean more towards the uniqueness of this company and would not extend the conclusion to all sin stocks.

In summary, we find some evidence that limited exclusion should not generate meaningful impact in performance in the long run, but that it can generate large impacts in shorter time periods. More substantial exclusion is however expected to affect risk negatively, as one can see by looking at our statistics for individual industries above (where we exclude, for example, everything but tobacco).

Exhibit 9: S&P 500 Index performance compared to Exxon Mobil and Altria, 1973-2020

Whole Sample	S&P 500	Exxon Mobil	Altria
Arithmetic Mean	15.1%	1.5%	13.2%
Geometric Mean	13.9%	-2.0%	10.9%
Standard Deviation	16.7%	25.9%	22.5%
Skewness	-0.98	-0.94	-0.58
Kurtosis	2.40	3.15	-0.09
Min	-19.6%	-44.8%	-20.5%
Quartile 1	1.0%	-6.0%	-1.9%
Median	4.1%	-0.3%	5.3%
Quartile 3	7.5%	7.1%	10.8%
Max	20.5%	22.9%	24.1%
Observations Count	40	40	40
Sharpe Ratio	0.87	0.04	0.56

Source: Refinitiv; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Approximating a carve-out

One of the advantages of using the DataStream aggregates is that a lot of variables, in addition to returns, are available all the way back to 1973. Therefore, we used the index capitalizations and created a synthetic carve-out as follows:

$$Return_{carveout,t} = \frac{(Return_{index,t} - w_{tobacco,t} - w_{oil,t} \cdot Return_{oil,t})}{(1 - w_{tobacco,t} - w_{oil,t})}$$

In plain English, we computed the quarterly weight in the total index of the tobacco and oil components and subtracted the weighted returns, then rescaled the index return to represent the fact that an investor who writes off tobacco and energy would invest more in the remaining industries.

The whole-sample results again suggest that the differences between the initial index and carve-out may well be within the confidence intervals of the estimated statistics:

Exhibit 10: Broad stock market performance vs. simple sin stock exclusion, 1973-1980

Whole Sample	World	Simple Exclusion
Arithmetic Mean	11.5%	11.2%
Geometric Mean	9.9%	9.5%
Standard Deviation	19.1%	19.4%
Skewness	-0.36	-0.29
Kurtosis	1.09	1.07
Min	-24.3%	-25.0%
Quartile 1	-0.7%	-1.0%
Median	3.5%	3.5%
Quartile 3	7.4%	7.3%
Max	26.0%	27.1%
Observations Count	192	192
Sharpe Ratio	0.36	0.34

Source: Refinitiv; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

We repeat the example for the S&P 500; however, we only have market values of the industry indexes for a limited period. Looking at the returns from January 2011 through December 2020, we see that the returns are quite similar even if the carved-out industries have materially different returns:

Exhibit 11: Comparing simple exclusion to sin industry performance, 2011-2020

2011–2020	S&P 500 TR	Simple Exclusion	S&P 500 Oil, Gas & Consu. Fuels	S&P 500 Tobacco
Arithmetic Mean	15.1%	15.7%	2.9%	12.3%
Geometric Mean	13.9%	14.5%	-1.5%	10.4%
Standard Deviation	16.7%	16.5%	28.9%	20.8%
Skewness	-0.98	-0.96	-0.95	-0.04
Kurtosis	2.40	2.34	3.16	0.23
Min	-19.6%	-18.9%	-48.7%	-16.8%
Quartile 1	1.0%	1.1%	-5.6%	-2.0%
Median	4.1%	4.3%	1.0%	3.7%
Quartile 3	7.5%	7.9%	9.4%	9.3%
Max	20.5%	20.5%	29.6%	26.5%
Observations Count	40	40	40	40
Sharpe Ratio	0.87	0.91	0.08	0.56

Source: Refinitiv; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

It is interesting to note that the small outperformance of the exclusion index appears to be explained mostly by the weak returns to the energy segment, which suffered during this period of declining oil prices.

Dedicated sustainable indexes

Finally, one might ask what the empirical difference is between traditional and ESG indexes from the same provider. In the academic literature, Mansi, Sharma, and Srivastava (2019) find that the traditional and ESG versions of the same index are virtually equivalent for the main vendors such as MSCI. This is because index vendors use weightings of ESG scores and of stocks in a factor-neutral basis, so that for example both the traditional and the ESG index have the same percentage of stocks in healthcare, they have about the same P/E, and so on.

What the index providers do is to produce indexes with higher exposure to high ESG names, but without including systematic biases. For example, it makes sense that larger companies may have more resources to fill out the questionnaires to communicate their ESG efforts, but this does not mean that sustainability requires overweighting large-caps; another example is the governance dimension: if we overweight firms with high governance ratings, we will probably overweight the Quality factor (firms with stable earnings and good governance). So, from this point of view, index providers are being accurate and the results in terms of index performance suggest that there is precious little empirical difference between conventional ESG and traditional indices once we correct for sector and factor exposures.

In the following table, we compare the traditional MSCI World Gross Index with its ESG companion as well as the Standard & Poor's 500 Index against its ESG version. We regret not being able to perform a longer comparison due to lack of data.

Exhibit 12: Comparing performance of some traditional and ESG indexes, 2011-2020

2011–2020	MSCI World	MSCI World ESG Focus	MSCI World ESG Leaders	S&P 500	S&P 500 ESG
Arithmetic Mean	11.8%	12.0%	11.5%	15.1%	15.3%
Geometric Mean	10.5%	10.7%	10.4%	13.9%	14.1%
Standard Deviation	16.7%	16.8%	15.8%	16.7%	16.4%
Skewness	-1.09	-1.05	-1.04	-0.98	-0.87
Kurtosis	2.53	2.32	2.39	2.40	2.26
Min	-20.9%	-20.2%	-19.6%	-19.6%	-18.6%
Quartile 1	0.7%	0.7%	0.9%	1.0%	1.1%
Median	4.2%	4.4%	4.0%	4.1%	4.3%
Quartile 3	7.5%	7.1%	7.0%	7.5%	7.7%
Max	19.5%	19.7%	18.9%	20.5%	21.2%
Observations Count	40	40	40	40	40
Sharpe Ratio	0.67	0.68	0.69	0.87	0.89

Source: S&P; MSCI; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

For the 40 quarters in the sample, US assets outpaced the rest of the world. All four of these indexes had similar behavior, though. Since the US market is about half the market value of the index of developed markets, this is not too surprising. Moreover, comparing the ESG version of an index to its traditional version, we notice limited differences as well.

The MSCI World ESG Focus has an R-square of 99.3% against the traditional MSCI World Index, while the S&P 500 ESG has an R-square of 99.6% against the traditional S&P 500 Index. Tracking error is very low.

An example

Let us go back to the previous example of our homemade exclusion index. That was outright exclusion, and not mainly under-and over-weight as one finds in most conventional ESG indexes. We want to test if we can get a custom index close to the traditional one by introducing exclusion within an optimization framework. For this exclusion with factor-exposure adjustment, we asked our colleagues of the UBS AM Quantitative Equities team for help. We are grateful for their kind and prompt assistance.

The synthetic portfolio produced by the UBS AM Quantitative Equities team is like the carve-out we produced above. However, we asked that the exclusion of tobacco and oil & gas from the S&P 500 be carried out in a factor-neutral basis—that is, instead of using the brute-force method we used to exclude oil & gas, our colleagues kept the exposure to the energy sector the same by giving more weight to renewable energy companies; and similarly with other sectors as well as factors (e.g., share of the portfolio in mega-caps, value vs. growth, etc.). In this way, we would obtain a pure exclusion portfolio that is factor-neutral with respect to the traditional S&P 500. The descriptive statistics are as follows:

Exhibit 13: S&P 500 Index returns compared to S&P 500 ESG, simple exclusion and factor-neutral exclusion, 2011-2020

2011-2020	S&P 500	S&P 500 ESG	Simple Exclusion	Factor-Neutral Exclusion
Arithmetic Mean	15.1%	15.3%	15.7%	15.6%
Geometric Mean	13.9%	14.1%	14.5%	14.4%
Standard Deviation	16.7%	16.4%	16.5%	16.6%
Skewness	-0.98	-0.87	-0.96	-0.99
Kurtosis	2.40	2.26	2.34	2.43
Min	-19.6%	-18.6%	-18.9%	-19.1%
Quartile 1	1.0%	1.1%	1.1%	1.1%
Median	4.1%	4.3%	4.3%	4.4%
Quartile 3	7.5%	7.7%	7.9%	7.7%
Max	20.5%	21.2%	20.5%	20.5%
Observations Count	40	40	40	40
Sharpe Ratio	0.87	0.89	0.91	0.90

Source: S&P; UBS Asset Management. Data as of 31 December 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

As can be easily seen, the factor-neutral portfolio produced by our colleagues in Quant Equities has very similar descriptive statistics as the original index. Despite excluding quite a few companies in the S&P 500 Index, the index behavior is about the same if factor and sector exposures are in line with the traditional index.

This demonstrates that if an index provider tries to match characteristics just like a portfolio manager using stratified sampling for statistical index replication (see for example Remillard, Nasri and Ben-abdellatif (2017)), the resulting baskets are likely to perform very similarly despite the exclusion of some names, the overweighing of highly rated names and the underweighting of names with low ESG scores.

In other words, this example shows that index providers such as MSCI and FTSE can easily overweight high-rated companies and underweight low-rated companies to increase the ESG rating of a benchmark while limiting the tracking error from the traditional index.

The crux of this example is therefore that the statistical differences among the four indexes appear to be quite small, and that the ESG index and Quant Back Test index are almost spot on the same as the S&P 500. Hence, it is possible to exclude or underweight ESG low-rated firms while overweighting high-rated ones without causing material tracking error, as long as the preferences are within normal ranges (what we defined as conventional ESG benchmarks earlier in the paper).

If an investor has much higher ESG-focused objectives, they can choose custom benchmarks that will provide higher ESG scores, but at the cost of higher risk due to lower diversification. Think for example of excluding all firms that are not carbon neutral: that would produce a materially higher tracking error from such material reduction of the investment universe.

The table above suggests that in the decade of 2011—20, there was little difference in performance between the S&P 500 Index and a carve-out that excluded tobacco and oil & gas stocks. This is not always the case. For example, the index with exclusions lagged substantially in the 1970s, when oil prices rose dramatically, and outperformed in the decades when oil prices fell. This means that while exclusions did not have material effect in a recent ten-year period, in other ones they created material tracking error and differences in performance. Lack of diversification, in the long run, tends to be costly. However, we do not see risk-adjusted performance of ESG-friendly assets over very long periods of time.

SECTION IV

Asset allocation and sustainability

Does ESG push an investor's efficient frontier higher?

In the previous sections we collected several findings, which we now summarize. Both the statistics and the academic research we outline above suggest that sustainability, when implemented in the more modern way of positive screening, produces an equity portfolio whose returns are quite like that of a traditional investment portfolio over the long term, but may outperform in the short term.

Therefore, implementing sustainability in the modern way of positive screening with limited exclusion does not negatively impact the efficient frontier and, looking at left-tail risk, may be better by filtering out companies at risk of environmental or accounting disasters.

Looking forward, there has been a significant increase in asset flows have been going into sustainability-focused mutual funds. Pedersen *et al*. (2019) suggests that investments with high ESG scores will become highly sought after and therefore expensive. In other words, will ESG investors overpay systematically? This is not necessarily the case if more and more companies embrace sustainability and improve their practices (if only to get higher valuations), so that more sustainable investments will be available eventually. We see this happening every day with companies announcing higher ESG standards, for example car companies planning to make only electric vehicles by 2035 or so, apparel companies controlling their sub-contractors to prevent abusive labor practices, and meat suppliers announcing higher animal welfare standards. Still, this will take time.

From the point of view of a diversified portfolio, the fixed income component is the less studied part within the sustainability literature. We conjecture that higher governance quality would improve an efficient frontier, particularly one based on mean vs. value at risk, as the risk of accounting manipulation might be lower. However, we do not have data to prove this—only logical intuition.

Performance in turbulent times

In this section, we examine the differences in performance of diversified portfolios with and without ESG investment options over market crises. Unfortunately, this is a difficult task as the definition of sustainability has changed remarkably over time and we do not have appropriate series going far back into the past.

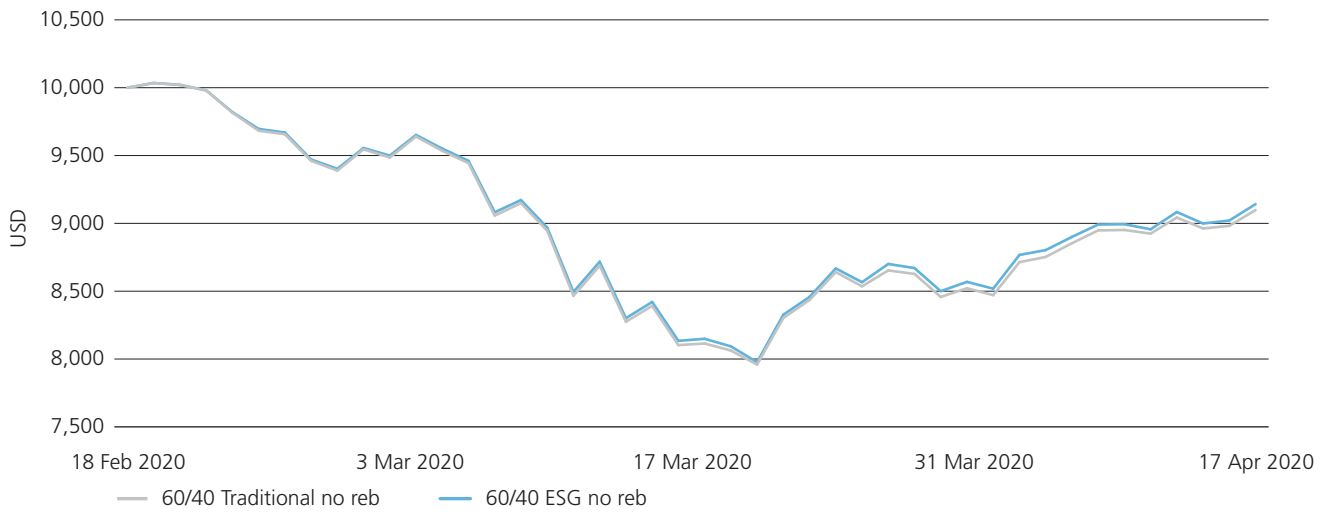
Therefore, we are looking at what a buy-and-hold portfolio would have returned in recent episodes of market stress. We computed for comparison also the results of a monthly rebalanced portfolio, but we focus on the buy and hold solution that is the typical experience of many small investors and the results of traditional vs. ESG are the same.

We consider very simple cases, where only two indexes are used: the MSCI All Country World Index (gross returns, USD unhedged) represents traditional equity, and the Bloomberg Barclays US Universal Index represents traditional bonds for a hypothetical US passive investor. The ESG equivalents are the MSCI ACWI ESG Leaders and the Bloomberg Barclays US Universal ESG Custom.

We simulate a traditional balanced portfolio of 60% stocks and 40% bonds; the analogous sustainable portfolio using the respective ESG indexes; a conservative traditional portfolio that is 30% equity and 70% bonds; and its analogous ESG version. For all four portfolios we show the statistics for buy and hold.[12]

Let us consider the COVID-19 market turbulence in March-April 2020. What happens with a more persistent market panic? Let us look at the balanced (60/40) portfolio first.

Exhibit 14: Traditional vs. ESG 60/40 portfolio performance during 2020 COVID-19 downturn

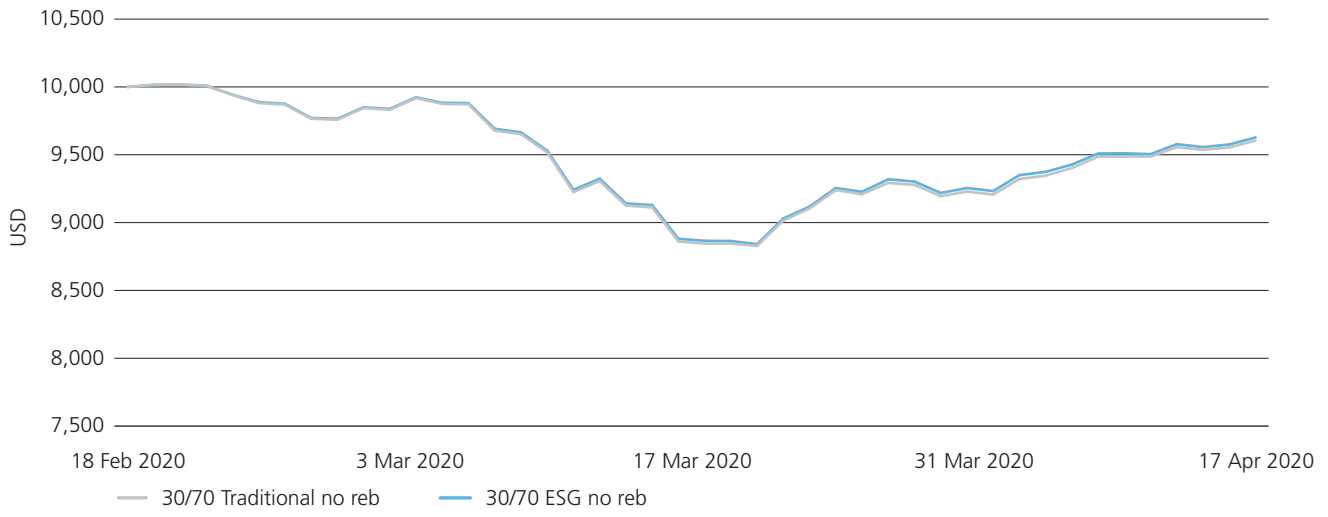


Source: Refinitiv; UBS Asset Management. Data as of 17 April 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

12 The same portfolios with daily rebalancing have lower returns but the difference between traditional and ESG portfolios remains the same. Important note: it is not possible to invest in indexes directly; this calculation is for illustration only; no management fees or trading costs are included in the calculation; past performance is no guarantee of future results.

Again, the ESG portfolio appears to be marginally better off, but the number is quite small and well within the margins of error. A look at the conservative portfolio confirms the results above.

Exhibit 15: Traditional vs. ESG 30/70 portfolio performance during 2020 COVID-19 downturn



Source: Refinitiv; UBS Asset Management. Data as of 17 April 2020.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

We must emphasize that event studies should not be considered exhaustive given the limited amount of data, which is more an anecdote than a statistical sample. However, we found no advantage or disadvantage in using a sustainability approach to investing.

Another finding is that it shows that ESG indexes appear to be calibrated to provide the same factor exposures as traditional indexes and therefore have the same risk and return (while having a higher ESG rating) also in moments of high market turbulence.

Conventional ESG benchmarks are close to traditional benchmarks

The previous example of the back-test produced by the UBS Quantitative Equities team shows that if we have an exclusion portfolio with some strict guidelines but use optimization to limit the tracking error from the initial index, we will obtain a new index with the characteristics in line with our preferences and still largely mimic the performance of the initial index.

Simulations of hypothetical balanced portfolios during periods of crisis show that ESG benchmarks produced by the best-known index providers track traditional indexes quite closely. They improve the ESG score by overweighting highly rated firms and underweighting low-rated ones without compromising performance.

These two pieces of information can be combined when producing an asset allocation with ESG focus. The reason is that benchmarks are geared towards replication of the basic, non-ESG indexes. Using quantitative techniques, index providers can manage the trade-off between higher ESG scores while looking to avoid significant risk and return discrepancies from traditional, non-ESG indexes.

We call these ESG indexes **conventional** because they are not produced to maximize the ESG score of the portfolio outright, but to maximize the ESG score under a constraint of maintaining diversification levels that are close to those of traditional, non-ESG benchmarks.

A person who has the preference to increase the ESG score of their portfolio should consider selecting funds with conventional ESG benchmarks so that they can achieve both higher ESG focus and keep the same level of high diversification. If an investor has much higher ESG preferences, they can choose custom benchmarks that will provide higher ESG scores, but at the cost of possibly higher risk due to lower diversification.

As we will see in the next section, the level of ESG preferences is one of our key dimensions in deciding about ESG asset allocation.

A framework for asset allocation

To do portfolio asset allocation incorporating ESG, the traditional dimensions of risk and return need to be expanded. We propose that there are four dimensions in ESG investing from the asset allocation point of view:

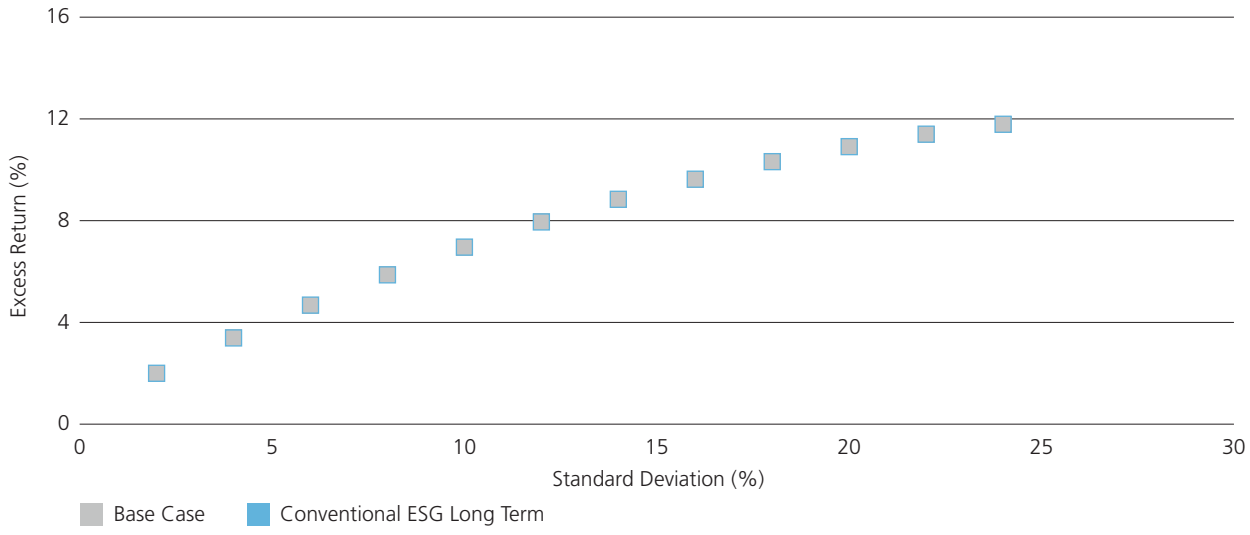
– Time (Short-term earnings opportunities)
– Preference for non-monetary results (higher ESG ratings)
– Returns
– Risk

Let us review our four dimensions in the investment context.

The preference for non-monetary results is the investor preference for ESG and applying it to their portfolios (as in Pastor *et al.* (2020)). For example, an investor can have no interest in ESG and thus likely use a traditional investment approach. In this case, their risk and return will not be affected by ESG choices. We will use this as the Base Case in the following comparison.

Let us start from the interaction of preference and long-term risk and return. The results of our research suggest that a conventional level of ESG (Conventional ESG Case hereafter), as exemplified by the indexes we mentioned in this paper, will not have substantial effects on investment performance over the long term. This means using conventional ESG benchmarks as the ones included in our data analysis above has the same risk and return over the long term as a traditional, non-ESG approach. Therefore, if we were to plot the mean-variance diagram for the Base Case approach and the Conventional ESG Case approach, the two efficient frontiers would coincide and be on top of each other:

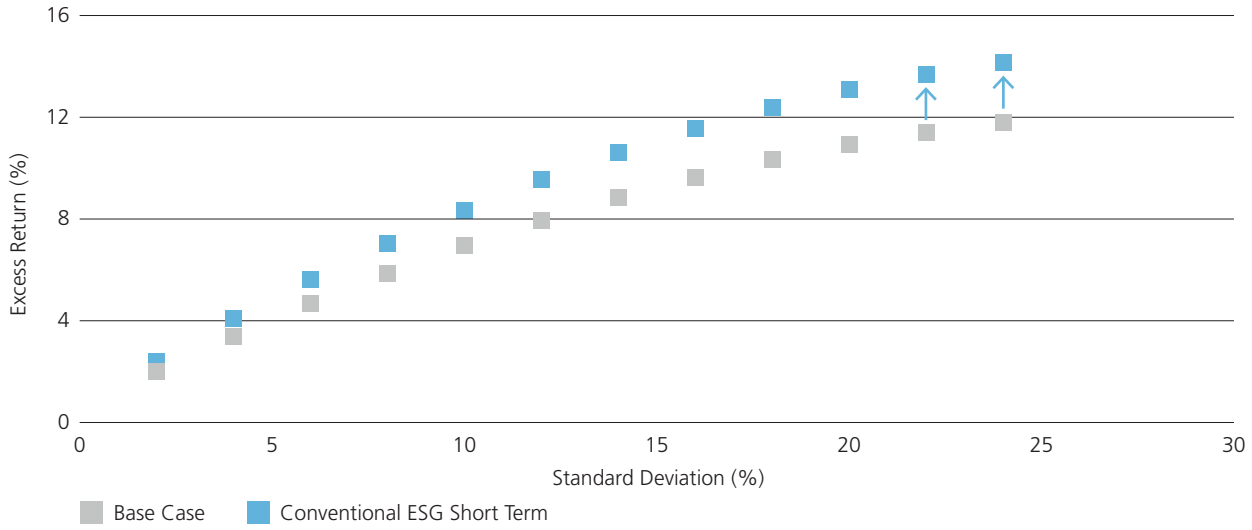
Exhibit 16: mean-variance for the Base Case approach and the Conventional ESG Case approach



For illustration only.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

The next step is to focus on preferences and short-term risk and return. If, as suggested by some academic papers discussed above in our review, the strong and increasing interest in conventional ESG strategies continues, it is possible that ESG assets will be bid up and outperform the market over the short term. In this case, a short-term effect of ESG investment could be a higher efficient frontier, where one could achieve higher returns with the same risk level:

Exhibit 17: Possibility of short-term outperformance if ESG assets are in high demand

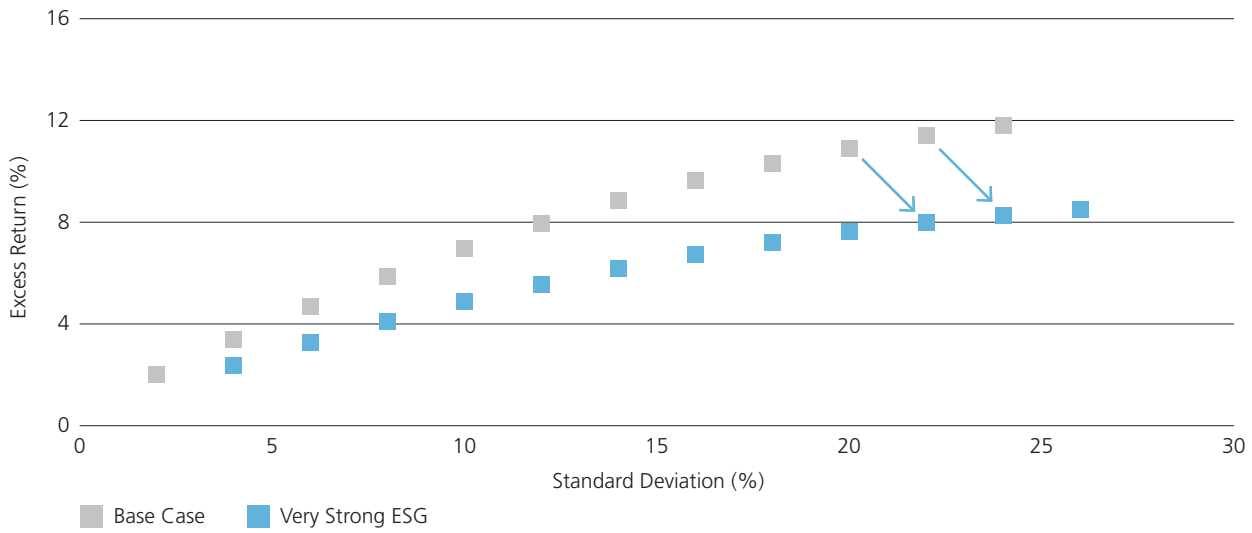


For illustration only.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Let us go deeper into the dimension of preferences: here is an example of an investor with very strong ESG convictions. A recent report from MSCI (2020, page 6) shows the effects of a much stricter approach to ESG (Very Strong ESG Case), particularly on the environmental side. The Paris Accord on climate change aimed to limit average world temperature increases to two degrees Celsius by the end of the century (continuing as present would likely increase the temperature by over three degrees Celsius). If a person with strong environmental preferences wanted to only invest in firms whose carbon footprint is consistent with just a 1.5 degrees Celsius increase in average world temperature by 2100, they would exclude over ninety percent of the stocks in the MSCI All Country World Index.

Excluding 90% of the names would necessarily have a remarkably negative effect on diversification. Moreover, even if carbon taxes were enacted across the world, it is difficult to expect that they would be so high that this small portfolio would outperform the market. Therefore and just based on our speculation on the effects of massive exclusion on diversification, we would expect the efficient frontier to shift to the right (higher risk across the board) and lower (lower expected return):

Exhibit 18: mean-variance for the Base Case approach and the Very Strong ESG Case approach



For illustration only.
PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Conventional ESG investments do not materially decrease diversification (and in turn, increase risk) and do not systematically exclude superior performing firms from their portfolios. Instead, a substantial negative screening does hinder diversification by definition as it reduces the number of portfolio assets. Moreover, while ESG has been enjoying increasing popularity, we do not expect assets from firms with high ESG ratings to become extremely expensive, for the simple reason that more and more firms are encouraged to become better ESG actors and more forthcoming communicators of their ESG efforts in order to be included in ESG investor buy lists. Demand creates its own supply in this case.

The following sections will present more information on the dimensions of our approach.

Time Dimension

The transition period between the current stage, where many investors and firms are interested in ESG, and the equilibrium stage, where we expect ESG to be the norm, is substantially longer than the tactical asset allocation horizon (normally considered to be about a year). It also is much shorter than the long-term time frame for strategic asset allocation. The most common target among developed economies for a shift to a net zero emissions is 2050. Since markets are forward looking, we would expect the transition period to last a maximum of 10–15 years. As the transition period will be governed by the speed at which the asset management industry aligns its holdings with ESG principles, this phase could be considerably shorter, especially with regards to the relative performance of ESG and non-ESG passive indexes. Early adopters are already seeing gains from being on the leading edge of this transition, but in our view this trend has not fully played out.

One issue an investor must resolve relating to the transition period is how ESG and non-ESG firms are priced. We believe a compelling case can be made that ESG-friendly companies can earn a transitional premium; but as plausible an argument can be made that the market has already priced this in, creating a segmented marketplace that differentiates between higher and lesser ESG-rated firms.

ESG and the cost of capital

ESG scores can affect return and risk through the cost of capital. By increasing the demand for high-scoring ESG firms, investors lower the cost of capital for these companies. All things equal, this increases their value. But for bonds held to maturity, the cost of capital (yield) is almost identical to the expected return as one person's cost is another person's revenue. This has several implications depending on how his cost of capital is impacted. We believe there are three potential scenarios for ESG's impact on cost of capital:

- **No effect on cost of capital**. ESG considerations have no impact on cost of capital and all firms have the same expected return.
- **Different cost of capital**. In equilibrium, high-rated ESG firms will have lower cost of capital and risks than non-ESG companies. A possible example of this is comparing an electric car manufacturer against a traditional car manufacturer. The electric car manufacturer is likely to have higher P/E multiple and lower cost of borrowing; the traditional car manufacturer has higher cost of debt as lenders are concerned about the possible pollution liabilities, carbon taxes, ever stricter emissions requirements, and the need for massive investments to convert production to more environmentally friendly vehicles.
- **Transition cost of capital**. If markets have not priced in the externalities of non-ESG compliance, but do realize it over time, there is the transition period where ESG firms, being a scarce commodity, enjoy higher multiples and earn a transition premium. This is the argument for temporary exceptional return for ESG: the market has not priced in future demand for ESG investments. The reverse is happening for firms with low ESG scores: they face lower demand and higher costs-of-capital (all other things equal) and consequently should have lower valuations, which should reverse if the companies transition to more sustainable practices.

Under the scenario in which better ESG-rated assets benefit from a lower cost of capital, ESG-friendly strategies should outperform during the transition period towards a lower-carbon, higher sustainability economy.

To summarize, during the transition period the fundamental driver for the relative performance of higher and lower ESG-rated firms here is cost of capital– that is, the rate of return required by investors to bear market risk and idiosyncratic risk for that firm. If investors lower the costs-of-capital for ESG-friendly companies, the market should price this in and value these firms at higher multiples. Thus, there may be significant alpha opportunities to capture over the transition period. If this cost of capital difference is sustained, the market becomes segmented: lower return (but lower risk) ESG firms and higher return (but higher risk) non-ESG firms. It is even possible that lower cost of capital may translate into higher earnings growth for sustainable firms. Understanding which low-rated firms may be upgraded is a clear alpha opportunity.

A note on the very long run

While during the transition period large-cap firms from developed markets may have higher ESG scores, in the long-run equilibrium (the time span after the transition period) most firms are likely to adopt the necessary changes and disclosures to catch up with their counterparts that enjoy a lower cost of capital and higher multiples – or be forced out of the market by increasing costs. Most companies that cannot or will not work to lower emissions likely will eventually be at such a disadvantage that they will cease operations through acquisition or exiting high emissions business lines. However, there will still be a small portion of companies whose revenues are high enough to allow them to cover the regulatory costs of their non ESG compliant business models

The long run equilibrium returns of conventional ESG strategies are likely to converge with non-ESG strategies as investors have far better information to discern ESG winners, as well as more clarity on the cost of non-compliance with ESG standards. Investors should use a higher discount rate for firms that are not ESG aligned so that their risk-return profile will be in line with the market. Market participants should incorporate the ESG elements efficiently over time, with negligible impact on return and risk after that.

Over the long term, we project that traditional investments and ESG investments will be efficiently priced relative to their risk and return if the ESG preference remains within conventional preference. Investors have multiple ways to enact ESG strategies: exclusion (negative screening), overweighting high-rated companies (positive screening) and engagement/ activism. Historically, investors have focused on exclusion, often providing explicit lists of firms or industries that are not allowed in portfolios. As noted previously, unless something is mispriced in the markets, overemphasizing this method leads to less-diversified, riskier portfolios.

More about negative screening, positive screening and engagement

Negative screening (exclusion) has been the traditional way of dealing with low scoring securities. However, most current ESG indexes only remove particularly undesirable companies, for example, producers of cluster ammunition. Positive screening is prevalent nowadays, where highly rated ESG firms see their holdings overweighted so that the ESG index has a higher average score than the traditional index it mimics. Interestingly, index providers implement positive screening while optimizing the ESG index to minimize tracking error from the traditional index by replicating sector weights, capitalizations, and factor exposures, so that the performance difference between traditional and ESG indexes is very small.

Our findings suggest that if investor preferences for sustainability are in line with the prevailing constraints for the investable universe, the tracking error and any trade-off in returns will be minimal; if the investor has very strong preferences and constrains the investable universe materially, there will be higher portfolio risk due to lower diversification. This results into higher required alpha to keep risk-adjusted returns the same.

An important characteristic of ESG is engagement. Specifically, some ESG investors engage with firms to increase ESG data disclosure and to encourage firms to follow more sustainable practices. The United Nations' Principles for Responsible Investment (PRI) has promoted collaboration among investors to understand the implications of sustainable investing and to support incorporating sustainability factors into investment practice.[13]

Recent academic research (for example, Dimson, Karakaş and Li (2020)) shows that stock prices outperform for companies that have recently had a successful ESG engagement. Low-rated companies tend to have a higher cost of capital due to legal, environmental, and reputational risks. Engaging with low-rated companies is expected to lead to outperformance.

13 Principles for Responsible Investment is a UN-supported network of investors who promote responsible investment. PRI has developed six principles for responsible investment that provide a framework for incorporating ESG issues into investment practice.

Opportunities in sustainability for active portfolio managers

Adding an ESG lens to traditional securities analysis provides more information for bond and equity portfolio managers to build an image of the true value of an asset.

Active investors have multiple avenues that may enable outperformance during the ESG transition period. One such method is through identifying those companies making adjustments that will lead to improved ESG scores, that therefore stand to gain from buying activity as they are added to or see their weightings increase in passive indexes that track ESG benchmarks.

Another window of opportunity for active portfolio managers is through activism. Engaging with company management, the portfolio manager could convince firms that disclosures and changes to corporate practices could improve their stock prices. For instance, UBS Asset Management, as part of an investor coalition Climate Action 100+, engaged with Norwegian energy producer Equinor, which resulted in the company improving their GHG emission reduction targets.[14] Its share price has outperformed key competitors over the last three years. More widespread disclosures may also enhance confidence in the reliability of passive ESG benchmarks to achieve their non-financial objectives – even more so if standardized disclosures address the heterogeneity in ESG rating processes by the various data providers.

It is certainly intuitive to suggest that portfolio managers can improve security selection if they know more about the likelihood of future monetary, legal, and reputational liabilities in terms of environmental, social and governance issues of the firms that comprise the investable universe. We believe that active managers that elect to specialize in separating ESG winners and losers even before ratings are issued or altered will have an acute advantage during the transition period.

The next key issue for setting preferences is the willingness to take short term risk to benefit from the return available during the transition period. If, as suggested by some academic papers we studied, which will be examined in an upcoming unabridged edition of this report, the strong and increasing interest in conventional ESG strategies continues, it is possible that ESG assets will be bid up and outperform the market over the short term (one could call this 'flow alpha'). In this case, a short-term effect of ESG investment could be a higher efficient frontier, where early adopters of ESG strategies could achieve higher returns with the same risk level.

Asymmetry of risk and risk impact of ESG

The ESG dimension of governance may improve disclosures on internal organization, compensation and accounting, which has the potential of avoiding huge losses such as the ones caused by accounting scandals such as the recent Wirecard case or the older WorldCom bankruptcy.

Going beyond the traditional CAPM approach from introductory finance textbooks, and instead considering a world where financial assets have fat tails, Rockafellar and Uryasev (2001) propose a practical way to carry out mean-CVaR optimization, where the variance of the portfolio is replaced by conditional value at risk (very loosely speaking, a worst-case scenario) as the risk variable in the optimization.

Since the tails of the distribution (extreme returns) are estimated using historical index returns, any sort of improvements to investment performance brought by ESG indexes would be automatically incorporated in this optimization, which is particularly suitable to loss-averse investors. While the mean-variance efficient frontier does not seem to be affected by sustainability choices, the mean-CVaR efficient frontier may be affected positively.

14 UBS Asset Management (2020). "Investing in an ESG World"
https://www.ubs.com/global/en/asset-management/insights/sustainable-and-impact-investing/2020/investing-in-an-esg-world.html

Opportunities for security selection

What can active bond and equity portfolio managers expect from increasing attention to ESG? Regardless of whether they are fundamental or qualitative managers, they will have more hard data to use in their mosaic of information and build an image of the true value of an asset. Consequently, more disclosures will increase the efficiency of active security selection – even more so if standardized disclosures address for example the concerns expressed by Berg *et al*. (2020) cited earlier in the paper.

It is certainly intuitive to suggest that portfolio managers can provide better security selection if they know more about the likelihood of future monetary, legal and reputational liabilities in terms of environmental, social and governance issues of the firms whose securities they can buy or sell. Active managers that elect to specialize in separating ESG winners and losers will have an acute advantage during the 10-to-15-year transition period.

Therefore, while a more antiquated negative screening approach might reduce possibilities of alpha generation by reducing the number of securities that can be selected, a more modern ESG approach with clear understanding of any risks for example in the environmental field can help exclude problematic companies and build better portfolios.

We already mentioned above the research by Berg, Koelbel and Rigobon (2020) and Ben Dor, Guan and Zeng (2020) on the heterogeneity of ESG rating across providers, as well as the UBS AM QED research on green capital expenditure and future earnings in different regulatory regimes. A possible outcome of this research is that **active portfolio managers may have a chance to add value if they think that a firm is assigned too low a score by ESG data providers**, because this firm's assets would be more valuable once the error is rectified – not unlike credit rating arbitrage in fixed income investing. Similarly, if a firm is reducing its environmental footprint and legislation seems to go towards pricing carbon externalities, an investment in that firm would be insurance against legislative changes.

From this point of view, novel data science approaches can provide interesting insights, as shown by Ben Dor *et al*. (2021): online job postings can be scrutinized to identify companies that are building an ESG compliance team or are otherwise moving towards higher ESG standards, as these firms are likely to be upgraded by ESG raters. Active portfolio managers could exploit this knowledge.

Another window of opportunity for active portfolio managers is through activism. Engaging with company management, the portfolio manager could convince firms that disclosures and changes to corporate practices could improve their stock prices – which would benefit first the portfolio manager's clients as well as all shareholders of that firm. More widespread disclosures will also enhance confidence in the reliability of passive ESG benchmarks to achieve their non-financial objectives – even more so if standardized disclosures address the heterogeneity in ESG rating processes by data providers.

Opportunities for engagement will not be equally available to investors globally due to different preferences of their board or regulators. Investors with more liberal ESG constraints will be able to take more proactive positions in companies and seek to engage with them to transform their practices. These investors will earn what we call the ESG Transition Premium for their efforts. Investors facing high levels of ESG constraints may not be able to take positions in companies until they transform and therefore will not benefit from the ESG Transition Premium.[15]

There is, of course, the possibility that this pendulum swings too far in favor of ESG-friendly assets. In such a scenario, there may be select opportunities for some classes of investors that are unburdened by ESG considerations to accumulate assets at depressed valuations and realize outsized returns.

15 In particular, investors with strict constraints who are not allowed to short excluded securities may be giving up material returns (see for example Pedersen, Fitzgibbons, and Pomorski (2019)).

Conclusion

This paper has reviewed independent academic research and presented novel data analysis. The results indicate that historical data shows there has been no trade-off between sustainability and investment performance for conventional ESG benchmarks.

We find that the adoption of modern ESG approaches, which are less restrictive in terms of exclusion and minimize tracking error from the original indexes, has not historically impacted performance and looking forward may have the positive externalities of contributing to stronger and more sustainable economic and social growth. Investors and institutional investment boards may have opportunities to capture excess returns during the ESG transition window for several reasons (including asymmetry, early mover, better analysis) as ESG assets become more popular and are valued higher in the market.

For investors looking to incorporate ESG into their asset allocation, our suggested framework is the following:

Preference for ESG
Unless the ESG requirements imply a substantial reduction of the investable universe, ESG investing has historically had similar outcomes as traditional approaches. It is possible and not onerous to align investments to evolving regulatory and client demands and requests. Very strong ESG preferences, however, may affect investment outcomes due to higher risk from less diversification, as well as trigger issues of regulation.

Time
Given the current steady growth in demand for ESG strategies, it is possible that ESG-friendly assets will be bid up in the short term, thus providing early adopters of ESG a first-mover advantage during the transition period. Those who allocate to active managers for whom ESG considerations play an integral role in security selection may benefit from enhanced alpha opportunities during this phase as well. Engagement, and identifying companies poised to improve their ESG status before index providers do, may be particularly alpha enhancing.

Returns
Market efficiency, over the long run, implies that all risk will be priced appropriately, and therefore risk-adjusted returns of ESG-friendly assets will not differ from those of ESG-unfriendly assets (as shown by our analysis of main benchmarks). However, material progress on ESG initiatives benefit the global economy and therefore may allow for higher levels of economic and earnings growth, and higher absolute returns for both ESG and non-ESG benchmarks.

Risk
Volatilities at the asset class level are the same between traditional investments and conventional ESG investments, as shown in Figure 6. It is possible that ESG investments may have better (less negative or more positive) skewness. Very strict ESG requirements likely lead to portfolios with higher risk due to lack of diversification, consistent with our analysis of the main benchmarks.

To summarize, we find that the adoption of modern ESG approaches, which are less restrictive in terms of exclusion and minimize tracking error from the original indexes, historically has not impaired performance and may have the positive externalities of contributing to stronger and more sustainable economic and social growth. Over the short term, investors and institutional investment boards may have opportunities to capture excess returns as ESG assets become more popular and are valued higher in the market. In brief, we find that sustainable investing without compromise is possible.

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