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ESG Engagement and Divestment: Mutually Exclusive or Mutually Reinforcing?

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Executive Summary

It is often argued that an investor who is dissatisfied with a company's ESG behaviour, and who wishes to remedy the situation, should stay on as a shareholder and engage with it. The reasoning is that when an investor divests, their influence over the company ceases. Moreover, the act of divesting is often presented as a passive approach that has no bearing on the company's management, a capitulation rather than a form of action.

We contend that both divestment and engagement are actions that promote change. Divestment is a force of change when it directly and indirectly contributes to raising the cost of capital for divested companies: this limits their ability to invest in projects the investor deems harmful and gives their management an incentive to improve their ESG performance. Properly managed and executed engagement can also contribute to improvement in the ESG performance of investee companies. The empirical results of academic studies indicate that both engagement and divestment approaches can be effective in achieving the desired ESG outcomes. We also argue that these two strategies are entirely compatible: the rise of collaborative engagement campaigns, in which current and potential shareholders combine their forces, is testimony to the fact that divestment does not put an end to an investor's possibility to engage with a company. Divestment and engagement are hence not mutually exclusive. And a shareholder who engages with a company without signalling a willingness to draw a red line – by exit in case engagement fails – will enter the negotiation in a weak position: the possibility of divestment is in that sense a prerequisite for effective engagement. Conversely, engagement can make divestment campaigns more effective: noisy exits can be more impactful than silent ones. Therefore, far from being mutually exclusive, both engagement and divestment are mutually reinforcing.

Those who deem ESG divesting strategies as incompatible with engagement sometimes see ESG mixing strategies – so-called ESG integration strategies whereby ESG data and analysis are mixed with traditional financial inputs in the portfolio construction process – as a good match with ESG engagement. However, contrary to common perception, ESG mixing strategies – such as over/underweighting based on ESG scores or using portfolio-average ESG scores as a constraint or objective in an optimiser – also lead to divesting based on ESG scores. This is apparent in the two practical examples of investment processes that mix ESG data with traditional factors (value, profitability etc.), which we study. But divestments based on such ESG mixing strategies are arguably less effective than those that result from straightforward filtering of the worst ESG performers; indeed:

- ESG reweighting – i.e. partial divestment as opposed to full divestment – dilutes the impact of divestment over a larger number of stocks and leads to divesting from companies with better ESG performances than filtering does.
- ESG optimisation based on portfolio-average ESG scores sends muddled and unpredictable signals to companies, which renders divestment (and engagement) less effective.

In contrast to ESG mixing strategies, straightforward ESG filtering, i.e. removing the worst ESG performers from the investable universe, concentrates divestment on the ESG laggards. It sends unambiguous and predictable – and therefore actionable – signals to all companies. In combination with ESG engagement, in particular through collaborative ESG campaigns, we argue that ESG filtering sets the ground for an effective ESG investing policy.

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Introduction

Introduction

A common criticism of ESG investment strategies based on ESG filtering is that once a stock has been divested, the investor loses any ability to influence the company's management, as it can no longer engage with the company as a shareholder. According to this strand of thinking, divesting means "forgoing the opportunities from active ownership to influence change" (Dimson et al. 2013), because "once a company is excluded, it is not possible to engage with it" (Robeco, 2018).

ESG filtering is thus sometimes frowned upon as a "bystander approach" (Ransome and Sampford, 2010), which fails to improve corporate behaviour. At best the stocks of excluded companies are simply bought by other investors without any impact. At worst they are handed over to less scrupulous owners, potentially pushed out of the limelight of public markets into more opaque private ownership, ultimately worsening the outcomes for the remaining stakeholders affected by the company's misdeeds. Or as Robeco (2018) frames it: "Divestment presents a similar problem in that it simply transfers ownership from an unhappy investor to a more willing one, and does not address the underlying issue."

Since we are to believe that ESG engagement can only be conducted by investors with "companies they are already invested in", among the different categories of ESG investment strategies[1], the investor is thus seen as having to make a choice between ESG filtering strategies such as norms-based screening and negative/exclusionary screening on the one side, and corporate engagement and shareholder action on the other (see Table 1). ESG engagement is, however, seen as compatible with some portfolio construction techniques that mix ESG and financial data and analysis in the decision-making process, in particular so-called ESG integration.

In its first section, this paper shows that both ESG engagement and divestment are active ESG strategies. Both can potentially improve corporate behaviour, although the mechanisms through which change may be achieved differ. We then investigate the basis for the claim that divesting puts an end to the possibility of engagement. We argue that, on the contrary, engagement is compatible with ESG divestment as investors can engage with companies they have not yet invested in, or have divested from, as is demonstrated for example with the success of collaborative engagement coalitions. In some respects, divestment, or at least the possibility of divestment, is even a prerequisite for effective engagement, as the absence of the threat of divestment would render engagement toothless. Far from being mutually exclusive, engagement and divestment should be seen as mutually reinforcing.

In the second part, we dig more specifically into the question of whether ESG mixing strategies – i.e. so-called ESG integration strategies whereby ESG data and analysis are mixed with traditional financial inputs in the portfolio construction process – are more compatible with ESG engagement than ESG filtering based strategies. We show that ESG mixing strategies may, contrary to common perception, also lead to divestment and are from that perspective not fundamentally different from ESG filtering. Nevertheless, we contend that by concentrating the divestments on the very worst ESG performers and sending clearer ESG signals to companies, ESG filtering may be more effective in inducing change than ESG mixing.

1 - As defined by the Global Sustainable Investment Alliance and used also by the UN Principles for Responsible Investing (PRI Reporting Framework Main Definitions 2018).

Introduction

Table 1: Ways to Invest Responsibly
There are many ways to invest responsability. Approaches are typically a combination of two overarching areas:

Considering ESG issues when building a portfolio (know as: ESG incorporation)			Improving investees' ESG performance (know as: active ownership or stewardship)	
ESG issues can be incorporated into existing investment practices using a combination of three approaches: integration, screening and thematic.			Investors can encourage the companies they are already invested in to improve their ESG risk management or develop more sustainable business practices.	
Integration	Screening	Thematic	Engagement	Proxy voting
Explicitly and systematically including ESG issues in investment analysis and decisions, to better manage risks and improve returns.	Applying filters to lists of potential investments to rule companies in or out of contention for investment, based on an investor's preferences, values or ethics.	Seeking to combine attractive risk-return profiles with an intention to contribute to a specific environmental or social outcome. Includes impact investing.	Discussing ESG issues with companies to improve their handling, including disclosure, of such issues. Can be done individually, or in collaboration with other investors.	Formally expressing approval or disapproval through voting on resolutions and proposing shareholder resolutions on specific ESG issues.

Source: PRI guide to "What is responsible investment?"

1. Divestment Reinforces Engagement – It Does not Preclude It

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1.1. Both Engagement and Divestment Influence Companies, But in Different Ways

What can an investor do when dissatisfied with a company management's strategy or performance? Since Hirschman's 1970 treatise on the *Responses to decline in firms, organizations and states*, shareholders are often seen as having to choose between two options to deal with the failings at a company they own: "exit" and "voice", or "divestment" and "engagement" respectively in more commonly used wording when this dilemma is set in an ESG portfolio management context. And while engagement is perceived as a way of actively promoting a change of behaviour, divestment is sometimes viewed as a rather passive bystander approach, or at least as less effective than engagement in achieving improvements.

Investors have different motivations for wanting to change a company's ESG behaviour. One possible categorisation of ESG investors' beliefs and motivations is set forth by the OECD (2017):
1. "*Modern investors*, who believe that pricing inefficiencies exist such that ESG integration can enhance their analytical capabilities, will integrate ESG factors to the extent that they impact corporate financial valuations and so portfolio returns.
2. *Broader goals investors*, who believe – like modern investors – that ESG factors are relevant to portfolio performance, but also feel that their duties to their beneficiaries include consideration of their long-term financial and non-financial well-being.
3. *Universal investors*, who believe that they have a financial responsibility to support global economic health and that ESG factors are drivers of future systemic risk, will fully integrate ESG factors into their investment governance."

One should note, therefore, that the desired ESG change can have primarily financial objectives (for example Robeco (undated) states that its "Engagement themes and companies are selected […] based on an analysis of financial materiality"), primarily ESG objectives, or both.

Contrary to the notion that divestment is a bystander approach, it can, like engagement, be a means to influence a company's management to improve its ESG performance. However, the two approaches work in different ways.

How Does Divestment Influence Companies?

Divestment can be carried out by ESG investors for different reasons:
- They may seek to avoid complicity with companies that perpetrate "breaches of inviolable and incommensurable standards" (Dawkins, 2018). Such a stance can be called deontological.
- Alternatively investors may divest in order to seek to influence a company's activities by increasing its cost of capital. The increased financing cost will hamper the company's ability to pursue investments in the activities the investor dislikes. Lower share prices also reduce the value of management's share-based remuneration, thereby giving top executives an incentive to integrate ESG considerations.
- Self-interest is the motivation of business-as-usual investors who consider that certain poor ESG practices or lagging performance will lead to financial losses that have not yet been properly priced in by the markets. For example, investors may elect to divest fossil fuel companies "because they

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expect reduced financial returns of fossil fuel-related investments caused by stranded assets through the rapid devaluation of fossil fuel reserves (Dordi and Weber, 2019).

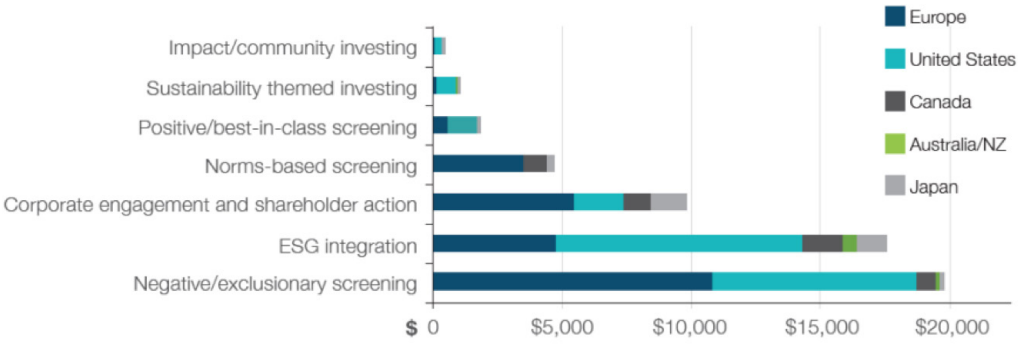
There is some uncertainty on what proportion of equity investors need to divest for the cost of capital to increase. Some researchers have pointed to a proportion of more than 20% (Heinkel, Kraus and Zechner, 2001), which would set a high bar for effective divestment campaigns. Note however that the proportion of assets invested according to at least one type of ESG strategy has, by 2018, topped the 20% bar in all developed equity markets except Japan (Table 2). As two thirds of these ESG invested assets follow an ESG strategy that includes negative/exclusionary screening (Table 3), e.g. screening of tobacco companies, it appears plausible that at least some industries have seen their cost of capital increase due to the implementation of large-scale divestment policies.

Table 2: Proportion of sustainable investing relative to total managed assets 2014-2018

	2014	2016	2018
Europe	58.8%	52.6%	48.8%
United States	17.9%	21.6%	25.7%
Canada	31.3%	37.8%	50.6%
Australia/New zealand	16.6%	50;6%	63.2%
Japan		3.4%	18.3%

Source: Global Sustainable Investment Review, 2018

Table 3: Sustainable investing assets by strategy and region 2018



Source: Global Sustainable Investment Review, 2018

There is also some empirical evidence that the announcement of ESG-related divestments may negatively impact stock prices. For example, Dordi and Weber (2019) find that stocks of oil and gas companies showed significant negative abnormal returns around 24 independent fossil fuel divestment announcement events between 2012 and 2015. Interestingly, the University of Oxford's pledge to divest from its endowment also had a significant impact, even though the fund held no fossil fuel shares at the time of the announcement. Thus, according to the authors, "pressure is achieved through direct effects of divestment on their stock prices or through the reputational damage that divestment or divestment announcements can make". This indirect effect is not any less rational than the direct price effect, as "divestment may establish an anti-fossil fuel norm

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intended to stigmatize the industry and delegitimize the industry's political, economic, and social license to operate" (Dordi and Weber, 2019). Hence, especially when conducted through vocal, collective campaigns involving both investors and other stakeholders such as academic institutions and NGOs, divestment movements are part of the routes towards global norm-setting (Martinsson, 2011) (Table 4):

Table 4: Four possible routes to the establishment of norms in the international community

Legal norm setting	International organisations and governments form norms through conventions, declarations, treaties, etc.
Multi-stakeholder initiatives	Stakeholders from government, the private sector, international organisations, and civil society form norms through inclusive and deliberative processes.
Global policy networks	State and non-state actors jointly bring new issues and ideas into public discourse and complement policy making and international cooperation.
Transnational advocacy coalitions	Non-state actors advocate norms through transnational campaigns and monitor implementation.

The effectiveness of divestment campaigns, such as the fossil-free divestment movement, could be reinforced by a strong non-linear relationship between the proportion of investors that divest and the impact on share prices / cost of capital. Some researchers point to the existence of so-called tipping points that suddenly break any linear relationship. For example, one recent article's results "suggest that socially responsible investors have leverage: a small share of 10–20% of such moral investors is sufficient to initiate the burst of the carbon bubble" (Ewers et al., 2019).

How Does Engagement Influence Companies?

When it comes to public equity investments, engagement consists in dialogue between shareholders and company executives and board directors, in a public or private manner and more or less confrontationally. More formally, shareholders also engage with companies through proxy voting and even the filing of shareholder resolutions. Engagement thus works through hard power – potentially getting new board directors nominated or voting down executive remunerations schemes for example – or soft power, through education, persuasion and shaming.

The mechanisms through which engagement promotes remedial change can for example be divided into three aspects:

- "(a) *communicative dynamics* – engagement enables the exchange of information between corporations and investors, creating 'communicative value';
- (b) *learning dynamics* – engagement helps to produce and diffuse new ESG knowledge amongst companies and investors, creating 'learning value'; and
- (c) *political dynamics* – engagement facilitates diverse internal and external relationships for companies and investors, creating 'political value'." (Gond et al., 2018).

Note that, as is unfortunately often the case in discussions on ESG investing, the term "value" used here is ambiguous as to whether it is financial value or ESG value that is created. Instead of clarity, it is often presumed that the two forms of value are necessarily aligned.

1. Divestment Reinforces Engagement – It Does not Preclude It

While the aforementioned dynamics focus on the potential benefits of non-hostile dialogues, more confrontational elements of engagement can also be effective. Filing shareholder resolutions on ESG issues, for example, is inherently the result of a disagreement between the company's management and some shareholders, which has failed to be resolved in a less hostile way. There is some empirical evidence that such ESG shareholder resolutions may lead to change in a company's ESG conduct and that they may create shareholder value. For example in a 2015 paper investigating ESG-related shareholder resolutions, Caroline Flammer finds that resolutions that passed with low voting margins ("close calls"[2]) lead to a 0.92% abnormal excess return for the stock on the day of the vote, which she attributes to shareholders anticipating the financial value of increased sales growth and labour productivity to which the implementation of the ESG resolutions would lead in subsequent years (Flammer, 2015).

Some studies of specific investors with a long track record in ESG engagement strategies also point to such strategies demonstrating potential to create shareholder value in the past. For example Dimson, Karakaş and Li (2015) show that one institutional investor's engagement strategy, which combines different engagement techniques, resulted in "size-adjusted abnormal return of +2.3% over the year following the initial engagement" for US companies from 1999 to 2009. This added shareholder value is related to the 18% of engagements that recorded a successful ESG outcome, with markets anticipating in particular the financial value of the subsequently improved operational performances: "after successful engagements, particularly for those on ES [Environmental and Social] issues, engaged companies experience improvements in their operating performance, profitability, efficiency" (Dimson, Karakaş and Li, 2015).

The 82% of engagements in this study that failed to achieve the targeted ESG improvements did not lead to any overall financial benefits. Note that this relatively low success rate for engagement is comparable to the one found for 1671 PRI coordinated engagements over a more recent 2007–17 period, with a rate of 26% of recorded successes (Dimson, Karakaş and Li, 2017).

1.2. Engagement and Divestment are not Mutually Exclusive, but Mutually Reinforcing

Both Current and Potential Shareholders can Engage with Companies

We have seen that both engagement and divestment are ESG strategies that can influence a company's behaviour – and can both potentially achieve improvements from an ESG perspective. Often, these two strategies are believed to be mutually exclusive options, with the possibility of engagement ceasing after the divestment has been carried out. This is mirrored in Robeco's rather peremptory statement that "once a company is excluded, it is not possible to engage with it".

First let us note that shareholders are not the only stakeholders engaging with companies. NGOs for example also engage with and seek to influence companies, with some success and irrespective of shareholding. Moreover, the idea that publicly listed companies would only enter into dialogue with

2 - She focuses on this subset of resolutions since they can be considered random events compared to shareholder resolutions that fail to pass with a small margin: "The passage of such 'close call' proposals is akin to a random assignment of CSR [Corporate Social Responsibility] to companies and hence is uncorrelated with firm characteristics". This methodology aims to circumvent the problem of many studies that analyse correlations between firm characteristics in terms of ESG/CSR performances and corporate financial performances, but without being able to determine in what direction a causality plays out. This study aims to show a causal link, that an independent ESG improvement leads to corporate financial improvements that the markets price in by anticipation.

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current shareholders, and not potential shareholders, would imply that companies are both naively optimistic about the loyalty of their existing shareholders and ignorant of the benefits of creating additional demand for their shares by attracting new shareholders. Indeed, public equity markets are a meeting place for buyers and sellers of equity capital. As in any open market, sellers assess and take into account the demand of buyers, whether they are existing clients or prospects: it would be a foolish seller who limited himself to making his product offering attractive to existing clients alone and who refrained from dialogue with prospects. Hence, "It is by no means obvious that interacting with a company as a prospective investor [rather] than as a current investor, is any less effective in influencing the activities and practices of a company" (Kolstad, 2014).

The rise of ESG-related investor coalitions that conduct collective engagement campaigns is in fact an illustration of the possibility of combining engagement and divestment. Collective engagements, which are facilitated for example by the UN PRI's Collaboration Platform, are seen by both investors and companies as more effective in pushing through change. Both sides of the table of those interviewed in Gond et al. (2018, see Table 55) underline that an argument in favour of collective (as opposed to individual) ESG engagements is the "Higher power and influence through the collective assets under management" (investors) and that "Larger, collective assets under management working together can give more leverage to internal corporate drives on ESG issues" (companies). This is also one of the conclusions from the oft-cited Dimson, Karakaş and Li paper (2015): "collaboration between the asset manager and other activist investors and stakeholders significantly increases the success rate of ES engagements".

Table 5: The most important pros and cons

	Individual investor ESG engagements		Collective investor ESG engagements	
	Corporate Perceptions	Investor Perceptions	Corporate Perceptions	Investor Perceptions
PROS	• Face to face and one-to-one dialogues are effective to address multiple ESG issues. • Avoidance of misrepresentation of ESG performance by third-parties. • One-to-one interactions allowthe buildingof trust, and long-term relationships, with investors.	• Alignment of engagement goals with internal ESG and engagement policies. • Strategic benefits of proactively addressing emerging ESG Topics. • Enables a strategic focus on corporate stocks with ambigous ESG scores.	• Larger, collective assets under management working together can give more leverage to internal corporate drives on ESG issues. • Cost savings in terms of time spent with investors. • Perceived higher ESG expertise of the investor group.	• Higher power and influence through the collective assets under management. • More relevantfor systemic and marketplace issues, or if investors have 'thematic' engagement policies. • Cost savings on monitoring.
CONS	• Need to manage numerous, different investor requests. • Redudancy in questions asked by multiple, individual investors. • Costly and time consuming process, especially if ESG requests by multiple investors increase.	• Potentially low shareholding insufficient to capture board-level attention. • Limited resources that can be spent to maintain the continuity of engagement and/or financial analyst engagement.	• Lack of interest from investors for overall corporate ESG management activities, due to specific ESG thematic focus. • Higher coordination costs if investors fail to coordinate their efforts. • Invetors with no or too little shareholding may attend meetings.	• Broad international focus that may not be cohernet with national investment stategies. • Possibility of free-riding. • Time-consuming process if investor views are divergent.

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One should note that such collaborative engagements are open to investors that are not currently shareholders, and this fact is sometimes seen as a "free-riding" problem (Gond et al., 2018; PRI, 2020). This latter reproach is, on closer inspection, not only wrong but self-contradictory. There are actually two sides to it:

- Firstly, in a collective engagement, the costs of organising the engagement process are shared among participants, whether they are invested or not in the company. Gond et al. find that both companies and investors see collective engagements as less costly than individual ones. Companies highlight "Cost savings in terms of time spent with investors" while investors find "Cost savings on monitoring". Both current and potential shareholders thus share the costs and benefit from lower costs. However only those shareholders with open positions on the companies being engaged stand to be further financially affected by the results of the engagement process, or during it.
- A second side to the free-rider argument could thus be that critics of divestment believe that companies with which they engage will underperform financially as a result of, or despite the efforts made, and that divesting enables some investors to avoid bearing the cost of poor stock returns. This not only ignores one of the mechanisms through which divesting actually works, namely pushing down stock prices in order to raise the cost of capital for the company (which are returns to providers of capital), but also contradicts the claims made by proponents of engagement strategies that they enjoy financial superiority over divestment strategies. Proponents of engagement often claim that this form of action creates shareholder value (Becht et al. 2009, Dimson, Karakaş and Li, 2015, Flammer 2015), and critics of divestment often claim that it leads to a diversification penalty, i.e. that a reduced universe leads to a lower diversification potential and thus to a financial cost in terms of less risk/reward efficient portfolios[3]. If investors who divest create attractive opportunities for new investors and suffer from reduced diversification, they are the very opposite of free-riders.

To conclude on this topic, it is absurd to claim simultaneously that engagement is financially beneficial and that divestment constitutes free-riding.

Engagement and Divestment are Mutually Reinforcing

Alternatively, divestment is viewed not as incompatible with engagement, but as the ultimate consequence of a failed engagement process. Or, put in a more positive guise, divestment is seen as a means to make engagement effective, acknowledging that "engagement as a negotiating posture is hollow without the explicit threat of withdrawal" (Dawkins, 2018).

Given the relatively low success rate observed in engagement campaigns, this leaves ample room for divestment as part of any ESG investment strategy, not only for deontological investors who seek to distance themselves from unacceptable activities, or self-interested ESG investors who aim to avoid under-priced risks, but also for investors pursuing a consequentialist approach, seeking to improve the ESG performance of companies[4].

3 - Trinks et al. (2018) compare fossil-free portfolios with standard portfolio over a 1927-2016 and conclude that "fossil fuel company stocks do not outperform other stocks on a risk-adjusted basis and provide relatively limited diversification benefits". As noted by Christiansen and Ducoulombier (2018), meta-studies comparing ESG fund and indices to standard funds and indices (Friede, Busch and Bassen, 2015, Revelli and Viviani, 2015) do not conclude that there exists a diversification penalty for ESG strategies. This could be because conventional portfolios are inefficient thus ESG restrictions are no hindrance (Bello, 2005; Humphrey, Warren and Boon, 2016), or because the penalty is offset by lower idiosyncratic risk of ESG portfolios (Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009; Sassen, Hardeck and Hinze, 2016; Jacobsen, Lee and Ma, 2019). Nevertheless the literature on improving risk parameter estimation with ESG data is sparse and points to benefits "of somewhat limited economic importance" (Dunn et al., 2017).

4 - In some circumstances neither engagement nor divestment is likely to be particularly effective from a consequentialist standpoint. This will in particular be the case for product-based ESG issues, where the product is not substitutable and represents the core of a company's current activity. For example, divesting from conventional weapons producers is unlikely to lead those companies to exit the industry. However, engaging with those companies with such a goal would likely have even less of an impact and would be poor usage of limited resources. At least, divestment, by raising the cost of capital for those companies, could hamper the growth of those activities by raising the hurdle at which new investment projects become profitable. Moreover, from a deontological ESG perspective, divestment enables the investor to distance itself from an activity it deems harmful.

1. Divestment Reinforces Engagement – It Does not Preclude It

In addition to divestment being a pre-requisite for effective engagement, other interactions can be implemented. For example, investors can adopt "noisy exits" such as those witnessed in the aforementioned divestment announcements. In the end "voice and exit options are dynamic, mutually reinforcing and not necessarily sequential. Divestment does not close the door to continuing external engagement with a company" (Goodman et al., 2014).

This dynamic relationship also means that in practice the distinction sometimes made between "ex ante" ESG filtering strategies and "ex post" divestment strategies where divestment is the solution of last resort, when engagement has been unsuccessful, is not necessarily a clear-cut or meaningful distinction. For example, the exclusion list made public by the Norwegian central bank for the Norwegian Government Pension Fund Global, is often adopted by other investors wishing to base their ESG filtering on a thorough and well-documented divestment process. One should note that applying this exclusion list to filter an investment universe in effect leads to filtering out both companies that were excluded without prior engagement by the manager of Norway's sovereign wealth fund (e.g. tobacco producers) and companies that were placed on the list only after an engagement process concluded that there still existed an "unacceptable risk that the company contributes to or is responsible for […] particularly serious violations of fundamental ethical norms"[5]. More generally, since some investors have already practised engagement strategies for more than two decades, if another investor chooses to ex ante filter out a company with persistently poor ESG performances, this filtering is now likely to occur after other investors have failed in their attempts to improve those same ESG performances through engagement: what constitutes ex ante filtering for one investor may constitute ex post filtering for others, making such a distinction less relevant than often thought.

5 - Guidelines for observation and exclusion of companies from the Government Pension Fund Global, 2017.

2. ESG Mixing ("Integration") Strategies also Lead to Divestment, but may be Less Effective than ESG Filtering in Influencing Companies

2. ESG Mixing ("Integration") Strategies also Lead to Divestment, but may be Less Effective than ESG Filtering in Influencing Companies

In the first section we discussed the compatibility, and interactions, between engagement and divestment strategies. However, divestment is often wrongly reduced to two ESG filtering based strategies, namely norms-based screening and negative/exclusionary screening. Proponents of ESG mixing strategies – i.e. so-called ESG integration strategies whereby ESG data and analysis are mixed with traditional financial inputs in the portfolio construction process – often claim that ESG mixing is more compatible with engagement than ESG filtering, on the ground that ESG mixing does not lead to divesting.

We will now have a closer look at two such ESG strategies that mix ESG data with market data and/or traditional risk factors such as value or momentum in their portfolio construction processes. We will show that not only do these ESG mixing strategies lead to ESG-justified divestment – contrary to what is often assumed – but that they also lead to unintended consequences that could hamper their effectiveness in achieving improvements in companies' ESG performances.

2.1. Compared with ESG Filtering, ESG "Reweighting" Techniques Lead to the Divestment of Companies with better ESG Credentials

One simple example of an ESG mixing strategy consists of applying an ESG tilt to index constituent weights. With this approach, stocks with relatively poor ESG characteristics may remain in the index but with reduced weights.[6] This preserves the relationship between ESG characteristics and benchmark-relative weighting, even though this relationship becomes less tractable when multiple ESG tilts are applied (as is becoming the fashion).

Naturally if the benchmark is not the market-capitalisation index of the relevant universe but is constructed to achieve certain financial characteristics, such as factor exposures, then there is no such relationship between ESG characteristics and over/under-weighting relative to the universe benchmark. Instead, relative weights are determined by a composite of ESG and financial characteristics, i.e. poor ESG characteristics can be offset by strong financial characteristics (and vice versa) and no clear signal can be conveyed to companies as to the importance of improving their ESG performance.[7]

However, even in the simple case where a single ESG metric is used to tilt market capitalisation weights, ESG reweighting may lead to greater divesting from companies with better ESG performances than filtering would.

In the context of low carbon strategies for example, reweighting leads to divesting from fewer carbon intensive companies than filtering for the same reduction in portfolio weighted average carbon intensity. To illustrate this point, in Figure 1 below we have ranked the companies in the Scientific Beta Developed equity universe in terms of carbon intensity (as per the definition endorsed by the Financial Stability Board,[8] i.e. the ratio of a company's Scope 1 and 2 emissions to its revenues). We then compare which proportion of companies needs to be impacted by the decarbonisation

6 - Certain recent implementations allow constituent removal at the tilting phase and/or embark exclusion policies.
7 - For example, the FTSE All-World Climate, Balanced Comprehensive Factor Index, applies three climate change tilts and five factor tilts to base weights (FTSE Smart Sustainability Index Series, Ground Rules, 2020)
8 - Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, Financial Stability Board, 2017.

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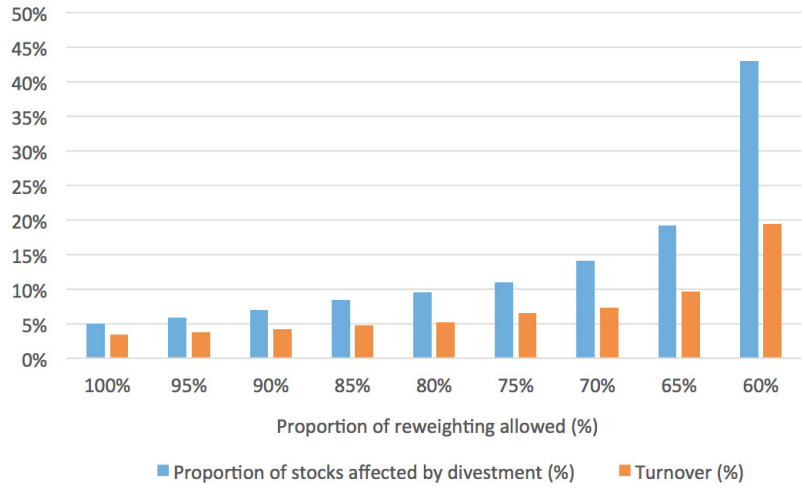
divesting scheme to reach the same decarbonisation target, by comparing different straightforward methods:

- The benchmark strategy consists of filtering out the 5% most carbon intensive stocks (i.e. reducing their weight by 100%) and market cap-weighting the remaining stocks.
- The other methods achieve the same level of weighted average carbon intensity as above, but by reducing the market-cap weight of carbon intensive stocks intensity by a certain percentage (and proportionally increasing the cap-weights of the remaining stocks).

The X axis thus represents the severity of the reweighting allowed, the Y axis plots the proportion of stocks affected by the partial divestment strategy in order to achieve the same carbon exposure reduction as the full divestment strategy.[9]

We also show the one-way turnover that the decarbonisation scheme entails to reach its target.

Figure 1: Proportion of stocks affected by divestment (%) and induced turnover (%), as a function of the weight reduction (%) allowed for carbon intensive companies.



All strategies achieve a similar level of weighted average carbon intensity as the filtering out of the 5% most carbon intensive companies, i.e. the same as a reweighting strategy where a 100% weight reduction of the 5% most carbon intensive companies is permitted. Scientific Beta Developed universe, December 2019. Carbon intensity means the ratio of a company's Scope 1 and 2 carbon emissions to its revenues.

While the filtering strategy by construction leads to divesting the 5% of stocks with the worst carbon intensities, the reweighting strategy needs to divest from 43% of the stocks if a 60% weight reduction is allowed for, and 11% of stocks if weights are allowed to be reduced by 75%, in order to achieve the same level of weighted average carbon intensity reduction. Note that in this example, if the investor does not wish to reduce the weight of carbon intensive companies by more than half, it is simply not possible to reach the same level of decarbonisation as a 5% filtering strategy.

By spreading out the divestment more thinly across more stocks, the price impact through which divestment is meant to influence companies' behaviour will be less significant for the worst ESG performers.

9 - Note that we are not claiming that the two types of approaches produce the same reduction in actual exposure to carbon risk. The pure divestment approach ensures zero exposure to companies which may be particularly exposed to carbon risk owing to their high intensities. The partial divestment approach assumes carbon risk to be linear and therefore that it can be approached by a weighted average. On this topic, refer to Ducoulombier and Liu (2019).

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Moreover, contrary to a common perception that reweighting is a less intrusive portfolio construction technique than filtering, reweighting may induce a larger turnover to reach the same weighted-average decarbonisation target: while the filtering strategy creates a 3% turnover, the reweighting strategy with a 60% weight reduction creates 19% turnover and the 75% weight reduction strategy a 6% turnover.

2.2. Optimising in Relation to Weighted Average ESG Scores Seriously Undermines Engagement

Another example of a strategy seeking to mix ESG objectives with factor investing is the one applied to the Robeco QI Institutional Global Developed Sustainable Multi-Factor Equities fund. This fund seeks, in particular, a "well-diversified exposure to the proven factors value, momentum, low-volatility and quality" while its "ESG integration aims for a total ESG score of the portfolio that is at least 20% higher than the index". By the asset manager's own admission, this is a divestment strategy as "stocks of companies that have very poor ESG scores are more likely to be divested from the portfolio"[10]. Interestingly, the same asset manager goes to great lengths to underline that divestment at universe level is to remain exceptional, explaining that: "Excluding a company from our investment universe represents our action of last resort, only to be used after all other dialogue-based methods have failed. If a company persists with a highly controversial behavior despite our best efforts to persuade it to improve its practices, we will exclude it from our universe"[11]. Apparently, divesting from the investment portfolio poses no difficulty to the asset manager, which sees this as a technical means to an end, i.e. increasing the portfolio's weighted ESG scores, but excluding from the investment universe is a far more serious business.[12] Could it be recognition that the latter has unique value?

Certainly, the ESG mixing strategy has some serious weaknesses. From a consequentialist perspective, i.e. its capacity to improve companies' ESG performances, there are two issues:

- As seen earlier, divestment impacts a company both through the direct impact of the trading on stock prices and through the indirect effects on the market's perception of reputation risk and norms-setting. This means that the clarity of the signal the divestment delivers to the market matters for how severely companies are impacted. ESG filtering delivers a clear-cut message – the divestment criteria are clearly announced and the divestment decisions are predictable for all market participants. By contrast, an ESG mixing strategy based on average ESG scores sends a blurred signal, since a company's poor ESG performance does not necessarily lead to divestment, but only makes divestment "more likely". The link between ESG performance and relative weight is intractable and the optimiser cannot send intelligible messages from an ESG point of view.
- For those companies with poor ESG performances that the manager elected not to divest immediately but instead to engage with, the mixing with traditional factors can be at odds with the manager's assertion that one can only engage with companies as long as one remains a shareholder. Engagement processes, even in the relatively rare cases where they are successful, are lengthy. Dimson, Karakaş and Li (2015, 2017) find that successes are recorded after 1.5 to two

10 - Factsheet Robeco QI Institutional Global Developed Sustainable Multi-Factor Equities T1 EUR with figures as of 29 February 2020.
11 - https://www.robeco.com/en/funds/prof-glob-en-11/robeco-qi-institutional-global-developed-sustainable-multi-factor-equities-t1-eur-nl0013216419.html#!#siclass
12 - The fund has extensive exclusions covering "military contracting, controversial weapons, fire arms, UN Global Compact breaches, tobacco, gambling, adult entertainment, palm oil, thermal coal, and alcohol".

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years on average. Given the inherent turnover that factor-based investing entails, the probability is significant that a stock that initially appeared attractive with respect to its factor exposures will, after two years, have become unattractive. This would put a manager who believes that divesting brings an end to the engagement process in a bind: should it sell the stock that now appears financially unattractive from a factor perspective, or should it keep the stock and continue to engage with it "on material sustainability themes that have the most potential to create value for shareholders" (Robeco, undated)?

2.3. Illustration: Sending the Wrong Message to Companies in the Area of Greenhouse Gas Emissions

The two previous sub-sections covered the potential difficulties that could exist in approaches where one mixes the financial and non-financial characteristics of stocks to obtain the weight, whether involving a score/tilt-based method or a pure optimisation method. This sub-section will show that the problems described above can result in counterproductive decisions from an ESG viewpoint. To illustrate this, we have taken two examples of popular low-carbon portfolio construction methodologies. The first corresponds to management of a limited relative risk budget (tracking error) compared to a reference cap-weighted index in the form of a score/tilted approach. The second aims to reconcile high factor intensity and reduction in carbon intensity by optimising the portfolio weights to satisfy these objectives while also targeting low tracking error.

In both cases, we will see that compared to the application of an exclusion filter on the 10% worst emitters, these methodologies can lead to an increase over time in the weight of these worst stocks from a carbon intensity perspective. This increase then sends a totally counterproductive signal to companies, because in spite of their harm to the environment, investors who declare that they are virtuous on this theme actually increase their investments in these companies. Their portfolio's score certainly expresses reduced carbon intensity, but this reduction does not mean that the worst companies in the area of carbon intensity are penalised. With approaches of that kind, the portfolios are virtuous but the companies that make up the portfolio are not!

Sending Mixed Signals with a Score-Weighting Approach in Low-Carbon Investing

One of the most popular approaches when it comes to constructing "low carbon" and/or ESG indices is to tilt market-capitalisation weights using firm-level scores towards more compliant stocks. This means that the weight of a stock is determined by both market-capitalisation and the respective score (the product of the two). The problem with such an approach is that, while divesting from high carbon emitters on average, the weight of a stock in a portfolio can increase over time if the stock is performing well relative to the others (e.g. high momentum stocks), irrespective of the carbon emission levels or change in carbon emission.

To illustrate this point, we construct a portfolio that weights securities based on the product of market-cap and the carbon score. The latter is defined as a normal cumulative density function of the

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standardised carbon intensity metrics that are iteratively winsorised and re-standardised until they range between 3 and -3. Stocks with a missing carbon intensity metric are assigned the standardised score of 0, and coal companies are excluded from the investment universe. This approach is quite popular among index providers, including the ones that have low-carbon index offerings[13].

Table 6 provides the analysis that highlights the problems with the score-weighting approach. Indeed, the score-weighted portfolio is expected to significantly reduce the average carbon intensity. In fact, we observe that the weighted average carbon intensity of this portfolio reflects a reduction of 84% relative to the cap-weighted index, on average over the five-year period we consider. Despite this very strong reduction in overall average intensity, the portfolio leads to problematic positions in individual stocks. Indeed, it systematically increases allocation over time[14] towards more than 30% of the stocks that fall into the category of the "worst emitters", i.e. 10% of the stocks with the highest carbon intensity. Increasing allocation to the stock that is among the worst emitters does not seem to be a good way to engage with companies.

Table 6: Percentage of deteriorators and worst emitters receiving higher weights in score-weighted portfolio.
The analysis is based on the Scientific Beta United States universe, from June 2014 to June 2019. Each June, we exclude coal stocks and classify the remaining stocks into deciles according to their carbon intensity over the previous year. Carbon intensity is the sum of scope 1 and scope 2 emissions divided by total revenue. Carbon stocks are the ones that (1) belong to the coal industry or derive turnover of at least 30% from thermal coal mining, (2) belong to the utility industry, which makes significant use of coal in its power generation fuel mix (30%), and (3) own coal reserves, except those in the iron and steel industry. The worst emitters are those classified within the highest decile, i.e. top 10% after exclusion of coal companies. The deteriorators are those classified within a higher decile compared to the previous year. The reported figures correspond to the percentage of stocks among the worst emitters and deteriorators that have a higher weight in a score-weighted portfolio than in the previous. The score-weighted portfolio weights securities based on their score times the market-capitalisation. Scores are transformed into a cumulative distribution function of the normalised (truncated z-Score at 3 and -3) Carbon Intensity measures.

Scientific Beta United States	Percentage of deteriorators with increasing weight	Percentage of the worst emitters (10%) with increasing weight
2015	47.1%	40.9%
2016	41.2%	60.5%
2017	47.5%	44.4%
2018	40.0%	39.6%
2019	48.0%	32.6%

While score-weighting clearly sends "wrong signals" to the worst emitters, it also happens to be the case when it comes to the firms that increase their carbon emissions. We extend the previous analysis by focusing on firms that had significantly increased their carbon intensity relative to the respective equity universe. If a firm moves from one decile of carbon intensity to a higher decile, we refer to such firms as "deteriorators".[15]

Here again, the score-weighted portfolio would increase allocation to more than 40% of the deteriorators. These firms lack incentives to reduce their carbon emissions. However, score-weighted portfolios would do the opposite and increase their respective weights. As such, we observe that the score-weighted approach not only fails to allow the investments to be controlled effectively according to the carbon intensity, but also according to the evolution in this carbon intensity.

13 - See e.g. the methodology of FTSE Global Climate Index Series, available at: <https://research.ftserussell.com/products/downloads/FTSE_Global_Climate_Index_Series.pdf>
14 - The differences in weights are compared between two years in the month of June, when we update carbon intensity metrics.
15 - Using deciles allows one to mostly ignore minor changes in terms of the ranking of stocks. If a stock moves from one decile to another, it is expected (on average) to rank higher or lower than 10% of the stocks in the universe, in terms of carbon intensity. Moreover, we exclude coal companies in this analysis as they were screened out from the investment universe.

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The illustrations above clearly indicate that using firm-level scores to tilt towards low carbon intensity stocks leads to a vague message to firms. While on average, score-weighting approach reduces weighted average carbon intensity, the change in stock weights is often not in line with the change in carbon emissions of the firm. Even more seriously, it can ultimately lead to the wrong message being sent to their directors. The worst emitters would be clearly penalised in an exclusion approach. However, using the score/tilted approach, these firms can experience a resurgence in investment without making any effort or change in practices with respect to the environmental cost of their activity.

Yet Another Way to Send Mixed Signals: Incorporating Low-Carbon and Factor Exposure Objectives Using Optimised Weighting Scheme

The problem with score-based approaches to green investing is only magnified when multiple stock-level information is mixed. Some index providers promote products that use portfolio-optimisation techniques to respect both ESG/low-carbon and factor exposure objectives[16]. Such approaches can lead to even greater increases in weights among the worst emitters. This is intuitive even without looking at the results, since optimisation will only care about the average carbon intensity across the portfolio. Moreover, such mixing approaches also consider other stock-level characteristics, such as factor scores and contribution to tracking error. Pursuing the low carbon objective and other objectives simultaneously can lead to increasing weights to a firm even if its emissions have become much worse over time.

To illustrate the point, we construct a stylised multi-factor portfolio that minimises the tracking error with respect to the broad cap-weighted index, while achieving a similar level of factor-score intensity (sum of individual factor scores) and carbon intensity to a low carbon smart beta strategy which simply excludes the 10% worst emitters. In particular, this reference strategy is a Low Carbon HFI Multi-Beta 6-Factor Equal-Weighted Portfolio, constructed in a top-down manner on a decarbonised universe (excluding the worst 10% emitters).[17] We estimate the covariance matrix of stock returns with a robust methodology that uses principal component analysis, based on the past 104 weekly observations. This significantly reduces instability introduced by noise in the covariance matrix.

Unsurprisingly, the optimisation-based portfolio leads to a substantial reduction in weighted average carbon intensity compared to the cap-weighted index. During the period we consider, this reduction amounts to 74% on average. Despite this reduction on average, the strategy leads to problematic weights in the worst-offending stocks. The results in Table 7 confirm that the optimisation-based portfolio would increase the weight of the worst deteriorators quite often. For example, each year between 2016 and 2018, the optimisation-based portfolio allocated higher weight to more than 60% of the stocks that were among the worst emitters in the universe. We also observe that, in certain years, allocation across more than 10% of the worst emitters is higher than that of the cap-weighted index.

16 - For example, the MSCI World Select Multiple Factor ESG Low Carbon Target Index, available a t : <https://www.msci.com/eqb/methodology/meth_docs/MSCI_World_Select_Multiple_Factor_ESG_Low_Carbon_Target_Index_Methodology_Jan2019.pdf>

17 - This is also a stylised portfolio that applies 10% exclusion of stocks with the highest carbon intensity from the initial universe, after excluding the coal companies. It then selects 50% of the stocks with the highest factor scores and excludes 40% of the remaining stocks with the lowest multi-factor scores (HFI). The resulting portfolio is an equal-weighted allocation across six single-factor HFI indices that equal-weight the selected stocks (top-down approach). The resulting portfolio is a simplified version of Scientific Beta United States Low-Carbon High-Factor-Intensity Multi-Beta Multi-Strategy 6-Factor Equal-Weighted index. The idea behind using stylised portfolio is to avoid impact of implementation rules. The factors considered are the size, value, momentum, low volatility, high profitability, and low investment.

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To sum up, our illustrations show that when one starts to mix multiple objectives, both financial and non-financial, the message sent to firms that increase their emissions or to those that already emit a lot will not be consistent. Engaging with firms using either a score-weighted approach, or using optimisation-based approaches to also respect factor exposure objectives, is unlikely to incentivise firms to emit less. If an investor engages with firms to reduce their emissions, and at the same time increases the weights of the worst emitters, they will send a contradictory signal, which is likely to undermine the impact of the engagement policy.

Table 7: Percentage of worst emitters receiving higher weights in optimisation-based portfolio.
The analysis is based on Scientific Beta United States universe, from June 2014 to June 2019. Each June, we exclude coal stocks and classify the remaining stocks into deciles according to their carbon intensity over the previous year. Carbon intensity is the sum of scope 1 and scope 2 emissions divided by total revenue. Carbon stocks are the ones that (1) belong to the coal industry or derive turnover of at least 30% from thermal coal mining, (2) belong to utility industry that make significant use of coal in their power generation fuel mix (30%), and (3) own coal reserves, except those in iron and steel industry. The worst emitters are those classified within the highest decile, i.e. top 10% after exclusion of coal companies. The reported figures correspond to the percentage allocation across the worst emitters and the percentage of stocks among the worst emitters that have a higher weight in an optimisation-based portfolio than in the cap-weighted market portfolio.

Scientific Beta United States	Percentage of worst emitters (10%) with increasing weight	Percentage of worst emitters (10%) with higher weight than the Broad Cap-Weighted Index
2015	18.2%	2.0%
2016	60.5%	0.0%
2017	68.9%	4.1%
2018	68.8%	12.2%
2019	17.4%	10.4%

Conclusion

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It is often argued that an investor who is dissatisfied with a company's ESG behaviour, and who wishes to remedy the situation, needs to stay on as its shareholder and engage with it. Indeed it is believed that if the investor divests from the company, its influence over the company will cease. Moreover, the act of divesting is seen as a passive approach that has no bearing on the company's management: divesting is viewed as a capitulation rather than a form of action.

We have argued that both divestment and engagement are actions that promote change, and we have seen from the empirical results of academic studies that both approaches can be effective. We have also seen that these two strategies are entirely compatible: the rise of collaborative engagement campaigns, in which current and potential shareholders combine their forces, are testimony to the fact that divestment does not put an end to an investor's possibility to engage with a company. Divestment and engagement are hence not mutually exclusive. And a shareholder who engages with a company without signalling a willingness to draw a red line – an exit in case engagement fails to produce the desired outcome – will enter the negotiation in a weak position: divestment is in that sense a prerequisite for effective engagement. Conversely, engagement can make divestment campaigns more effective: noisy exists can be more impactful than silent ones. Therefore, far from being mutually exclusive, engagement and divestment are mutually reinforcing.

Those who deem ESG divesting strategies as incompatible with engagement sometimes see ESG mixing strategies – i.e. so-called ESG integration strategies whereby ESG data and analysis are mixed with traditional financial signals in the portfolio construction process – as a good match with ESG engagement. However, contrary to a common perception, ESG mixing strategies such as over/underweighting based on ESG scores or using portfolio-average ESG scores as a constraint in an optimiser, also lead to divesting based on ESG scores. But such divestments are arguably less effective than those that result from straightforward filtering of the worst ESG performers:

- Even at its simplest, ESG reweighting dilutes the impact of the divesting over a larger number of stocks and may lead to divesting from companies with better ESG performances than filtering does. Mixing of ESG and financial characteristics lead to compensation at stock level, which can only send muddled signals to companies in respect of ESG performance.
- ESG optimisation based on portfolio-average ESG scores allows compensation of ESG performance across stocks which further dilutes any potential for signalling.

As an illustration of these limitations, we have shown that the application of popular score/tilting or portfolio optimisation construction can lead to a preference for portfolios whose average carbon scores are very much lower than those of the reference cap-weighted index. At the same time, this approach increases positions in the firms with the worst carbon intensity scores, in absolute terms or over time. This inconsistency sends an incoherent message to firm's directors, preventing a serious engagement policy in this ESG dimension from being implemented.

In contrast with ESG mixing strategies, straightforward ESG filtering, i.e. removing the worst ESG performers from the investable universe, concentrates the divesting on the ESG laggards and sends clear-cut signals to all companies and stakeholders. In combination with ESG engagement, in particular through collaborative ESG campaigns, this more direct approach sets the ground for an effective ESG investing policy.

References

References

• Becht, M., J. Franks, C. Mayer and S. Rossi (2009). Returns to shareholder activism: Evidence from a clinical study of the Hermes UK Focus Fund. *Review of Financial Studies* 22: 3093–129.

• Bello, Z.Y. (2005). Socially responsible investing and portfolio diversification. *Journal of Financial Research* 28(1): 41-57.

• Boutin-Dufresne, F. and P. Savaria (2004). Corporate Social Responsibility and Financial Risk. *The Journal of Investing* (Spring): 57-66.

• Christiansen, E. and F. Ducoulombier (2018) ESG Incorporation – A Review of Scientific Beta's Philosophy and Capabilities. Scientific Beta white paper, September.

• Dawkins, C. (2018). Elevating the Role of Divestment in Socially Responsible Investing. *Journal of Business Ethics* (December).

• Dimson, E., O. Karakaş and X. Li (2015). Active ownership. *Review of Financial Studies* 28(12): 3225-68.

• Dimson, E., O. Karakaş and X. Li (2017). Local leads, backed by global scale: the drivers of successful engagement. *RI quarterly* 12: 14-16.

• Dimson, E., I. Kreutzer, R. Lake, H. Sjo and L. Starks (2013). Responsible Investment and the Norwegian Government Pension Fund Global. Strategy Council.

• Dordi, T. and O. Weber (2019). The Impact of Divestment Announcements on the Share Price of Fossil Fuel Stocks. *Sustainability* 11: 3122.

• Ducoulombier, F. and V. Liu (2019). Scientific Beta Low Carbon Option – Supporting the Transition to a Low Carbon Economy and Protecting Multifactor Indices against Transition Risks. Scientific Beta white paper, June.

• Dunn, K., S. Fitzgibbons and L. Pomorski (2017). Assessing Risk Through Environmental, Social and Governance Exposures, White Paper, AQR Capital Management.

• ESG and passive investment strategies signatory consultation results (2020), PRI 2020.

• Ewers, B., J.F. Donges, J. Heitzig and S. Peterson (2019). Divestment may burst the carbon bubble if investors' beliefs tip to anticipating strong future climate policy.

• Flammer, C. (2015). Does Corporate Social Responsibility Lead to Superior Financial Performance? A Regression Discontinuity Approach. *Management Science* 61(11): 2549-68.

• Friede, G., T. Busch and A. Bassen (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment* 5(4): 210–33.

• FTSE Russell (2020). FTSE Global Climate Index Series, April 2020. Available at: <https://research.ftserussell.com/products/downloads/FTSE_Global_Climate_Index_Series.pdf>

• Gond, J.P, N. O'Sullivan, R. Slager, M. Homanen, M. Viehs and S. Mosony (2018) How ESG engagement creates value for investors and companies. PRI.

• Goodman, J., C. Louche, K. van Cranenburgh and D. Arenas (2014). Social Shareholder Engagement: The Dynamics of Voice and Exit. *Journal of Business Ethics*, 125: 193–210.

• Heinkel, R., A. Kraus, and J. Zechner (2001). The Effect of Green Investment on Corporate Behavior. *Journal of Financial Quantitative Analysis* 36: 431.

References

• Hirschman, A.O. (1970). Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States. Harvard University Press.

• Humphrey, J., G. Warren and J. Boon (2016). What is Different about Socially Responsible Funds? A Holdings-Based Analysis. *Journal of Business Ethics Volume* 138(2): 263-277.

• Jacobsen, B., W. Lee and C. Ma (2019). The Alpha, Beta, and Sigma of ESG: Better Beta, Additional Alpha? *The Journal of Portfolio Management* September 45(6): 6-15.

• Kolstad, I. (2014) Three myths about engagement and exclusion in responsible investment, Chr. Michelsen Institute working paper.

• Lee, D.D, and R.W. Faff (2009). Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective. *The Financial Review* 44(2). 213–237.

• Martinsson, J. (2011). Global Norms: Creation, Diffusion, and Limits. The International Bank for Reconstruction and Development / The World Bank, Communication for Governance & Accountability Program.

• MSCI (2019). MSCI World Select Multiple Factor ESG Low Carbon Target Index Methodology, January 2019. Available at: https://www.msci.com/eqb/methodology/meth_docs/MSCI_World_Select_Multiple_Factor_ESG_Low_Carbon_Target_Index_Methodology_Jan2019.pdf>

• OECD (2017). Investment governance and the integration of environmental, social and governance factors.

• Ransome, W. and C. Sampford (2010), Ethics and Socially Responsible Investment – A Philosophical Approach, Farnham: Ashgate.

• Revelli, C. and J-L. Viviani (2015). Financial Performance of Socially Responsible Investing (SRI): What Have We Learned? A Meta-Analysis. *Business Ethics: A European Review* 24(2): 158–85.

• Robeco (2018). The truth about sustainability investing Fact-checking nine common ideas, March 2018.

• Robeco (undated). Engagement Policy, Robeco Institutional Asset Management.

• Sassen, R., I. Hardeck and A. Hinze (2016). Impact of ESG factors on firm risk in Europe. *Journal of Business Economics* 86(8): 867-904.

• Trinks, A., B. Scholtens, M. Mulder and L. Dam (2018). Fossil Fuel Divestment and Portfolio Performance. *Ecological Economics* 146(C): 740-48.

About Scientific Beta

About Scientific Beta

EDHEC-Risk Institute set up Scientific Beta in December 2012 as part of its policy of transferring know-how to the industry. Scientific Beta is an original initiative which aims to favour the adoption of the latest advances in "smart beta" design and implementation by the whole investment industry. Its academic origin provides the foundation for its strategy: offer, in the best economic conditions possible, the smart beta solutions that are most proven scientifically with full transparency of both the methods and the associated risks. Smart beta is an approach that deviates from the default solution for indexing or benchmarking of using market capitalisation as the sole criterion for weighting and constituent selection.

Scientific Beta considers that new forms of indices represent a major opportunity to put into practice the results of the considerable research efforts conducted over the last 30 years on portfolio construction. Although these new benchmarks may constitute better investment references than poorly-diversified cap-weighted indices, they nevertheless expose investors to new systematic and specific risk factors related to the portfolio construction model selected.

Consistent with a full control of the risks of investment in smart beta benchmarks, Scientific Beta not only provides exhaustive information on the construction methods of these new benchmarks but also enables investors to conduct the most advanced analyses of the risks of the indices in the best possible economic conditions.

Lastly, within the context of a Smart Beta 2.0 approach, Scientific Beta provides the opportunity for investors not only to measure the risks of smart beta indices, but also to choose and manage them. This new aspect in the construction of smart beta indices has led Scientific Beta to build the most extensive smart beta benchmarks platform available which currently provides access to a wide range of smart beta indices.

Scientific Beta Publications

Scientific Beta Publications

2020 Publications

- Amenc, N., E. Christiansen, M. Esakia, and F. Goltz. ESG Engagement and Divestment: Mutually Exclusive or Mutually Reinforcing? (May).
- Amenc, N. and D. Korovilas. Robustness of Smart Beta Strategies: a Competitor Overview. (May).
- Aguet, D., N. Amenc and E. Shirbini. Q1 2020 Performance Analysis. (April).
- Amenc, N., G. Bruno and F. Goltz. Crowding Risk in Smart Beta Strategies. (April).
- Amenc, N., G. Bruno and F. Goltz. Ten Misconceptions about Smart Beta. (March).
- Amenc, N., G. Bruno and F. Goltz. Investability of Scientific Beta Indices. (March).
- Amenc, N., and F. Ducoulombier. Unsustainable Proposals (February).
- Amenc, N., F. Goltz, and B. Luyten. Intangible Capital and the Value Factor: Has Your Value Definition Just Expired? (February).
- Amenc, N., F. Goltz, B. Luyten and D. Korovilas. Assessing the Robustness of Smart Beta Strategies. (February).
- Aguet, D., N. Amenc. Improving Portfolio Diversification with Single Factor Indices. (January).
- Aguet, D., N. Amenc and F. Goltz. Managing Sector Risk in Factor Investing. (January).
- Aguet, D., N. Amenc and F. Goltz. What Really Explains the Poor Performance of Factor Strategies Over the Last Four years? (January).

2019 Publications

- Amenc, N., and F. Goltz. A Guide to Scientific Beta Multi-Smart Factor Indices. (December).
- Mathani, R. Effective Frameworks for Forecasting Volatility (December).
- Aguet, D. and M. Sibbe. Scientific Beta Analytics: Examining the Financial Performance and Risks of Smart Beta Strategies (November).
- Aguet, D. and N. Amenc. How to Reconcile Single Smart Factor Indices with Strong Factor Intensity (November).
- Aguet, D. and M. Sibbe. Scientific Beta Analytics: Examining the Financial Performance and Risks of Smart Beta Strategies (November).
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Scientific Beta Publications

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