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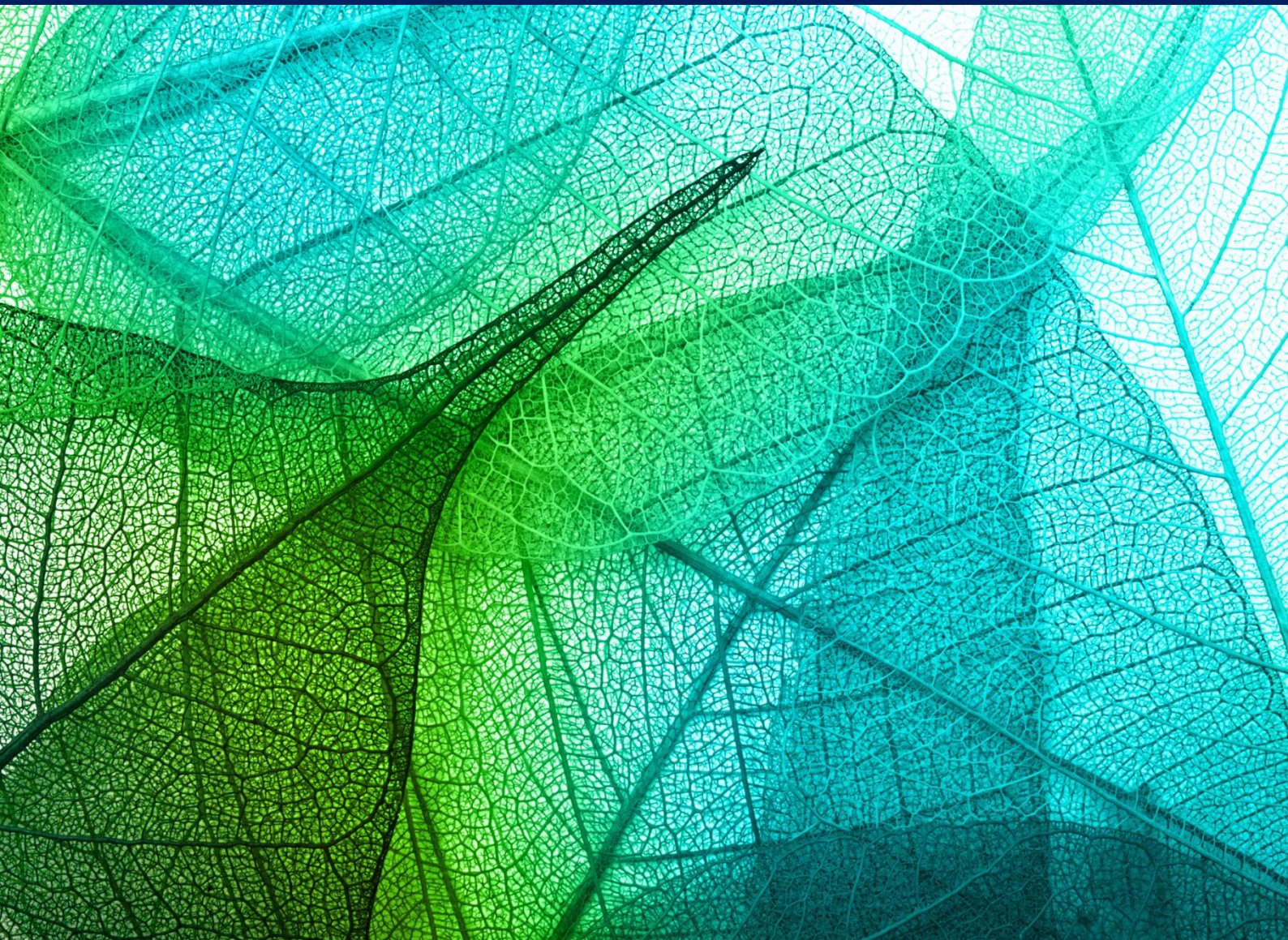


Sustainable Finance and Transmission Mechanisms to the Real Economy

Ben Caldecott, Alex Clark, Elizabeth Harnett, Krister Koskelo,
Christian Wilson & Felicia Liu

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Aligning finance with sustainability is a necessary condition for tackling the environmental and social challenges facing humanity. It is also necessary for financial institutions and the broader financial system to manage the risks and capture the opportunities associated with the transition to global environmental sustainability.

The University of Oxford has world-leading researchers and research capabilities relevant to understanding these challenges and opportunities. The Oxford Sustainable Finance Group is the focal point for these activities and is situated in the University's Smith School of Enterprise and the Environment. The Group is multidisciplinary and works globally across asset classes, finance professions, and with different parts of the financial system. We are the largest such centre globally and are working to be the world's best place for research and teaching on sustainable finance and investment.

The Oxford Sustainable Finance Group is based in one of the world's great universities and the oldest university in the English-speaking world. We work with leading practitioners from across the investment chain (including actuaries, asset owners, asset managers, accountants, banks, data providers, investment consultants, lawyers, ratings agencies, stock exchanges), with firms and their management, and with experts from a wide range of related subject areas (including finance, economics, management, geography, data science, anthropology, climate science, law, area studies, psychology) within the University of Oxford and beyond.

Since our foundation we have made significant and sustained contributions to the field, including in some of the following areas:

- Developing the concept of "stranded assets", now a core element of the theory and practice of sustainable finance.
- Contributions to the theory and practice of measuring environmental risks and impacts via new forms of geospatial data and analysis, including introducing the idea and importance of "spatial finance" and "asset-level data".
- Shaping the theory and practice of supervision as it relates to sustainability by working with the Bank of England, the central banks' and supervisors' Network for Greening the Financial System (NGFS), and the US Commodity Futures Trading Commission (CFTC), among others.
- Working with policymakers to design and implement policies to support sustainable finance, including through the UK Green Finance Taskforce, UK Green Finance Strategy, the UK's Presidency of COP26, and the high-level Transition Plan Taskforce.
- Nurturing the expansion of a rigorous academic community internationally by conceiving, founding, and co-chairing the Global Research Alliance for Sustainable Finance and Investment (GRASFI), an alliance of 30 global research universities promoting rigorous and impactful academic research on sustainable finance.

The Global Sustainable Finance Advisory Council that guides our work contains many of the key individuals and organisations working on sustainable finance. The Oxford Sustainable Finance Group's founding Director is Dr Ben Caldecott.

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How Sustainable Finance Creates Impact: Transmission Mechanisms to the Real Economy

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Abstract

When and how does sustainable finance contribute to a better world? In this paper, we outline the mechanisms through which impact is transmitted from the financial system to the real economy. We argue that, in order to have a positive environmental impact, financial institutions must make a clear and measurable difference in one or more of the following ways: (i) reducing (increasing) the cost of capital for (un)sustainable activities; (ii) increasing (reducing) access to capital for (un)sustainable activities; and (iii) encouraging or enabling sustainable practices by counterparties, such as companies, sovereigns, and individuals. We assess the availability of impact across key asset classes, hypothesising a maximum potential for impact for each. We call for financial institutions, and particularly large universal owners, to integrate the development of “impact budgets” into strategic asset allocation. Future research could usefully consider the implications for impact-oriented portfolio construction in more detail, as well as seeking to develop empirical methods for further testing and quantifying the impact of the different transmission mechanisms discussed here.

Executive Summary

When and how does sustainable finance contribute to a better world? Increasing numbers of financial institutions are committing themselves to align with international goals, such as net-zero greenhouse gas emissions by 2050 (or earlier). As sustainability issues rise up political and social agendas around the world, serious questions remain around the practical role of sustainable finance¹ in supporting the delivery of these goals. Sustainability trends in the financial sector are increasingly well documented, but the extent to which sustainable finance and sustainable investments are directly transforming the real economy (notably, firms and households) remains less clear. This has led to accusations of “greenwashing” and “impact-washing” (Busch et al., 2021) where real-world impact cannot be convincingly demonstrated.

Within the emerging sustainable finance discourse many actors, including a wide range of financial institutions, policymakers, regulators, and civil society organisations, have implicitly or explicitly accepted the view that holding more sustainable assets proportionally equates to having more of a sustainable impact on the real world. Financial institutions are therefore under escalating pressure to increase their holdings of sustainable assets quickly enough to align with environmental thresholds, such as the Paris Agreement. As a result, there is a large and growing body of emerging regulation, target-setting frameworks and methodologies, and literature focused on defining what sustainable activities are. Perhaps the most well-known example of this is the European Union’s sustainable finance taxonomy and associated regulations, which seek to influence investment flows and ultimately asset stocks, by labelling assets as either sustainable or unsustainable.

In this paper we argue that definitional debates over “what” is green or sustainable actually matter less than “how” financial products make the world greener or more sustainable. Building on a nascent literature exploring how sustainable finance can have “impact”, this paper offers a more critical exploration of the transmission mechanisms available to financial institutions to exert real economy impact and examines how these apply differently across key asset classes. The “transmission mechanisms” examined include the *cost of capital* faced by firms when raising finance; *access to liquidity*, which affects corporate operations, planning and refinancing, particularly when under financial pressure; and the financial sector’s role in

¹ This paper focuses on “green” sustainable finance with goals relating to climate change and the environment, although the analysis presented here is also applicable to other areas of sustainability.

changing corporate practices (Table ES-1). This paper examines five key asset classes: public equity (i.e. of listed companies), fixed income (e.g. bonds and loans), private equity (i.e. direct investment in unlisted companies, including venture capital), real assets (e.g. infrastructure and real estate), and hedge funds.

Table ES-1: Transmission mechanisms through which sustainable finance can influence the real economy

Mechanism	Definition	How this can result in real economy impact
Cost of capital	<p>The opportunity cost of similar possible uses for capital resources. In theory, firms invest in projects where returns exceed this opportunity cost.</p> <p>A firm's cost of capital is the weighted average of the cost of equity and cost of debt.</p>	<p>Corporate cost of capital affects firms' ability to finance capital expenditure. Sustainability performance can affect the cost of capital where investors seeking impact, or perceiving lower risks in sustainable firms, or both, offer cheaper financing (i.e. lower return requirements) to more sustainable firms or projects, influencing how capital expenditure is allocated. These preferences can be expressed in traditional bond, loan, and equity markets, and in dedicated markets for sustainable products, including:</p> <ul style="list-style-type: none"> • <i>Sustainability-linked bonds and loans</i>, with coupons or interest rates tied to the achievement of sustainability targets • <i>Green and sustainable bonds and loans</i>, which can price debt differently for sustainable versus unsustainable firms or projects.
Access to liquidity	<p>The ease and speed at which firms can access funding and working capital.</p>	<p>Restrictions on lending to unsustainable projects can constrain the supply of capital for unsustainable activities. This includes both short-term liquidity from banks and longer-term liquidity from financial markets associated with the ability to raise capital from markets, and the cost thereof. Ultimately, this can drive a wedge between the cost of capital for sustainable and unsustainable projects and firms.</p> <p>Firms can access a broader investor base by participating in green or sustainable bond markets. Relative to traditional bond markets, a wider pool of investors can be willing to offer firms funding for impact-aligned or impact-generating projects or strategies. This potential widening of the investor base can be particularly relevant for smaller firms, and/or those with a limited track record in capital markets.</p>

Changing corporate practices

Influence over corporate governance and operations. Application of tools, including but not limited to shareholder engagement and voting rights, to persuade a firm to behave differently than it otherwise would have.

Majority shareholders and coalitions of minority shareholders can directly influence corporate strategy, governance, and organizational management. They can press firms to adopt more sustainable policies and practices, including through:

- **Collaborative engagement** with the management of publicly listed firms and private firms
- **Filing of shareholder resolutions and proxy voting** requiring firms to adopt more sustainable policies and practices.
- **Signalling effects of publicised engagement with, and/or divestment** from, companies that do not adequately alter, or commit to altering, corporate practices.

Creditors without shareholder voting rights can influence corporate practices through making lending conditional on the adoption of sustainable practices and can also engage collaboratively with company management while negotiating future funding agreements.

Impact by asset class: For each asset class we rank the potential impact on counterparties, on a scale from negligible (1) to strong (5). We acknowledge that asset class is only one factor among others that can ultimately affect impact, including firm size and maturity, and the structure and type of a given transaction. Our indicative scoring, by asset class and transmission mechanism in Table ES-2 (assuming an investor in that asset class of a typical size), suggests that the most high-impact asset class is loans, followed by private equity, and that the highest-impact mechanism is via firms' adoption of practices. Public equity is the least likely to generate impact when considering aggregated potential impact across each transmission mechanism (although this does not account for different weightings of each mechanism or the relative size of each asset class).

Table ES-2: Transmission mechanism strength by asset class

	Public equity	Fixed Income (bonds)	Fixed Income (loans)	Private Equity	Real Assets	Hedge Funds
Cost of capital	1 / 3	2 / 4	3 / 5	2 / 3	2 / 3	2 / 4
Access to liquidity	1 / 3	2 / 3	3 / 5	2 / 4	1 / 3	1 / 4
Adoption of practices	2 / 4	1 / 3	3 / 5	3 / 5	2 / 4	1 / 4

Scale: 1: negligible 2: limited 3: moderate 4: significant 5: strong

Variance in potential impact reflects the specific characteristics of each asset class. For instance, in public equities, any given investor’s investment in (divestment from) the publicly listed shares of green (dirty) companies is not likely to have an impact on the firm’s cost of capital, as any one stake is typically small, and most listed firms have dispersed, diversified ownership structures. Meanwhile in lending, where firms are reliant on fewer lenders or even just one, the interest rate set by the lender can significantly determine the cost of capital that firm faces.

The paper then sketches out ideal types of the maximum potential impact for investors by asset class. For instance, an impact-maximising public equity investor would use active engagement in coalition with other investors, building up to voting against management, or ultimately divestment. A bond investor or lender would promote the uptake of sustainability-linked bonds and loans. A private equity fund would impose more sustainable practices at investee firms.

Figure ES-1: Illustrative relationship between asset class impact and risk-return profile



After examining each major asset class separately, the analysis concludes by considering how financial institutions with multi-asset portfolios could pursue impact in their strategic asset allocation (SAA), putting forward the notion of an “impact budget” to go alongside traditional risk budgets. On SAA, asset owners seeking to maximise both impact and risk-return may want to weight private equity and loans more highly in portfolios (See Figure ES-1).

These findings are relevant to investors seeking to exert impact on the real economy, and especially for universal owners, large financial institutions who, due to their size and portfolio composition, effectively “own the economy” and are less able to dampen the impacts of macroeconomic trends. Further research could consider more detailed implications and seek to develop empirical methods for testing and quantifying the impact of the different transmission mechanisms discussed here and the relationships between them.

1. Introduction

When and how does sustainable finance contribute to a better world? Increasing numbers of financial institutions are committing themselves to align with international goals, such as net-zero greenhouse gas emissions by 2050 (or earlier). As sustainability issues rise up political and social agendas around the world, serious questions remain around the practical role of sustainable finance² in supporting the delivery of these goals. Sustainability trends in the financial sector are increasingly well documented, but the extent to which sustainable finance and sustainable investments are directly transforming the real economy (notably, firms and households) remains less clear. This has led to accusations of “greenwashing” and “impact-washing” (Busch et al., 2021) where real-world impact cannot be convincingly demonstrated.

The concurrent rapid growth in sustainable finance instruments and investment strategies reflects two separate trends: growing recognition by financial institutions that sustainability risks, such as climate change, can affect financial returns, financial stability, and creditworthiness of firms; and growing desire for “impact”, with stakeholders ranging from retail investors to large institutional asset owners looking to make positive contributions to sustainability goals through their investment decisions. A 2020 survey of large banks found investor demand for sustainable products to be a major driver for integrating environmental, social and governance (ESG) considerations into lending practices (OECD, 2020). In a 2019 survey of credit risk analysts that also cited investor demand, over 80% of respondents saw ESG considerations as a central component of risk analysis. The European Systemic Risk Board (2020) found that financial markets’ failure to fully price climate-related risks exposed investors in high-emitting firms to significant losses from credit downgrade events.

In this paper, we contribute to addressing a gap in the sustainable finance literature by exploring the “transmission mechanisms” through which finance can influence the real economy, focusing on the role of investments. In doing so, we generate a set of hypotheses for the “potential impact” that investments in major asset classes can have, drawing implications for manager selection, strategic asset allocation, and universal ownership.

We critique the assumption that simply holding green assets is sufficient to contribute to positive environmental outcomes. While definitional debates over “what” is green are

² This paper focuses on “green” sustainable finance with goals relating to climate change and the environment, although the analysis presented here is also applicable to other areas of sustainability.

important, we argue that this should not be the main source of contention if sustainable finance is to support sustainable outcomes. What counts is “how” financial products make the world greener. Without this criterion, investors cannot have confidence that their assets and investments are making an impact and cannot reliably distinguish between genuinely sustainable finance and greenwashing.

Busch et al. (2021) called for a “re-orientation of what impact investments are”, and we answer this call through an asset class-specific typology of financial transmission mechanisms whereby investor action generates a change in the real economy. Ultimately, we argue that the real economy impact of sustainable finance should be judged on two broad criteria. First, the financial product or investment approach should be encouraging sustainable activity, and/or discouraging unsustainable activity. Second, it should make a clear and measurable difference in one or more of the following ways: (i) reduce (increase) the cost of capital for (un)sustainable activities; (ii) increase (reduce) access to capital for (un)sustainable activities; (iii) encourage or enable sustainable practices by firms.

We begin by summarising current debates (Section 2), then outline transmission mechanisms for investments from the financial to the real economy and their application to sustainable finance (Section 3) as the basis for assessing the theoretical impact of sustainable investing by asset class (Section 4) and positing ideal-type “impactful” sustainable finance strategies for each (Section 5). Section 6 evaluates the implications for portfolios and strategic asset allocation, and Section 7 concludes.

2. Literature Review: Sustainable Finance and Real Economy Impact

Our paper builds on a nascent literature linking the real economy impact in investments to sustainable finance, in which “impact” is not yet a well-defined concept (Busch et al., 2021; Nicholls and Daggars, 2016). Authors from academia, public policy and finance have different understandings of the means, motivations and outcomes of impact in this context. This has been exacerbated by blurred distinctions between “sustainable finance” and “impact investment”.

The “impact investment” market is estimated at US\$502 billion by the most prominent network in the field (Global Impact Investing Network, 2020). Meanwhile, the amount of assets managed sustainably stood at US\$30.7 trillion at the start of 2018 by a broad definition (Global Sustainable Investment Alliance, 2019). Naturally, this raises questions regarding what counts as impact investment, and whether sustainable finance ex-“impact” is really sustainable. Whilst several classification typologies highlight impact investment as a distinctive sustainable investment approach (O’Donohoe et al., 2010), it is often ill-distinguished from the broader categories of socially responsible investment and/or ESG³ approaches. For example, the Global Sustainable Investment Alliance (2019, p. 3) describes the impact investment market as “a small but vibrant segment of the broader sustainable and responsible investing universe”.

To further distinguish impact investment from other sustainable investing strategies, Busch et al. (2021) provide a useful framing of the evolution of sustainable finance, arguing that impact investing and the shift towards consideration of investment outcomes and portfolio alignment with sustainability goals can be viewed as “Sustainable Finance 3.0” (where “1.0” centred around value-driven socially responsible investment, and “2.0” saw mainstreaming into financial markets through ESG-based approaches to sustainable value creation). Broadly, the literature agrees that impact investment requires focussing on the social and/or environmental outcomes of investments, rather than solely on financial performance (Brest and Born, 2013; Freireich and Fulton, 2009). Busch et al. (2021) go further, suggesting there should be differentiation between impact-aligned investments and impact-generating investments. While for impact-aligned investments, environmental and/or social outcomes can be claimed *post hoc* (i.e. already-realized outputs measured against sector benchmarks, or degree of

³ ESG refers to the integration of environmental, social and/or governance factors in investment decision making and is often used synonymously with the term “responsible investment”. See: [Principles for Responsible Investment](#).

alignment with impact goals), impact-generating investments require that further impact be achieved as a result of the investment.

Two remaining issues are particularly thorny topics of discussion in defining impact: intentionality and additionality (Brest and Born, 2013; Findlay and Moran, 2019). Here we address intentionality, arguing that financial institutions should be more rigorous in articulating and documenting their theory of change for creating real economy impact. We do not explore the concept of additionality (i.e. whether or not impact-aligned investments, and any further impact that results, would have occurred anyway). Ideally, sustainable finance products and funds should aim to generate (and measure) additional impact. But here we are content with identifying criteria for demonstrating that a sustainable finance product, fund or investment approach is actually having a positive impact, not whether that impact would have happened anyway given a counterfactual baseline. The establishment of baselines for assessing impact is also an important discussion, related to additionality (Gillenwater, 2012), but is beyond the scope of this paper.

In summary, impact literature to date has focused on definitional issues and identifying potential impact outcomes. Brest and Born (2013), for example, outline six kinds of capital benefit that impact investors can provide. Here, we are more interested in “how” this real economy change occurs. Busch et al. (2021) outline three mechanisms through which sustainable finance can achieve impact (providing additional capital allowing firms or projects to generate social/environmental impact; investing in companies with forward-looking targets for impact generation; or prompting firms to change through engagement and voting rights). In their review of channels for investor impact, Kölbel et al. (2020) identify shareholder engagement, capital allocation and indirect impact, finding that the first is well supported in the literature, the second “only partially”, and that claims of indirect impact currently “lack empirical support”. Building on these foundations, we conduct an extended exploration of the transmission mechanisms available to financial institutions to have real economy impact, and seek to assess their relative potential impact through the lens of different asset classes. We then offer recommendations for how this can influence manager selection and strategic asset allocation.

From this grounding, we can begin to assess claims of sustainability outcomes made by existing sustainable finance products and strategies against evidence of these outcomes. Without rigorous evaluation, the risk of “impact-washing” will likely continue unabated. Impact-

washing refers to the use of the term “impact” and/or “sustainable” as a marketing tool to attract capital or boost reputations without providing material solutions to environmental and/or societal challenges (Busch et al., 2021). This can dilute the reputation and contribution of sustainable finance to these challenges (Findlay and Moran, 2019; Harji & Jackson, 2012).

How, therefore, do investors who want to label their products as contributing to sustainable goals actually make—and demonstrate—positive contributions to real-world changes? Prevailing discourse and policymaking on green finance, for example, implicitly assumes that holding assets defined as environmentally sustainable is sufficient to be sustainable. This view is fundamental to the European Commission’s current approach (see Kahlenborn et al., 2017), evident in the sustainable finance taxonomy proposed by the High-Level Expert Group on Sustainable Finance (2020) and the EU Sustainable Finance Action Plan, as well as collaborative efforts like the Science-based Targets Initiative (SBTi).

However, there is insufficient evidence that rebalancing a portfolio to hold a greater proportion of green assets necessarily has any real economy impact. Most green assets are acquired through secondary trading and are (at best) impact-aligned rather than impact-generating: any impact (e.g. emissions reductions) has already been achieved. Further, divesting from high-emitting or otherwise misaligned companies has been shown to have limited impact on real economy emissions due to emissions “leakage” as alternative capital sources step in (Ansar et al. 2013; Hunt and Weber, 2019). If we define impact as “the change that investor activities achieve in company impact” (Kölbel et al., 2020), simply holding green assets, or not holding brown assets, does not automatically imply any influence over the underlying companies’ activities. More to the point, there is no robust evidence that aligning a portfolio with a given vision for the wider economy (e.g. Paris alignment, the EU sustainable finance taxonomy) or according to a general set of principles (e.g. recommendations of the Task Force for Climate-Related Financial Disclosures (TCFD)) is a compelling proxy for the real economy changes required to deliver that vision.

Addressing the potential for impact-washing is a major priority for governments and regulators – see, for instance, the UK government’s Roadmap to Sustainable Investing (2021); and more recent guidance from by the UK’s Financial Conduct Authority (2021) introducing TCFD-aligned disclosure requirements for asset managers and asset owners, and broadening the pool of listed issuers subject to TCFD-aligned listing requirements. In general, however, the approach endorsed by the EU taxonomy and implicit in most existing regulatory frameworks

does little to acknowledge the critical difference between portfolio alignment and the real economy changes that must be made to meet impact targets. Taxonomy-based approaches do not require investors to take responsibility for deciding what qualifies as “green”, nor do they classify financial products to reflect the merits of the real economy activity underlying them. “Climate alignment” of financial portfolios can be subject to many of the same limitations, but should not be confused with impact-based strategies. Aligning an individual portfolio with climate-related goals does not necessarily require an institution to have any real economy impact. This does not make alignment incompatible with impact but does mean that not all alignment strategies are created equal. An alignment strategy consisting of an aspirational “net zero portfolio” objective that does not substantively alter decision-making processes, differs markedly from “impact-oriented climate alignment” which focuses “decision-making on facilitating rapid, real economy decarbonization” in line with specific time-bound climate targets (RMI, 2022). While regulatory guidance on alignment claims will likely continue improving, buyers of financial products still largely lack the means to assess whether an institution’s alignment commitment is driving any real economy impact, or is simply a tool to avoid taking short-term action. This paper seeks to accelerate consideration of these potential pitfalls for sustainable finance-focused actors and offers a framework for defining real economy impact more robustly.

3. Transmission Mechanisms for Real Economy Impact

We posit that impact is achieved only when a sustainable investment reaches the real economy⁴ through at least one of three “transmission mechanisms”: the *cost of capital* faced by firms when raising finance; firms’ *access to liquidity*, which affects corporate operations, planning and refinancing, particularly when under pressure; and investors’ influence over *corporate management and practices*. These three mechanisms are interlinked, and the nature of the impact that results depends at least partly on these linkages. Exerting pressure on firms through these channels may also improve or inhibit their ability to *manage and mitigate risk*; and generate broader *spill-over effects* which in turn can trigger systemic feedbacks.

These three transmission mechanisms and their applications to sustainable investment are described below and summarised in **Table 1**.

Table 1: Summary of transmission mechanisms through which sustainable finance can influence the real economy

Mechanism	Definition	How this can result in real economy impact
Cost of capital	<p>The opportunity cost of similar possible uses for capital resources. In theory, firms invest in projects where returns exceed this opportunity cost.</p> <p>A firm’s cost of capital is the weighted average of the cost of equity, and cost of debt.</p>	<p>Corporate cost of capital affects firms’ ability to finance capital expenditure. Sustainability performance can affect the cost of capital where investors seeking impact, or perceiving lower risks in sustainable firms, or both, offer cheaper financing (i.e. lower return requirements) to more sustainable firms or projects, influencing how capital expenditure is allocated. These preferences can be expressed in traditional bond, loan, and equity markets, and in dedicated markets for sustainable products, including:</p> <ul style="list-style-type: none"> • <i>Sustainability-linked bonds and loans</i>, with interest rates tied to the achievement of sustainability targets. • <i>Green and sustainable bonds and loans</i>, which can price debt differently for sustainable versus unsustainable firms or projects.

⁴ Although we focus on firms as a proxy for the real economy, the same logics could also apply to households, governments etc.

Access to liquidity

The ease and speed at which firms can access funding and working capital.

Restrictions on lending to unsustainable projects, can constrain the supply of capital for unsustainable activities. This includes both short-term liquidity from banks and longer-term liquidity from financial markets associated with the ability to raise capital from markets, and the cost thereof. Ultimately, this can drive a wedge between the cost of capital for sustainable and unsustainable projects and firms.

Firms can access a broader investor base by participating in green or sustainable bond markets. Relative to traditional bond markets, a wider pool of investors can be willing to offer firms funding for impact-aligned or impact-generating projects or strategies. This potential widening of the investor base can be particularly relevant for smaller firms, and/or those with a limited track record in capital markets.

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Majority shareholders and coalitions of minority shareholders can directly influence corporate strategy, governance, and organizational management. They can press firms to adopt more sustainable policies and practices, including through:

- **Collaborative engagement** with the management of publicly listed firms and private firms.
- **Filing of shareholder resolutions and proxy voting** requiring firms to adopt more sustainable policies and practices.
- **Signalling effects of publicised engagement with, and/or divestment** from, companies that do not adequately alter, or commit to altering, corporate practices.

Creditors without shareholder voting rights can influence corporate practices through making lending conditional on the adoption of sustainable practices and can also engage collaboratively with company management while negotiating future funding agreements.

3.1 Cost of Capital

The cost of capital, composed of cost of equity and debt capital, is influenced by a variety of macroeconomic variables, including central bank interest rates, inflation, the business cycle, and borrowers' creditworthiness (Elton, 1994). It can also be driven by factors such as secondary market liquidity, which has been shown to affect the cost (yield spread) of new bond issuance (Chen et al., 2007; Goldstein et al., 2019) and the cost (fees) of new equity issuance (Butler et al., 2005). The cost of capital can be calculated at project- and corporate-level. In the latter case, the most common approach is the capital asset pricing model (Brotherson et al., 2013; Brounen et al., 2004; Graham & Harvey, 2001).

Evidence shows a clear negative correlation between the implied cost of equity capital and corporate investment (with higher equity costs associated with lower investment, consistent with theory), but not for the cost of equity calculated according to factor-based approaches like the capital asset pricing model (Murray and Shen, 2016; Byoun, Ng, and Wi, 2015). For the cost of debt, there is clear evidence both at the firm level and the macro-level that corporate investment is negatively correlated with the cost of debt capital (Gilchrist and Zakrajsek, 2007, 2012; Murray and Shen, 2016; Lin et al., 2018). Emerging evidence suggests that the overall sensitivity of firm investment to the cost of capital is lower under conditions of greater economic policy uncertainty, especially for smaller and unrated firms, and for those operating in less transparent countries (Drobetz et al., 2018). However, for large, listed companies, ordinary fluctuations in the equity cost of capital (via stock prices) are less likely to directly affect short-term investment activity (Blanchard et al., 1993). Smaller, younger firms, unlisted firms, or those in less-developed financial markets, are more likely to be affected by external financing costs (Kölbel et al., 2020). Firms, particularly large ones, can also use internal finance (retained earnings) to finance projects with little or no exposure to external funding costs (Allen and Gale, 2000). Listed firms generally have enough cashflow and cash reserves to be largely self-financing if required, such that the cost of (external) capital matters less to them (Kay, 2015).

There are indications that corporations' cost of capital is being affected by their sustainability performance, though this varies across asset classes. Zhou et al. (2021) show divergence in the cost of capital between renewable and high-carbon energy companies. Evidence collated in the same publication finds that ESG and CSR ratings that incorporate environmental performance measures are associated with a lower cost of equity (Drobetz et al., 2018) and cost of debt (Ge and Liu, 2015), as well as lower credit default risks (Kiesel and Lücke, 2020). Similar associations have emerged for the cost of capital and carbon emissions (Chen and

Silva Gao, 2012; Kleimeier and Viehs, 2016) and may become more widespread and pronounced as government and investor climate policies tighten. For instance, some financial institutions now require a hurdle rate for new coal projects of 40%, up from 16% for recently completed coal projects, and compared to 10% for wind or solar (Fattouh, 2019).

Recent survey evidence (Alessi, 2019) suggests that some investors are explicitly willing to accept a lower remuneration for investments that are linked to more sustainable economic activities. The advent and growth of sustainability-linked loans/bonds, where the interest/coupon rate that banks/investors charge is tied to reaching pre-agreed thresholds on sustainability metrics, are the clearest examples to date; and while the market for these is still small and nascent, it is growing rapidly (Linklaters, 2019; Environmental Finance, 2022, p.28).

Green and sustainable bond issuance represented 11% of total bond issuance in 2021, increased by 64% from 2020 to reach \$992 billion in 2021, and is estimated to reach \$1.35 trillion (and 15% of all issuance) in 2022 (Moody's, 2022). The use of green and sustainable bonds allows for financing of balance sheets with guarantees of "use of proceeds" and mandatory impact reporting mechanisms. Evidence that these attributes lower cost of capital for the activities being financed is mixed and context-specific (Brennan and MacLean, 2018; Shishlov et al., 2016). Tang and Zhang (2020), for instance, find in a global study that although stock prices rise in response to green bond issuance, this rise is not driven entirely by changes in the cost of debt. Recent analysis of China's green bond market provides strong evidence that green bond issuance not only lowers corporate cost of debt, but is also associated with a lower overall cost of capital for issuers (Zhang, Li and Liu, 2021). Leaving aside debates on additionality, some studies show no difference in yield compared to conventional bonds (OECD, 2017); others show a modest negative premium in the order of two basis points (0.02%), giving issuers a marginally lower cost of capital (Zerbib, 2019). It is unclear whether green bonds are less exposed to market conditions, although they can be used to refinance impact-aligned projects favourably as green bond demand rises.

3.2 Access to Liquidity

Without access to liquidity, working capital, and funding, managing cashflow is more difficult, and longer-term projects and investments will be disincentivised (Bencivenga et al., 1995). The presence of investors and banks willing to provide liquidity allows firms to access capital to grow and invest and adapt to changing circumstances. While the most direct channel for liquidity to influence corporate activity is through primary issuance and short-term borrowing,

it is also important to recognise the importance of liquidity in secondary market trading in many contexts, including its effects on corporate cost of capital (Chen et al., 2007; Goldstein et al., 2019), its wider impact on the functioning of financial markets (Bruche and Segura, 2017), and the benefits of sustainable products, such as green bonds, having become more liquid (Febi et al., 2018). There is some evidence that secondary market liquidity affects the rate of issuance, at least at a country level. In bond markets, changes in trading liquidity and pricing can affect the amount and timing of further issuance (Arseneau, 2015; Hanselaar et al., 2019).

For access to liquidity to be an effective transmission channel from a sustainability perspective, sustainable firms or projects would need to have greater or easier access to capital than their unsustainable peers. Financial institutions' lending policies are critical in driving this wedge between the availability, hence cost, of capital for sustainable and unsustainable projects. There is some emerging evidence supporting this conjecture in the case of oil and gas divestment, where greater divestment pledges in a country have been associated with lower domestic capital flows to oil and gas in that country, although this does not discount the possibility of capital leakage into other jurisdictions (Cojoianu et al., 2020). Anecdotal evidence suggests a similar pattern in coal power and mining, with a lack of liquidity directly slowing the expansion of coal activity in Indonesia as the number of banks willing to back new coal projects declines (IEEFA, 2019). At a more macro level, major stock exchanges (e.g. (Hong Kong Stock Exchange, 2021; London Stock Exchange, 2020)) have implemented mandatory ESG screening and/or green economy markers, which place some limits on access to liquidity to firms that cannot demonstrate a minimum level of sustainability (Grabski and Miller, 2019). Despite banks' crucial role as the main providers of short-term liquidity to the real economy in terms of working capital loans and rolling credit facilities, only a few US, European, and international banks moved to actually cut off or limit access to capital for unsustainable firms. Where they have, these policies have been applied only for select examples of notably climate-misaligned projects with high reputational risks, such as coal, tar sands or Arctic oil exploration (BankTrack, 2020). Beyond these cases, rather than directly limiting the amount of liquidity available through negative screening, banks have so far moved primarily to tie sustainability to pricing, e.g. through sustainability-linked loans.

In fixed income markets, primary issuance is much more frequent than in equity markets, with large firms regularly rolling over and refinancing debt structures as market conditions change. At present, fixed income funds channel a large proportion of capital flows through primary markets into fossil fuel industries, including 14% of capital flows from the largest US Exchange

Traded Funds (ETFs) (Wilson and Caldecott, 2021). Large firms typically require ongoing access to liquidity at favourable rates. If and when investors make their willingness to participate in purchasing further issues conditional on sustainability criteria, this can have a sizeable impact relatively quickly, particularly where the decision influences other investors' behaviour. Since ease of access to finance is partly a function of the breadth and diversity of a firm's investor base, green bond issuers can not only (sometimes) benefit from tighter spreads, but also, improved market access. Surveys of market participants have pointed to the importance of access to capital as a motivation for issuing green bonds (Maltais and Nykvist, 2020), and analyses of green bond issuance suggest that the label does indeed facilitate access to a wider pool of investors than would otherwise be the case (Climate Bonds Initiative, 2017, 2020). Anecdotally, market participants point to an additional benefit: they argue green bond issuers are able to access capital through this broader investor base more easily even during periods of market turmoil, thus insulating them to an extent against volatility and uncertainty, for instance in Italy in 2018 (Martin, 2019) or in Asia in spring 2020 (Xu, 2020).⁵ A route for impact-misaligned issuers unwilling or unable to tap green bond markets is the use of "transition bonds", which require issuers to take concrete strategic action towards sustainable outcomes⁶.

3.3 Changing Corporate Practices

Shareholders' right to have a say in company management is as old as the development of modern joint-stock companies themselves, from the 17th century onwards (Ferguson, 2008). After a post-WWII lull, institutional shareholders started taking more interest in corporate governance issues from the 1980s as their proportion of ownership in publicly listed firms grew; institutional investor ownership share of US equities, for example, rose from 16% in 1965, to 47% by 1987 and then to 80% in 2017 (Cheffins, 2013; McGrath, 2017).

While divestment has a long history as a means for shareholders to express their views on corporate activity (Chow, 2010), the notion of shareholder pressure for "good", and the term "engagement" itself, traces to the more recent idea of corporate social responsibility (CSR) which became a mainstream concept in the 1990s and early 2000s (O'Rourke, 2003).

⁵ In addition, several market participants consulted for feedback on drafts of this paper independently emphasised that it was easier to issue green over conventional bonds at times of market instability.

⁶ In the climate context, this may take at least two forms: (i) allowing a firm to continue the formation of high-carbon capital (e.g. gas plants) providing headroom to manoeuvre into a stronger strategic position; (ii) financing the formation of fixed capital assets necessary for decarbonisation (e.g. production of cement and steel for low-carbon infrastructure).

Engagement has been recognised by institutional investors as a more effective transmission mechanism than divestment, as it allows investors to retain influence over corporate climate policies (Krueger, Sautner, and Starks, 2020). The ability of investors to encourage and pressure companies to adopt sustainable practices is a transmission mechanism with significant empirical support in the literature, although the strength and nature of the relationship are highly context-specific (Bauer, Derwall and Tissen, 2019; Dimson et al., 2015; Gifford, 2010; Horster and Papadopoulos 2019). Traditionally, investor engagements with firms have overwhelmingly involved equity holders pressing company management for improved performance on sustainability issues and disclosure of sustainability policies through the formal procedures of filing resolutions and voting on them (Goronova and Ryan, 2014). Analysis of sustainability-related shareholder proposals requests from 1999-2017 shows they enjoy success rates ranging from 18-60% (Kölbel et al., 2020), though it is worth noting that with compliance cost being a key determinant factor of success alongside investor influence and company ESG experience, environment-related issues have a comparatively lower success rate than social and governance issues due to their high cost burden (Dimson et al., 2015). Shareholder proposals have also been empirically linked to subsequent increases in the ESG ratings of the targeted firms (Barko, 2017; Dyck et al., 2019). Flammer, Toffel and Viswanathan (2021) found the filing of a shareholder proposal in itself signals investors' concerns to managers and could subsequently lead to changes in corporate climate risk disclosure. In the 2021 shareholder voting season, major proponents have been observed withdrawing proposals, but only under the condition that firms acquiesce to shareholders' demands, such as the implementation of net zero commitment and strategies, green energy use, and production goals (Treviño et al., 2021). This does not necessarily imply changes in how investment is deployed, although Bauer, Derwall and Tissen's 2022 study evidenced that proposal withdrawals have led to an improvement in targeted firms' environmental performance compared to non-targeted firms.

Filing formal public proposals and engaging privately with a company are not mutually exclusive strategies. In fact, asset managers such as BMO and Legal and General have been adopting "escalation" strategies, where tactics become increasingly severe as investee firms fail to respond to investor demands, with divestment being the ultimate consequence of inadequate responses. Collaboration amongst minority shareholders on sustainability-related engagement is also on the rise. Since individual institutional investors rarely own majority holdings in publicly listed firms, collaboration is a particularly important strategy for building coalitions of investors with a substantial minority or majority holding to exert pressure to

change corporate behaviour (Dimson et al., 2015). Activist hedge funds have used confrontational versions of this approach to target firms with high environmental impact, with a notable example being Engine No. 1's vote targeting Exxon Mobil's board composition. There are early signs of this disruptive model of driving corporate change being scaled up (Lipton, 2021).

The bulk of investor engagement has focussed on public equity shareholders. Investors in other asset classes, including bonds, private equity and real assets, also hold leverage over corporate practices. Although bondholders do not have voting rights, they do (as capital providers) have direct access to company management through roadshows, at debt issuance, and in collaborating on their engagement strategies with other bondholders (World Bank, 2018). Bondholder engagement can be particularly effective where it is strategically timed to coincide with key points in a company's business cycle where it seeks to tap debt markets, for instance, in withholding expected refinancing (UNPRI, 2018; World Bank, 2018). In a 2019 survey by Russell Investments, 89% of surveyed asset managers with equity and bond offerings, and 71% with bond-only offerings, claim they often or always discuss ESG topics when speaking with investee companies, suggesting it is now a mainstream strategic tool for influencing corporate practices across debt and equity alike (Phillips, 2020).

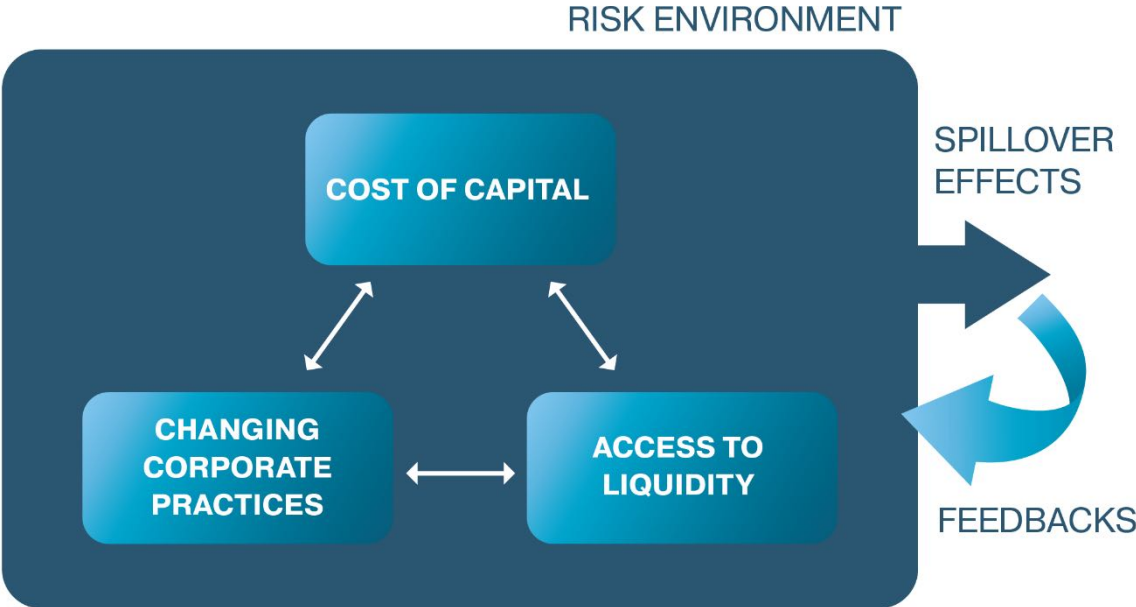
In the private equity world, general partner funds tend to hold controlling or significant minority shares for defined ownership periods, which affords them significant leverage in driving change in investee companies. This potential is increasingly, albeit gradually, being realised by private equity funds. A recent PwC survey finds that 56% of surveyed funds engage the executive board on ESG issues more than once a year (PwC, 2021).

Beyond public equity, potential investors can therefore engage with companies before they commit funds, making adoption of sustainable practices a condition of their investment. Whilst they are a creditor of, or hold a stake in, the company, they can encourage change by playing a stewardship function to improve the governance and practices of the company. Further research is, however, needed to study the relative effectiveness of different configurations of engagement strategies, especially in determining the effectiveness of collaborative engagement involving investors of different sizes and different asset classes, deploying a range of engagement strategies. As our conceptualisation of what "engagement" entails broadens, there is a further need to establish a comprehensive and rigorous methodology to track the impact of engagement.

3.4 Interlinkages between Transmission Mechanisms and Firms

We recognise that these transmission mechanisms are not separate and independent, but rather closely linked to one another in overlapping and interdependent ways, such that changes in one can influence or simply be correlated with the other, depending on a firm's unique circumstances (see Figure 1). For instance, firms with easier access to liquidity from a wide pool of investors are also more likely to face a lower cost of capital and to have corporate practices acceptable to the market, whereas firms with lower access to liquidity (e.g. due to reliance on a small or shrinking pool of investors), are also likely to face a higher cost of capital from those investors who are still willing to lend. Investors' unwillingness to lend, or demands for greater returns, may in turn reflect unsustainable corporate practices, or a failure to change these practices as a result of prior engagement from financial institutions. Meanwhile, through instruments such as sustainability-linked loans and bonds, direct links also exist between corporate practices and cost of capital; these instruments "reward" good practices with a lower cost of capital or "punish" for non-achievement of targets with a higher cost of capital. All of these processes affect the risk environment faced by the firm, hence also affecting its decision-making. Where the firm's decisions or the preferences of its investors generate spill-over effects on the wider universe of firms, investors and regulators, this in turn may trigger actions that feed back into investor preferences and the firm's risk environment, driving further change (e.g. where investors choose to collaborate following the success of a particular engagement campaign, or where a firm's impact-focused activities generate positive externalities for other firms, or inspire regulatory changes).

Figure 1: Transmission Mechanism Interdependencies: A Firm Perspective



4. Potential for Impact Across Asset Classes

Building on the mechanisms discussed, in this section we discuss the theoretical impact that an *individual* investor in a particular asset class can have through each mechanism. This first-principles assessment can help financial institutions better understand their current impact, and devise allocation strategies across complex portfolios that can maximise the effectiveness of their impact strategies going forward. To do this, we analyse five key asset classes: public equity (i.e. of listed companies), fixed income (bonds and loans), private equity (direct investment in unlisted companies, including venture capital), and real assets (infrastructure and real estate). These asset class universes vary quite significantly in size and this should be taken into account when designing a high-impact strategy. At the end of 2020, total bond markets outstanding totalled approximately US\$124tn, with the largest national market being the US, followed by the EU, Japan, and the UK. Global stock market capitalisation totalled \$105.8tn (SIFMA, 2021). Private equity assets under management are an order of magnitude smaller, standing at approximately US\$7.4tn globally, and the value of real estate and infrastructure assets owned by investors through funds is estimated at just under US\$2.0tn (McKinsey and Co, 2021).

We differentiate here between active and passive public equity strategies, as they lead to a different relationship with firms, which can alter potential impact and available transmission mechanisms, and we treat fixed income loans and bonds separately. We also analyse the role of hedge funds as actors, given their unique role in the financial system, even though they can and do trade in multiple asset classes.

In Table 2 we present an indicative ranking, by asset class and transmission mechanism, of the potential impact an individual financial institution may theoretically have. On our scale of 1 to 5, 1 is “negligible impact” and 5 is “strong impact”. Table 2 provides an overview of the criteria used. In designating a score, we considered the potential, likelihood, magnitude and persistence of real economy impact. Expert interviews were conducted to calibrate our qualitative assessments and validate our assumptions. Table 3 outlines the results, using deeper shades of green to denote greater potential impact⁷ for additional clarity. We recognise

⁷ Progressively lighter shades of green represent high impact scores (3 – 5), medium impact (2-3), and low impact (1-2).

that the impact actually realised also depends on several other important factors, including the type and size of the investing financial institution, willingness of the company to engage, and policies and regulatory structures in local jurisdictions. Where relevant, we allocate a range for potential impact where specific examples of impact variation within the asset class exist.

Table 2: Potential impact rating marksheet

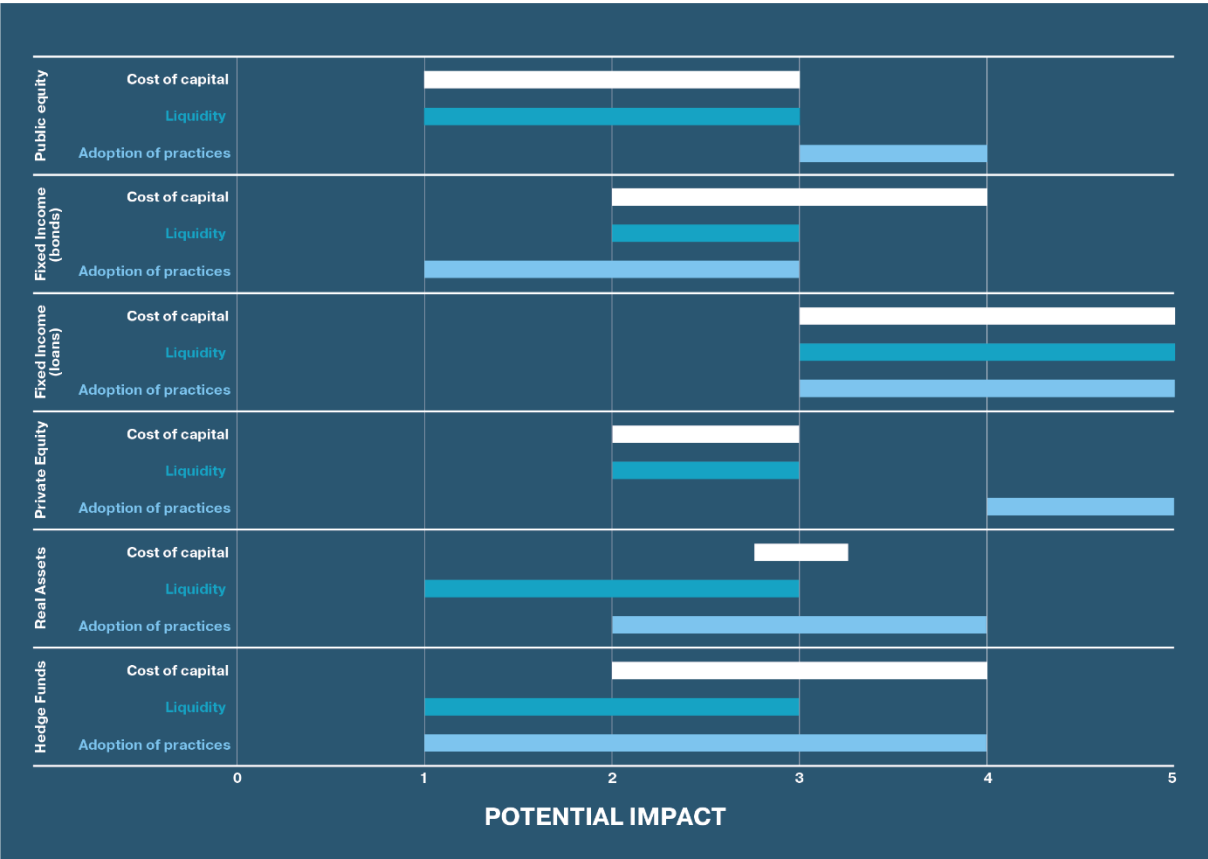
Rating	Descriptor	Example
1	<p>Negligible:</p> <ul style="list-style-type: none"> ● Potential for impact: low to none ● Likelihood of impact: low to none ● Magnitude of impact: small to none ● Persistence of impact: limited, if any 	A single investor with a minority share in a listed company is unlikely to have any significant effect on the firm’s cost of capital by simply divesting its position without coordinating with other investors.
2	<p>Limited:</p> <ul style="list-style-type: none"> ● Potential: possible ● Likelihood: low ● Magnitude: small ● Persistence: weak 	Hedge funds operate mostly in secondary markets. They are unlikely to significantly impact a firm’s ability to access liquidity through primary bond issuance or bank loans. Exceptions apply for severely distressed firms, and specialist distressed debt funds.
3	<p>Moderate:</p> <ul style="list-style-type: none"> ● Potential: yes ● Likelihood: medium ● Magnitude: moderate ● Persistence: variable 	Private equity funds can arrange better access to liquidity to firms they control, for instance, through debt facilities with private debt investors or through connections to a greater breadth of banks than would be accessible to a typical small or medium-sized enterprise.
4	<p>Significant:</p> <ul style="list-style-type: none"> ● Potential: yes ● Likelihood: high ● Magnitude: medium ● Persistence: strong 	Active public equity investors can generate significant change in corporate behaviour in firms where they are large shareholders and vocal about the strategy informing their actions, especially in coordination with other investors.
5	<p>Strong:</p> <ul style="list-style-type: none"> ● Potential: yes ● Likelihood: high ● Magnitude: large ● Persistence: strong 	Private equity investments resulting in a controlling share in the company or asset have a strong impact on investee/acquired firms’ adoption of sustainable practices, as the private equity owner can simply dictate them.

Table 3: Potential Impact Rating Scorecard

	Public equity	Fixed Income (bonds)	Fixed Income (loans)	Private Equity	Real Assets	Hedge Funds
Cost of capital	1 / 3	2 / 4	3 / 5	2 / 3	2 / 3	2 / 4
Access to liquidity	1 / 3	2 / 3	3 / 5	2 / 4	1 / 3	1 / 4
Adoption of practices	2 / 4	1 / 3	3 / 5	3 / 5	2 / 4	1 / 4

Our scoring results, visualised by asset class and transmission mechanism in Figure 2, suggest that the most high-impact asset class is loans followed by private equity, and that the highest-impact mechanism is via firms’ adoption of practices. Public equity is the least likely to generate impact when considering aggregated potential impact across each transmission mechanism, although this does not account for different weighting of each mechanism, which could be addressed in further work.

Figure 2: Potential Impact by Asset Class and Transmission Mechanism



Next, we detail our justification for the potential impact for each transmission mechanism against this scorecard, before outlining an “ideal type” of investor seeking to maximise impact in each asset class in Section 5, and discussing the implications and limitations of these findings on impact-conscious strategic asset allocation in Section 6.

It should be noted that in commenting on the potential impact across asset classes, we are assuming that the financial institution in question is of average size and influence, and operating in a realistic, fairly competitive market environment. Potential for impact would be enhanced in an oligopolistic or monopolistic financial market as financial institutions would have greater leverage in the market. Further, through our focus on asset classes, we are agnostic on the role of geography and sector in determining the impact of financial products. However, when considering impact-oriented tactical and strategic asset allocation, it is likely that investing in emerging markets and encouraging transition in heavily polluting sectors could generate important impact, though this will depend on the sustainable priorities and desired outcomes of individual investors and financial institutions. Exploring these dynamics is out of scope for this paper but could usefully be addressed in future research.

4.1 Cost of Capital

- **Negligible to moderate (1-3)** impact from *public equities*. Any single investor’s investment in (divestment from) the publicly listed shares of green (dirty) companies is not likely to have an impact on the firm’s cost of capital unless it holds (or would hold) a significant proportion of the firm’s shares when it takes the decision. There is little to no potential for impact in most cases because a typical investor’s stake is small, and most firms have dispersed, diversified, ownership structures. The magnitude of impact of any given investor’s actions when acting alone is very minor, potentially small enough to be lost amid the “noisiness” of public equity pricing signals, which are influenced as much on shorter timescales by market sentiment and shorter-term trading arbitrage as by company fundamentals. Moderate impact could occur in cases where there is a strong market signal conveyed by a group of investors (e.g. blacklisting), or when ownership is concentrated such that equity trading directly affects the terms of capital, such as during an IPO or around the time of new equity issuance. Passive investors following widely-used indices are unlikely to affect the cost of capital, though large investors following their own indices, and index providers, exert control over the composition of indices that passive strategies

follow, which can affect equity cost of capital by featuring or overweighting (excluding or underweighting) specific sustainable (unsustainable) companies in indices and funds.

- **Limited to significant (2-4)** impact from *bonds*. Secondary trading in bonds does not directly affect the coupon paid by the issuer on those bonds, but it does affect secondary market yields, in turn influencing the costs of future issuance, meaning that even at the lower bound, there is some potential for impact of at least a small magnitude. At the upper bound when a particular investor is among a firm's largest creditors, and largest participants in new bond issues, that individual investor's risk and return preferences (or decision to sit out a particular new issue) will, with high likelihood, have a substantial impact on the firm's cost of capital with a persistent effect. Meanwhile, the structure of sustainability-linked bonds, where the coupon rate is linked to the achievement of sustainability targets, or transition bonds incorporating specific use-of-proceeds or other conditions, can affect cost of capital of the issuer much more directly on an ongoing basis (although this market segment is still in its infancy). As such, impact will depend on the instrument used.
- **Moderate to strong (3-5)** impact from *loans*. Loans are a crucial source of capital for all firms, and even more important for smaller firms where they are usually the only source of debt and generally not tradable. The interest rate set by lenders is based on the risk-return profile of the company. Where the pool of available lenders is small, the rate set by a specific lender can influence the firm's cost of capital where it has few other borrowing options, exerting a large impact with strong persistence. For bigger or more mature firms that can access loans from multiple sources, can tap bond and equity markets, and are likely to have access to a wider group of banks, the impact of the decision of any one lender is likely to be more moderate, with more variable persistence. Where the lender provides a sustainability-linked loan, the cost of capital can be tied directly and dynamically to a firm's performance as measured by sustainability key performance indicators (KPIs).
- **Limited to moderate (2-3)** impact from *private equity*. For a leveraged buyout, the actual loan facility to buy a company depends more on the creditworthiness of the buyer (i.e. the private equity firm) than of the portfolio company. There is thus a relatively low likelihood that PE will in itself impact the cost of capital of the firm involved, and the persistence of any effect is weak. However, for early stage companies relying mainly on equity, not debt, financing, the cost of capital set by a venture capital firm can be significant, and persist

until affordable refinancing options are available. In addition, if a PE/VC firm manages to help a company develop strong sustainability disclosure relationships with bank lenders, this effect may persist and contribute to a lower cost of capital even once the PE firm has sold the company.

- **Limited to moderate (2-3)** impact from *real assets*. Real assets investors own a significant portion of all commercial real estate, as well as a portion of residential real estate. Many real asset funds tend to invest in project equity rather than project debt, or buy pre-existing (brownfield) assets on the secondary markets, where there is limited to moderate potential for impact on the cost of capital of the firm selling the assets. If the assets are purchased from developers, sales on secondary markets provide them with capacity to reinvest in additional projects. If markets perceive these transactions as establishing or enhancing a secondary market for the assets, this may lower the risk – hence cost of capital – associated with future projects undertaken by the developers. Given the relatively limited pool of capital seeking real asset exposure and the capital-intensive nature of most real asset projects, the conditions under which funds are willing to invest equity or debt capital in new greenfield projects or purchasing existing assets on secondary markets, have the potential to have a moderate impact on the cost of capital faced by these projects (though banks have an even greater role in this capacity).
- **Limited to significant (2-4)** impact from *hedge funds*. Hedge funds that trade in shares or derivatives for arbitrage or other purposes in large, liquid markets do not have a strong effect on the underlying firms. However, hedge funds that trade in the distressed debt (bonds or loans) of companies that are close to bankruptcy or have trouble finding creditors are highly likely to have a significant impact on the cost of capital those firms face.

4.2 Access to Liquidity

- **Negligible to moderate (1-3)** impact from public equity. The extent to which active investors can influence capital availability through investment (divestment) decisions for publicly listed firms has little to no potential for impact, nor is this impact of any notable magnitude, relative to the scale of liquidity available to listed firms through financial markets. At the higher end of potential impact for public equity, impact has the potential to be moderate where a large shareholder works in concert with other investors to either expand or restrict access to investor funding, particularly in cases of young companies seeking capital through an IPO, or distressed ones seeking equity capital through a rights

issue. Passive investing ETFs can also affect access to capital for individual companies depending on their focus and funding levels.

- **Limited to moderate (2-3)** impact from *bonds*. The majority of bond investors buy and sell on secondary markets, not affecting firm-level access to liquidity directly, though there is the potential for secondary market trading to affect primary market issuance, which is the means through which bond markets allow access to new liquidity. At the upper bound, when a particular investor is among a firm's largest creditors and/or largest participants in new bond issues, that individual investor's willingness to lend, or decision to sit out a particular new issue has the potential to have a moderate impact on the firm's ability to access capital. Green bond markets provide an example of how bond issuance can improve access to liquidity: issuing green bonds has provided some smaller, less well-known issuer firms with a broader investor base that can improve their ability to access new capital, including at times of market dislocation.
- **Moderate to strong (3-5)** impact from *loans*. Most firms, large and small, rely on loans for working capital, and thus loans play a crucial role in providing firms with access to liquidity. At the lower bound, for larger firms able to access capital markets and typically working with a consortium of lenders, the decision of any one lender to stop lending would only have a moderate impact on the firm's access to capital. At the upper bound for a smaller firm, which may be heavily reliant on a single lender, that lender's decision can determine the firm's access to capital and thus have a strong impact.
- **Limited to significant (2-4)** impact from *private equity*. PE firms certainly can certainly provide access to capital and liquidity, but the importance of the impact depends on the situation. At the lower bound, for a large firm with many sources of capital—and even more so for a publicly listed one that is taken private by PE—the PE buyout has limited impact on the firm's access to capital. But in the case of smaller firms, such as family-owned businesses too small to access capital markets, there is a high likelihood for the capital provided by a PE buyout to have a significant impact. Not only does the buyout directly matter, but for these smaller firms, the PE buyer can also offer connections to a broader range of banks or private debt investors than the firm would otherwise have had access to.
- **Negligible to moderate (1-3)** impact from *real assets*. In the same way real asset funds can affect developers' cost of capital, funds that purchase existing assets can provide developers with liquidity for reinvestment in additional projects. Funds that participate in

arranging project financing for greenfield development projects (e.g. buying land), to then build a residential building, warehouse, or toll road on top of it) have the potential to have a moderate impact on a developer's access to liquidity through their role in structuring and conditioning the release of funds at different project stages.

- **Negligible to significant (1-4)** impact from *hedge funds*. Most types of hedge funds trade exclusively in assets on secondary markets, thus not directly influencing the ability of firms to access new funding, e.g. through primary bond issuance or through bank loans. In distressed debt specifically, hedge funds are sometimes in a sense the “funder of last resort.” However, in distress situations debt often ends up converting to equity, in which case HFs exert control through adoption of practices more than through being a liquidity provider *per se*.

4.3 Changing Corporate Practices

- **Limited to significant (2-4)** impact from *public equity*. Through active ownership, public equity investors can have a moderate effect in encouraging change towards more sustainable corporate practices. The main channels through which impact can be achieved are regular direct engagement, the filing of shareholder resolutions and the use of voting rights. Important factors for determining the extent of the impact are the size of the investor and their ability to convince other investors to join in pressuring corporations. Acting on its own, a small to medium sized financial institution has a low likelihood of having an impact, and it will be small even if it succeeds. At the upper bound, in the case of investors owning a large stake in a given company and/or having successfully built tight-knit investor coalitions, the impact can be significant. Threats of divestment and/or blacklisting by large financial institutions if the company does not respond positively to engagement can also act as an incentive for managers of companies to change corporate practices to avoid reputational risk and (potentially) reduced cost of capital and liquidity (see above).
- **Negligible to moderate (1-3)** impact from *bonds*. Since bondholders do not have shareholder rights, their interaction with firms is limited to engagement and, at most, refusing to participate in new issuance. At the lower bound, for an issuer with a broad investor base, attempts by a small bondholder to engage company management or threaten to withhold investment if certain practices are not adopted are unlikely to have an impact. At the upper bound, when a particular investor is among a firm's largest creditors and/or largest participants in new bond issuances, if that investor makes participation

conditional on changing practices, this has the potential to have a moderate impact. Sustainability-linked or transition bonds can present opportunities for more direct impact on firms' practices, especially if bond investors engage with firms on the rigour of KPIs and the design of sustainability performance targets (SPTs) prior to investment. Engagement is also likely to be more impactful if carried out by larger investors, and/or by investors who are both shareholders and bondholders in the company.

- **Moderate to strong (3-5)** impact from *loans*. Small firms are deeply reliant on loans, and even large companies depend on them to a significant extent, though they do have other sources of financing. At the lower bound, where firms have access to a consortium of lenders, decisions by any one lender matter less and have only a moderate impact. At the upper bound, where smaller firms may be reliant on one lender, and if that lender makes lending conditional on project-level characteristics or company practices, this is highly likely to have a strong impact on the firm. The rise of sustainability-linked and transition finance loans is another way in which loans are becoming more deeply tied to company practices, with loan repayment rates linked to the changing corporate practices and the meeting of sustainability targets. As mentioned above, potential impact on corporate practices is likely to be higher for those who hold both the equity and debt of a company.
- **Significant to strong (4-5)** impact from *private equity*. Start-ups typically have a few VC firms involved in providing equity finance, and buyout PE firms almost always buy a controlling stake. In both cases, but especially with a buyout, the PE/VC firm(s) have a very large say in how a company is run and what sort of practices it adopts. Even at the lower bound, for instance in deals involving several VC or PE firms, each one individually still has a substantial stake in the firm and its wishes are highly likely to translate into a significant effect on company practices. But at the upper bound, with one PE firm buying near-full ownership of a firm, there is very little to stop it and its preferences essentially get translated directly into corporate practices, thus exerting a strong impact.
- **Limited to significant (2-4)** impact from *real assets*. Real asset funds, particularly those with a role in arranging and securing financing for greenfield projects, have significant latitude to shape the corporate practices of the project developer, ranging from environment and safety practices to sustainability commitments. Even for existing physical assets (e.g. toll roads, airports, or buildings), day-to-day operations are often handled by a management company. Real asset funds can and do exert a large degree of control over

the adoption of practices for how to run these assets, typically through holding majority ownership over the project and having the ability to instruct, sanction and replace management companies.

- **Negligible to significant (1-4)** impact from *hedge funds*, depending on their strategy. Most HF strategies do not affect company practices significantly, because these kinds hedge funds engage in price arbitrage in secondary markets, with no transmission into company practices. However, activist hedge funds, which buy significant minority stakes in companies and then seek to build investor coalitions, can use the resulting considerable clout to strongly influence how companies are run, including what sorts of sustainable practices they adopt. In May 2021, with an 0.02% shareholding, the impact-focused hedge fund “Engine No. 1” successfully nominated three of its preferred candidates to oil major ExxonMobil’s 12-person board at its annual shareholder meeting, by building a coalition of investors around its nominees including the asset manager BlackRock, and pension funds CalPERS, CalSTRS and the New York State Common Retirement Fund (Hiller and Herbst-Bayliss, 2021; Mufson, 2021).

4.4 The Usefulness of an Asset Class Lens

We hope that this analysis initiates a discussion around the potential transmission mechanisms and impact that each asset class can have in the sustainable finance context. Importantly, we have shown that many of these asset classes may have only limited opportunities for impact in the real economy, or that this impact is contingent on coordinated action and/or a confluence of factors over which investors in a given asset class have only partial control. This provides theorisation behind our earlier statement that holding “green” products is insufficient for generating environmental outcomes, and that a theory of change is required. Potential for impact for a given investor may vary considerably depending on portfolio composition. Furthermore, the potential for overall impact will depend on the relative allocation of capital. We discuss this, and the implications of our findings, further in Section 6.

We recognise that considering asset classes separately as we do here is an oversimplification, and further research could explore empirical evidence for our assessment and seek to understand the transmission mechanisms of multi-asset portfolios, or interdependencies between asset classes. There are also other cases in which transmission mechanisms may combine in complex ways, such as if a change in company behaviour as a result of engagement leads to spill-over effects from subsequent corporate leadership.

However, this can quickly lead into debates as to the extent of additionality of the investor, and although this is an important question, it is out of scope for this paper.

4.5 Discussion: Risk Management and Spill-over Effects

Changes in firms' cost of capital, access to liquidity and corporate practices all affect the risk context in which they operate. By reducing the risk burden that firms face, investors can help firms free up resources otherwise dedicated to managing these risks, and facilitate additional sustainable activity. While it is unusual for investors (as opposed to sellers of risk products, like insurance and derivatives) to help firms manage risk directly, changes in risk are implied in the three transmission mechanisms identified. Impact-seeking investors can help firms manage financial risks by rewarding sustainable activity with a lower cost of capital and greater access to liquidity; by contributing to improved corporate practices, they can also have a broader impact on the sustainability outcomes generated by a firm. Conversely, investments that facilitate the continuation or expansion of unsustainable activities can drive a deterioration in sustainability outcomes.

Investors' approach to impact can also generate spill-over effects (and subsequent feedback effects) on the wider economy in a number of ways, divided into two broad categories. First, the generation of public goods (or bads) derived from either sustainability outcomes, or the manner in which they are produced. For example, if a drop in the cost of capital accelerates a firm's deployment of renewable technologies, positive spill-overs can result from a decline in the cost of the technology (prompting further deployment, and so on); and from reduced climate risks associated with lower greenhouse gas emissions. In aggregate, the activities of impact-seeking investors may ultimately reduce climate-related risks faced by the wider economy. This is of particular relevance to "universal owners" (see Section 6). Where investor activity results in greater financial and/or sustainability-related disclosures by firms, greater information is made available to other investors. In turn, this can improve decision-making, enhance risk-adjusted returns, and drive demand for the relevant data (see Spatial Finance Initiative (2020)).

This can also work in the opposite direction: where impact-seeking investors fail to affect real economy change, increased systemic risks and persistent mispricing of underlying risks can result. Campaigns by financial firms to promote their sustainable offerings could also lead to changing consumer awareness of the environmental relevance of finance and drive broader behavioural change (Baker and Nofsinger, 2012).

The second category of spill-over effects relates to the ability of finance actors to influence political decision-making. Investors have considerable influence over sustainability-related policy, both in support of, and in resistance to, changes that affect them. In turn, policy changes relating to disclosure, carbon pricing and other areas of sustainability can have a wide-ranging impact on real economy activity. The finance sector can be an influential source of support for policies that facilitate sustainable economic activity. In February 2021, the Institute for International Finance, representing leading banks, asset managers and insurers, added its voice to calls for carbon pricing in the US (Kerber, 2021). Tomlinson et al. (2018) find that financial sector interests are also important determinants of regressive sustainability policy positions. In Germany, the perceived threat of TCFD to the competitiveness of national financial centres and the cost of capital of key national firms has seen some finance actors actively slowing implementation. In the US, long-standing opposition to regulation in the finance sector (InfluenceMap, 2021) remains a brake on greater transparency, although the Financial Stability Oversight Council's identification of climate change as "an emerging and increasing threat to U.S. financial stability" in October 2021 and the Securities and Exchange Commission's establishment of a Climate and ESG Taskforce to examine regulation of sustainability claims signals much more active regulatory engagement and has prompted calls for mandatory ESG disclosures in financial filings from large investing firms including Pimco and Invesco (Verney, 2021).

Through these and other channels, investors have the potential to drive significant real economy spill-over effects by supporting regulations and policies that affect companies' behaviour directly (e.g. through carbon pricing) or indirectly (e.g. through the impact of mandatory disclosure on their cost of capital).

5. Sustainable Finance Ideal Types by Asset Class

In this section, we draw on the above analysis, a series of interviews with leading practitioners, and feedback from a presentation to participants in the 2020 Global Research Alliance for Sustainable Finance and Investment (GRASFI) conference, to posit ideal type sustainable finance strategies for impact within a fund consisting of a particular asset class.

5.1 Ideal Public Equity Strategy: Active and Passive

The “ideal type” investment strategy for equities differs depending on whether the equity fund in question invests on an actively or passively managed basis. Both types of fund should send strong signals to markets, particularly stock exchanges and index providers, by publicly announcing targets to align with net zero emissions pathways by 2050 or earlier and articulate a transition strategy for meeting this goal. Remuneration and performance targets should be aligned to this strategy. Similarly, both passive and active equity funds should use their ownership rights to clearly outline expectations of investee companies, including a time-bound engagement strategy and escalation processes where expectations are not met. This could include voting against management, building coalitions with other investors, and, for actively managed strategies, ultimately divestment and public blacklisting of individual companies or activities (e.g. new coal power and oil and gas exploration). Equity investors should also engage with investee companies to improve sustainability reporting and increase the ambition of performance targets. This includes both direct engagement and participation in collaborative engagements with other investors and civil society and government stakeholders. Finally, investors should work with policy makers and financial regulators to create a supportive environment for sustainable investment, both directly and through collaborative investor initiatives.

Active equity investors specifically should integrate observed and predicted climate and environmental impact data into strategic asset allocations and equity investment decisions. An active investor would also seek out companies that are aligned with sustainable solutions, to increase their access to liquidity and lower their cost of capital. Passive equity investors have less scope to proactively allocate assets but can include sustainability considerations in the index selection process. This may include investment in climate-focused indices (e.g. those screening out high-emitting companies, and/or investing in climate solutions) or adjusting constituent weightings in standard indices to account for climate risk profiles of companies.

5.2 Ideal Fixed Income Strategy: Bonds and Loans

An impact-maximising bond investor or lender should actively promote the use and standardisation of sustainability-linked and transition bonds and loans and engage closely with key issuers on bond design and loan conditions, key performance indicators and sustainability targets, including on both structural characteristics (i.e. the relationship between performance targets and coupon rate/loan conditions) and on the level of ambition of the targets themselves. Internally, the ideal bond investor or lender would earmark a minimum percentage of the bond portfolio/loan book for sustainable and green bonds/loans, with this segment growing over time in line with a strategy consistent with net-zero emissions by 2050 or sooner. The investor/lender would systematically engage with specific issuers and other investors by requesting and interrogating information on (i) sustainable long-term strategy (including by indicating continued investment is conditional on progress towards it); and (ii) mitigation of climate-related physical and transition-related risks (including by accelerating retirement of high-carbon capital assets), in order to influence future issuance and lending decisions and pricing. Subject to the results of engagement, it would exclude the worst-performing firms according to published criteria that would also get more stringent over time, and under/over-weight the remaining portfolio according to performance against sectoral or financial benchmarks and the ability of the company's business model to facilitate, and/or succeed in, a long-term low-carbon transition. The investor would establish internal hurdle rates for different levels of climate risk to guide bond selection strategy.

Externally, the bond investor or lender would demonstrate to the market, through research, reports and returns, any lower downside risks associated with sustainable bonds and loans and/or reductions in systemic risks associated with sustainable bond investment and sustainability-linked lending to lower the cost of capital for sustainable issuers. The investor would also articulate and publish a net zero-compatible active stewardship strategy and communicate it clearly to the market. It would push actively for the creation of sustainability risk-adjusted versions of major indices and facilitate greater inclusion of green and climate-aligned bond issuances in standard indices, particularly for project and infrastructure finance.

Finally, the investor or lender should maximise long-term financing for new sustainable projects, participating in refinancing only where the proceeds either (i) lower the cost of financing sustainable projects; or (ii) directly reduce capital costs for issuers specialising in sustainable products or services.

5.3 Ideal Private Equity Strategy

Private equity (PE) and venture capital (VC) funds play a specific role in the financial system and have much greater scope to shape and engage with investee companies than those in public markets (even if their overall market prominence as measured by assets under management, and thus total footprint, is smaller). PE/VC funds, especially buyout PE funds, typically operate by buying controlling stakes in investee firms. An impact-maximising private equity firm should focus its energies on “transition turnaround investments”, acquiring stakes in unsustainable firms with high potential for decarbonisation (e.g. steel producers able to switch to clean fuels, manufacturers with scope for much greater efficiency and electric utilities standing to benefit from early retirement of high-emitting assets and heavy investment in renewables). To garner public support for these efforts and minimise hostility from investee company management, the PE fund should partner with governments, academia and/or civil society to research and address the socioeconomic consequences of failing to transition and have a fallback plan in place for companies that fail to transition to ensure that their bankruptcy does not lead to long-term suffering for workers left unemployed.

The PE investor should have a dedicated fund segment focused on growing green industries, investing in firms and technologies likely to benefit from a rapid, large-scale transition (e.g. renewable energy firms, electric mobility, hydrogen, ammonia, carbon capture). A venture capital fund would invest in early-stage start-ups, while a growth-focused fund would seek out established, rapidly expanding firms.

PE investors also have scope to influence the capital structure and capital-raising practices of investee firms. They should encourage the use of sustainability-linked loans and bond issuance where possible to ensure accountability against green targets and develop internal reporting and monitoring capacity. Similarly, they should work with portfolio companies to integrate the use of granular sustainability data into processes and decision-making, establish firmwide targets for alignment with net zero by 2050 or sooner, and build up internal expertise on climate risks and opportunities, dedicating permanent staff resources to this purpose. Where relevant, PE investors should sign up to industry initiatives and encourage portfolio firms to do so.

3.5.5.4 Ideal Real Assets Strategy

Real assets are typically less liquid and less standardised than competing asset classes, presenting investors with greater challenges. Real assets also play a central role in

infrastructure investment pathways and reducing carbon lock-in, suggesting they may play a high-impact role in an ideal investment strategy. An impact-maximising real assets investor would therefore approach every new investment through the lens of sustainability risk and opportunity, investing only in assets that either already are, or can be put on, a path to adapt and transition effectively. Thus, they would avoid investments exposed to excessive physical or transition-related climate risk without the potential to transition or adapt (e.g. assets subject to imminent sea level rise). Any assets invested in today must still be viable in 20-30 years; for example, even if an argument can be made that natural gas is in some instances a transition fuel away from coal to renewables, investing now in new gas infrastructure does not make sense.

The investor would also systematically work to reduce the exposure of its existing assets to climate and environmental impacts, including through efficiency retrofitting, adaptation measures such as flooding protection, and transition planning. These measures should be financed, where possible, with sustainability-linked/green loans and bond issuance. The investor should actively partner with local stakeholders to address the exposure of surrounding areas, especially where this enhances portfolio returns by reducing overall localised risks (e.g. flood walls, heat dissipation measures).

These direct engagements would be complemented by the use of sustainability data and metrics to set targets for investee projects (e.g. project finance vehicles for large infrastructure) and firms (e.g. property management companies) and build capacity for reporting sustainability-relevant information.

5.5 Ideal Hedge Fund Strategy

Impact-maximising hedge funds have the potential to generate significant pressure on firms to accelerate or improve their net zero transition strategies. An activist fund should, similarly to private equity, focus on investments in undervalued, unsustainable firms with high decarbonisation potential, and work with other shareholders to pressure firm management to draw up and execute a turnaround strategy. Where shareholder pressure fails, the hedge fund should work to replace company management by building a coalition of activist investors. For distressed debt investment, the fund should leverage its buying power to influence company management and tie loan/bond conditions to sustainability outcomes. Where this strategy fails or has low chances of success, the fund should short-sell firms with insufficient or non-existent

sustainability strategies, particularly those with high short-term stranded asset risks, sending negative price signals to other investors to encourage either divestment or transition.

Funds active in commodity markets should expand trading in carbon credits and emissions permits: this should allow the fund to both make healthy returns as climate policies tighten, and also to smooth volatility and promote the maturing and development of these markets. Simultaneously, funds should contribute to sustainability standards and practices in the trading of existing commodities, expand trading in labelled products, and restrict trading in products of uncertain or unsustainable provenance. Those active in bond markets should similarly expand trading in green and sustainability-linked bonds, restricting trading in bonds that are not linked to additional sustainable activity. These activities should be underpinned by the use of sustainability metrics and targets at the fund level, which can also be used to attract further investment by differentiating the fund from the wider market.

6. Implications for Manager Selection, Strategic Asset Allocation and Universal Ownership

So far, this paper has outlined three transmission mechanisms available for generating real economy environmental impact. In particular, we have outlined how the availability and strength of these transmission mechanisms differ across asset classes and further expanded a theoretical “ideal type” of action within each asset class to deliver maximum impact. This analysis can support financial institutions seeking to develop impactful strategies across individual and multiple asset classes. In this section, we outline the implications for asset owners.

Asset owners could implement these findings in both their choice of their asset managers, and/or in their strategic asset allocation.

Firstly, asset owners can use the above framework to select internal and/or external asset managers who present strategies and capacities that are most closely aligned with (or have strategies in place to build towards) the “ideal type” of strategy highlighted across different asset classes. This could drive demand among asset managers to further align their own investment products and services with impact-maximising strategies and apply the range of actions outlined above.

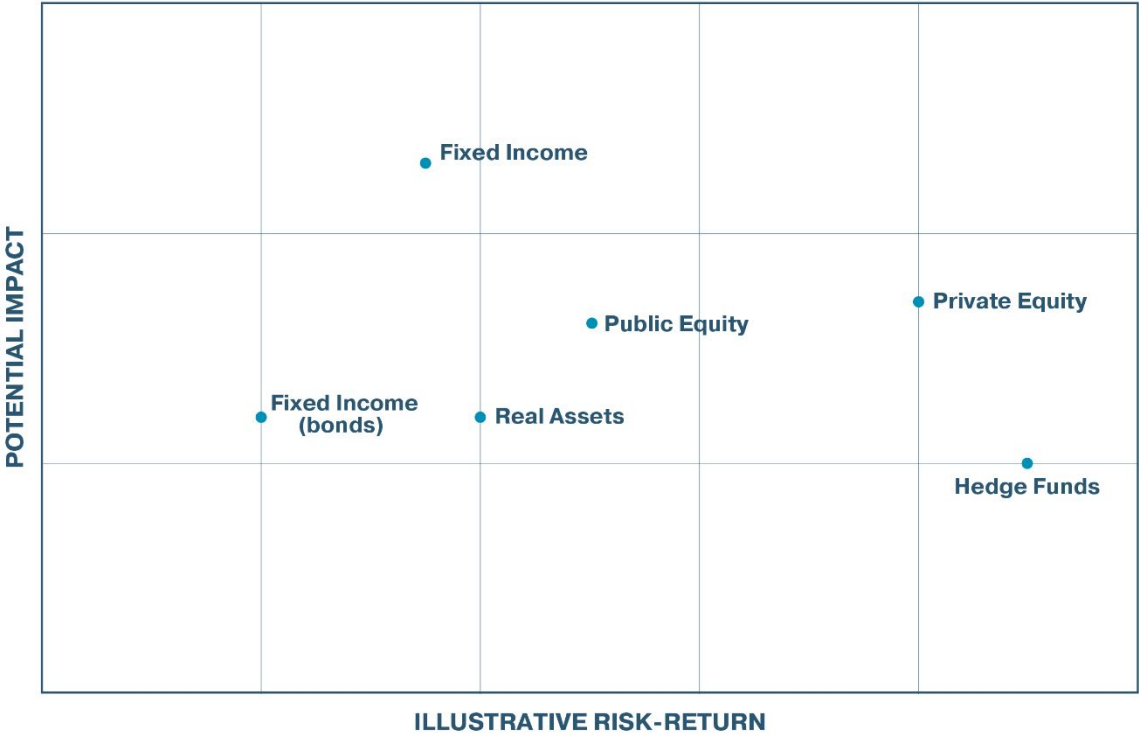
Secondly, those responsible for impact-driven portfolio construction could use the above analysis to allocate capital towards asset classes shown to generate the most impact. Strategic asset allocation (SAA) is the process through which financial institutions periodically set target allocations to various asset classes (Brennan et al. 1997; Campbell et al. 2002). These allocation decisions are usually based on a range of factors such as the investor’s risk tolerance, time horizon, and investment objectives. If a key investment objective is to generate sustainability impact, SAA decision-making should consider which asset classes available to the financial institution can drive the most impact and then overweight these in their SAA decision. Conversely, those asset classes with the lowest potential impact would be underweighted. As such, we call for financial institutions interested in impact generation to consider adding an “impact” budget, allocated across their portfolio using this framework to identify a clear theory of change, alongside the traditional risk and return budgets used to develop SAA decisions. Examining the extent to which this step would be compatible with

fiduciary duties in different jurisdictions is an important area for future research, perhaps building on the “legal framework for impact” published by Freshfields (2021).

Based on our analysis in Section 3, an impact-focused SAA should allocate more of its “impact budget” to fixed income (especially through sustainability-linked loans and bonds) and private equity and allocate less to passively managed public equity investments. An impact-maximising asset owner may also seek to implement their strategy by holding assets across multiple classes in the same company, particularly where equity and bond strategies previously diverged (e.g. firms that may have continued to hold long-duration bonds in an oil major while underweighting its shares in their equity portfolio). Joined-up strategies can increase leverage by combining voting power with the ability to affect cost of future issuance and refinancing. Conflicts of interest between equity holders (taking risks to increase upside) and bondholders (seeking protection against downside) complicate this process, but consistency across asset classes is needed to achieve lasting real economy impact through corporate transformation and avoid sending mixed signals to corporate management.

These are important findings at a time when there is growing investment in passive listed equity strategies as financial institutions seek lower fees and costs (Mercer, 2019; Pleye et al., 2020; Anadu et al., 2020). Such a shift is not necessarily going to support the drive towards a sustainable financial system, though there are opportunities for passive investors to generate impact whilst also securing lower cost strategies. This is why we believe it useful to have outlined the “ideal type” of investor for each asset class. However, these decisions, as noted above, are often not made with the sole aim of impact, so Figure 3 demonstrates (illustratively) how such an analysis might be considered in alignment with the risk-return profile of each asset class. This suggests that portfolios with the same risk-return profiles can have different environmental impact and that higher potential impact portfolios do not have to mean lower risk-return expectations. Further empirical work is required to evidence this.

Figure 3. Illustrative relationship between asset class impact and risk-return profile



These findings are perhaps particularly important for “universal owners”, large financial institutions who, due to their size, effectively “own the economy” and “therefore, bear the costs of any shortfall in economic efficiency and reap the rewards of any improvement” (Hawley and Williams, 2000, p.45). As a result of their size and their exposure to the global economy, universal owners have both the means and motive to maximise their real economy impact across their portfolios (Hawley and Williams, 2000; Quigley, 2019).

7. Conclusions

Holding green financial assets is not sufficient for investors to have an impact on the real economy. In this paper, we introduce three possible transmission mechanisms linking the financial and real economies in application to sustainable finance, contributing to the nascent discussion on how sustainable finance activities can generate impact. We develop a novel approach to assessing the potential impact of each transmission mechanism across major asset classes and consider how the mechanisms might interact with one other and generate spill-over effects on other firms, investors, and the regulatory environment. Our findings suggest that fixed income, notably sustainability-linked bonds and loans, could present the greatest opportunity for impact, and hedge fund strategies the least. We then present possible “ideal types” for each asset class to help guide a high-impact strategy for each as well as highlighting the opportunities for broader political economy and public good spill-over effects. Finally, we suggest how this analysis might be applied to strategic asset allocation by investors with multi-asset portfolios, calling for the addition (and tactical allocation) of an “impact budget” to these decisions. This cross-asset class analysis could also usefully inform targeted investment and engagement among financial, policy and corporate decision-makers to further reduce barriers between financial services and the real economy and extend the potential impact available from the growing field of sustainable finance. Future research in this area could consider the implications in more detail and seek to develop empirical methods for testing and quantifying the impact of the different transmission mechanisms discussed here (for individual investors and investor coalitions) and how interactions between them serve to reinforce or weaken overall real economy impact.

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