

Universal Owners and Climate Change

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ABSTRACT

Universal ownership theory proposes that widely diversified investors have a financial self-interest at the portfolio level in reducing market-wide risks relating to environmental or social (ES) issues. This article sets out a double test for determining when universal owner theory justifies investor action and applies these tests to the case of climate change. When applied to the commonly adopted goal of limiting global warming to 1.5°C, universal owner theory runs into problems on both tests. First, it is uncertain whether this goal is financially optimal at the portfolio level. Second, even if it were optimal, investors have limited efficacy to achieve this outcome. This article considers goals that climate-concerned investors might set and the actions they could take that would be consistent with the tests. The actions best supported by evidence involve four areas of focus. First, engagement with investee companies based on realistic goals. Second, positive engagement on policy. Third, modest and bounded impact investments that can credibly be considered as reducing climate risk. Fourth, working to ensure that transition and physical risks are fully incorporated into investment models. Through targeting a more modest set of ambitions, climate-concerned investors can be more impactful while avoiding conflicts with fiduciary duties to clients.

KEYWORDS: Universal owners, Externalities, Global warming, Climate change, Institutional investors, Fiduciary duty

1. INTRODUCTION

1.1. Context

At the time of writing, the battle over environmental, social, and governance (ESG) investing continues to rage, especially in the US. Opponents of the practice accuse ESG investing of being a backdoor way for unelected elites to impose on society environmental and social policies for which they cannot get support via the ballot box. Supporters say that ESG investing is just about taking material environmental (E), social (S), and governance (G) factors into account to manage risk and so enhance risk-adjusted returns, and therefore it is nothing other than capitalism in action.

At the individual company level, E, S, and G factors can clearly be financially material. Government action to reduce greenhouse gas emissions, and the uncertainty about its extent and pace, is self-evidently critical to the expected cashflows of renewable energy projects and of

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the fossil fuels they seek to replace. Treating employees well holds out the potential to deliver both enhanced earnings and stock price out-performance over the long term. Governance failures have come back to bite companies and their shareholders on many occasions.

That E, S, and G factors may *sometimes* be material to stock valuation, and therefore an entirely legitimate area for fiduciaries to consider in investment strategy, should not be grounds for serious debate. As Edmans has written ‘considering long-term factors isn’t ESG investing; it’s investing’.¹ But this article considers a more ambitious theory, which is used to justify a more expansive role for fiduciaries in the ESG arena: universal ownership. Universal ownership is the idea that a diversified investor may have a *financial* interest in voluntarily reducing or internalizing the externalities produced by one of their portfolio companies if the cost of this is more than offset by the gain from reducing the impact of the externalities on the rest of their portfolio. The archetypal example is climate change: reducing emissions by polluting companies within the portfolio may be expensive for those companies but could be worth it at the portfolio level if the damaging effects of climate change, which may harm the entire portfolio, are reduced.

Universal ownership theory has the potential to set environmentally and socially conscious investors free in one bound from the constraints of fiduciary duty with which critics try to bind them. For if their preferred environmental or social (ES) issue can be demonstrated to give rise to systemic risks that potentially harm risk-adjusted portfolio returns, then addressing those risks may be permissible, even required, notwithstanding that it may come at the financial cost of particular companies in the portfolio. While the concept that fiduciary duty applies at the portfolio level, rather than individual stock level, is now well established, including in case law, the status of systemic risk management is less well developed, although it has appeared more prominently, especially recently, in academic discourse.

1.2. Organization of the article

This article starts with a brief review of the history of the universal ownership idea and the recent interest it has garnered in the legal academy and practitioner initiatives. That universal owner theory could apply *in principle* is reasonably well established. More contentious is whether it applies *in practice* in any of the cases that it is used to justify. This article provides a two-part test for determining whether universal owner theory justifies investor action on an ES issue in a given case. Part one of the test asks whether achieving the ES objective has a credible connection to improving risk-adjusted portfolio returns. Part two of the test asks whether investors plausibly have efficacy to achieve the ES objective. The article then assesses the implications of these tests for asset managers and asset owners wishing to adopt a universal ownership rationale for action on climate change.

The analysis identifies considerable difficulties for universal ownership theory when applied to the commonly adopted goal of limiting global warming to 1.5°C with limited or no overshoot. First, I argue that fiduciaries may consider there is reasonable doubt about whether achieving this goal would maximize risk-adjusted *financial* portfolio returns, even if it could be achieved. Second, through a review of the empirical research literature, I show that investor efficacy to affect climate change is extremely limited, casting significant doubt on the extent to which investors *can* influence the climate outcome even if they want to. The combination of these two limitations means that universal owners seeking to influence the climate change outcome may expose their clients or beneficiaries to potential costs and risks with little hope of commensurate benefits. This creates potential conflicts with their fiduciary duties.

Having concluded that there is uncertainty over whether universal owner theory can, in the absence of an explicit client or beneficiary mandate, support assertive pursuit of the goal

¹ A Edmans, ‘The End of ESG’ (2023) 52(1) *Financial Management* 3.

of limiting global warming to 1.5°C with limited or no overshoot, I consider how climate-concerned investors can nonetheless develop a goal of limiting climate change while fulfilling their fiduciary duties to clients or beneficiaries. I make the case that the extreme negative impacts of runaway global warming do enable investors to adopt climate goals in good faith, consistent with fiduciary duty in line with the universal owner logic. However, fiduciary duties, the difficulty of predicting the impact of climate outcomes on portfolio returns, and the limited efficacy of investor action all mean that modest goals may be more likely to meet the tests set out in this article than very ambitious goals and are a more realistic reflection of investors' role in change. The more modest goals would be built around plausible (rather than very ambitious) technological, economic, and political pathways to decarbonization.

I further contend that, given their limited efficacy, rather than attempting directly to reduce global warming, investors should instead focus on how their actions contribute to the circumstances in which global warming can be reduced. This involves four key areas of focus, each focusing more on influencing real world activity at the margin rather than seeking to enforce step changes in behaviour. First, engagement with companies to encourage them to lean into the net zero transition to the extent consistent with their financial success. Second, positive engagement on policy, both directly with governments but also with investee companies, to encourage alignment between their own policy lobbying and stated public positions on global warming and targets on emissions. Third, for asset managers to work on developing impact and blended finance products that are attractive to clients; and for asset owners to make modest and bounded-impact investments (for example 5 per cent of the portfolio or less) that can credibly be considered as reducing climate risk. Fourth, working to ensure that transition and physical risks are fully incorporated into investment models will contribute to ensuring that these factors are properly taken into account by markets. Through targeting a more modest set of ambitions, climate-concerned investors can have greater impact while avoiding conflicts with fiduciary duties to clients, and as such universal ownership theory can apply in attenuated form.

These areas of focus place a much lower weight than is widely seen in practice on the use of asset allocation—for example portfolio decarbonization or screening. Asset allocation methods have both questionable efficacy in terms of real-world impacts but also the greatest potential to create costs and risks for clients and beneficiaries in less favourable climate scenarios. The proposed approach, therefore, can be characterized as engaging for the world as you wish it to be, while investing for the world as it is.

2. THE HISTORY AND INCREASED RELEVANCE OF UNIVERSAL OWNER THEORY

2.1. A brief history of universal owner theory

The concept of universal ownership is commonly attributed to Monks and Minow² and was later developed in a paper by Hawley and Williams:³

The fundamental characteristic of a universal owner is that it cares not only about the governance and performance of the individual companies that compose its investment portfolio, but that it also cares about the performance of the economy as a whole. Simply put, the universal owner's concern with overall economic performance is the recognition that it 'owns' the economy (typically, a highly representative sample of the economy) and, therefore, bears the costs of any shortfall in economic efficiency and reaps the rewards of any improvement.

² R Monks and N Minow, *Watching the Watchers: Corporate Governance in the 21st Century* (Wiley 1996).

³ J Hawley and A Williams, 'The Emergence of Universal Owners: Some Implications of Institutional Equity Ownership' (2000) 43(4) *Challenge* 43.

As such, universal owners will not simply view themselves as ‘takers’ of the economic environment but as ‘makers’ of it. Hawley developed his ideas in a book⁴ published with Lukomnik where they describe the concept of ‘beta activism’⁵ in which:

beta activists target issues and seek to affect systemic risks . . . In theory, the sum of all investors’ expectations about any systemic risk (e.g. climate change, lack of gender diversity, etc.) is built into the perceived riskiness of ‘the market’. Therefore, if a beta activist can cause a reduction in the perceived riskiness of a systematic risk, the entire market re-rates.

The tools for achieving such a reduction in systematic risk go beyond traditional investment tools of asset allocation, stock selection, factor analysis, and trading to encompass stewardship, standard setting, and policy advocacy.

Universal Owner Initiatives describes universal ownership more precisely in the context of global warming as follows:⁶

If a company in their portfolio engages in [Green House Gas]-intensive activities, from the point of view of the universal owner, those costs are not simply borne by ‘third parties’. Instead, they are felt by the rest of their portfolio. Indeed, in theory, universal owners should make a cost-benefit calculus of whether a given GHG-intensive project contributes to the net health of the market (and so to its portfolio): do the economic benefits derived by that company from the project, exceed all of the costs borne by the market as a whole? Where it does not, the universal owner has a strict financial interest in bringing it to a stop.

While heavy emitters may incur costs in cutting their carbon emissions today, this could be more than offset by the benefit to other companies in the portfolio if the effects of global warming are thereby reduced.

The concept of universal ownership has recently attracted interest in the legal academy. Condon⁷ has explained how diversified share ownership should lead investors to seek to internalize intra-portfolio externalities to maximize portfolio returns and uses this to explain the ‘climate activism’ of a number of institutional investors. Condon uses the example of a diversified investor holding stakes in oil majors and food and beverage conglomerates. The former cause climate change, the latter suffer from it. A diversified investor may conclude that the value-maximizing action at the portfolio level is to cut emissions at their oil holdings to preserve value in their food and beverage holdings.

Gordon uses the term ‘systematic stewardship’ to emphasize a similar concept. This focuses more on reducing portfolio risks, although still in a way that is designed to improve risk-adjusted returns:⁸

Systematic stewardship grounds engagement to reduce climate change risk in the economics of investor welfare. The goal of such engagement is lower systematic risk and thus to improve risk-adjusted returns for portfolio investors. There is no trade-off of investor welfare for social welfare.

⁴ J Lukomnik and JP Hawley, *Moving Beyond Modern Portfolio Theory: Investing that Matters* (Routledge 2021).

⁵ Note that the term ‘beta activism’, although now widely used, makes little sense. Beta is by definition a relative term, and the beta of the whole market cannot be improved, indeed it must always by definition be 1. Instead, what must be meant by ‘beta activism’ is either improving the risk premium on the whole market or reducing the risk of the market portfolio by some measure.

⁶ Universal Owner Initiatives, ‘What is Universal Ownership Theory’ <<https://www.universalowner.org/universalownershiptheory>> accessed 14 February 2024.

⁷ M Condon, ‘Externalities and the Common Owner’ (2020) 95 *Washington Law Review* 1.

⁸ JN Gordon, ‘Systemic Stewardship’ (2022) 47(3) *Journal of Corporation Law* 627.

Note that universal ownership, or systemic stewardship, as described by Condon and Gordon, remains financially motivated. It therefore differs from the concept of shareholder welfare maximization, outlined in the mid-1970s by Jensen and Meckling⁹ and recently repopularized by Hart and Zingales.¹⁰ Shareholder welfare maximization recognizes that shareholders have both financial and non-financial preferences, and that investor stewardship should take both of these into account. By contrast, universal ownership theory argues that investors' *financial* interests *at the portfolio level* are optimized by taking an economy-wide view of the impact of investment decisions, managing systemic risks and internalizing intra-portfolio externalities.

It can immediately be seen that in an era of scrutiny about fiduciary legitimacy of investor action, universal ownership is an attractive horse to which an environmentally or socially conscious investor can hitch their ES wagon. Action on any ES issue that can be presented as a systemic risk can be justified as consistent with an asset manager or asset owner's fiduciary duty to maximize portfolio risk-adjusted returns to investors, indeed even *required* by it. The rationale provides an explanation for why, in line with their fiduciary duty, an investor might take an action that is inconsistent with the financial interests of a given portfolio company.

The issues that are identified as being 'systemic risks' show why this more activist approach to ESG investing is likely to remain politically contentious. The examples of systemic risks identified by Lukomnik and Hawley include: climate change, anti-microbial resistance, gender diversity, deforestation, artificial intelligence, and mining safety. Others have added inequality, racial diversity, and human rights. The suspicion on the political right is that universal ownership theory is being used as a trojan horse to shoehorn all manner of progressive causes into the investment process. Supporters claim that the right is ignoring systemic risks that will damage the value of all investments and which investors are required by their fiduciary duty to address.

2.2. Universal ownership in practice

The potentially contentious nature of universal ownership and systemic risk is increased by the fact that, as outlined by Condon, they are far more than theoretical concepts. They go to the heart of current investor initiatives on issues like climate change.

For example, the UN Principles for Responsible Investment has published a paper called Active Ownership 2.0 which is:¹¹

[A] framework for the more ambitious stewardship needed to deliver against beneficiaries' interests and improve the sustainability and resilience of the financial system. Under this framework, investors use their influence to shape sustainability outcomes by engaging in more effective and assertive stewardship activities.

Climate Action 100+, an investor group formed to engage with the world's heaviest emitters, similarly articulates the business case for investor action thus:¹²

If left unchecked, these climate risks will threaten investors' long-term ability to sustain value and generate ongoing returns for their beneficiaries over decades. But because of the scope and size of these climate risks to the global economy, researchers from Cambridge University have indicated climate change entails 'unhedgable' risk for investment portfolios. That means

⁹ MC Jensen and WH Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure' (1976) 3(4) *Journal of Financial Economics* 305.

¹⁰ O Hart and L Zingales, 'The New Corporate Governance' (2022) 1(1) *Chicago Business Law Review* 195.

¹¹ UNPRI, 'Active Ownership 2.0' <<https://www.unpri.org/investment-tools/stewardship/active-ownership-20>> accessed 14 February 2024.

¹² Climate Action 100+, 'The Business Case' <<https://www.climateaction100.org/business-case/>> accessed 14 February 2024.

action to cut emissions and avoid the worst impacts of climate change is the only real path to protect long-term investment value and returns.

Norges Bank Investment Management (NBIM), responsible for managing Norway's sovereign wealth fund is a self-described universal owner of global assets. In their 2025 Climate Action Plan¹³ they outline two justifications for engagement with portfolio firms on emissions. One is the transition risk to the firm itself, the other is the adverse impact on other companies in the portfolio:

The fund seeks to manage risks and capture investment opportunities by being broadly invested. The greenhouse gas emissions associated with portfolio companies give rise to transition risk. Their contribution to climate change may also adversely affect other companies in the fund's portfolio, and the economy at large. Analysis of the equity portfolio's transition risk shows that a scenario with a delayed policy response would create greater financial losses for the fund than staying on a 2°C pathway throughout. We therefore stand to benefit from an orderly transition that allows for the investment and technological advances needed for a sustainable economy, the redeployment of financial and human capital over time, and the phasing out of carbon-intensive energy provision and activities.

So universal ownership is with us as more than an idea. But it is not without its critics in the academic literature.

2.3. Academic discussion of universal ownership

Condon presents initiatives such as Climate Action 100+ as evidence of universal owner motives amongst diversified investors. But Condon also highlights a number of challenges with universal ownership in practice, including concerns about the democratic legitimacy of investors encroaching on the political realm and the dangers of anticompetitive effects of common ownership.

Lund also notes some of the democratic concerns about the movement of the 'Big 3' (BlackRock, State Street, and Vanguard) into the sphere of 'private regulation'.¹⁴ Moreover, rather than seeing the actions of large diversified investors as being motivated by portfolio risk-adjusted return maximization, Lund sees the 'Big 3' as being motivated by the desire to please their clients. However, the clients of such asset managers are skewed towards the wealthy and are not fully representative. Moreover, the desire to please clients imposes limits on what such asset managers will ever do, as they will be disinclined to move ahead of client and government preferences for fear of a backlash—something that has recently been witnessed in the widely covered ESG backlash in the US.

Kahan and Rock¹⁵ and Tallarita¹⁶ have questioned the ability of universal ownership to have the hoped-for impact. They point out that for various reasons the financial incentives of universal owners, particularly the 'Big 3' index funds, are not aligned with internalizing the externality of climate change. First, universal owners do not, in fact 'own the economy'. They are biased very much towards public equity markets, yet climate impacts are profound from private and state-owned companies. Indeed, any reduction in emissions from the public companies they own could simply be offset by competitive responses from private or state-owned actors. Second,

¹³ Norges Bank Investment Management, '2025 Climate Action Plan' <<https://www.nbim.no/en/the-fund/responsible-investment/2025-climate-action-plan/>> accessed 14 February 2024.

¹⁴ D Lund, 'Asset Managers as Regulators' (2022) 171(77) University of Pennsylvania Law Review 77.

¹⁵ M Kahan and EB Rock, 'Systemic Stewardship with Tradeoffs' (2024) 48(3) Journal of Corporation 497.

¹⁶ R Tallarita, 'The Limits of Portfolio Primacy' (2023) 76 Vanderbilt Law Review 511.

universal owners' incentives are focused on the impact of externalities on (predominantly large) companies in developed markets. Impacts on smaller companies and individuals are ignored. Third, asset management intermediaries face duties and constraints that inhibit application of universal owner principles. Fiduciary duties are owed at the fund level and the optimal approach to climate action may differ between funds (for example, a clean energy fund versus an oil fund in the same fund family). Therefore, the hope of having a coherent universal ownership position at the fund family level is illusory.

Tallarita identifies the geographic misalignment between investment fund cashflows and climate impacts and the effects of discounting. They note that India, Africa, the Middle East, and Latin America, accounting for over half the global population, represent only 8 per cent of the portfolio revenues of the 30 largest BlackRock Exchange Traded Funds (ETFs). The financial interests of large index fund holders will not be aligned with the interests of a global population. And finally, the long-term nature of climate costs, coupled with the relatively high discount rates applying in financial markets, means that universal owners seeking to optimize portfolio values will inevitably take too little account of climate change from a social perspective.

Kahan and Rock also undertake a detailed analysis of how the concept of universal ownership comes up against the deeply ingrained 'single-firm focus' within corporate law. This is different from the notion of shareholder primacy, which relates to the question 'for whom is the firm managed?' Instead, it is focused more on the question of 'at what level do relevant duties and obligations reside?' Corporate law in most territories, and certainly in the US, is based around the idea of a company to whom directors owe duties and whose interests they must serve. This in practice makes it very difficult for directors to pursue actions that harm their own company's long-term interests, even if that benefits the portfolio value of their shareholders.

Goshen and Hamdani question whether universal owners have the incentives or competence to internalize externalities at the portfolio level.¹⁷ Focusing on the role of asset management intermediaries, they note that marketing considerations may dominate pursuit of real-world impact. Moreover, asset managers may have an interest to encourage activities that make firms look green while enabling those asset managers to benefit from the returns of brown business lines retained within those firms.

Gordon identifies a number of problems with ambitious framings of universal ownership. Internalizing externalities at the portfolio level is unlikely perfectly to address the underlying social welfare deficit: beneficial owners have interests apart from their portfolios; the distribution of share ownership is skewed creating the potential for costs externalized onto non-shareholder interests; and a large proportion of the economy is privately held. Finally, governments will never surrender power to asset managers. Instead, they propose a focus on systemic stewardship as a financially motivated mechanism primarily focused on reduction of portfolio risks.¹⁸

Turning to empirical studies, Kölbel and others address the efficacy of sustainable investing in general, rather than focusing on universal owner theory.¹⁹ Their comprehensive review of the literature suggests that most sustainable investing techniques have limited impact in the real world. They highlight engagement with corporates, lending to capital constrained green businesses, and exclusions based on specific ESG standards as being the most well-supported channels by which investors can influence corporate behaviour. But they emphasize that the

¹⁷ Z Goshen and A Hamdani, 'Will Systemic Stewardship Save the Planet?' (2023) 739 *European Corporate Governance Institute Law Working Paper* <http://ssrn.com/abstract_id=4605549> accessed 14 February 2024.

¹⁸ Gordon (n 8).

¹⁹ J Kölbel and others, 'Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact' (2023) 33(4) *Organisation and Environment* 554.

evidence suggests that even this influence is limited, raising questions about investors' ability to impose externality internalization.

Marti and others review the mechanisms of investor impact for diversified investors.²⁰ In addition to the well-established mechanisms of portfolio screening (positive or negative) and engagement, they identify five sustainable investing practices under the heading of field building: shifting the views of other shareholders; sharing expertise with other shareholders; delegitimizing certain business activities; establishing voluntary standards; and supporting regulatory changes. These practices relate more to influencing the environment in which sustainable practices can emerge than in directly bringing such practices about in investee companies. This is a topic I will return to later.

Gosling and MacNeil highlight the fiduciary dilemma for investors pursuing the climate goal of 1.5°C with limited or no overshoot:²¹ given that this scenario is now unlikely, investors face a tension that strategies that have most impact to limit warming towards this level may also expose clients and beneficiaries to greater risks in the event that the target is not achieved. This will cause many investors to conclude that investing to control systemic risk in accordance with universal ownership is not for them in the light of slow progress in the development of 1.5°C-aligned government policy.

2.4. Contribution of this article

This article builds on these previous papers in the following ways. First, many existing papers tend to either promote or dispute the applicability of universal ownership theory. This is often based on an assessment of the incentives and conflicts faced by the 'Big 3' index fund managers. This article focuses instead on asset owners, who will be the true source of universal owner motivations. Further, rather than taking a black and white perspective, this article proposes two tests to determine whether universal ownership theory supports asset owner action in a given case in order to enable a more nuanced discussion. Second, this article combines theoretical analysis of fiduciary duties available in the legal scholarship with insights from finance research on the economics of climate change and the efficacy of investor action on ES issues to determine whether, and in what circumstances, universal owner theory can apply to climate change, which is arguably the most significant area of application of universal owner thinking to date. Third, this combined analysis provides concrete insight into how far climate-concerned investors can go without an explicit mandate from their clients or beneficiaries. The article therefore provides a constructive contribution to the debate about the positive, but realistic, role investors, and in particular asset owners, can make in fighting climate change, while respecting their fiduciary duties to clients and beneficiaries.

3. DEFINING AND TESTING UNIVERSAL OWNER THEORY

3.1. Formal description of universal owner theory

Although the characteristics of universal owners and their motivations have been discussed in the academic literature and practitioner writings, I am not aware of a formal definition of universal ownership theory. I define universal ownership theory as comprising the following two propositions:

A. Asset owners *should* use their influence to reduce market-wide risks where they can, even if in so-doing they reduce long-term returns of particular companies or sectors within their

²⁰ E Marti and others, 'The Impact of Sustainable Investing: A Multidisciplinary Review' (2023) *Journal of Management Studies* <<https://doi.org/10.1111/joms.12957>> accessed 14 February 2024.

²¹ T Gosling and I MacNeil, 'Can Investors Save the Planet? NZAMI and Fiduciary Duty' (2023) 18(2) *Capital Markets Law Journal* 172.

First, most jurisdictions around the world do not allow fiduciary investors (ie asset owners or asset managers looking after the money of clients or beneficiaries) to invest with the objective of achieving sustainability goals *at the cost of risk-adjusted financial returns* unless they have a clear mandate from those clients and beneficiaries. Of course, sustainability objectives can be pursued instrumentally *if they improve* risk-adjusted financial returns. Under some regimes, sustainability objectives may be pursued *provided they do not conflict* with long-term risk-adjusted returns (although under the US legislation governing retirement funds—ERISA—even this is difficult). This is why the Proposition A of universal ownership theory, as set out above, is so important. Universal ownership theory is framed in purely financial terms. Investor preferences, for example arising from climate-concerned beneficiaries, may reinforce the universal ownership motivation. But the underpinning of that motivation is financial self-interest. This is important because it provides a justification, for example in the case of climate change, for pursuing a goal such as 1.5°C with limited or no overshoot without obtaining an explicit mandate from clients.

It is also worth pointing out immediately that, from the investor's perspective, there is no fiduciary problem with seeking to maximize risk-adjusted returns at the portfolio level rather than at the individual company level. The duty to clients and beneficiaries requires the pursuit of portfolio returns, not individual company returns, even if the latter is normally the route to the former. The analysis here does not challenge the idea that universal ownership theory could in principle hold in certain circumstances.²⁴ Indeed, in a UK context the Financial Markets Law Committee has recently clarified this point.²⁵ Instead, the focus of this article is on whether enacting universal ownership in pursuit of commonly held climate goals would in fact be beneficial at the portfolio level or indeed would be plausibly possible.

Where fiduciary questions arise most strongly at the individual company level is in relation to the duties of directors. In practice the business judgement rule applicable formally or informally in most jurisdictions means that directors have wide discretion in how they act to pursue the interests of their company. However, in most cases directors' duties relate to the individual company and directors cannot use enhancement of the overall portfolio value of their company's shareholders as a justification for actions that harm the long-term prospects of the company of which they are a director. This limitation of the actions of directors places a very serious limit on the extent to which universal ownership theory is likely to be effective in practice. This issue has been extensively discussed by Kahan and Rock²⁶ and is not the focus of discussion here.

A final point to make on fiduciary duty, relevant to the discussion in this article, relates to the uncertainty of investment outcomes. In practice it is very difficult to know *ex ante* which investment strategies will outperform or underperform. Fulfilment of fiduciary duties does not require investors to be right. However, it does require them to act in good faith. A universal owner, applying universal ownership theory, needs to have a sincere and well-grounded belief in the alignment of a specific climate goal with client or beneficiary interests as well as a conviction about their efficacy in achieving the goal. But equally, there is more than one strategy that can reasonably be adopted with the aim of fulfilling the interests of beneficiaries.

²⁴ Although note that Kahan and Rock discuss the case of limited fiduciary duties applying to majority owners, which prevent them from pursuing private benefits at the expense of minority shareholders. This of itself could limit the most extreme cases of universal ownership in action.

²⁵ Financial Markets Law Committee, 'Pension Fund Trustees and Fiduciary Duties—Decision-Making in the Context of Sustainability and the Subject of Climate Change' (FMLC, 6 February 2024) <<https://fmlc.org/publications/paper-pension-fund-trustees-and-fiduciary-duties-decision-making-in-the-context-of-sustainability-and-the-subject-of-climate-change/>> accessed 14 February 2024.

²⁶ Kahan and Rock (n 15).

4. SHOULD UNIVERSAL OWNERS SEEK TO LIMIT GLOBAL WARMING?

4.1. The target of 1.5°C with limited or no overshoot

This section considers Proposition A and Test A in the context of climate change: whether universal owners would be maximizing client or beneficiary risk-adjusted financial returns over the long-term through pursuing a goal of limiting global warming to 1.5°C with limited or no overshoot. The major uncertainties involved along many dimensions means it will be hard to be definitive on this point. Different asset owners with different contexts and perspectives could reasonably come to different views. This article will, however, conclude that it is not straightforward to adopt this goal justified purely through a financial, universal owner lens. The purpose of this section is to outline the factors and considerations that fiduciary investors should carefully take into account in adopting such a goal in the absence of a specific climate mandate from clients. Although it draws on the academic literature on the impacts and economics of climate change it is not intended to be a comprehensive review of these literatures, but instead to illustrate the considerations for fiduciaries.

Existing investor commitments made under NZAOA, PAAO, and NZAM are aligned with the Race to Zero criteria including targeting net zero 2050, in order to target global warming of no more than 1.5°C with no or limited overshoot.²⁷ The choice of this goal, often described as being ‘based on the science’, is predicated on analysis showing that the adverse physical impacts of climate change become markedly more severe as temperatures increase beyond 1.5°C. This analysis first gained wide-spread exposure with the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C²⁸ and led to the push to ‘keep 1.5 alive’ at the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow. The risks of exceeding 1.5°C have gained increased prominence through recent work on negative tipping points, which, once exceeded, trigger feedback loops that result in irreversible acceleration of physical climate change.²⁹ These studies reinforce the case for timely abatement action by governments, not least in light of the precautionary principle and ethical obligations both from current to future generations and from richer to poorer countries.

To what extent do these considerations support adoption of 1.5°C with limited or no overshoot as a goal by *fiduciary investors*? This question will be considered under three headings:

- Impact on expected returns.
- Impact on portfolio risk.
- The nature and implications of the goal.

4.2. Impact on expected returns

One fiduciary argument in favour of climate action by investors is that it will enhance expected portfolio returns. Supporters of the 1.5°C target point to analysis suggesting that the economic costs of achieving net zero 2050 are relatively small, and indeed there will be net benefits for global Gross Domestic Product (GDP) if physical damage is reduced and if the investment required for the transition delivers a ‘green growth’ multiplier in the economy and a surge of innovation with positive spillovers. Furthermore, once factors beyond pure GDP are taken into account the case is even stronger: non-financial welfare benefits such as clean air; intergenerational fairness and consequent low discounting of future climate damages; and inequality

²⁷ Race to Zero, ‘Criteria’ <<https://climatechampions.unfccc.int/system/criteria/>> accessed 25 July 2024.

²⁸ IPCC, *Special Report: Global Warming of 1.5C* <<https://www.ipcc.ch/sr15/>> accessed 25 July 2024.

²⁹ DI Armstrong McKay and others, ‘Exceeding 1.5C Global Warming Could Trigger Multiple Climate Tipping Points’ (2022) 337 *Science* eabn7950; TM Lenton and others, ‘Summary Report’ in TM Lenton and others (eds), *Global Tipping Points Report 2023* (University of Exeter, UK, 2023) <<https://report-2023.global-tipping-points.org>> accessed 25 July 2024.

of impacts on rich and poor both within and between countries.³⁰ On the other hand, some authors argue, often based on the work of William Nordhaus, that mitigation costs are high and adaptation is feasible, leading to optimal end of century warming of 3°C or more.³¹

Adjudicating on the GDP benefits of different levels of climate action is extremely difficult for fiduciaries even under expert advice. However, the first point to make is that, increasingly, economists who study climate change agree on the significant economic benefits of decisive action to limit global warming. Indeed, when summarizing points of consensus amongst economists studying climate change the first observation highlighted by Pisani-Ferry and Posen is that ‘whatever the views on the economic consequences of climate action, the alternative of no action would be much worse’.³²

The IPCC review of the consensus of economic studies as part of the Sixth Assessment Report (AR6) concluded that ‘estimated [negative] global economic impact increases with warming in all methodologies, indicating higher risk in terms of economic impacts at higher temperatures (*high confidence*)’ and ‘variation in estimated global economic impacts increases with warming in all methodologies, indicating higher risk in terms of economic impacts at higher temperatures (*high confidence*)’.³³ The IPCC analysis finds a clear GDP benefit of mitigating from 3°C (a reasonable proxy for a ‘current policies’ scenario³⁴) to below 2°C across all studies for which it was able to undertake this comparative assessment, with benefits of 2 per cent to 13 per cent found in GDP in the year 2100. Net benefits are also found from mitigating from 2°C to below 1.5°C, although in all cases the benefits were less than 5 per cent with a median impact of around 2 per cent.

However, the types of economic analysis used to estimate GDP losses have been criticized for fundamentally understating key risks.³⁵ In response, more recent studies are tending to show higher losses. For example, the 2022 vintage of scenarios from Network for Greening the Financial System (NGFS) estimated the benefits in 2050 of mitigation from a 3°C to a 1.5°C end of century pathway to be 4 per cent of GDP. This has increased to 7 per cent of GDP for the 2023 vintage due to improved modelling of acute physical risks,³⁶ but has still been criticized in some quarters for underestimating potential damages.

Some analyses therefore use stronger functions for the physical damages arising from climate change or apply magnification factors for damages to allow for perceived underestimates of damages, tail risks, or ‘unknown unknowns’. One such example from Swiss Re, based on the Moody’s Analytics model, finds a net GDP benefit of over 10 per cent of GDP by 2050 in moving from a 2.6–3.2°C increase to well below 2°C, obtained by applying a 10× multiplier to the GDP sensitivity of climate damages.³⁷ Another from Ortec Finance and a team from the Institute of

³⁰ N Stern and JE Stiglitz, ‘Climate Change and Growth’ (2023) 32 *Industrial and Corporate Change* 277.

³¹ W Nordhaus, ‘Climate Change: The Ultimate Challenge for Economics’ (2019) 109(6) *American Economic Review* 1991.

³² J Pisani-Ferry and AS Posen (eds), ‘The Green Frontier: Assessing the Economic Implications of Climate Action’ (2024) Washington, DC: Peterson Institute for International Economics.

³³ IPCC, *Sixth Assessment Report—Working Group 3: Mitigation of Climate Change* (2022) Chapter 3, Section 3.6.2 Cross-Working Group Box 1 <<https://www.ipcc.ch/report/ar6/wg3/chapter/chapter-3/>> accessed 25 July 2024.

³⁴ IPCC, AR6 *Synthesis Report: Climate Change 2023* (2023) <<https://www.ipcc.ch/report/sixth-assessment-report-cycle/>> accessed 25 July 2024.

³⁵ N Stern, J Stiglitz and C Taylor, ‘The Economics of Immense Risk, Urgent Action and Radical Change: Towards New Approaches to the Economics of Climate Change’ (2022) 29(3) *Journal of Economic Methodology* 181.

³⁶ Network for Greening the Financial System, *Climate Scenarios for Central Banks and Supervisors* (September 2022) <<https://www.ngfs.net/en/ngfs-climate-scenarios-central-banks-and-supervisors-september-2022>> accessed 25 July 2024; Network for Greening the Financial System, *Climate Scenarios for Central Banks and Supervisors—Phase IV* (November 2023) <<https://www.ngfs.net/en/ngfs-climate-scenarios-phase-iv-november-2023>> accessed 25 July 2024.

³⁷ Swiss Re Institute, *The Economics of Climate Change: No Action is Not an Option* (April 2021) <<https://www.swissre.com/institute/research/topics-and-risk-dialogues/climate-and-natural-catastrophe-risk/expertise-publication-economics-of-climate-change.html>> accessed 25 July 2024.

Actuaries finds a finds that mitigating from a 4°C world (well above most current projections) to below 2°C avoids a GDP loss of over 60 per cent by 2100.³⁸

The overall picture arising from the studies described above is that there are potentially significant GDP benefits from reducing projected end of century warming from a current policies trajectory, which would lead to around 3°C of warming or above, to a below 2°C trajectory, in line with the Paris agreement. What about further mitigation to limit warming to 1.5°C or less? Here the economic modelling appears less conclusive in the central case. One evidence review found the uncertainties of comparison between 1.5°C and 2°C simply to be too high and concluded only that: ‘it cannot be ruled out that the 1.5C target passes a cost–benefit test’³⁹ another that ‘assessment of the medium-term growth impact [of the green transition] remain divergent’.⁴⁰ However, while benign scenarios for high levels of warming have rightly been criticized for missing important physical risks, scenarios for limiting warming to 1.5°C may themselves miss important transition risks. These may include the political or social viability of pathways that involve very dramatic and rapid changes to current modes of production; lack of international co-ordination of policy; the requirement for less efficient command-and-control as opposed to market-based solutions to deliver the required pace of decarbonization; underestimated costs in incorporating intermittent renewables at very high levels of penetration into developed market grids; and uncertain availability of viable clean technologies at reasonable cost for carbon capture and storage or for hard to abate industries.

While assessing economic impacts of different climate scenarios is challenging, inferring the implications for financial markets is even harder and work in this area remains embryonic. Yet this connection is crucial to fiduciary arguments relating to universal ownership. However, it is possible to state some important differences that will arise between economic and financial market implications.

First, there are various aspects that quite rightly are taken into account in public policy making that are not greatly relevant for financial market valuations:

- Considerations of intergenerational equity imply use of low (or zero) discount rates for future climate damages on ethical grounds, whereas markets discount future damages using, generally much higher, market discount rates.
- Non-financial co-benefits of climate action such as clean air or improved diets, are less relevant for financial market valuations than for public policy considerations.
- Climate change has unequal impacts with those most exposed generally also having the least by way of resources to adapt—given declining marginal utility this suggests greater attention being paid to climate impacts on the poor in consideration of public policy; however, this is not a relevant consideration for financial market valuations.

Second, financial markets will be most affected by climate change impacts in the developed world where most of the value of equity markets resides. It is clear from multiple studies that the economic impacts of climate change are, in general, much less in regions where financial markets capitalization is concentrated. For example, in just one typical study, the Swiss Re Institute finds GDP losses in Organisation for Economic Co-operation and Development (OECD) countries in a current policies scenario (compared with below 2°C) to be half the global average.⁴¹

³⁸ L Bongiorno and others, ‘Climate Scenario Analysis: An Illustration of Potential Long-term Economic and Financial Market Impacts’ (2022) 27(e7) *British Actuarial Journal* 1.

³⁹ S Dietz and others, ‘The Economics of 1.5C Climate Change’ (2018) 43 *Annual Review of Environment and Resources* 455.

⁴⁰ Pisani-Ferry and Posen (n 32).

⁴¹ Swiss Re Institute (n 37).

None of this is to say that the rich world is somehow immune from the impacts of climate change or that non-financial considerations are entirely irrelevant to financial market valuations over the long term. However, it seems clear that financial market valuations will not reflect the full global economic or welfare costs of climate change, which inevitably drives a wedge between what might be best for global society, and what fiduciaries should consider with a mandate based on financial returns.⁴² At uncontrolled levels of global warming this distinction becomes moot, given the potentially disastrous consequences. But at lower levels of warming above 1.5°C the distinction is important and should be taken into account in fiduciary considerations. This, after all, is the very nature of an externality.

Translating climate impacts on GDP into financial market valuation effects is complex and requires models to link various macroeconomic variables emerging from integrated economic and climate models to asset pricing models. Analysis by Moody's shows that the relative impact on asset prices across scenarios and timeframes is very sensitive to assumptions about when future damages or transition costs are priced by the market, the extent of such damages, changes to interest rates and, in a successful transition scenario, the extent of any green growth multiplier.⁴³

Unsurprisingly, then, attempts to model the impact of different climate scenarios on equity prices yield mixed results. Practitioner analyses, which often form the basis of advice to pension trustees and other fiduciaries, tend to find that stricter mitigation action is *negative* for diversified market portfolios, at least up to a point. For example, abrdn's climate scenario analysis⁴⁴ found in 2021 that at that time equity markets were around 1 per cent overvalued based on a current policies outcome, 3 per cent overvalued for a 2°C outcome, and 5 per cent overvalued for a net zero 2050 outcome. This directional trend is driven by modelling in which more stringent mitigation scenarios upfront transition costs for businesses are increased which, when discounted at a market rate of return, outweigh the reduced, but longer term, physical risk costs on a net present value basis. Similarly, a Norges Bank Investment Management analysis from 2019 estimated portfolio losses of 1 per cent, 4 per cent, and 8 per cent in 3°C, 2°C, and 1.5°C scenarios based purely on transition risk.⁴⁵ However, the rank ordering was not affected by physical risk which was estimated as causing only a 4 per cent portfolio loss in an RCP8.5 scenario (approximately 4°C of warming!). A more recent analysis by Allianz Global risklab finds even stronger results with a 2050 net zero scenario resulting in global equity returns 1.1 per cent to 1.4 per cent pa lower over 10 years than in a scenario based on nationally determined contributions (roughly equivalent to a current policies scenario), representing portfolio values that are 10–13 per cent lower in the stronger mitigation scenario.⁴⁶

These practitioner studies have, in our view rightly, been criticized as complacent by a group from The Institute and Faculty of Actuaries and Exeter University in the UK. They assert that such results are implausible given the consensus amongst climate scientists about the negative consequences of climate change and are only possible based on incomplete or weak damage

⁴² Tallarita (n 16).

⁴³ N Jessop, A Thompson and M Laffer, 'Translating Long-term Climate Scenarios to Short-term Market Stresses' (October 2023) Moody's working paper <<https://www.moodys.com/web/en/us/insights/climate-risk/translating-long-term-climate-scenarios-to-short-term-market-stresses.html>> accessed 25 July 2024.

⁴⁴ abrdn, 'abrdn's 2021 Climate Scenarios: The Evolution of Investment Risk and Opportunity Since the COVID Crisis' (November 2021) <<https://www.abrdn.com/en-gb/intermediary/sustainable-investing/climate-change/climate-scenario-analysis>> accessed 25 July 2024

⁴⁵ Norges Bank Investment Management, 'Climate Change as a Financial Risk to the Fund' (August 2021) <<https://www.nbim.no/en/publications/asset-manager-perspectives/2021/climate-change-as-a-financial-risk-to-the-fund/>> accessed 25 July 2024.

⁴⁶ X Huang and G Koch, 'Evaluating and Addressing Climate Impact on Portfolio Returns' (March 2024) <<https://www.allianzgi.com/en/insights/outlook-and-commentary/risklab-climate-navigator>> accessed 25 July 2024.

functions and inadequate accounting for downside risk.⁴⁷ Moreover, these analyses have been criticized as being simplistic through use of deterministic discount rates.

In a recent working paper Rebonato and others usefully identify key factors determining equity valuations through use of a probabilistic approach to climate, economic, and financial scenarios with state-dependent discounting.⁴⁸ In their base model without tipping points, they find that portfolio losses due to climate change generally *decrease* with increasing stringency of climate action. They find portfolio values are 27 per cent higher in a 2°C versus 3.3°C scenario, but only modestly higher, by around 4 per cent, in a warming scenarios of 2C versus 2.5°C. Scenarios below 2°C are not modelled. This trend suggests that for mitigation of warming around 2°C and below, incrementally higher short-term transition costs and longer-term physical costs broadly cancel on a discounted basis, especially when changes in interest rates, inflation, and discount factors are taken into account. Only when physical losses become severe at towards 3°C of warming do they dominate the valuation outcome. The most severe portfolio losses are obtained in Rebonato and others by incorporation of a fairly arbitrary and illustrative tipping point function, which imposes immediate and accelerating damages for warming above 2.25°C, which is arguably not entirely realistic. A similar shape of results is found in the previously referenced study by a team from The Institute and Faculty of Actuaries and Ortec Finance.⁴⁹ They find negative return impacts, relative to a baseline of no climate change, of 0.4 per cent pa, 0.7 per cent pa, and 1.7 per cent pa out to 2060 for orderly 2°C, disorderly 2°C, and 4°C scenarios. These impacts imply portfolio values that are around 10 per cent higher in an orderly versus disorderly 2°C scenario, and over 60 per cent higher in an orderly 2°C versus a 4°C scenario. This again suggests that it is at higher levels of warming that adverse portfolio impacts become clear.

What conclusions can be drawn? First, that there is persuasive evidence that there would be long-term net global GDP and portfolio benefits from mitigating from a current policy trajectory (c 3°C of warming) to a 2°C or below scenario. Practitioner studies suggesting improved portfolio outcomes up to 4°C of warming seem surely ill-founded. However, further mitigation towards 1.5°C appears to show uncertain benefits in purely financial terms in a central range of expected scenarios as the discounted value of increased mitigation costs (which are overweighted in portfolio valuations due to high discount rates) comes into balance with that of longer-term physical damage costs. This means that the benefits for expected returns on diversified portfolio returns of further mitigation below 2°C are very uncertain.

4.3. Impact on portfolio risk

The focus placed on central or median climate damage outcomes (and hence on expected returns) by financial institutions, and indeed governments, has been criticized by the team from the Institute and Faculty of Actuaries and the University of Exeter, who argue that, particularly at lower levels of warming, the most negative consequences of climate change are overwhelmingly in the tails of the probability distribution.⁵⁰ Rather than considering central cases, market participants should instead consider downside risks in the presence of climate tipping points. This is especially the case given that not only could climate damages for a given level of temperature rise be worse than expected, it is also possible, given uncertainty

⁴⁷ S Trust and others, 'The Emperor's New Climate Scenarios' (July 2023) <<https://actuaries.org.uk/emperors-new-climate-scenarios>> accessed 25 July 2024.

⁴⁸ R Rebonato, D Kainth and L Melin, 'How Does Climate Risk Affect Global Equity Valuations? A Novel Approach' (July 2024) EDHEC Risk Climate Impact Institute Publication <<https://climateimpact.edhec.edu/publications/how-does-climate-risk-affect-global-equity>> accessed 25 July 2024.

⁴⁹ Bongionro and others (n 38).

⁵⁰ S Trust and others, 'Climate Scorpion—the Sting is in the Tail' (March 2024) <<https://actuaries.org.uk/news-and-media-releases/news-articles/2024/mar/14-mar-24-climate-scorpion-the-sting-is-in-the-tail/>> accessed 25 July 2024.

over climate sensitivity, that levels of warming are significantly higher for a given level of greenhouse gas emissions. This view is also consistent with the concept of 'systemic stewardship' put forward by Gordon.⁵¹ In this view, diversified investors use stewardship not to increase expected returns but to reduce market-wide risk, thereby enhancing risk-adjusted returns for the portfolio.

The concept of tipping points has gained increased prominence in the discourse on climate effects. A tipping point arises when a level of warming triggers an irreversible climate effect, often because of a reinforcing feedback loop. A well-known example is the model for the collapse of the Greenland Ice Sheet. As global temperatures rise, the surface of the ice sheet melts at an increasing rate. Meltwater reduces the reflectivity of the surface causing more heat absorption and accelerated melting. Furthermore, as the ice sheet reduces in height it enters warmer air, accelerating melting further. Once underway, the process is irreversible, leading to an estimated 7 m of sea level rise.⁵²

Analysis of tipping points suggests that a number are in danger of being breached at levels of warming above 1.5°C, with risks increasing for every rise in temperature above that point.⁵³ If tipping points lead to extreme climate outcomes that could damage the economy or portfolio returns, there is potentially a fiduciary motivation to target more stringent limits on warming of 1.5°C rather than the 2°C or so that might be justified by a focus on expected returns in the most probable outcomes.

A fiduciary relying on tipping point risks to justify climate action needs to bear in mind that some tipping points, once triggered, have consequences that play out over very long timescales. Returning to the Greenland Ice Sheet, once the melting feedback loop is triggered, the world is largely committed to around 7 m of sea level rise, but this will likely take place over at least 1000 years. While such tipping points create ethical considerations relating to future generations, they are not clearly relevant to a financial fiduciary today, unless their mandate or robust view of beneficiary preferences clearly broadens the frame. A comprehensive analysis of tipping points identified 16 such potential processes, of which half had both a lower bound temperature for tipping below 2°C and a timescale for impact of less than 500 years (longer than this is not credibly relevant for a current financial fiduciary).⁵⁴ Of these, some, such as coral die back and glacier retreat, have clear environmental and human importance but the link to portfolio valuations is more uncertain. Therefore, fiduciaries need to be clear why they are considering the risk of tipping points, given the requirement for such tipping points to be potentially imminent, fast acting, severe, and cashflow-relevant in order to be relevant for portfolio valuations over the practical time horizons for those fiduciaries. Some fiduciaries will in good faith feel able to make this connection. After all, fast-acting tipping and economically impactful points such as collapse of the Atlantic Meridional Overturning Circulation (AMOC) are, of course, possible and some climate scientists warn that they are underestimated.⁵⁵

However, the more economically severe tipping points with potential near-term impact, such as AMOC collapse, are also often subject to deep uncertainty about whether, at what temperature, and how quickly they will onset. None of this is intended to undermine the case for assertive government action to mitigate climate change. From a public policy perspective, especially given the broader intergenerational, international, wealth equity, and non-financial considerations that reinforce the case for action, this emphasizes the need for application of the

⁵¹ Gordon (n 8).

⁵² NASA Climate Q&A <<https://climate.nasa.gov/faq/30/if-all-of-earths-ice-melts-and-flows-into-the-ocean-what-would-happen-to-the-planets-rotation/>> accessed 25 July 2024.

⁵³ Armstrong McKay and others (n 29); Lenton and others (n 29).

⁵⁴ Armstrong McKay and others (n 29).

⁵⁵ ME McIntyre, 'Climate Tipping Points: A Personal View' (2023) 76(3) *Physics Today* 44.

precautionary principle on climate action. Although, as Martin and Pindyck have highlighted,⁵⁶ in a world facing multiple potential mega-crises it is not possible or rational to pay the full premium for averting all of them, even if such a premium were available, and the preferred order in which they are tackled depends on time preferences and risk aversion, which differ between individuals.

The precautionary principle could also apply to investor action, but has a weaker justification given the need for a clear financial risk motivation—fiduciaries generally cannot take into account the full range of social, moral, and even economic considerations that are properly considered by governments. Any application of the precautionary principle needs to be applied also with regard to the likely efficacy (probably limited—see section V) of investor action to reduce risks; the deep uncertainty of risks and risk reduction; and the potential for costs to be incurred for beneficiaries in the event that the targeted climate scenario does not come to pass.

In summary, then, while there is scope for climate tail risk to motivate universal owner objectives relating to risk reduction, it is a more complex case to make, particularly in relation to the ambitious target of 1.5°C with limited or no overshoot, and fiduciaries need to be clear on their reasoning. While it would be possible for fiduciaries in good faith to conclude that such a goal is appropriate, it would also be possible for them to have doubts.

4.4. The nature and implications of the target

A further consideration relating to adoption of climate targets by investors is what the target actually means in practice. If the target is merely a statement of preference or an exhortation for policy makers to progress faster on climate action, then it is difficult to see serious fiduciary considerations arising. However, signatories to commitment statements from NZAOA, PAAO, and NZAM are clearly doing more than this. Beyond general advocacy these frameworks also require engagement and investment policy to be aligned in some sense with the 1.5°C target. This then leads to the important questions:

- How likely is the target to be achieved?
- What impact can we have through our actions on that likelihood?
- What are the potential costs and risks of attempting but failing to hit the target?

The target of 1.5°C with limited or no overshoot is now widely considered to be out of reach, if not technically then at least practically.⁵⁷ Indeed a poll of climate scientists for Nature found that of those responding, fewer than 5 per cent thought warming would be limited to 1.5°C by the end of the century.⁵⁸ Of course ‘will’ and ‘can’ are different things. But overall, the level of profound change and policy action required in politically very contentious areas makes achievement of the 1.5°C goal implausible. There are arguments that an explicit reframing of the 1.5°C goal becomes self-fulfilling and undermines efforts to mobilize activism and create accountability.⁵⁹ Given that the 1.5°C target also has some absolute relevance as a threshold beyond which risks increase rapidly, understanding how far off track the situation is from this target retains value. But for fiduciary investors, who as the next section will show have influence generally at the margin of economic activity, it is questionable how much sense it makes to have a goal that is so far removed from likely trajectories, particularly if those investors then act on it.

⁵⁶ IWR Martin and RS Pindyck, ‘Averting Catastrophes: The Strange Economics of Scylla and Charybdis’ (2015) 105(10) *American Economic Review* 2947.

⁵⁷ HD Matthews and S Wynes, ‘Current Global Efforts are Insufficient to Limit Warming to 1.5C’ (2022) 376 *Science* 1404.

⁵⁸ J Tollefson, ‘Top Climate Scientists are Sceptical that Nations Can Rein in Global Warming’ (2021) 599 *Nature* 22.

⁵⁹ J Hadden and A Prakash, ‘The Value of Unrealistic Targets: Why Some Climate Activists are Unwilling to Abandon the 1.5C Target’ (2024) 3 *npj Climate Action* 29.

This is because the disconnect between the 1.5°C target and reality can, if investors seek to meet the target, give rise to actions that increase costs and risks for investors.⁶⁰ Investment allocations that seek to align with or create impact towards a 1.5°C world may underperform in a slower decarbonization scenario. Engagement demands for companies to align with 1.5°C pathways that are not realistic may create competitive disadvantage. Incurring such costs and risks is difficult to justify if the efficacy of investor climate action is low. Alternatively, and this is perhaps the bigger problem in practice, having committed to a goal which is no longer realistic, investors and corporates may adopt practices that appear to be 1.5°C aligned but are nothing of the sort, such as portfolio decarbonization indices, carbon offsets, or long-term commitments to ‘science based’ targets, but with little follow through action. In other words, they may practise ‘greenwashing’.

At the time of the Glasgow COP, there was a temporary sense that governments were recommitting to ‘keep 1.5 alive’. It was in this context that investors signed on to the goal, with the express rider that: ‘Our commitment is based on the expectation that governments and policy makers will deliver on their commitments to achieve the 1.5°C temperature goal of the Paris Agreement’.⁶¹ Now, it might be argued that in a world where governments implement policies to limit warming to 1.5°C, the commitment to invest in line with that goal does not amount to much—it simply becomes a commitment to invest in line with policy and economic signals. But with governments not on track to fulfil their part of the bargain, there is a need for investors to reappraise what their own commitments really mean. Indeed, attempting to achieve the 1.5°C target in the absence of supportive government policy raises many issues. Given the deep changes required to the economy, the innovations, and the investments in public goods that would be needed, it is almost certainly impossible for investors to bring about the change in any coherent way. Nor is it obviously desirable for them to do so. Investors would be in no position to undertake the redistributive policies required to ensure a just transition. And any attempt to impose a 1.5°C transition could be seen as significant political over-reach.

4.5. Evaluation of Test A: The misalignment of climate and financial market goals

To summarize this section so far, the following conclusions have been reached.

- Because of discounting, geographical concentration, and lack of relevance of non-financial and ethical factors for financial market valuations, there are strong reasons to think that mitigation efforts that are beneficial for diversified portfolio values will fall short of mitigation efforts that optimize global social welfare.
- Notwithstanding this, there is good evidence that expected returns on diversified portfolios could benefit, even potentially in more probable central cases, from mitigation of warming from the current policies trajectory of around 3°C end of century warming to below 2°C in line with the Paris Agreement. It is less certain that mitigation to 1.5°C leads to further benefits in expected returns.
- Financial fiduciary arguments in favour of mitigation to 1.5°C with limited or no overshoot rely on reducing the risk of imminent, fast-acting, severe, and cashflow-relevant tipping points, which form only a subset of identified tipping points and which are subject to deep uncertainty.
- Achievement of the 1.5°C goal appears unlikely, even if not technically infeasible, and so fiduciaries taking *investment action* to meet a 1.5°C target need to consider carefully the

⁶⁰ Gosling and MacNeil (n 21).

⁶¹ PAAO commitment, other initiatives make comparable statements.

consequences for beneficiaries of pursuing the goal but failing to meet it, especially given the likely low efficacy of investor action (see the next section).

- Investors need to consider the extent to which it is desirable to pursue goals that go well beyond the trajectory of government policy action.

Overall, these findings suggest that some fiduciaries may not feel able to justify adopting a goal of limiting global warming to 1.5°C with limited or no overshoot especially if they place concrete investment and corporate engagement actions upon it. Test A is not clearly met in relation to the 1.5°C goal, although some fiduciaries may consider in good faith that it is. Nonetheless, the evidence suggests it is certainly reasonable for climate-concerned fiduciary investors to have goals that indicate their commitment to more rather than less climate action compared with our current policies trajectory, given the evidence that this is plausibly favourable for risk-adjusted returns. Section VI considers the type of climate goal that may be more justifiable for investors to hold in relation to our tests. Section V turns to the question of whether investors actually *have the ability* to influence climate outcomes in the way that Proposition B of the universal ownership logic implies.

5. CAN INVESTORS AFFECT CLIMATE OUTCOMES?

5.1. Investor impact model

For universal ownership theory to apply, it is not just necessary that the climate goal being pursued by investors is consistent with maximizing portfolio returns (Test A), they must also have the means to pursue that goal (Test B).

This section of the article reviews the academic evidence relating to commonly assumed direct channels of investor influence, to consider whether they can, in fact, plausibly affect climate outcomes to the extent required by the universal owner model. The section will conclude that while the evidence suggests that investors can have *some* influence, it is likely nowhere near enough to support the most ambitious application of universal owner theory to climate change.

Essential to the proposition that universal owners should act to curb climate change is the presumption that they can have influence. Quigley articulates it thus:⁶²

Using climate change as an exemplar systemic risk, this paper proposes an evidence-based practical framework for universal owners that comprises several features designed to produce real-world outcomes at a low cost: a more urgent and tactical version of active ownership; asset allocation within the primary market; a particular focus on assets transitioning from the primary to the secondary market; ‘ungameable’ metrics linked to real-world results; strategic engagement with public policy and standard-setting regimes; and forward signalling to reduce wastage and accelerate decarbonisation timelines. Together these elements of the framework have the potential to change the rules of the game, alter company behaviour and fundamental strategy, reallocate capital, and render externalities unprofitable—precisely what is required of universal owners in an era of worsening and increasingly global systemic risks.

However, while it is certainly true that investors can have impacts on real world outcomes, the extent to which they can truly impact a major issue such as climate change has severe limits.

Any chain of causality between investor action and climate outcomes must have the following three links:

⁶² E Quigley, ‘Universal Ownership in Practice: A Practical Investment Framework for Asset Owners’ (2020) working paper <<https://ssrn.com/abstract=3638217>> accessed 14 February 2024.

- First, the investor action must create an observable effect on companies.
- Second, managers in companies must respond to that effect with changed activity that reduces emissions or otherwise mitigates global warming in the real world.
- Third, the effect must hold after second order responses, meaning that the actions of one company do not simply result in offsetting actions by another actor.

As discussed below, in the area of climate impact these tests are demanding and rarely, if ever, passed in combination.

The main channels typically identified for investor influence through the investment and stewardship process are:

- *The cost of capital channel.* This involves increasing the cost of capital of dirty firms by divesting and decreasing the cost of capital of clean firms by investing. The idea is that changes to the cost of capital will cause managers to change their investment decisions.
- *The engagement channel.* This involves investors engaging directly with companies to encourage changes to strategy, operations, and capital investment decisions in order to become cleaner. Engagement may be behind the scenes or activist, and may include filing or supporting shareholder proposals.
- *The incentives channel.* Here the presence of incentives in manager compensation causes managers to improve environmental performance. This can arise because managers have stock-based pay and the threat of exit or promise of further investment conditional on improvements in environmental performance creates incentives for them to act through changes in share price. Or it can arise because of the inclusion of environmental measures in executive pay contracts.

Some authors also highlight the importance of policy engagement and other ‘field building’ activities.⁶³ These will be discussed in section VI.

Each of these three channels will be considered in turn below.

5.2. Cost of capital channel

Here the contention is that investors can increase (reduce) the cost of capital of a company by preferentially divesting from (investing in) its securities. This change in cost of capital then affects management investment decisions, resulting in real-world action. It is important here to distinguish between cost of capital effects that arise because of investor perceptions of risk versus those that arise from investor tastes, expressed in terms of exclusions or portfolio tilting. It is the latter set of effects that are most significant from the perspective of universal owners impacting climate change. The effects can be difficult to disentangle.

The extent of any cost of equity impact arising from divestment due to investor preferences on climate is contested, although there appears to be more consensus around impact on cost of debt. This topic is the subject of an extensive and complex academic literature. In this section, conclusions drawn from a review of the key academic evidence on this topic are summarized. A more detailed discussion of individual research papers is included in the Appendix for the interested reader and a thorough discussion can also be found in Kölbel and others.⁶⁴

Fund flows, including preference-based fund flows, and lending restrictions do appear to affect security prices and therefore, at least in principle, cost of capital. Overall, the evidence⁶⁵

⁶³ Marti and others (n 20).

⁶⁴ Kölbel and others (n 19).

⁶⁵ For a recent review see M Eskildsen and others, ‘In Search of the True Greenium’ (2024) working paper available at <<https://ssrn.com/abstract=4744608>> accessed 26 July 2024.

seems to point to the potential of cost of capital impacts from exclusion or taste-based factors, amounting up to the order of 50 to 200 basis points on cost of equity and up to around 20 basis points on cost of debt, although the evidence is mixed, especially in relation to cost of equity. The question then arises: what impact does this have on corporate decision making?

Even if there is a cost of capital impact, there is a question of whether it influences the decision-making of managers. Corporate managers calculate cost of capital periodically, often using a fairly imprecise model, and are unlikely to be attuned to changes in cost of capital over short periods. Indeed, Gormsen and Huber find that over 60 per cent of managers leave their investment discount rate unchanged for as long as five years, even as interest rates change.⁶⁶ Moreover, they find that as interest rates fell in the first two decades of this century, discount rates remained elevated, with the result that the 'wedge' between the perceived cost of capital and the discount rate used for investment appraisal increased by around 200 basis points over the period. It seems that corporate managers are not very sensitive to even quite large changes in market cost of capital.

Studies linking cost of capital changes to changes in management action are relatively limited in number. Lou and Wang analyse the behaviour of firms affected by extreme buying or selling pressure arising from aggregated flows into and out of mutual funds⁶⁷ (note that these flows are not ESG-related flows and so their findings may not translate to the setting we are considering here). They show that this buying or selling is not informative about the prospects of the individual firms (the pressure arising from the fund flows is exogenous) but it does lead to short-term increases or decreases in share price of affected firms. They show that firms issue less equity if the fund flows drive their price down. Moreover, these firms also on average cut investment. The effects on share price and investment persist for up to two years. However, the impacts on investment are small, with the firms subject to heaviest selling pressure cutting investment by just over 4 per cent, and the setting may not translate precisely to selling pressure in the universal owner case.

Furthermore, there is a question over what investment may be cut. Would brown firms cut brown investment or instead cut back on green initiatives? Hartzmark and Shue find that the impact of cost of capital changes on management actions are themselves unpredictable.⁶⁸ Financially constrained dirty firms may respond to increases in financing costs by doubling down on brown activities and cutting green investment, while reducing the cost of capital for firms that are already green has little real-world impact, so impacting cost of equity may have exactly the opposite result to that desired. Whether increasing cost of capital makes firms greener or browner is therefore an empirical question.

The evidence in relation to debt financing is more promising, although this operates through a binary denial of debt channel rather than via an incremental cost of debt. Green and Vallee focus on the impact of strengthening bank lending policies on coal financing.⁶⁹ This is a sector with high capital demands, highly dependent on bank syndicates for finance, and where there are relatively stringent bank policies in place. Coal firms with higher exposure to banks with lending policies raise less debt and experience reduced total assets. They also find that power firms exposed to banks with lending policies are significantly more likely to retire coal-fired plants early, with closure rates increasing by 41 per cent. The baseline retirement rate is not disclosed

⁶⁶ NJ Gormsen and K Huber, 'Corporate Discount Rates' (2023) NEBR working paper 31,329 <<http://www.nber.org/papers/w31329>> accessed 14 February 2024.

⁶⁷ X Lou and AY Wang, 'Flow-Induced Trading Pressure and Corporate Investment' (2018) 53(1) *Journal of Financial and Quantitative Analysis* 171.

⁶⁸ SM Hartzmark and K Shue, 'Counterproductive Sustainable Investing: The Impact Elasticity of Brown and Green Firms' (2023) working paper <<https://ssrn.com/abstract=4,359,282>> accessed 14 February 2024.

⁶⁹ D Green and B Vallee, 'Can Finance Save the World? Measurement and Effects of Bank Coal Exit Policies' (2024) working paper <<https://ssrn.com/abstract=4090974>> accessed 14 February 2024.

but appears from the fitted hazard function to be around 3 per cent pa, implying an increase to around 4.5 per cent pa. Carbon emissions for continuing plants also reduce, although again the effect appears small with a one standard deviation change in exposure to coal lending policies resulting in a reduction in emissions of less than 2 per cent. So even in this more promising case, the impacts are rather small when set against the challenge of internalizing externalities from climate change, and there are indications that the significant results may be arise from developed markets where coal usage has already been in decline for some time, suggesting that the mechanism may be most useful in accelerating the decline of polluting assets that are already unattractive for other reasons.

To finish on the cost of capital discussion, even upper-end estimates for the impact of preference-driven increases in cost of equity amount to at most around 300bp. This sounds like a lot, but based on return on equity of 10–15 per cent, this is economically equivalent to an impact of around 25 per cent of profits. This is much lower impact than a carbon tax even at \$100 a tonne, the minimum required to keep the world on a 1.5°C path, which would wipe out entirely the profits of over half of companies in heavy emitting sectors.⁷⁰ One study finds that for the heaviest emitters to create an incentive equivalent to a carbon price of \$100 requires a cost of equity impact of 10 percentage points.⁷¹ Overall, those signals that are sent via the cost of capital channel, even if they were fully recognized and acted upon by management, appear to be entirely insufficient to meet the challenge of global warming and certainly insufficient to direct the world onto a path towards 1.5°C with limited or no overshoot.

5.3. Engagement channel

The limitations of divestment, and of broader cost of capital impacts, are recognized by many investors who instead focus on engagement.

There is a broad body of work that supports the idea that engagement on environmental and social issues can have successful outcomes. Given the focus of this article, I concentrate below on results for environmental engagements where available. Dimson, Karakaş, and Li find a 13 per cent success rate for environmental and social engagements in general and a 10 per cent success rate for climate change engagement specifically.⁷² A successful engagement is one where the asset manager's recommendations are implemented. Importantly, success rates for collaborative engagements are much higher than the average, approaching 50 per cent. This success rate is supported in the same authors' follow-on paper relating to collaborative engagements under the auspices of the UN Principles for Responsible Investment.⁷³ However, it should be noted that the objectives were not always demanding, with many environmental engagement objectives relating to the engaged firms adopting disclosure practices, setting an environmental objective, or commencing an environmental programme. These are arguably low cost for the target company with correspondingly limited real-world impact.

Hoepner and others study the impact of environmental and social engagements on downside risk.⁷⁴ Studying the engagements of a single asset manager, they find that 22 per cent of environmental engagements are successfully completed, as defined by the asset manager, and 40 per cent result in at least some response from the target company. Barko, Cremers, and Renneboog

⁷⁰ R Eccles, X Gao and S Rajgopal, 'How a carbon tax would hit the earnings of US companies' (Responsible Investor, 1 March 2022) <<https://www.responsible-investor.com/how-a-carbon-tax-would-hit-the-earnings-of-us-companies/>> accessed 14 February 2024.

⁷¹ LH Pedersen, 'Carbon Pricing versus Green Finance' (2024) working paper <<https://ssrn.com/abstract=4382360>> accessed 26 July 2024.

⁷² E Dimson, O Karakaş and X Li, 'Active Ownership' (2015) 28(12) *Review of Financial Studies* 3225.

⁷³ E Dimson, O Karakaş and X Li, 'Coordinated Engagements' (2023) working paper <<https://ssrn.com/abstract=3209072>> accessed 14 February 2024.

⁷⁴ AGF Hoepner and others, (2023) 'ESG Shareholder Engagement and Downside Risk', 28(2) *Review of Finance*, 483. <https://ssrn.com/abstract=2874252>.

present results from a single socially responsible activist fund.⁷⁵ They find a 53 per cent success rate on environmental engagements (of which only a very small number are on climate change directly), where success is as measured by the asset manager. These papers are based on behind-the-scenes engagement. Dyck and others provide an analysis of public engagement via the means of shareholder proposals.⁷⁶ Such proposals can bring about impact even if they are withdrawn, which frequently occurs when the company addresses investor demands to a satisfactory degree. They find that 45 per cent of such engagements on environmental issues are successful.

Azar and others analyse the relationship between carbon emissions and 'Big 3' index fund ownership (BlackRock, State Street, and Vanguard).⁷⁷ They find that the Big 3 are more likely to engage with large high emitting firms where they have a large stake and find a negative relationship between Big 3 holding and carbon emissions, with the effect driven by firms where their model suggests a higher probability of Big 3 engagement. Using changes in Big 3 ownership either side of the threshold between the Russell 1000 and Russell 2000 indices, which are deemed to be exogenous, they find support for a causal link between higher Big 3 ownership and reduced carbon emissions, although they are careful to caveat that causality is not definitively proven. Heeb and Kölbel also assess the impact of an index provider's engagement, this time using a field experiment.⁷⁸ The index provider wrote to a randomly chosen sample of 300 out of 1227 fund holdings saying that they had to set a science-based target in order to remain in the provider's climate transition benchmark indices, which were used as the basis for multiple tracker funds. After one year, 21 per cent of companies in the treatment group committed to science-based targets as opposed to 15.7 per cent in the control group—a 33 per cent increase in probability of adoption. They interpret their results as providing casual evidence that engagement on a feasible request for the corporate, coupled with a credible threat of divestment, can trigger company action.

The evidence in the round suggests that investor engagement can produce outcomes in terms of changing corporate behaviour and, if undertaken on a collaborative basis, can have success rates of up to around 50 per cent, which appears impressive. However, there are two factors that must be borne in mind when considering how much support these success rates provide for the universal owner argument. First, even when successful, where studies have measured the impact of these engagements on corporate outcomes it has been found to be quite small. Second, many of the studies find that the improvements in ES performance are associated with subsequent operating performance and share price improvements. This suggests that the environmental and social changes requested are consistent with long-term value maximization at that company. Success rates are likely to be much lower in cases where engagement seeks to reduce value at the target company in order to reduce negative spillovers to other companies in the portfolio.

Consider first the magnitude of the impact on environmental performance. Hoepner and others primarily measure the impact of engagement on downside risk, but they also look at the impact on future environmental incidents. Both measures lead to similar impacts. They find that environmental engagements reduce downside risk by around 12–13 per cent of the standard deviation of downside risk across companies. They similarly find that engagements reduce the number of future environmental incidents by around 15 per cent of the standard deviation of

⁷⁵ T Barko, M Cremers and L Renneboog, 'Shareholder Engagement on Social, Environmental, and Governance Issues' (2022) 180 *Journal of Business Ethics* 777.

⁷⁶ A Dyck and others, 'Do Institutional Investors Drive Corporate Social Responsibility? International Evidence' (2019) 131(3) *Journal of Financial Economics* 693.

⁷⁷ J Azar and others, 'The Big Three and Corporate Carbon Emissions Around the World' (2021) 142 *Journal of Financial Economics* 674.

⁷⁸ F Heeb and J Kölbel, 'The Impact of Climate Engagement: A Field Experiment' (2024) working paper <<https://ssrn.com/abstract=4711873>> accessed 14 February 2024.

environmental incidents across companies. If 100 companies were ranked according to their downside risk/environmental incidents, this equates to an improvement in ranking of around three to four places on average. Barko, Cremers, and Reeneborg find no statistically significant effect on environmental scores from engagement overall, but there is a statistically significant improvement for firms in the bottom quartile of ESG scores. The improvement amounts to a little over one-half of the standard deviation in ESG scores across the sample, which equates to a more material ranking improvement of 14 to 15 places amongst 100 companies. However, there is a curiosity in the result, which is that for the matched sample the improvement in environmental scores for lower quartile ESG performers is offset by a *reduction* in environmental scores for upper quartile ESG performers that are engaged, making it difficult to know how to interpret these results.

Dyck and others do not directly measure the impact of engagement on ES outcomes, but do so indirectly by measuring the linkage between institutional investor ownership and environmental performance. They find that increasing ownership by UN PRI signatories (who are committed to engagement on ES issues) by one-standard deviation (16.8 percentage points) leads to a 13 per cent improvement in environmental performance, which equates to between one-third and one-half of the sample standard deviation, depending on the environmental performance measure used. Using our simplified ranking explanation, this is equivalent to an improvement of 7 to 12 ranking positions out of 100. Thus, it is significant but not a transformation, and consistent with the evidence discussed above.

Becht and others find that an index manager engaging on behalf of the Japanese Government Pension Investment Fund on environmental issues was associated with subsequent improved scores under one of the two measures used.⁷⁹ On the environmental dimension, average Financial Times Stock Exchange (FTSE) environmental scores were increased by 0.3 on a 5-point scale. The standard deviation of scores in the sample was not disclosed so it is difficult to be definitive about how 'large' an impact this is. However, there was no identified improvement based on the Morgan Stanley Capital International (MSCI) scores. The authors note that the FTSE methodology places a relatively high weighting on improving disclosure and the asset manager's engagement often focused on climate-related financial disclosures. They attribute the effect on FTSE scores to the disclosure channel, suggesting that the real-world impacts are extremely modest. Given the prominence of investor demands for disclosure as an engagement outcome, it is likely that many of the recorded 'successful' engagements are along this dimension.

Azar and others find that a one standard deviation in Big 3 ownership is associated with just 2 per cent lower emissions, and this is a one-off rather than a recurring effect. Moreover, it is not tested whether emissions are lower because of real-world reductions or simply arise from portfolio divestments, renewable energy credits and the like. The effect reported by Heeb and Kölbl is merely a commitment to a target rather than real world action. The extent to which SBTi encourages real-world emissions reductions remains contested. Moreover, they excluded companies subject to Climate Action 100+ engagement from their experiment, meaning that the study by construction excludes those companies that are the biggest corporate emitters and for whom setting science-based targets would be the most costly but also, for the planet, potentially the most meaningful.

Turning now to the performance implications, many of the studies referenced above describe positive shareholder outcomes for engaged companies. Dimson, Karakaş, and Li in both of their papers and Barko, Cremers, and Reeneborg find positive abnormal returns from successful

⁷⁹ M Becht and others, 'Does Paying Passive Managers to Engage Improve ESG Performance?' (2023) working paper <<https://ssrn.com/abstract=4,506,415>> accessed 14 February 2024.

engagements. Hoepner and others find reduced downside risk. Dyck and others identify financial as well as social motivations for ES engagement.

The fact that successful engagements are associated with positive subsequent abnormal returns (or downside risk reduction), suggests that the environmental and social changes requested through successful engagements are consistent with long-term value maximization at that company. This is a win-win for the company and its shareholders. Therefore, it is not clear that these findings are relevant to a case where the engagement reduces value at the target company in order to reduce negative spillovers to other companies in the portfolio. This lose-win scenario is central to the universal ownership case.

The reasons why engagement on ES issues is likely to be focused on win-win issues for the company and its shareholders have been documented by Kahan and Rock⁸⁰ and by Tallarita⁸¹ as described in sections II.3 and III.2. First, corporate governance has a strong single-firm focus. In particular, boards of directors have fiduciary duties at the firm level. Second, many shares of companies, even if held within a fund family that could be considered a universal owner, are actually held in quite focused funds with specific clients and objectives (fiduciary obligations operate at the fund level). It will be impossible for boards of directors to take into account investors' holdings at other companies when deciding the strategy at the company at which they are responsible. This would not be in line with their fiduciary duties.

Overall, while the aggregate body of evidence is undoubtedly supportive of the idea that engagement by investors can affect the behaviour of portfolio firms, this finding in no way supports the contention that engagement by universal owners can correct for an externality like climate change:

- First, success rates for environmental engagements are variable, and even when part of collaborative efforts average at most around 50per cent.
- Second, the definition of success can include a relatively modest environmental milestone, such as disclosure, and success rates for more substantial operating changes are, where studied, found to be lower.
- Third, impacts on environmental outcomes from successful engagements are typically quite modest in the context of the environmental challenges we face: quite consistently across studies, the magnitude of the impact is equivalent to, at best, moving up 10 to 15 ranking places in a list of 100 companies ordered by environmental performance.
- Fourth, the studies tend to find positive outcomes for shareholder value from the engagement, which suggests that engagement is focused on win-win, or at least low cost, issues for the company concerned. By contrast the universal ownership logic requires shareholders to press changes on companies that may be costly for them individually but beneficial for the wider portfolio: a lose-win scenario.

Overall, engagement is one of the channels that has the best evidence impact in terms of changing corporate action. But nonetheless the impacts are modest and are most effective when the desired actions are aligned with value creation at the level of the engaged company rather than, as may be the case with universal ownership theory, acting against it.

5.4. Incentives channel

A further channel that can be used to influence executive behaviour is the incentive effect of executive compensation. There are two strands of research literature in this context. One relates

⁸⁰ Kahan and Rock (n 15); M Kahan and EB Rock, 'Corporate Governance Welfarism' (2023) working paper, <<https://ssrn.com/abstract=4328626>> accessed 14 February 2024.

⁸¹ R Tallarita, 'Fiduciary Deadlock' (2023) 171(1) University of Pennsylvania Law Review <https://scholarship.law.upenn.edu/penn_law_review_online/vol171/iss1/1> accessed 14 February 2024.

to the effects of stock-based compensation when a group of investors may have ES preferences. The other relates to the effects of directly including ES measures in executive incentives.

Gantchev, Giannetti, and Li explore the impact of management incentives on ES performance.⁸² They find that negative coverage of corporate ES policies results in selling by ES-conscious investors, driving down the stock price particularly where the firm has a larger body of ES-conscious shareholders. Analysing firms experiencing the most extreme fifth of share price falls, they find a statistically significant improvement in ES scores where managers are incentivized through stock-based compensation. The interpretation is that such managers face an incentive not to lose further ES investors or to regain those lost because of the negative ES news. They find that the effect is driven by the combination of ES conscious investors and stock-based compensation. For the group of stock-compensated firms, they find that a one standard deviation increase in the proportion of ES conscious investors prior to negative news results in subsequent improvements in ES scores and GHG intensity over three years that are between one-third and one-half of the average three year improvement.

Edmans, Levit, and Schneemeier adopt a similar approach,⁸³ building a model that studies the approach of tilting or conditional divestment, whereby an investor holds a firm's stock if, but only if, they make specified ES improvements, and compares this with divestment. Tilting creates incentives for the manager to adopt the desired practices because of the impact of sales or purchase on the value of their stock-based compensation. The analysis shows that tilting is more likely to be effective if managers can realistically make changes at reasonable cost.

It should be noted that this channel is immediately less relevant for the universal owner logic. In the universal owner case the investor may be seeking to push a target firm (for example, an oil company) to harm its share price (for example, by cutting production) in order to benefit other companies in the portfolio (by reducing oil company greenhouse gas emissions). In this case, the direct impact of the action on the target company would likely outweigh the relatively small impacts of share prices changes caused by fund flows, which are typically measured in a small number of percentage points or less.

An alternative approach is to consider direct incentivization of ES targets by including such metrics in the compensation contract. This practice has exploded in recent years and can now be considered normal across many territories.⁸⁴ The evidence on the impact of including ES metrics in pay is mixed. Overall, there is some evidence for at least a correlation with improving ES performance, although causality is hard to determine definitively. But the impacts in terms of ES performance are small and, furthermore, also seem to be associated with positive or at worst neutral share price changes.

Carter, Pawliczek, and Zhong analyse introduction of ESG targets in incentives following adoption of say on pay rules around the world and track the subsequent ESG and share price performance of the companies adopting the practice.⁸⁵ By considering the adoption of say-on-pay as exogenous they present their results as at least indicative of causality. They find that ESG contracting improves environmental scores by 10 per cent and improves valuations. Note that the 10 per cent improvement in environmental score is about one-tenth of the cross-sample standard deviation of scores.

⁸² N Gantchev, M Giannetti and R Li, 'Does Money Talk? Divestitures and Corporate Environmental and Social Policies' (2022) 26(6) *Review of Finance* 1469.

⁸³ A Edmans, D Levitt and J Schneemeier, 'Socially Responsible Divestment' (2023) working paper <<https://ssrn.com/abstract=4093518>> accessed 14 February 2024.

⁸⁴ R Barontini and JG Hill, 'Sustainability and Executive Compensation' in K Alexander, M Gargantini and M Siri (Eds), 'The Cambridge Handbook of EU Sustainable Finance: Regulation, Supervision and Governance' (2025), Cambridge University Press. <https://ssrn.com/abstract=4671966>.

⁸⁵ ME Carter, A Pawliczek, and R Zhong, 'Say on ESG: The Adoption of Say-on-Pay Laws, ESG Contracting, and Firm ESG Performance' (2022) working paper <<https://ssrn.com/abstract=4125441>> accessed 14 February 2024.

Cohen and others show that adoption of carbon targets is associated with lower carbon emissions.⁸⁶ However, the effect is extremely small (less than 1T CO₂ Scope 1 reduction) and they do not address causality. Indeed, as they find firms that have stated ES targets are more likely to include ES targets in pay, it is highly plausible that firms that expect and have plans to reduce emissions both set targets and then link those targets to pay. They find no association between ESG contracting and performance.

Overall, the incentives channel does not provide a plausible mechanism for universal owners to effect significant change. The incentives created through stock-based compensation will not work if the carbon reductions are very costly, as the direct impact of this on share price would outweigh any flow-driven effects. Yet this is the whole point of the universal ownership approach.

So, the evidence for the impact of including environmental metrics in pay is also not supportive of the universal owner case. First, where found, the impacts are relatively small, being just a 10 per cent improvement in scores, which is only one-tenth of the standard deviation of the cross-sectional variation. This is equivalent to an improvement of three places in a ranking of 100 firms. Furthermore, the improvements are associated with increases in share price. This suggests that the targeted changes are focused on those areas where there is a win-win between investors and the environment. This is clearly not generalizable to the universal ownership case where environmental targets may be pursued even at the expense of value in the targeted firm. Given that environmental targets typically form only about 20 per cent of pay but most executive pay is delivered in the form of shares, executive incentives overall remain dominated by the share price.

5.5. Evaluation of test B: The limited efficacy of investor action

There is some limited evidence for the ability of investors to influence real-world outcomes through engagement, incentives and, at least in relation to debt, cost of capital. But too often limited evidence in support of a particular channel of influence is translated into universal statements such as ‘engagement works’ or ‘incentives work’. In fact, the evidence for the efficacy of any of these channels is mixed and quite weak. In particular:

- In relation to cost of capital, the evidence on how much cost of capital can be influenced by sustainable investors is mixed and there is very limited evidence of cost of capital changes translating into management action. Where such evidence exists, the impacts are small.
- In relation to engagement, the success rates are generally at or below 50 per cent even for collaborative engagements, the impacts relatively modest given the scale of the environmental challenges faced (and particularly the challenge of limiting global warming to 1.5°C with limited or no overshoot), and outcomes to date are quite plausibly dominated by the ‘achievement’ of disclosure adoption, with limited effect on real-world outcomes. Moreover, the general finding of a positive association between engagement and share price or risk-reduction at the individual company level suggests that engagement on environmental issues has tended to focus on win-win issues for the company and the environment. Universal ownership engagement needs to be effective in the much tougher case of interventions that benefit the environment but may reduce value at the individual firm level: win-lose.
- Much of the evidence on incentives suffers from similar limitations. The effects, even if they are causal (which is uncertain), are extremely small. Moreover, it appears that ES targets have largely focused on win-win or at least value-neutral issues, as opposed to the much tougher case required for universal owners. The same applies to the incentive that fund flows

⁸⁶ S Cohen and others, ‘Executive Compensation Tied to ESG Performance: International Evidence’ (2023) 61(3) *Journal of Accounting Research* 805.

can provide through stock-based compensation: this incentive is undermined if universal owners are demanding changes that reduce value at a given company.

There is a general theme behind all of these findings. Academic studies often focus on statistical significance. This simply means the degree of confidence that there is a non-zero result for a particular relationship, for example between engagement and ES performance. Even setting aside the often-vexed question of causality, it is also frequently the case that the effects although *statistically significant* are in practical terms *economically rather small*. There is a danger of taking from an academic study the message that ‘engagement works’ or ‘pay incentives work’ and then extrapolating from rather small observed effects to the very much tougher case of universal owner theory. For universal owner theory to work, the effects have to be order of magnitudes larger in order to internalize the externality caused by carbon emissions. Moreover, the universal owner also will have to overcome all of the incentives that exist within the targeted companies to create long-term value at the level of the company, not the investor’s portfolio.

These concerns only relate to parts one and two of our impact framework: is there an economic signal and will management act on it? There remains a third hurdle: the general versus partial equilibrium effects. Most studies on the efficacy of divestment, engagement, or incentives study the effect on individual companies. But this ignores the effect on the economy as a whole. Does any reduction in carbon emissions, say, create true reduction in the real economy or is there simply displacement, intended or otherwise, to other parties. Are carbon reduction targets met by genuine reductions in emissions or through divestments?

Analysis by Atta-Darkua and others indicates that institutional portfolio carbon intensity has dropped significantly over the last decade, while emissions have not.⁸⁷ It appears that emissions are simply shifting into less scrutinized ownership structures such as state-owned enterprises or privately held firms. This has been documented anecdotally by Ringe and Gözlügöl in relation to the oil and gas industry specifically.⁸⁸ Furthermore, detailed empirical analysis by Duchin, Gao, and Xu has shown that in the case of industrial pollution, reductions in response to environmental incidents are generally achieved through divestment of assets to other owners, with no subsequent improvement in aggregate pollution outcomes.⁸⁹ It should be noted that in some very specific circumstances involving relatively closed systems, for example the case of coal financing, the evidence is more encouraging that leakage may not always be occurring. But often the second order effects will be significant and even defining.

6. A POSITIVE AGENDA FOR CLIMATE CONSCIOUS INVESTORS

6.1. Problems with targeting 1.5°C with limited or no overshoot

Universal ownership theory in principle overcomes concerns about fiduciary duty in relation to investor attempts to pursue ES objectives. The basis of the theory is that effective action by investors increases risk-adjusted returns at the portfolio level by reducing externalities produced by individual constituent companies. Even if some targeted companies suffer reduced value, this is offset by broader gains or reductions in risk in the portfolio.

In this article so far, it has been established that even if investors were able to determine their chosen climate outcome, there is uncertainty whether the commonly adopted target of 1.5°C with limited or no overshoot would enhance risk-adjusted returns at the portfolio level.

⁸⁷ V Atta-Darkua and others, ‘Decarbonizing Institutional Investor Portfolios: Helping to Green the Planet or Just Greening Your Portfolio?’ (2023) working paper <<https://ssrn.com/abstract=4212568>> accessed 14 February 2024.

⁸⁸ A Gözlügöl and G Ringe, ‘Net-Zero Transition and Divestments of Carbon-Intensive Assets’ (2023) 56(5) UC Davis Law Review 1963.

⁸⁹ R Duchin, J Gao and Q Xu, ‘Sustainability or Greenwashing: Evidence from the Asset Market for Industrial Pollution’ (2023) working paper <<https://ssrn.com/abstract=4095885>> accessed 14 February 2024.

Moreover, it has been established that, far from being able to determine their chosen climate outcome, evidence suggests that investors in fact have very limited ability to influence outcomes on a systemic issue like climate change.

The extremely limited efficacy of the investor toolkit then raises serious fiduciary considerations. As Gosling and MacNeil outline, if investors are more ‘takers’ than ‘makers’ of the climate outcome, there is a tension between impact and fiduciary duty.⁹⁰ Given that investors seeking impact face a real probability of incurring the full costs of action but only very partial benefits, if any, there is a significant risk of imposing costs on beneficiaries for no purpose.

6.2. Framing investor objectives on climate

So where does this leave the climate-concerned asset owner? Must climate action be sacrificed entirely on the altar of fiduciary duty? I would argue not. However, investors not relying on a specific climate mandate from clients need to be clear-eyed on three questions:

- Is it appropriate for the investor to target a climate goal—can a credible connection be drawn between climate goals and risk-adjusted returns on the portfolio?⁹¹
- What climate goal is being targeted and is it in the financial interests of the investor’s clients or beneficiaries given their time horizons and other factors?
- Given the limited efficacy of investor action, how can the investor best support progress towards that goal without exposing their clients or beneficiaries to costs and risks in the event that the goal is not achieved?

This section will focus particularly on asset owners, because their objectives, and how they interpret their fiduciary duty to beneficiaries, at least in principle set the tone for the entire asset management value chain. They also face the most fundamental question of how to address climate impacts in the context of their goals of risk-adjusted return over long-term time horizons.

The first of these three questions should not be overlooked: is it appropriate for asset owners to have a climate goal at all? For it to be so, the asset owner should believe that it is possible to draw a plausibly reliable connection between a given climate goal and enhanced risk-adjusted portfolio returns as well as believing that they have credible means by which to affect achievement of the goal at appropriate cost to beneficiaries. This is far from obvious. An asset owner could reasonably hold the view that they are ‘takers’ rather than ‘makers’ of the climate outcome and so focus on optimizing returns for beneficiaries within whatever climate outcome seems likely to emerge. In my view, the potential negative impacts of our current climate trajectory, coupled with investors having at least some influence on the ecosystem in which business and political decisions are made, means that it is appropriate for asset owners, in good faith, to have a climate goal.

If the asset owner does believe it is appropriate to have such a goal, the question then turns to what that goal should be.

6.3. Choice of high-level climate goal

In order to develop their position on the question of a climate goal it will be important for asset owners to develop a robust point of view on the link between climate scenario outcomes and

⁹⁰ Gosling and MacNeil (n 21).

⁹¹ Note that this is very different from having a view on *likely* trends in climate and climate regulation and taking this into account to inform which investments will be profitable in future, which is directly connected with risk-adjusted return optimization.

financial returns and risks over the time horizon of their obligations to beneficiaries. This is a highly contested and difficult area, and one where the evidence does not reveal many definitive conclusions—indeed the most reliable conclusion is probably that asset owners face extreme uncertainty. However, asset owners must engage with this question in order to form a good faith position on the appropriate level of climate goal.

A commonly adopted climate goal, underpinning initiatives like the Net Zero Asset Owners Alliance, Climate Action 100+, and the Science Based Targets Initiative, is the goal of limiting global warming to 1.5°C with limited or no overshoot. Section IV.2 showed that there is significant uncertainty over whether this goal can be justified purely on financial motivations from a diversified portfolio perspective, regardless of whether it is the right goal for long-term global social or even economic welfare. My analysis suggests that adopting this goal relies on the view that limiting global warming to 1.5°C would mitigate plausible imminent, rapid onset, severe and cashflow-relevant climate tipping points and *therefore reduce portfolio risk* to an extent that justifies potential costs of so-doing. Fiduciaries may well in good faith come to this view, but equally they may not, and the conclusions of financial fiduciaries may legitimately differ from those of governments.

On the other hand, an increasing body of evidence suggests that global warming of 3°C or above, consistent with the current policies trajectory, is likely to be more damaging not just to the economy but also to portfolio values, even over time horizons of current beneficiaries, than an orderly attempt to limit warming in line with the Paris goal of 2°C or below. This seems to us to be a more straightforward position for fiduciaries to adopt.

Given the difficulty in making a connection between climate outcomes and portfolio values and given the limited efficacy of investors to influence outcomes, my view is that the most plausible climate goals will be:

- Modest in nature: it is easier to argue that limiting extreme global warming, or strengthening climate action compared with current policies, is in beneficiaries' financial interests than it is to argue the same for what is now the very ambitious goal of limiting warming to 1.5°C with limited or no overshoot.
- Aligned with plausible government policy and economic/technology trajectories: investor efficacy is limited and fiduciary duties require asset owners to invest for the world as it is rather than the world as they wish it to be—therefore a goal that involves reinforcing plausible rather than implausible trajectories is less likely to create conflicts between the climate goal and fiduciary duties.

Given this, rather picking a specific target such as 1.5°C, some fiduciaries might consider it more appropriate to support the most rapid possible policy-led decarbonization pathway, recognizing the inevitably marginal impact of investor action.

The point of this section is not to state definitively which goal is correct. The point is instead, first, to emphasize that asset owners adopting a climate goal need to have a good faith view on whether that goal, if achieved, would be in the *financial* interests of their beneficiaries. Or to the extent that it is not, that they have a clear mandate from those beneficiaries to pursue a non-financial objective on climate, even if costly to risk-adjusted portfolio returns. Second, it is to point out that goals at the extremes of particularly high or low climate ambition both require explanation in terms of the requirement of being in clients' best financial interest. It should further be emphasized that the considerations outlined here for financial fiduciaries do not undermine the case for *governments* to set more ambitious climate goals, which may trade short-term financial costs against moral, non-financial welfare, precautionary, or intergenerational considerations.

6.4. Developing a theory and practice of change

Having established the climate goal, investors then need to determine the actions they will take to pursue it. As argued by Täger, Dittrich, and Kob, an asset owner's approach to climate action should be underpinned by a transparently articulated, plausibly causal theory of change, which is assessed for effectiveness over time.⁹² But asset owners need to think beyond the efficacy of their approach to also consider the consequences for beneficiaries. The approach should have regard to the realistic efficacy of the tools available to shareholders and should fulfil fiduciary duty to beneficiaries by protecting their interests in a range of plausible climate outcomes.

The first step is to consider the actions, within the control of investors, that have impact. This is not straightforward. Section V highlighted how commonly considered direct channels of investor impact in fact have much less efficacy than commonly assumed. A consequence is that investors need to calibrate their actions on the assumption that their influence is marginal rather than primary. This means that it is probably not credible for investors to attempt to target directly ambitious societal decarbonization goals or to force internalization of externalities within the portfolio by enforcing costly actions upon some firms to the benefits of others. The rejoinder might be that this was never what was intended by investor signatories to the various climate initiatives. But I would counter that it is an inevitable consequence of a commitment to set fixed and ambitious decarbonization targets that are not supported by current policy incentives. Moreover, the direct influence channel is very much still in evidence through various commitments to portfolio decarbonization, engagement goals (for example, cuts to oil and gas production), and, more generally, the focus on 'science-based' targets in portfolio companies.

What does it mean to focus on marginal influence? Here, the discussion will be restricted to providing some general indications to help frame investor thinking and future research. The starting point is that investors need to focus on where and how they can influence the system change that needs to happen, recognizing the importance of supporting climate-aligned innovation and policy development, but acknowledging the limitations of their power and the need to fulfil fiduciary duties to clients to deliver the best possible long-term risk adjusted returns in whatever climate scenario comes to pass.

There is no single viable theory and practice of change. What is most important is that asset owners, in good faith, think through the issues carefully and are able to articulate why their approach is plausibly in the financial interests of their clients. However, this fiduciary duty constraint leads me to believe that the theory of change for climate conscious asset owners should be focused less on trying to achieve specific climate goals (over which they have little control and the pursuit of which may give rise to conflicts with fiduciary duty) and instead focus on contributing to creating the circumstances in which climate goals can be met.

My suggested set of priorities is similar to those laid out by Gosling and Walkate, which will be developed in the following subsections. It is also consistent with a realistic implementation of the systemic stewardship approach outlined by Gordon.⁹³ It should be noted that not every proposal here can be objectively justified with the highest quality evidence. At some point, evidence must give way to judgement in determining how to act. But I have tried to ensure that such judgements are based on plausible channels of effect, in light of the evidence considered earlier in this article. Understanding how these different points of marginal influence can aggregate into a plausible impact on system change is an important area for future research.

⁹² M Täger, K Dittrich and J Kob, 'A Call for Clarity: What is Finance's Theory of (Climate) Change?' (Warwick University Climate Finance Blog, September 2023) <<https://warwick.ac.uk/fac/soc/wbs/research/ikon/research/climate-finance/blog/#issue8>> accessed 14 February 2024.

⁹³ Gordon (n 8).

6.5. The role of corporate engagement

Despite its limitations in driving direct outcomes, the available evidence suggests corporate engagement can make a difference at the margins. Ultimately, boards take responsibility for company decisions. Although the board has a duty to act in the interests of the company and its shareholders, it has significant leeway about how it interprets this. Within their zone of discretion, directors can choose to lean into the net-zero transition or lean against it. A vocal group of committed, climate-concerned shareholders can ensure that there is always a finger on the scale in favour of the more climate-conscious decision.

But investors in this context need to be realistic about what is achievable. The evidence suggests that engagement is successful when identifying win-wins between environmental outcomes and long-term value. Climate-concerned investors may at times form a minority of investors. The board will face constraints based on what is commercially feasible within their competitive environment and will have the best understanding of where the win-win opportunities reside. Fiduciary duties at the company level are strong, and generally do not permit directors to consider the impact on any given investor's overall portfolio. In any event, a company's investor base will comprise funds and investors with very different objectives. So climate-conscious investors need to be prepared to be dissatisfied, but also to persist. In this context, investors need to be more focused on *influence* and less on *outcomes*.

Investors can also focus on technological and economic tipping points. One reason for the relative (although still modest and contested) success of bank coal phase-out policies in developed markets may be that banks have been pushing on an issue where there were alternatives available that were already becoming economically as well as environmentally attractive. Investor action will not be able to push water up a hill in the face of the gravity of profit incentives. But as positive tipping points in technology and economic viability come onto the horizon, investors can encourage their arrival consistent with delivering strong risk-adjusted returns.

Investors can also effectively encourage the roll-out of market-wide initiatives that enable climate risk to be better assessed, for example adoption of relevant disclosure standards. As pointed out by Gordon,⁹⁴ there are analogies between this type of initiative and adoption of market-wide governance standards, which have sought to reduce risks across the market. However, while undoubtedly of value, it must be recognized that these relatively less contentious initiatives fall very far short of achieving the stated ambition of some investor climate commitments in terms of their effect on real decarbonization.

Finally, the available evidence suggests collective engagements have a significantly higher success rates than individual asset manager engagements and so collaboration with other asset managers is desirable where possible. From the point of view of asset owners' fiduciary duty, there is every reason to conduct collaborative engagements including through industry initiatives such as the net-zero alliances or Climate Action 100+ in order to increase effectiveness. Anti-trust concerns that have been raised in relation to investor alliances are clearly unhelpful in this context. However, it is also the case that by adopting goals and targets that go substantially beyond the current trajectory of both government policy and realistic outcomes, without a fully and rigorously articulated explanation of how this enhances beneficiary returns, the investment industry has to some degree facilitated the charge of political over-reach.

So, in general, investor engagement will likely be most successful when working in a focused manner on specific issues relating to economic and technological tipping points, drawing on the influence of collective engagement, in a way that goes with the grain of economics for the individual firms. Future research could usefully focus on how engagement fits into a mosaic

⁹⁴ Gordon (n 8).

of influences on company behaviour including economic incentives, social norms, and the potential for regulation.

6.6. The role of lobbying alignment

Effective government policy is the only route out of the climate crisis. But policy is not created in a vacuum; it also requires pull from the private sector. Investors have a role in influencing policy, and indeed investor collaboration on climate had the initial goal of reinforcing commitment of governments to the Paris agreement and has subsequently supported increased ambition in EU climate policy. However, while policy development is still highlighted as critical by the net zero investor networks, the target setting protocols that they have developed place limited focus on the issue, devoting much more attention to the direct portfolio and asset decarbonization or engagement mechanisms analysed in this article.

One approach is for investors to advocate directly for policy change themselves. Indeed a number of universal ownership advocates increasingly place lobbying at the top of their list of proposed actions.⁹⁵ Investors have an important role in vocally advocating for effective climate policy to act as a counterbalance to vested corporate and labour interests which are likely to resist any change.

Investors can also play a role in ensuring lobbying alignment within investee firms. Again, the boundary between the board and investors must be recognized. Indeed, there is evidence that lobbying is, for politically exposed firms, an effective way of managing risk and enhancing firm valuations.⁹⁶ Demanding that firms lobby in a particular way likely takes investors into the realms of micromanagement and over-reach, as well as potentially putting directors in conflict with their duties. But it is reasonable for investors to shine a light on, and demand *consistency* in, the public statements made by firms and their lobbying activities. The Net Zero Asset Owners Alliance lobbying alignment framework focuses on ensuring consistency and alignment rather than dictating a specific lobbying position.⁹⁷ There is evidence that a number of firms claim to ‘act green’ while ‘lobbying brown’.⁹⁸ Even if such lobbying inconsistency, and even corrupt lobbying practices, may be profitable for firms, insisting on consistency, transparency, and plain dealing—simple ethical business practices—would not be considered in contravention of an investor’s fiduciary duties.

Influencing policy development and lobbying takes us away from attempting to achieve direct impacts at the company or portfolio level towards what Marti and others describe as ‘field building’.⁹⁹ In broad terms, field building involves the investor’s use of public voice and network influence to bring about change. How investors can most effectively achieve this is indeed a rich avenue for future research, as highlighted by Marti and others.

6.7. The role of impact investment

This article has described how there is evidence that improving supply of capital can increase investment at firms that face financing constraints. This is most likely to be relevant for smaller

⁹⁵ J Moreland, ‘Why we Should Abandon Engagement with Oil and Gas Firms’ (Net Zero Investor, 12 February 2024), <<https://www.netzeroinvestor.net/news-and-views/why-we-should-abandon-climate-engagement-with-oil-and-gas-firms>> accessed 14 February 2024.

⁹⁶ E Gorbatikov and others, ‘Is Firm-Level Political Exposure Priced?’ (2023) working paper <<https://ssrn.com/abstract=3480494>> accessed 14 February 2024; A Borisov, E Goldman and N Gupta, ‘The corporate value of (corrupt) lobbying’ (2016) 29 *Review of Financial Studies* 1039.

⁹⁷ Net Zero Asset Owner Alliance, ‘Aligning Climate Policy Engagement with Net-Zero Commitments: A foundation for asset owner engagement of asset managers’ <<https://www.unepfi.org/industries/aligning-climate-policy-engagement-with-net-zero-commitments/>> accessed 14 February 2024.

⁹⁸ S Kwon, M Lowry and M Verardo (2023) ‘Firms’ Transition to Green: Innovation Versus Lobbying’, working paper <<https://ssrn.com/abstract=4300352>> accessed 14 February 2024.

⁹⁹ Marti and others (n 20).

and less mature firms. It is also clear that capital is sorely needed in hard-to-finance climate projects mainly in developing markets, for which blended finance and elements of concessionary capital are required.¹⁰⁰ At the same time, there is little evidence that directing more secondary markets investment towards established ‘sustainable’ firms makes any difference to real-world outcomes relating to climate investment. The investor seeking impact therefore faces a conundrum: the areas where impacts are to be found are those that may have risk–return characteristics that are inconsistent with the investor’s fiduciary requirements.

Different responses to this conundrum by asset managers and asset owners can be seen.

Asset managers will have some clients or potential clients who will be interested in taking additional risks or accepting lower returns for additional impact. Asset managers can therefore invest resources in developing products that have truly additional impact and marketing them to segments of the market that have those preferences. To be done in good faith such products should be focused on additionality and real-world impact rather than on merely creating sufficient sustainability ‘warm glow’ for clients to purchase the product.¹⁰¹ In the area of blended finance this will involve investing time and resources to build the networks and connections between multiple stakeholders in order to create investible projects.¹⁰² These approaches give rise to no fiduciary issues for the asset manager, as they involve them investing their own resources in the development of products the terms of which clients then freely sign-up to.

For asset owners, impact-oriented investment approaches are often problematic even with client consent, given the overarching mandate of the asset owner to deliver a financial objective. Non-financial objectives can generally only be pursued if they have no negative impact, or at least no significant negative impact, on financial returns. So how can climate-concerned asset owner approach this?

At the moment asset owners are at times adopting ‘sustainable’ investment strategies that may expose clients to concentration risks or costs across the portfolio that are difficult to quantify in exchange for benefits that are impossible to assess but almost certainly small.¹⁰³ An alternative approach would be to allocate a fixed percentage of portfolios to strategies that explicitly pursue impact, even if these operate at higher-than-normal risk tolerances. Allocating, say, 5 per cent of a portfolio to such approaches may be preferable to incurring unknowable costs and risks across 100 per cent of the portfolio. For a start, this approach at least explicitly bounds the risks: the asset owner is taking more risk with this portion, but the worst case is a 5 per cent loss to the portfolio and a total loss at this level is unlikely. It may also be easier to obtain explicit beneficiary support for such a strategy, which would have clearer aims, a more robust theory of change, and more explicitly contained costs than a broader sustainable investment strategy across the portfolio. In the UK, the Financial Markets Law Committee recent guidance on fiduciary duty relating to climate change opened the door to consideration of impact investing as part of a portfolio approach:¹⁰⁴

Some investments will be marketed or offered as designed to be positive in their ‘impact’ on sustainability and climate change. Some of these may involve a reduction in financial return to reflect the use to which the investee will put the sums invested in the interests of sustainability or to address the subject of climate change. In principle, these investments may still properly

¹⁰⁰ LP Jena and R Saxena, ‘Blended finance: How setting up a financial intermediary can accelerate sustainable development’ (World Economic Forum, 3 April 2023) <<https://www.weforum.org/agenda/2023/04/blended-finance-financial-intermediation-can-accelerate-sustainable-development/>> accessed 14 February 2024.

¹⁰¹ F Heeb and others, ‘Do Investors Care About Impact’ (2023) 36(5) *Review of Financial Studies* 1737.

¹⁰² S Gupta, H Walkate and R van Zwieten, ‘Blended Finance is Like Music’ (Illuminem 2023) <<https://route17.world/thought-leadership/>> accessed 14 February 2024.

¹⁰³ Gosling and MacNeil (n 21).

¹⁰⁴ Financial Markets Law Committee (n 25).

be considered by pension fund trustees in keeping with their duties (and by their investment managers); they do not fall outside what may be considered. But both financial return and risk would be the considerations, and at the level of the investment, at a portfolio level, and at the level of whole economies material to the pension fund.

Although there will be difficult questions to address with such an approach, I consider that this is a plausible line of argument that merits further study.¹⁰⁵

6.8. The role of investment strategy

In these recommendations a low weight has been applied to the potential impact from investment strategy choices that are designed to influence capital flows and cost of capital, especially when applied to secondary markets and large or mature companies. The evidence for the efficacy of such approaches is limited and they are prone to expose clients to concentration, sector, and liquidity risk. It should be acknowledged that ‘net-zero aligned’ strategies that are based on portfolio decarbonization are extremely unlikely to increase the chances of the world hitting net zero and have the potential, as outlined by Gosling and MacNeil,¹⁰⁶ to expose clients to increased risks. Asset owners should have regard to the likelihood of an outcome as well as its desirability, and so position client and beneficiary portfolios to protect their interests in probable scenarios.

However, a climate-concerned investor who has adopted a climate goal will likely believe that the impacts of transition or physical risk, especially the latter, on their portfolio could be significant. It is entirely appropriate for such an investor to use the knowledge and beliefs gained through scenario analysis and other tools to inform investment strategy. Indeed, if the market is underpricing physical risk, for example, then climate-concerned asset owners can make a useful contribution by factoring climate considerations into their investment decisions in order to improve the pricing of climate factors. This will not directly create impact, in the traditional sense of the word, but will help to ensure that any emerging climate risks or signals are propagated more rapidly through market prices and therefore will play a useful role.

7. CONCLUSIONS

Universal ownership theory as a mechanism to solve climate change looks nice on paper but faces significant difficulties in practice. There is significant uncertainty as to whether pursuing a target of 1.5°C with limited or no overshoot would maximize risk-adjusted portfolio returns for clients even if universal owners could achieve it. And the evidence strongly suggests that the tools at universal owners’ disposal are too weak to bring the targeted change about. Therefore, the idea of forcing change to reduce externalities from one set of companies to gain offsetting benefits elsewhere in the portfolio is challenging to justify.

Nonetheless, there is the potential for climate-concerned asset owners to contribute to action to limit global warming, based on a more modest application of universal owner or systemic stewardship logic. But climate-concerned asset owners need to ask themselves several important questions when developing their approach in this area. First, they need to establish their basis for having a climate goal at all: do they in good faith see a plausible connection between the specific climate goal and risk-adjusted portfolio returns and do they believe that they have any efficacy as investors to affect the outcome? Second, they need to be clear what their climate goal is and how achievement of that goal would be aligned with the financial interests of their

¹⁰⁵ T Gosling, ‘A Fiduciary Argument for Impact Investing?’ (2024) <<https://www.tom-gosling.com/blog/a-fiduciary-argument-for-impact-investing>> accessed 14 August 2024.

¹⁰⁶ Gosling and MacNeil (n 21).

beneficiaries through portfolio risk-adjusted returns. Third, they need to develop a theory and practice of change to guide their actions towards the goal, taking into account the evidence about where investor action is, and is not, effective and reflecting their fiduciary duties to clients and beneficiaries.

Focusing on asset owners, this article has presented the view that it is reasonable to adopt a climate goal, given the significant risks from runaway climate change. However, the combination of limited investor efficacy to bring about change and fiduciary duties to beneficiaries means that modest goals are likely to be considered more justifiable by some fiduciaries. These would reflect plausible technological, economic, and political pathways as opposed to what are now very ambitious goals linked to limiting warming to 1.5°C with limited or no overshoot.

Limited investor efficacy and fiduciary duty also implies moving from trying to change climate outcomes directly, to trying to influence the environment so that climate outcomes can be changed. Given the need for investors to focus on how they can use their marginal influence to deliver marginal gains, there is a need for more research to focus on how climate concerned investors can best use their role to influence change. This article has highlighted plausible options based on the evidence available today, but more research is required.

I propose that this more modest role can be achieved through corporate engagement, creating a space for companies to lean into rather than against the energy transition, and identifying positive tipping points that are coming into view. Given the foundational importance of government policy to a successful transition it can be achieved through lobbying alignment, both for investors themselves and their portfolio companies, with a focus on pursuing own-firm lobbying with the same vigour as when faced with issues directly impinging on the investor's core business. It can be achieved by asset managers through working closely with clients to establish demand for genuine impact products and deploying the time and resources to match clients with appropriate products. For asset owners, modest, contained impact investments as one part (say 5 per cent) of the portfolio may be more effective than uncontrolled attempts to create uncertain impact through universal owner techniques across the whole portfolio. Finally, actively undertaking work to ensure that the pricing impacts of physical and transition risk are fully reflected in their market analysis will help to ensure that these factors are fully priced in the market.

All of these initiatives have some credible evidence of efficacy, but equally they do not expose clients or beneficiaries to excessive costs or risks in the event that the strategy is unsuccessful.

Given the excitement and claims around the role of markets and the investment industry in solving major societal problems like climate change, this may seem a bit of a comedown. But it has the advantage of focusing investor actions where they are likely to have impact and in ways that align with fiduciary duties to clients. Moreover, attempts to save the world have run into trouble. Given the decreasing plausibility of trajectories to limit global warming to 1.5°C with limited or no overshoot, targets based on this risk becoming aspirations without a plan. A consequence has been strong structural incentives for greenwashing, either on the corporate side, as evidenced by the use of carbon offsets or the travails of the Science Based Targets Initiative, or on the investor side, through promotion of 'net-zero aligned' investment solutions, such as portfolio decarbonization, with questionable impact. On the other hand, while achieving only a modest amount in practice, investors have, through overclaiming, left themselves open to accusations of political over-reach and lack of legitimacy in pursuit of environmental and social goals. Only by founding their climate action rigorously, not speculatively, within the framework of their fiduciary duties, politically credible pathways, and realistic assessment of their potential impact, can investors navigate these twin perils.

It is better to have a modest goal, pursued with dogged determination and effectiveness, than an ambitious one that is met in perception rather than reality.

APPENDIX

Further academic studies on the cost of capital channel

Hong and Kacperczyk reported a significant 'sin premium' of around 3 per cent a year for stocks, such as tobacco, commonly subject to exclusion by institutional investors.¹⁰⁷ However, Blitz and Fabozzi find that this premium can be explained by profitability and investment factors, which are now a standard part of asset pricing models.¹⁰⁸ Bolton and Kacperczyk find that a one standard deviation increase in the level or rate of change of scope 1, 2, or 3 carbon emissions leads to an increase in stock returns of between 1.8 per cent and 4 per cent a year.¹⁰⁹ However, they attribute this to a carbon risk factor and find limited evidence of a premium arising from exclusionary screens. Aswani, Raghunandan, and Rajgopal, by contrast, find no evidence of a carbon premium, whether driven by risk, mispricing, or investor preferences, and argue that the findings of Bolton and Kacperczyk are sensitive to model specification and data handling choices.¹¹⁰ Atilgan and others find that the results of Bolton and Kacperczyk are explained by neither risk nor investor preferences but by mispricing.¹¹¹

Berk and Van Binsbergen find theoretical support for a cost of equity premium for firms subject to divestment. However, they find that empirically it is less than a basis point and that 80 per cent of investors would have to exclude or divest based on green preferences in order for the cost of equity premium to amount to just 1 per cent pa.¹¹² Zerbib is more optimistic about the role of investor preferences, based on a sophisticated model taking into account both exclusions and ESG integration, leading to an exclusion premium and a tastes premium (i.e. a premium based on a preference for green assets).¹¹³ Although he also finds a small exclusion premium over the period covered by Berk and van Binsbergen, over the longer period of his study, he finds an average exclusion premium of 2.79 per cent, similar to the Hong and Kacperczyk result. Moreover, the tastes premium, caused by the over and under weighting of stocks in the sustainable investor's portfolio rather than their exclusion, can differ by up to around 1 per cent pa between industries and by around 2 per cent pa between the top and bottom tercile of companies within an industry. Pastór, Stambaugh, and Taylor use two separate methods to separate realized returns from expected returns. They find that while realized returns on green stocks have exceeded those on brown stocks, on their analysis expected returns on green stocks are lower than on brown stocks.¹¹⁴ Indeed these two facts are connected and are based on a repricing of green stocks relative to brown over the study period. The magnitudes under their various specifications broadly fall within the range of 0.5 per cent to 1.5 per cent pa, but include both a risk premium and a tastes premium. It should be noted that the definition of 'green' is based on the environmental dimension of ESG ratings and so extends beyond climate impacts.

What about debt? The International Energy Agency has reported a significant increase in borrowing costs for firms in the oil and gas sector¹¹⁵ and coal mining in particular seems to

¹⁰⁷ H Hong and M Kacperczyk, 'The Price of Sin: The Effects of Social Norms on Markets' (2009) 93(1) *Journal of Financial Economics* 15.

¹⁰⁸ D Blitz and FJ Fabozzi, 'Sin Stocks Revisited: Resolving the Sin Stock Anomaly' (2017) 44(1) *Journal of Portfolio Management* 105.

¹⁰⁹ P Bolton and M Kacperczyk, 'Do Investors Care About Carbon Risk' (2021) 142(2) *Journal of Financial Economics* 517.

¹¹⁰ J Aswani, A Raghunandan and S Rajgopal, 'Are Carbon Emissions Associated with Stock Returns' (2024) 28(1) *Review of Finance* 75.

¹¹¹ Y Atilgan and others, 'Does the Carbon Premium Reflect Risk or Outperformance?' (2023) working paper <<https://ssrn.com/abstract=4573622>> accessed 14 February 2024.

¹¹² JB Berk and JH van Binsbergen, 'The Impact of Impact Investing' (2024) working paper <<https://ssrn.com/abstract=3909166>> accessed 14 February 2024.

¹¹³ D Zerbib, 'A Sustainable Capital Asset Pricing Model (S-CAPM): Evidence from Environmental Integration and Sin Stock Exclusion' (2022) 26(6) *Review of Finance* 1345.

¹¹⁴ L Pastór, RF Stambaugh and LA Taylor, 'Dissecting Green Returns' (2022) 146 *Journal of Financial Economics* 403.

¹¹⁵ IEA, 'World Energy Investment 2020' <<https://www.iea.org/reports/world-energy-investment-2020>> accessed 14 February 2024.

have experienced a large increase in financing spreads, especially in Europe.¹¹⁶ However, higher spreads need not be a result of activity to restrict financing, but may instead be explained by differences in risk. Halling, Yu, and Zechner look at corporate bond spreads in the US and conclude that in industries most exposed to environmental risk, worse performing firms on environmental dimensions face higher spreads and hence higher cost of debt by up to around 80 basis points.¹¹⁷ However, further analysis indicates that the most likely cause of the higher spreads is a risk-based explanation rather than it being due to a constraint on capital supply. It should also be noted that the environmental dimension used is again broader than just climate, and so it cannot be assumed that these results would hold for climate risk alone. This is consistent with research by Pietsch and Salakhova, who look at matched firms in Europe and find that spreads on green versus standard bonds seem to differ only by the order of 20 basis points.¹¹⁸ Pastór, Stambaugh, and Taylor similarly find the spread between matched green and non-green German Government bonds differ by fewer than 10 basis points.¹¹⁹ Baker and others study US corporate and municipal bonds and find a ‘greenium’ (that is a lower yield for green bonds) of 6 basis points although this rises to around 15 basis points for green bonds subject to external certification.¹²⁰

Overall, the evidence seems to point to a potential cost of capital impacts from exclusion or taste-based factors, amounting up to the order of 50 to 200 basis points on cost of equity and up to around 20 basis points on cost of debt, although the evidence is mixed, especially in relation to cost of equity. The question then arises: what impact does this have on corporate decision making?

Even if there is a cost of capital impact, there is a question of whether it influences the decision-making of managers. Corporate managers calculate cost of capital periodically, often using a fairly imprecise model, and are unlikely to be attuned to changes in cost of capital over short periods. Indeed, Gormsen and Huber find that over 60 per cent of managers leave their investment discount rate unchanged for as long as five years,¹²¹ even as interest rates change. Moreover, they find that as interest rates fell in the first two decades of this century, discount rates remained elevated, with the result that the ‘wedge’ between the perceived cost of capital and the discount rate used for investment appraisal increased by around 200 basis points over the period. In this context it is worth noting that, the average exclusion premium of 279 basis points from Zerbib’s analysis arises from a short period around the financial crisis when the estimated exclusion premium changed from around –900 basis points to +1100 basis points over just a few years. It seems hard to imagine corporate managers responding to such swings.

Rohleder, Wilkins, and Zink study the effects of mutual fund decarbonization on carbon emissions.¹²² They find that selling pressure from portfolio decarbonization suppresses stock prices and results in firms reducing carbon emissions. High carbon intensity firms subject to selling pressure reduce emissions by just over 4 per cent compared with firms not subject to such

¹¹⁶ X Zhu, C Wilson and B Caldecott, ‘The Energy Transition and Changing Financing Costs’, working paper <<https://www.smithschool.ox.ac.uk/sites/default/files/2022-02/The-energy-transition-and-changing-financing-costs.pdf>> accessed 14 February 2024.

¹¹⁷ M Halling, J Yu and J Zechner, ‘Primary Corporate Bond Markets and Social Responsibility’ (2021) working paper <<https://ssrn.com/abstract=3681666>> accessed 14 February 2024.

¹¹⁸ A Pietsch and D Salakhova, ‘Pricing of Green Bonds: Drivers and Dynamics of the Greenium’ (2022) ECB Working Paper Series No 2728 <<https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2728-7baba8097e.de.pdf>> accessed 14 February 2024.

¹¹⁹ Pastór, Stambaugh and Taylor (n 114).

¹²⁰ M Baker and others, ‘The Pricing and Ownership of US Green Bonds’ (2022) 14 Annual Review of Financial Economics 415.

¹²¹ Gormsen and Huber (n 66).

¹²² M Rohleder, M Wilkins and J Zink, ‘The effects of mutual fund decarbonization on stock prices and carbon emissions’ (2022) 134 Journal of Banking and Finance <<https://doi.org/10.1016/j.jbankfin.2021.106352>> accessed 14 February 2024.

pressure. However, their analysis does not establish causality and there are possible explanations caused by omitted variables.¹²³

Lou and Wang analyse the behaviour of firms affected by extreme buying or selling pressure arising from aggregated flows into and out of mutual funds.¹²⁴ They show that this buying or selling is not informative about the prospects of the individual firms (the pressure arising from the fund flows is exogenous) but it does lead to short-term increases or decreases in share prices of affected firms. They show that firms issue less equity if the fund flows drive their price down. Moreover, these firms also on average cut investment. The effects on share price and investment persist for up to two years. By contrast, firms subject to positive selling pressure experience rising share prices and raise more equity, but do not undertake more investment, presumably because they were unconstrained and able to fulfil all positive net present value projects.

Although this at first seems positive for the divestment argument, there are two problems. The first is that even firms experiencing the strongest selling pressure only cut investment by 4.3 per cent on average. This is economically significant, but not a game changer if it were translated to oil and gas majors, given the scale of the climate challenge. Moreover, the effect is concentrated in firms that are most financially constrained and dependent on equity issuance to finance investment. However, analysis of monthly bulletins by S&P Global Market intelligence suggests that of \$137bn of capital raised over 2020, fully 95 per cent was from debt issuance.¹²⁵ So even if divestment restricted access to equity markets for the oil and gas industry, it is not clear it would make a lot of difference.

Finally, there is a question over what investment is being cut. Is investment in damaging polluting activities being cut or are financial constraints causing reduction in green CAPEX? Hartzmark and Shue find that the impact of cost of capital changes on management actions are themselves unpredictable.¹²⁶ Financially constrained dirty firms may respond to increases in financing costs by doubling down on dirty activities, while reducing the cost of capital for firms that are already green has little real-world impact, so impacting cost of equity may have exactly the opposite result to that desired. Whether increasing cost of capital makes firms greener or browner is therefore an empirical question.

This leaves debt financing as the more promising channel for cost of capital influence. Unlike with equity, the cost of debt is directly visible for managers, and in many high emissions industries, debt is the most prevalent form of financing on an ongoing basis. There are two unpublished working papers that seek to shed light on this issue. Kacperczyk and Peydró study how bank-level decarbonization commitments affect bank lending and carbon emissions.¹²⁷ They find that firms previously borrowing from banks that make SBTi decarbonization commitments subsequently receive less credit (around a 5 per cent reduction in total credit for a one-standard-deviation difference in Scope 1 emissions after controlling for firm risk) and end up with smaller balance sheets, suggesting that there is not substitution to alternative lenders or equity markets. Affected firms cut CAPEX and increase liquid assets, consistent with facing tighter financial conditions. The reduction in credit occurs at the extensive margin—ie banks declining to lend to some firms at all, rather than reducing credit to a wide range of firms. However, despite these financial effects, they find no subsequent reduction in carbon emissions.

¹²³ T Gosling, 'Does Divestment Work' (2021) <<https://www.tom-gosling.com/blog/does-divestment-work>> accessed 14 February 2024.

¹²⁴ Lou and Wang (n 67).

¹²⁵ DM Bade, 'Oil & Gas Capital Raises in December' (S&P Global Market Intelligence, 11 January 2021) <<https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/oil-gas-capital-raises-in-december-total-climbs-back-to-7-54b-lifted-by-debt-62013067>> accessed 14 February 2024.

¹²⁶ Hartzmark and Shue (n 68).

¹²⁷ M Kacperczyk and J-L Peydró, 'Carbon Emissions and the Bank-Lending Channel' (2022) working paper <<https://ssrn.com/abstract=3915486>> accessed 14 February 2024.

This could be a reflection of the effect found by Hartsmark and Shue, ie that cutting financing does not necessarily result in brown firms becoming greener.

The second study on this topic, which is more promising for the cost-of-capital cause, is by Green and Vallee and focuses on the impact of strengthening bank lending policies on coal financing.¹²⁸ This study is more specific than the study carried out by Kacperczyk and Peydró along two dimensions. First, their measure of bank lending policy strength is much more specific to lending decisions than general SBTi decarbonization commitments. Second, their focus on the coal industry provides a more tightly defined experimental setting. In brief, they find that bank coal lending policies do result in banks issuing materially less financing to coal firms. Coal firms with higher exposure to banks with such lending policies raise less debt and experience reduced total assets, with higher impacts for small firms and for firms with a high share of coal revenues. There does not appear to be significant substitution to alternative sources of finance, consistent with the idea that banking relationships can be sticky and are not easily substituted. They also find that power firms exposed to banks with lending policies are significantly more likely to retire coal-fired plants early. Carbon emissions also reduce, although the effect appears small with a one standard deviation change coal lending policy strength resulting in a reduction in emissions of around 2 per cent compared with the pre-2015 period.

It should further be noted that the statistically significant impact on lending volumes arises for coal miners not power companies, and the authors were not able to establish a real-world impact on coal production. There is, therefore, a possibility that power companies can substitute coal for other sources of energy without major disruption to their business model, especially in developed markets where coal is already in decline. But it is not known whether the coal they would have bought is burned elsewhere. This is particularly the case given that the prevalence of strong coal lending policies, and the impacts in the study, are concentrated within European headquartered banks, who form a minority of coal-financing firms. Indeed, my understanding from a presentation by one of the paper's authors is that statistically significant results are driven by developed markets where coal is already under regulatory and commercial pressure, raising doubts on how far the results can be extrapolated into cases where the industry in question has longer-term underlying commercial viability. Overall, the study by Green and Vallee provides promising support for the idea that bank financing policies can hasten the demise of a polluting industry where it is already in decline. It is less clear that it supports the idea that bank financing can seriously constrain polluting industries where they continue to have a strong economic future.

¹²⁸ Green and Vallee (n 69).