Environmental Beta or How Institutional Investors Think about Climate Change and Fossil Fuel Risk

Brett Christophers
Department of Social and Economic Geography, Uppsala University

It is widely recognized that to limit the long-term extent of global warming and its socioecological consequences, the world must transition over future decades to a low- or zero-carbon economy. Among the many imponderables relating to this eventual transition is the role of the principal owners of the fossil fuel companies that are primarily responsible for global greenhouse gas emissions—namely, institutional financial investors. The investment behavior of these institutions will substantively shape not only the speed and nature of the economy and society's transition to cleaner energy sources but also the speed and nature of the global financial system's own parallel transition to a low- or zero-carbon world. In the wake of the global financial crisis of 2007 to 2009, governments and regulators around the world are increasingly concerned that the latter transition might represent a major potential source of future financial instability. These authorities are calling on institutional investors to effect an orderly and measured transition by fully recognizing the climate-related risks of investment in fossil fuel companies and pricing these risks appropriately. Yet they are doing so in the absence of informed, up-to-date, and meaningful knowledge of how the investment community actually thinks about climate change and fossil fuel risk. This article maps out the key lineaments of this thinking on the basis of an extensive program of interviews with global investment institutions. Contra government and regulator hopes and expectations, this thinking indicates that fossil fuel investment is set to be a long-term locus of excess, not minimal, financial market volatility: of environmental beta. Key Words: climate change, financial risk, fossil fuel companies, institutional investors.

为了限制长期的全球暖化程度及其社会生态后果，全世界必须在未来数十年转化成低碳或零碳经济一事已众所皆知。与此般终极转变相关的诸多难以估量之事之一，便是对全球温室气体排放负主要责任的石化公司的所有所有者之角色——亦即制度金融投资者。这些机构的投资行为，不仅将大幅形塑经济与社会转为更乾淨的能源来源的速度与本质，同时形塑全球金融系统自身转向低碳或零碳世界的何形转换速度与本质。在 2007 至 2009 年全球金融危机之际，世界各地的政府与规范者逐渐开始忧虑后来的转变或许会成为未来金融不稳定的主要潜在来源。这些政府正呼吁机构投资者，通过全面认识与气候相关的石化企业投资风险，适切地对这些风险进行估价，以实施有关次序且可测量的转。但这些政府却是在缺乏有关投资者群如何实际思考气候变迁和石化风险的良好、最新且有意义的知识之下进行。本文根据访谈全球投资机构的大规模计划，描绘此般思考的主要特徵。与政府和规范者的希望和期待相反的是，此般思考指出石化投资正开始成为过渡，而非最小的金融市场波动的长期所在——亦即环境贝塔。 关键词：气候变迁，金融危机，石化公司，制度投资者。

Es ampliamente reconocido que para limitar los alcances a largo plazo del calentamiento global y sus consecuencias socioecológicas, el mundo debe convertirse en las décadas próximas en una economía baja en carbono o de cero carbono. Entre los muchos imponderables relacionados con esta eventual transición se encuentra el rol de los principales propietarios de las compañías de combustibles fósiles, que son primariamente responsables de las emisiones globales de gases de invernadero—concretamente, los inversionistas financieros institucionales. La conducta inversora de estas instituciones configurará sustancialmente no solo la velocidad y naturaleza de la transición de la economía y de la sociedad a fuentes de energía más limpias, sino también la velocidad y naturaleza de la propia transición paralela del sistema financiero global a un mundo bajo o cero en carbono. Siguiendo los pasos de la crisis financiera global de 2007 a 2009, los gobiernos y reguladores alrededor del mundo están cada vez más preocupados de que la
In recent years, interest in the nexus of climate change and institutional investment has ranged across a wide variety of themes. Four stand out. One is investment in carbon credit and other ecosystems services markets geared to pricing negative environmental externalities and thereby limiting ecologically harmful economic activities (Bernstein et al. 2010). A second is investors’ assumption of insurance liabilities relating to catastrophic weather events through the use of catastrophe bonds (Johnson 2013). A third is investment in renewable or “clean” energy (Kaminker and Stewart 2012) and in clean or “green” infrastructures (Castree and Christophers 2015). The fourth and last, and the specific concern of this article, is investment in fossil fuel companies (FFCs), which is to say companies substantially involved in the extraction, burning, or both of those fuels responsible for greenhouse gas (GHG) emissions. Interest in this final theme is readily explicable. The future warming trajectory of the planet will be shaped to a significant extent by the quantum of fossil fuels burned; this quantum will be determined to a significant extent by the decisions and actions of FFCs, and those decisions and actions themselves will depend to a significant extent on the financing environment within which such companies operate. Institutional investors, in short, will play a vital role in the eventual transition to a low–fossil fuel economy—its pace, its regional variegation, and the nature of its socioecological legacy to future generations.

Scholars have been contemplating and examining this all-important investor role from a number of primary angles. They have, for example, analyzed attempts by “activist” investors to influence the decision making of FFCs (MacLeod and Park 2011), as well as attempts by various environmentally minded interest groups to influence less actively minded investment institutions, most notably through the high-profile divestment movement (Ayling and Cunningham 2017). Scholars have also considered the possibility of FFCs ultimately being compelled to leave some fossil fuel reserves in the ground in the form of so-called stranded assets, the thorny valuation and ownership questions this potential stranding raises for institutional investors, and the attendant implications for (in)stability and volatility in financial markets (Ansar et al. 2013)—concerns also highlighted by senior financial regulators such as Mark Carney, chairman of the Financial Stability Board, which is the international body charged with
fostering stability of the global financial system (Carney 2015). Relatedly, scholars have explored moves by regulators and nongovernmental organizations to encourage FFCs to disclose the climate change–related risks to which they are exposed (Zenghelis and Stern 2016). These moves reflect inter alia the conviction that risk disclosure will enable investment institutions and other shareholders to accurately price FFCs’ risk exposures, thus helping financial markets make a smooth and efficient transition to a warmed but low-carbon world (Carney 2015).

Consideration of these last disclosure-related issues has prompted researchers to begin to ask some especially searching and complex questions about climate change and FFC investments. How, for one thing, can we expect climate change to impact the market value of these assets (Dietz et al. 2016)? Do markets currently price in the risks facing FFCs (Sowerbutts 2016; Liesen et al. 2017)? Given what we know—or at least what we think we know—about the nature of financial risk, the nature of financial markets, and the nature of investment institutions, can we realistically expect FFCs and the risks they bear ever to be “accurately” priced (Christophers 2017)? Given these existing knowledges, how should investors approach FFC investment and the financial risks of climate change more broadly: What might a how-to guide for investors look like (Calvello 2009; Andersson et al. 2016)?

What tend to be missing from all of the aforementioned accounts, however, are investors’ own perspectives. So, although we have forceful advice about how investors should think about climate change and fossil fuel risk (Calvello 2009; Andersson et al. 2016) and inferential readings—based on price data—of what they appear to be thinking about this risk (Sowerbutts 2016; Liesen et al. 2017), there has been remarkably little discussion about how investors actually do approach the subject of FFC investment in the light of climate change. The question of whether and how institutional investors are factoring climate change considerations into their analysis and decision making vis-à-vis investment in FFCs remains essentially an open one. The single exception is a study published a decade ago, in which the authors (Pfeifer and Sullivan 2008) interviewed UK-based investment groups, finding that “soft” policy measures such as those relating to information disclosure had only a marginal influence on investment decisions and that only with the introduction of “harder” (e.g., regulatory) policy measures had investors begun meaningfully to integrate climate change concerns into investment practice. As ever, however, the exception proves the rule: The reality is that, today, very little is known about how investors think about climate change and fossil fuel risk. Indeed, there is a dearth of knowledge about how the finance sector at large approaches climate change issues more generally, in significant part because those academics with the best access to finance professionals—scholars of finance—have shown extraordinarily little interest in the topic: Diaz-Rainey et al. (2017) found that of more than 20,000 articles published in the leading twenty-one finance journals between 1998 and June 2015, only twelve (0.06 percent) were related substantively to climate change.

This article updates and, in ways to be discussed shortly, significantly extends and expands Pfeifer and Sullivan’s (2008) analysis. It discusses how institutional investors think, in practice, about climate change and fossil fuel risk. Understanding investors’ perspectives is, I suggest, fundamental. If, for example, governments and financial supervisory bodies want to enhance mechanisms—market based or otherwise—both to limit GHG emissions and to minimize the likelihood of climate-change-related financial instability, they clearly need to know how the principal owners of FFCs think about their investments; equally, if environmental and other interest groups want to influence institutional investors’ decision making regarding FFC investments, they need the same knowledge.

The article argues that institutional investor perspectives on climate change and fossil fuel risk can be usefully understood in terms of four key themes or tropes: subjectivity, economism, temporality, and convention. In elaborating on these tropes, the article connects with, draws on, and aims to contribute to relevant scholarly literatures bearing on each one. The first such literature, broadly defined and bearing on subjectivity, is social studies of finance; the second, bearing on economism, is the critical literature on shareholder-value orthodoxy; the third, bearing on temporality, is the literature on finance, risk, and time; and the fourth, bearing on convention, is the literature on corporate culture. The arguments that the article makes about subjectivity, economism, temporality, and convention with respect to investor perspectives on climate change

---

756 Christophers
and fossil fuel risk are couched explicitly in relation to those respective literatures.

The article further argues that running through all four tropes is a common implication, which I call environmental beta. In finance, the beta (\( \beta \)) of an investment refers to its relative volatility; if an asset has a \( \beta \) of greater than one, it is more volatile than the market. If, then, “environmental alpha” as coined by Calvello (2009) refers to the positive or “excess” financial return that investors can realize by successfully navigating the risks and opportunities of climate change, environmental beta refers to the “excess” volatility associated with fossil fuel investment. I suggest that precisely in view of the fact that subjectivity, economism, temporality, and convention characterize institutional investor perspectives on fossil fuel risk, the future FFC investment landscape is likely to be highly volatile and to precipitate exactly the kinds of instability feared by Carney and fellow regulators. The article thus lends further substance to my earlier (Christophers 2017) critique of disclosure-based approaches to the financial stability risk of climate change, which questioned the conviction that disclosure alone will abet a smooth transition in financial markets, specifically by interrogating the conceptual assumptions underlying this conviction. This article comes to a similarly skeptical conclusion but using a very different approach; that is, by talking and listening to the individuals at institutions whose investment decisions will actually determine the trajectory of the transition in question.

The article is based on a substantial program of interviews, carried out in 2017 and early 2018, with individuals working at twenty-one different investment institutions around the world. In approaching potential interviewees, I did not preselect for or against FFC investment exposure. In the event, it transpired that all but two of the institutions are currently (at the time of this writing, in mid-2018) invested in the financial securities of one or more fossil fuel companies; of the other two, one focuses exclusively on investments relating to renewable energy; the other does not in principle exclude FFC investments, but it has only ever owned one oil or gas company stock (Petrobas) and found it to be, in the words of one executive, “such a source of heated debate and conflict that we decided after a few months to divest.” In selecting institutions and individuals to interview, I aimed for, and was fortunate to be able to achieve, interviewee diversity in four principal regards:

- **Institutional size**: The institutions I chose for interviews to range from the very large to the relatively small: At one end of the spectrum was one of the world’s five largest fund managers, with significantly more than $1 trillion assets under management; at the other were small, specialist managers with less than $10 billion under management (but none managing less than $1 billion).

- **Geography**: All of the institutions I chose invest internationally, albeit often with a particular country focus, and sometimes relying on external managers in territories where they lack local expertise. Some of the institutions are also international firms themselves, operating out of multiple territories (in one case, more than twenty). I interviewed individuals at firms headquartered in North America (both the United States and Canada), the United Kingdom, continental Europe, and Australasia.

- **Institutional type**: The interviewees ran the full gamut of types of institutional investor: active-only investors as well those using a mix of active and passive (indexing) strategies; from equity-only investors to investors in all major asset classes; from long-only funds to hedge funds; from industry-specific investors to those investing across all industries; and from sovereign wealth funds to funds investing for high-net-worth individuals.

- **Interviewee role**: I interviewed individuals working in a range of different roles at their respective investment institutions. Four main roles were represented by the interviewees: senior executives in management positions, investment managers (i.e., individuals with responsibility for investment decisions), analysts (individuals responsible for evaluating sector and company investments and putting together buy, sell, and hold recommendations), and individuals working with questions of “sustainable” or “responsible” investment or, more broadly, environmental, social, and governance (ESG) policy.

Needless to say, the interview program did and does not provide a comprehensive picture of how institutional investors think about climate change and fossil fuel risk, but the picture is, I believe, broadly representative. I stopped recruiting interviewees when each new interview began to involve significant repetition of information from previous interviews and rapidly diminishing amounts of new information.

The article consists of four sections, corresponding respectively to the four previously mentioned tropes.
of subjectivity, economism, temporality, and convention. This is not to suggest, however, that in practice the tropes are so readily and cleanly separated. They are not. They impinge on and seep into one another. Nor are they necessarily always consistent with one another: As we will see in the case of the relationship between subjectivity and convention, there is sometimes tension, even contradiction. Nevertheless, analyzing investor perspectives through these four lenses is, I think, illuminating and ultimately meaningful. Throughout, I quote extensively from the interviews. I do so not just to substantiate my arguments but to give voice to a constituency (finance industry professionals) whose views, in critical social-scientific scholarship—which this article aspires to contribute to—are seldom heard but are frequently assumed or imputed.

Subjectivity: Thinking about Risk Imperfectly and Individually

One of the central theoretical pillars of the current regulatory consensus that enhanced disclosure of climate risks by FFCs and by other operating entities with significant economic exposure to climate change will enable an orderly transition of financial markets to a low-fossil fuel world is the premise that institutional investors are “rational” and thus price disclosed risks “accurately.” Investors require disclosure of material risks, the orthodoxy has it, “in order to be able to assess and price those risks properly” (Sowerbutts, Zimmerman, and Zer 2013, 326). In enabling “proper” pricing, improved disclosure of climate risks “will allow [investors] to respond rationally and systematically to climate change,” preventing risks from “manifest[ing] into market shocks, disorder and large scale financial losses” (Institute and Faculty of Actuaries 2015, 1, 10). In sum, investors are objective, and the job of regulators is therefore merely to ensure that markets enjoy access to the rich information necessary for investors to exercise that objectivity.2

Yet investors, by their own admission, are not objective, least of all where climate change and its investment implications are concerned. They think about climate change and fossil fuel risk subjectively. In interviewing investors, I was repeatedly struck by the lengths to which many of them went to impress on me the deeply human and thus imperfect nature of the enterprise of pricing climate risk. Lack of reliable or credible information about underlying risk—the constant critical refrain from those calling for improved disclosure—is certainly one significant barrier to “accurate” pricing, but it is not the only or even necessarily the most important one. Humans and the institutions they create, including investment institutions, are inherently fallible. Referring to the complex algorithms used to estimate carbon exposure in the different parts of the investment portfolio held by her company, one interviewee interrupted herself when she sensed that I was overly impressed by the apparent scientism her explanation evoked. “Don’t get me wrong, this is all very subjective,” she cautioned. “Please don’t think there is any real science behind it.” As if to prove the point, she offered a salutary example of the subjectivity that is always in play. Her company had recently taken initial steps toward reducing its portfolio’s carbon exposure by a specified (percentage) amount by a specified future date. How had this particular percentage been arrived at? It was based on a carbon footprinting exercise, but this exercise was, the interviewee admitted, “crude.” Furthermore, there was nothing remotely scientific about the chosen percentage of targeted reduction: “We wanted a target that was a stretch, but achievable.” Even if the percentage had been “scientific,” its “truth” was always fundamentally contingent in the way that all humanly and institutionally derived truths are. “We realized a year or so later,” this interviewee confessed, somewhat sheepishly, “that our carbon footprinting calculation was wrong.”

Of course, in evaluating investments in FFCs, some investors are more objective or “scientific” about climate risk than others. At one end of the spectrum, I spoke to multiple companies that admitted, in the words of one, that “all of this is in its infancy, and we are really only just at the stage of beginning to try to get our heads around the relevant issues.” At the other end of the spectrum are investors with exceptionally sophisticated understandings of these issues and who have been thinking closely about them for many years. Notably, North American investors appear, by their own reckoning as much as by the reckoning of others, generally to be some way behind their European and Australasian counterparts; to the extent that they consider climate risk at all, the former are in many cases only now beginning, tentatively, the ascent of a steep learning curve. Far “ahead,” if we can put it
that way, are investment institutions like one that has developed in-house models for different climate change scenarios (with global temperature increases ranging from 2°C to 6°C), where the estimated probabilities of these different scenarios are based on the immediate power to make investments in FFCs in particular, since as far back as 2001. Whatever the sophistication and science involved, however, the analytical results—and the resulting investment decisions—are always subjective inasmuch as they are always subject to human judgment and imperfection. Forecasting the relative likelihoods of different political and regulatory responses to climate change, for example, is, after all, about as far from “objective” as it gets.

Institutional investors think subjectively about climate change and fossil fuel risk in another, related sense, too. Subjective thinking is not just imperfect thinking but individual thinking; in fact, the latter form of subjectivity (individuality) is integral to the former (an absence of objectivity). Investment institutions do not think about climate change as monolithic, impersonal institutions but rather as ensembles of interacting individuals, all with their own views on climate change and what it does or does not mean for fossil fuel risk; if there happens to be a company line, then it is only because an inevitably uneven cobbled together of those individual views, or at least of some of them, has somehow been effected. Unsurprisingly, the range of individual views on climate change and fossil fuel risk is as wide as the range of degrees of sophistication or “objectivity” with which those views are articulated and acted on. Some of the individuals I spoke to live and breathe climate change and its implications to their very existential, not just professional, core. It was clear, though, that many in the industry are deeply skeptical, not just about whether climate change will materially affect FFC prospects and valuations but about climate change per se. One investor I talked to, although not a skeptic himself, had recently returned from a trip to the United Kingdom and United States providing seminars on fossil fuel divestment for some of the world’s largest investment institutions, and he spoke frankly—and depressingly—about the cognitive dissonance he encountered:

There is so much money in the market that couldn’t give a flying fuck about this stuff. Oil and gas analysts are generally not building climate risk into their models. There is zero chance that any of these groups are going to divest from oil or gas companies any time soon. You still get investors in the U.S. who don’t believe in climate change. These guys honestly couldn’t give a stuff.

What ultimately matters, of course, is whose individual views—or what combination of those individual views—come to be embedded in future investment trajectories by virtue of determining current and future investment decisions. An investment institution might be populated disproportionately by people convinced that climate change represents a clear and present danger to the value of investments in FFCs, but if a contrary view is held by those individuals who actually decide whether and on what scale the institution makes such investments—a chief executive determined to overweight energy-sector equities, say, alongside an energy-sector fund manager bullish on fossil fuels and bearish on renewables—then the majority perspective is essentially for nothing. We tend to think in terms of generalized questions such as (as per the title of this article) how institutional investors think about climate change and fossil fuel risk, but perhaps what we really should be asking is how those particular individuals at investment institutions with the immediate power to make or unmake substantial investments in FFCs think about climate change and fossil fuel risk.

Consider, by way of illustration, the variety of ways in which knowledge of climate risk does or does not find its way to the coal face—to use an appropriate metaphor—of the actual investment decision at an investment institution. Whose job is it to consider, and factor in, climate change considerations? Should all individual fund managers be thinking actively about climate change and what it means for their respective portfolios? Should this be a material concern only for energy-sector fund managers and for the energy-sector analysts whose evaluations they rely on? Or should climate change effectively be delegated to one or more specialist individuals whose specialist knowledge and advice can then be freely tapped by fund managers when making investment decisions? There are multiple different models. The choice of model manifestly influences both whose thinking about climate change and fossil fuel risk ultimately configures investment choices and
the ways in which it does so. It fundamentally shapes, that is to say, the subjectivity of investment.

To appreciate this is to register a notable weakness in existing scholarship that (rightly) rejects the notion of rational, disembodied actors seamlessly integrating information about risk into financial market prices. Behavioral finance, which represents the most mainstream branch of such scholarship and has been popularized within geography especially by Clark (e.g., Clark 2011), focuses primarily on emotional and psychological impediments to rational information processing. It downplays organizational considerations. So, too, does the main critical alternative, in the shape of so-called social studies of finance. This literature has long recognized that markets are socialized, subjective phenomena, fusing economy with culture. As Tickell (2003) pointed out, however, in the early years of the development of this literature, “Making the transition from showing that financial markets are culturally constituted to demonstrating that this makes a difference to, for example, the price and efficiency of these financial markets is a complex and underdeveloped task” (121). It remains so today: How exactly social, including organizational, factors mediate the incorporation of information—for example, about climate change—into price is still understudied. An important reason for this was recognized by Hall (2011). Social studies of finance have been preoccupied with the calculative devices that frame or “perform” financial markets and prices. Up to a point, this focus is understandable: These devices and their performative effects are important, including, as we will see in a subsequent section, in the context of climate change and FFC investment. The geographical and institutional contexts within which such performance occurs are important, too, though, and social studies of finance have had much less to say about these (Hall 2011).

My interviews made the significance of these contexts abundantly clear. There are a wide variety of organizational models for getting information about climate risk into decision making and thus asset prices. Every single investment institution I spoke to had one or more persons dedicated to what were variously termed sustainable investment, or responsible investment, or ESG issues. This is not to suggest that questions of climate change and fossil fuel risk are seen solely, or even primarily, as ethical issues; as we shall see in the next section, they increasingly are not. It is to say, however, that these individuals—generally working in ESG teams rather than as solitary shepherds—are typically charged with the primary responsibility at their companies for thinking about climate and other environmental risk matters. At some companies, these ESG teams have been in place for a decade or more and are now relatively large. At others, they are small and relatively new. At one such company, a member of the team in question told me that before the team was created (in 2012), “it was left to individual financial analysts to factor in ESG issues.”

The makeup, role, and influence of these internal ESG groups vary enormously. At most investment institutions, the ESG team represents an advisory body: One interviewee from such a team spoke of “providing advice on an ad hoc basis to portfolio managers” and another of providing an “internal source of expertise to challenge the views of individual analysts.” Some such bodies, clearly, have considerable clout, no doubt buttressed by the advocacy of senior management; at other companies, I was told, “the ESG people are largely symbolic.” At most investment institutions, ESG personnel are not themselves directly involved in investment decisions; they usually have noninvesting backgrounds (e.g., in environmental science) and are “just” advisers. One interviewee worried that at such institutions “ESG has tended to become a bit of a stand-alone topic, delinked from, rather than embedded in, valuation and investment practice.” Sometimes, however, the lines are more blurred: I interviewed one person, head of an ESG team, who not only helps fund managers to integrate climate change considerations into their investment decisions but, coming from an investing background, also manages funds himself. Meanwhile, there are investment institutions where the subjectivity or embodiment of thinking about climate change and fossil fuel risk is altogether more diffuse and complex. One major company I spoke to, for instance, has an ESG group, a risk group, and a strategy group. Not only does each of these teams have its own people looking at climate questions but so, too, does each of the company’s five asset-class investor teams (one for each of equities, fixed income, private placement, real estate, and infrastructure).

The upshot of all of this is that the real world belies, in all sorts of profound ways, the simplistic image of the homogeneous institutional investor “rationally” responding to and acting on risk signals. The investor can only ever interpret and act on
those signals humanly, which is to say, imperfectly; the “investor,” at least in institutional form, is itself an assemblage of individuals with individual views, and the ways in which these individual views cohere as institutional investment decisions can and do vary greatly, according in particular to the vagaries of organizational design. All said, then, institutional investor thinking about climate change and fossil fuel risk is shot through with various types of subjectivity. To expect the investment community to deal “rationally” with climate risk and thereby to mitigate market volatility is, one might say, itself deeply irrational.

Economism: Thinking about Climate Risk as Financial Risk

I began all of my interviews with the same question: How do you understand the idea of climate risk? The answer, explicitly or implicitly, was always the same: Climate risk is financial risk; that is, the risk to investment performance stemming from climate change and related regulation. “We do the best we can to understand how the value of the investments we make for our clients will be affected by different future scenarios, and to invest accordingly. So climate change definitely enters the equation,” as one interviewee representatively explained. “But it doesn’t mean we can’t invest in carbon-intensive companies. Our duty is simply to incorporate risk—climate risk and other risk—into the decision-making process.”

Contemplating climate risk specifically as financial risk, two of the institutions, as I mentioned in the introduction to the article, have made decisions that have resulted in them not currently being invested in FFCs: The institution focused exclusively on renewable-energy investments focuses on this area because it sees renewable energy as the (profitable) future; the “heated debate and conflict” that led the other institution to sell the only oil or gas stock it has ever owned turned on the facts that “some people thought the stock was too cyclical (we tend to avoid cyclical industries), and others were uncomfortable with the company’s governance arrangements.” The other nineteen institutions, however, have all decided, again on economic grounds, that investment in FFCs remains advisable. None, in other words, has divested, still less on noneconomic grounds. Few, meanwhile, are pursuing the alternative approach vis-à-vis climate change concerns frequently recommended to investment institutions—active engagement with fossil fuel investees. Most, in fact, appear deeply skeptical about investors’ abilities, through either divestment or engagement, to do what advocates of those approaches claim they can achieve, which is to influence FFC operating strategy and thus potentially to shape future energy transitions. One interviewee, for example, said: “The divesting mechanism is available to us—but the academic view is that it’s an imperfect solution to influencing management. And direct intervention doesn’t work in most cases because most shareholders don’t care—we’d need to work collectively to have any impact.” Another, even more skeptical, explained:

If I sell shares in BP, that has no effect on their strategy because it has no effect on the funds they have available. In the equity markets, at least, we aren’t providing capital to these companies. And I actually think it’s dangerous for investment institutions to say to clients that they have the power to discipline FFCs, because it’s not realistic.

Dissenters from this view were few and far between and generally hesitant. “I guess divestment would have an effect if enough investors did it,” one, rather meekly, offered, “because companies would become low-multiple stocks, and that would raise the cost of their equity.”

Of the handful of institutions that are actively engaging with fossil fuel investees on climate change issues, two of the interviewees intimated, at least, that their reasons for doing so are not wholly returns oriented. My interviewee at the first said that her institution had chosen engagement over divestment because “it gives us greater capacity to effect positive environmental change,” and the interviewee from the other institution noted that “if you divest, you are selling to someone who cares less than you.” When pushed on the actual nature of their “engagement,” however, these same interviewees ultimately circled back to questions of fund performance. As one said:

Engagement is currently about probing, gaining clarity on a company’s degree of exposure to the energy transition, and securing better risk disclosure. I suppose ultimately we will have to ask the question of whether the company’s future is one of managed transition to a clean business, or managed decline and the return of cash to shareholders. But we are not asking that question yet.

“We are single bottom-line investors,” another interviewee, echoing the wider economy-centric
worldview, explained. “The P&L [profit and loss account] is our sole criterion. Climate risk does not restrict us. Nor is it something we are measured on.” Measurement, of course, is key to understanding why investors think about climate change and fossil fuel risk in the ways they do. Investors are measured, first, as institutions. This means that they are constantly alive to clients’ assessments of them and that they tend—for obvious economic reasons—to focus on those issues that clients expect them to focus on. “Our clients are increasingly challenging us—constructively—on climate risk questions,” one observed. Another was more forthright still: “Some of our clients, especially in Scandinavia, are more and more concerned about the implications of climate change. We have to show that we are factoring in these considerations to even get in the room with them. But this is relatively new, and still a relatively small set of clients.” Investors are measured as individuals (as individual, named, and often ranked fund managers), too, with equally important consequences for investment strategies. Why would a fund manager evaluated on the performance of his or her portfolio make an investment decision—for example, to sell an FFC stock—except on financial grounds? As one interviewee who uses a handful of external managers noted, “They don’t want their performance to be tarnished.” Bonuses, even careers, are at stake.

It should be emphasized that for most investment institutions and fund managers around the world, including those I interviewed, temperament—thinking strictly in terms of investment performance—is not necessarily elective, nor is it dictated solely by concerns to please clients and advance individual careers. It is a legal obligation, a fiduciary duty, or at least it is understood as such—there has been some legal debate about the absoluteness of the duty to focus singularly on financial returns (see Sandberg 2013). One investment professional I spoke to said that the industry appears to be entering a transition period on this score, with the concept of fiduciary duty set to be expanded to factor in nonfinancial responsibilities. “There is a growing appreciation that we are on shifting sands where fiduciary duty is concerned,” he said. For now, though, the norm undoubtedly remains to understand fiduciary duty in the narrow terms of “maximizing returns, pure and simple,” in the words of the same interviewee. “Our fiduciary duty to our members always comes first,” as another interviewee explained, and for his firm, like the investment industry more broadly, what this means for climate-risk considerations is clear-cut: “We think about climate change and other ESG issues only insofar as we think they are likely to impact investment returns.” Or as a third interviewee, using a telling formulation, explained, “Sustainability is part of fiduciary duty, because it impacts on investment returns.” The notion that sustainability might shape fiduciary duty and hence investment practice other than through its effect on returns is not considered.

Although most investment professionals I spoke to believe that their fiduciary duty is indeed unambiguous, it became clear during my interviews that this perceived legal obligation to focus exclusively on returns is rarely the sole motivation for doing so. Fund managers prioritize investment performance also because they believe, often fervently, that this is the correct approach. All that investors should be thinking about is returns, whether legal guidelines happen to stipulate such single-mindedness or not. So even if it were possible for investors through their investment decisions deliberately to, for example, nudge or push FFCs toward greener forms of energy, this is not considered part of investors’ remit, nor is it believed that it should be. “It’s not our responsibility to make oil and gas companies do anything,” one interviewee insisted, “other than manage their risks responsibly—everything else is politicians’ role.” A second opined that “if we really want to help the world, we should focus on allocating capital properly—that’s where investors can add value.” Another was blunter still: “We are not mandated to care about the planet.” This is not just the way things are, these interviewees made it clear; it is the way things should be. Statements about the duty to maximize returns were normative, not positive, ones.

Equally revealing is the fact that investors posit their prioritization of financial returns as being fundamentally different—even mutually exclusive—from what they typically termed an ethical approach to investing. The time when climate change was an ethical issue, I was told, has long since passed. “Climate change,” as one interviewee noted, “has now spread well beyond a ‘responsible investing’ issue to become a much more macro risk issue.” “We cannot legally divest on an ethical issue,” another said, “if it would potentially have negative financial implications for the scheme—we would need to prove that we would lose money for our clients by
remaining invested.” A third explained that “the law kind of precludes making an ethical investment decision if the returns are lower.” Making an investment decision aimed at maximizing returns, in short, is not deemed an ethical one. It is economic and value neutral. The investors I spoke to were adamant that just such a value-neutral, economic approach—and not, contrary to some suggestions, ethics—has informed the global investment community’s large-scale disinvestment from coal companies in recent years, and will likewise drive any eventual large-scale disinvestment from other FFCs. Said one:

People have been getting out of coal on economic grounds, not climate change ones. Low natural gas prices thanks to fracking were and are the key consideration for investors—that’s what has killed coal. If there were an economic case for coal, you’d likely see a resurgence in interest from investors. Looking ahead, it won’t be social conscience that drives the shift to renewables, it will be declining relative costs.

Indeed, my interviewees suggested that economism dominates thinking even at those few, and generally small, investment institutions that do espouse a social or moral responsibility to try to shape investee behavior and that promote this avowedly ethical standpoint. Ethical investment houses behave “ethically,” I was told, merely as a means to an economic end: Ethics, in other words, are a source of competitive advantage. “Saying ‘we’re more ethical than our competitors’ is simply about trying to sell products,” argued one cynic.

In reality, of course, an economic approach is not value neutral. One of the most important insights of recent work in economic and financial anthropology has been to demonstrate that discourses and practices of shareholder value and the like constitute their own tribal held belief systems. They are not devoid of an ethical perspective—they simply espouse a different ethics, and distancing this particular ethics from what are deemed to be explicitly ethical worldviews, as my interviewees did, serves to veil this ethical content. Ho’s (2009) ethnography of Wall Street’s shareholder value philosophy is an especially compelling illustration of this point. Shareholder value, like my interviewees’ return maximization imperative, is itself, she showed, an “ethos,” a “cultural system” (Ho 2009, 6). Like all deeply held belief systems, moreover, it is “understood to be righteous” and is frequently articulated as such (Ho 2009, 5).

If, in any event, climate risk is understood as financial risk—whether this is construed as an ethical stance or not—what do investors perceive to be the most significant such risks? At the current moment in time, they clearly regard regulation relating to climate change, as opposed to climate change’s biophysical manifestations per se, as the biggest threat to the financial performance of FFCs and hence as the greatest prevailing risk to FFC investment. This is not to suggest that no interviewees talked about physical risks. A few did, including one who discussed “unprecedented numbers of extreme weather events in the U.S., which are already costing companies that we do or might invest in.” Some interviewees also mentioned reputation risk, in relation not to the performance of FFCs and the financial securities they issue so much as the performance of investment institutions themselves—who might, for example, lose clients if they are regarded as “unethical.” Regulation, and underpinning it political thinking and action, is clearly uppermost in investors’ minds, though. “Right now,” one interviewee said, “the regulatory risks are much more material to us than the physical risks.” Others concurred, with one saying, “For now, at any rate, it is not climate change itself that matters to company value, but the response to climate change in terms of political action. Of course the risk will eventually be a mix of the two (physical and political). But not yet.”

This raises in turn another important question. To the extent that they take these political—regulatory risks seriously, how do investors actually attempt to factor them into investment analysis? Or to put the question differently, if investors think—as I have argued they do—at climate change and fossil fuel risk economically, with a current emphasis on the political—regulatory realm, what does this economic thinking look like in practice? What form does it take? I will come back to this question in more detail in the final section of the article. For now, it suffices to say that although there are some bespoke analytical methods (i.e., methods specific to climate risk), investors rely for the most part on the standard tools of the trade. In terms of bespoke tools, carbon footprinting is perhaps the most widespread. One interviewee explained how her company uses this approach to map concentrations of risk across its asset base: “Carbon footprinting helps us to locate carbon hotspots—and thus particular risk
exposures—in our portfolio." In terms of more generic tools, meanwhile, scenario analysis is certainly common—"we do scenario analysis, using different carbon costs, and looking at what this does to expected returns"—but discounted cash flow (DCF) techniques remain investors' meat and drink. "We generate our best estimate of the projected cash flows from any corporate asset and the present value of these," one individual explained. "We then compare this value with the current market value. And we buy if the asset is underpriced." Another interviewee, an analyst specializing in energy sector equities, including oil and gas company equities, said that if and when he begins to integrate climate change into his valuations (he does not yet do so), it will have to be at the heart of the valuation model: "I do a DCF for all companies. A big assumption is of course the projected oil or gas price. Within that, I need to take a view of global supply and demand. That'll have to capture climate change."

Climate change will also have to be—and by some investors, is already being—captured in DCF valuations in others ways. As I noted in the introduction, the possibility of some fossil fuel assets becoming stranded and therefore not generating any cash flows is attracting considerable attention, including from financial regulators, and my interviewees, as we will see momentarily, mulled it at length. In doing so, however, they pointed out that, contrary to popular belief, asset stranding would not necessarily have a direct bearing on how much an FFC is worth and therefore on financial stability. Why?

Just because a company has an undeveloped asset in its reserves statement doesn't mean the market believes it will one day be exploited, or therefore that its eventual exploitation is reflected in the current valuation of the company. So if it becomes stranded, this doesn't necessarily affect market value. It only does so if the market was banking on the asset being exploited.

Understanding the investment industry's methods for "seeing" (or, alternatively, not yet seeing) climate risk is essential to understanding why the typical dualistic framing of the industry's options for FFC investment—invest or disinvest, "in" or "out"—is actually rather misleading. For this framing simply does not get at how things work in reality. Most investors do not think about climate change and fossil fuel investment risk in this totalizing, dichotomous way. Instead of in or out, they tend to think in terms of less or more, under- or overweight. One of my interviewees, in the course of reflecting on the aforementioned "stranded asset" conundrum, explained why, and he is worth quoting at length:

The way I think about it is this: To what degree is an outcome likely under which global demand for oil and gas assets declines at such a rate that assets which oil and gas companies expect to exploit will not in fact be exploitable? For what it's worth, we think the oil and gas industry is investing for a +5–6 degree world, whereas we think a +3.5–4 degree world is more likely—so if we're right, there will be some stranded assets. But what I am interested in in investment terms is whether the risk of stranding is material enough for me to be factoring it into the price I pay for shares. And all of this is nonbinary: It's not a question of invest or not. In terms of company valuation, it's a question of am I being paid sufficiently to accept the risk I have identified. If not, he considers reducing his holding. He does not necessarily offload it.

Given these methods for thinking about and evaluating climate risk, how do institutional investors currently perceive the economic attractiveness of investment in FFCs? Do they think the time has come—given physical risks, regulatory risks, or both—to begin to pare down their holdings? Or do they think that the future for FFCs, coal excepted, remains rosy and thus that the rationale for remaining heavily invested remains economically robust? The majority of the individuals I spoke to were relatively sanguine. Some institutions, to be sure, have set about limiting their exposure to FFCs, beyond coal; in the previous section, I mentioned one that aims to reduce its portfolio's overall carbon exposure by a specified amount by a specified future date. Most have definitely not been selling, though, nor do they plan to do so in the near future. All things considered (or, in some cases, not considered), investors tend to believe that oil and gas companies, symptomatically, will continue to flourish and that disinvesting from the sector would therefore be to the detriment of the constituency that primarily matters to them: their clients. The energy-sector equity analyst I referred to earlier expressed the majority view when he opined that "demand for oil and gas is strong, and will remain strong" and that "this is largely about emerging market demand." The future of the oil and gas industry, it was frequently suggested, is in South and East Asia.
Even if institutional investors were more cautious about the prospects for FFCs than they appear in reality to be, it is not clear that they would be selling. This might sound contradictory, but the premise that negativity about a firm’s or sector’s prospects necessarily would entail disposal reflects another important and common misconception about the investment world. To explain why, consider, as one interviewee recommended I should, the example of Norway’s massive sovereign wealth fund. This fund has something like $1 trillion under management—the exact figure is immaterial for our purposes—and remains heavily invested in oil and gas, even though it has made more concerted efforts than many of its counterparts to invest in renewables. There appear to be various reasons why its exposure to fossil fuel investments remains substantial, but an important one concerns alternative investment opportunities or, rather, a perceived paucity thereof. “You can’t invest a trillion dollars in renewable energy because there just isn’t that capacity. Right now it’s a limited opportunity space,” the interviewee said. Whether this particular claim about the size of the renewables investment opportunity is true or not, the broader point is true. Investment is not a game of absolutes. It is always a relative question. For rational investors to reduce holdings in one area, they have to believe not only that this area is overvalued but that there is better value—and ample capacity to handle the quantum of intended investment—elsewhere.

It appears, therefore, that where FFCs are concerned, institutional investors are in for the long haul. They do not plan to desert the sector in the short term or even, it would seem, in the medium term; their economistic approach to FFC investment helps explain why. What are the likely implications of this standpoint for market volatility and for the financial stability concerns widely vexing financial regulators? To return to these matters, we need to focus more closely on an issue that until this paragraph—and my reference to the short, medium, and long term—I had set to one side: the temporality of investment.

Temporality: Thinking about Risk in Time

In The General Theory of Employment, Interest and Money, Keynes ([1936] 1973) famously distinguished between two different but related components of the activity of financial investment, using the term enterprise for “the activity of forecasting the prospective yield of assets over their whole life” and the term speculation for “the activity of forecasting the psychology of the market” (158). Keynes knew that financial markets are inherently volatile, because the investor’s core calculative “enterprise” of valuing financial assets by forecasting their prospective yield—the enterprise we explored in the previous section in relation to investment in FFCs—can never be entirely stripped of “speculative” tendencies, which we turn to shortly. Sometimes, in fact, the latter dominate.

Considered in the context of institutional investment and climate risk, Keynes’s insights raise three crucial questions, and it is these that I explore in the following paragraphs, in conversation with contemporary scholarly thinking about finance, risk, and time. First, in the light of Keynes’s reference to assets’ “whole life,” over what time frames do institutional investors actually think about financial risk and estimate prospective yield? Second, given these investment horizons, how satisfactorily can and do investors integrate an intrinsically long-run phenomenon such as climate change into their thinking? Third, how might we understand investors’ approach to climate risk, and especially its temporal dimensions, in terms of Keynes’s enterprise-speculation dualism?

Carney, from the Financial Stability Board, has foregrounded some of the key issues at stake. Suggesting that “the catastrophic impacts of climate change will be felt beyond the traditional horizons of most actors” (including investors), Carney (2015, 4, 11) worried that by the time people begin to address those impacts it will be too late—including, although not only, for financial stability. Hence both his labeling of climate change as the “Tragedy of the Horizon” and his recognition that an “abrupt resolution” of this tragedy—this temporal incongruity—“is in itself a financial stability risk.” The fundamental question that Carney’s warning asks us to consider in the context of our investigations in this article is this: Will institutional investors factor climate change into their thinking in time?

Viewed from the perspective of recent writing on finance, risk, and time, Carney’s concerns are understandable. By most reckonings, financial market actors, including institutional investors, are notably short-termist in outlook. Indeed, some scholars,
including financial geographers (Clark 2011), have argued that this short-termism was a significant contributory factor underlying the global financial crisis of 2007 through 2010. Hope (2011) invoked a "crisis of temporalities" in which "long-term strategies of capital accumulation" were "besieged by the short-termist tendencies of financialized capitalism" (94). Such writers suggest, therefore, that if investor short-termism remains endemic, we can expect instability and volatility to remain a feature of financial markets in the future. As Clark (2011) wrote, "Whether or not myopia can be in some sense managed will have enormous implications for how we cope with the prospect of increasing global financial market volatility over the coming decades" (4). And "myopia"—or, less pejoratively, short-term investment horizons—would appear to be particularly problematic and particularly prone to fomenting volatility, in the context of a phenomenon such as climate change where the likely effects are typically enumerated in terms of decades or even centuries rather than years.

To a significant extent, this conventional story about investment horizons—and, by extension, the likely incapacity or unwillingness of investors to adequately integrate climate change into their thinking—is true. Investment horizons are limited. One manager I spoke to pithily articulated her temporal horizons thusly: "Can we sell these assets back to the market in five years' time?" Indeed, the principal reason that the energy-sector analyst I discussed in the previous section is not currently factoring climate change into his valuations and yield estimates is that he considers it "too far away, too at the edges. It is a tail risk, not a central-case scenario. Sure, it's at the back of people's minds. But at most it might make people think twice about overweighting the oil and gas sector, or at least give them a reason not to." Another interviewee, whose firm owns shares in Volvo Trucks, conceded that in light of climate change and associated regulation, "modes of transportation are likely to be radically different in fifty years' time; but that is way beyond our investment horizon."

Several individuals I spoke to suggested that five years is actually the very outer bound of investor horizons. Generally, horizons are even shorter than this. "Big investors are short-termist," one said. "They are looking at the next couple of years." What does this perspective mean when it comes to risks, like climate change, that are perceived to stretch out way beyond the investor's time frame? Sacha Sadan, director of corporate governance at Legal & General Investment Management, recently told the Financial Times that it means climate risk is being underpriced: "He likens the position to just before the financial crisis of 2008–9, when complex mortgage-backed securities were overvalued and little understood. 'It's only when it hits you between the eyes that realistic valuations take effect,' he says" (Plender 2017). I heard much the same thing from my own interviewees. "Longer-term risks are always underpriced, until they come up and bite people in the ass," said one. "That's just the way the capital markets work." When I asked a hedge fund manager whether and how the wider institutional investment industry is factoring climate change into investment strategies, he responded with palpable incredulity: "Frankly the short answer is that investors are so worried about career risk that they don't look past the end of the next few months as a rule." A tragedy of the horizon indeed.

In reality, however, the story is a bit more complicated and nuanced than this would seem to indicate, and certainly more so than is suggested by most of the academic literature on finance, risk, and time. This does not necessarily mean that the likelihood of climate-related market volatility is any lower than one might deduce from the aforementioned quotations or than Carney and other regulators fear. Things are, nonetheless, more complicated.

For one thing, just because investors are focused on the value of their investments over a period of only a few years (or months), this does not necessarily mean that in making investment decisions they can or do ignore what might or might not happen after the end of the period in question. This is the standard reading of investment horizons: that five years means, literally, five years. It does not, though. When investors buy a financial asset like a company stock, they are making projections, as Keynes observed, both about how the company will perform (and thus about the yields its stock will generate) and about how the stock will perform (which depends as much, pace Keynes, on speculation, or "the psychology of the market," as on operational performance). If they envisage holding that stock for around five years, both company and stock performance could very well be affected in
the meantime by risks not actually crystallizing until much later. For example, significant revisions in climate science—say, the expectation that the long-term physical effects of climate change will be considerably deeper and broader than previously anticipated—would potentially affect in the short term both the profitability of FFCs and the market’s valuation of them. Thus, “even though our time frame is short,” in the words of one investor I spoke to, “we need to think about risks over the longer term because longer term risks—like climate change—may have become more obvious within the next three years, which would affect our prospects of exiting profitably.” I return to this point at the end of the section.

Furthermore, investment horizons in fact vary widely. They depend intimately on both who is investing and what they are investing in. In terms of the former variable, some investors look much further ahead than others. Several of the institutions, for instance, are involved in managing public-sector pension funds, including in countries where these funds remain largely defined benefit rather than defined contribution schemes. As one interviewee made clear, this is a material difference. “The fact the scheme is defined benefit strongly influences how you think about long-term risks,” she said, “because you’re effectively on the hook for the next 100 years!” Little wonder that the institution she works for has done more work on thinking about climate risk than the vast majority of the others I interviewed.

In terms of the object of investment, all investors—or at least all of those I talked to—think carefully about asset temporality or “life” and about the implications of this temporality for their own investment horizons. This concern relates in the first place to the companies that issue the financial securities in which investors invest. In fact, one of the reasons, seldom mentioned, why institutional investors currently are often quite relaxed about the implications of climate change for their investment practices is that they do not even expect most of the companies they are investing in to be around by the time the biophysical effects of climate change are widely and substantially evident. “The average company in the world has an expected life of years,” one investor told me, “so the average company will be gone by the time we begin to see the serious physical effects of climate change.” The significance of asset temporality to investment horizons also relates to the life span of the securities issued by these companies. All fixed-income securities have a specific tenor, which refers to the length of time until the bond matures and its principal amount must be repaid. Bond tenors typically range from one to thirty years. One investment institution I interviewed said that although it would likely be comfortable buying a two-year bond issued by a “traditional oil and gas company,” a thirty-year bond would be a different matter: “Do we want to be buying that type of asset, given climate change risks? Probably not.”

The third important temporality consideration pertains to the underlying operating or resource-based assets that companies, including FFCs, exist to exploit. Some assets are much more liquid—readily sellable without affecting their price—than others; relatedly, some assets turn over (generate) value more quickly than others. These differences matter, including to investors. “Where the asset is a liquid one,” one of my interviewees, speaking generically, said, “our investment horizon is usually somewhere between five and seven years. Where the asset is less liquid, you are maybe looking at over ten years.” Other interviewees, helpfully, gave specific examples to drive the point home. Here are two, from interviewees working at different investment institutions:

Right now, because it feels more close at hand, regulatory risk is much more material to us than the physical risks of climate change—but we would need to look at the latter if we were going to buy say a port or a refinery, where we would expect to remain invested for a much longer period of time.

If demand for oil is going to be significantly impacted for whatever reason (for example, more electric cars), then that will clearly affect the price of oil, which is a key consideration when we are valuing oil companies. And when we are valuing companies investing in slow-turnover assets like an oil sands mining project, then obviously we need to take a much longer term view of the oil price.

Indeed, asset temporality and its relationship to investment horizons—and thus also to investment strategy—helps partly to explain why most of the investors I interviewed were significantly less concerned about the “stranded asset” issue than I had expected. Surely, I had figured, if substantial fossil fuel reserves become stranded, then FFCs are ultimately likely to be much less valuable than markets.
are presently assuming. My mistake, however, as one interviewee explained, was to overlook the question of the life of the pertinent asset:

With oil companies, P1 (proven) reserves—the reserves on which those companies are essentially being valued—will typically only last ten to twelve years. And right now, nobody can foresee things changing rapidly enough in the regulatory realm to strand any of these assets within that short a time frame. So as far as I am concerned, stranded assets are currently only a material issue in relation to coal companies.

The nexus of climate change and fossil fuel risk, this example underscores, is, for investors, always to be understood in its temporal specificity, and that specificity depends as much on the nature of the asset being capitalized as on the nature—and temporal disposition—of the investor doing the capitalizing.

As emphasized earlier, these subtleties do not necessarily render the world of fossil fuel investment any less susceptible to future volatility in the light of climate change than it would be if the more reductive but not wholly inaccurate picture of simple short-termism were true. The details of the preceding paragraphs, in fact, should be sufficient to disabuse the reader of such a view. The more reflective paragraphs, in fact, should be sufficient to disabuse us of the idea that climate change is a problem that is adequately captured by our current financial models. We have tried to embed climate-related regulations in our models. We have done this either where we think these regulations will impact within five years, or where we think the market, in five years’ time, will expect such regulations to impact at some point thereafter.

Such insights go a long way to confirming what some of the more astute writers on finance, risk, and time have recently sought to argue: that there is no meaningful dividing line between enterprise and speculation—no former without the latter—in either the short or long run. Konings (2017) observed that for all of his recognition of speculative tendencies in financial markets, “Keynes still held on to the idea of a long-run market outcome against which short-run valuation shifts could be judged—as if there exists some neutral notion of what the ‘whole life’ of something consists in.” But speculation, as my interviewees appreciate, is pervasive. Konings, following Minsky, wrote that “all economic choices and investments [are] speculative in the sense that their value [will] only be determined in a future that is unknowable because it will be shaped by events that we cannot predict.” At the risk of hyperbole, one might say that climate change dramatizes this point better than any other phenomenon in human history. Speculation, said Konings, is not in some sense “pathological” to a normal, “enterprising” capitalism. It is capitalism where ultimately “all there is” is “a game of valuation driven by mutual expectations, in which people speculate on what other people are thinking”—including, I would add, increasingly, about climate change.

Convention: Thinking about Climate Risk as Calculable Risk

As I noted earlier, investors are largely using existing, well-established tools and methods to try to think analytically about climate risk and to render this risk in the form of actionable data. They are thinking about it, in other words, conventionally. The DCF is the quintessential example. In fact, for all of the talk of stranded assets and all of the significance of FFCs’ asset base, one analyst confessed that for the most part, “the market is not really valuing these companies on the basis of their resource base, but more on their current cash flow.” The DCF reigns. More generally, the conventional models through which institutional investors think and act in the financial world are ordinarily bottom-up, discrete models. “We always tackle valuation from a bottom-up perspective, a company-
specific perspective,” one said. “We look at things on a case-by-case rather than aggregate basis,” said another. Both parts of my formulation—discrete and bottom-up—are important. The focus is the (one) company. Although external factors—top-down “environmental” variables such as, say, climate change—are not immaterial, neither are they the primary focus. The focus is internal: valuing the company from the bottom up, in terms of the sum of its profit-generating parts.

The significance of the reliance on traditional analytical tools is that, in reality, as some investors are only too willing to admit, these tools do not readily or comfortably accommodate climate change considerations. Noting that eventually the physical risks of climate change will become a much more pertinent concern for institutional investors than they are today, one interviewee acknowledged how hard, if not impossible, it is and will remain “to square the devastating ultimate physical impacts of climate change with their likely effects on company valuations.” Why? “Because the models don’t allow this” (emphasis added). There is, in effect, a pivotal issue of translation. To wit, even if FFCs ultimately respond positively to calls to “fully” disclose the climate-related risks to which their businesses are exposed, is it reasonable to expect that these disclosed risks can be straightforwardly translated into investors’ investment decisions and hence asset prices? Given the limitations of existing calculative devices, the aforementioned interviewee—and others—suggests not. The premise that disclosed risks can be seamlessly factored in, and thus that enforcing disclosure is all that regulators need do to maintain market stability, is a chimera. This, of course, is not to mention the related question of whether FFCs can meaningfully and fully capture climate-related risks in tractable risk metrics in the first place.

It is no wonder, then, that the few intrepid institutional investors who are already trying to get climate change into their models are finding it exceptionally hard. I spoke to one investor who suggested that factoring in climate change necessitates melding the stock-in-trade bottom-up approach—that is, “looking at individual securities to see how well positioned they are to deal with climate shock”—with a top-down approach because its (climate change’s) impacts are likely to be all-encompassing. Hence, the key question for her is this: “How can we translate environmental change into the macroeconomic indicators like GDP [gross domestic product] and inflation that we use in our models?” Answering this question, she suggested, will help her and her company address issues such as whether they should be making significant shifts (e.g., between sectors) at the level of their overall investment portfolio. She also recognized that it is not a matter of choice or a mere nice-to-have: “Unless we can convert climate change into economic indicators, we simply can’t get climate risk into our models.” What progress is currently being made on this front? “We are really struggling to do this.”

Neither is it any wonder, given these difficulties, that the models that are currently being used frequently produce bizarre or just plain erroneous results. The same interviewee related the telling example of perhaps the best known such model, created by the global consultancy firm Mercer. To much fanfare, Mercer used this model in 2015 to estimate “the potential impact of climate change on returns for portfolios, asset classes and industry sectors between 2015 and 2050, based on four climate change scenarios and four climate risk factors. The four scenarios represent a rise in global temperature above preindustrial era temperatures of 2°C, 3°C and two 4°C scenarios (with different levels of potential physical impacts)” (Mercer 2015). According to my interviewee, “Mercer took our portfolio and ran it through its model.” The outcome was not comforting:

The results led us to believe that existing tools in the market don’t capture the future at all well. Mercer’s model showed us—our portfolio—to be only marginally affected by climate change. Given the extent of exposure to fossil fuel risk that we know we have, we were rather mystified.

This particular institution is in the process of trying to develop its own better model. Crucially, moreover, it appears to be the case that a relatively small subset of off-the-shelf tools is being used by more or less all investment institutions; few are going down the in-house, customized development route. The same names cropped up repeatedly in my interviews: Mercer, 2° Investing, and Carbon Tracker. This, then, is a second important connotation of the word convention in the title of this section. Convention does not necessarily only mean tradition, doing things largely as one has typically
done them in the past; it can also mean conformity, or doing things largely as everyone else does them, conforming to convention. For all of the subjectivity (individuality) of investor perspectives on climate change that I discussed in the first section and all of the variation in the organizational design of the institutions within which these individual perspectives are translated into investment practice, such subjectivity is to one degree or another flattened if it is filtered—enacted—through conventional, conformity-inducing tools of analysis. This is the type of tension or contradiction between tropes (here, subjectivity and convention) that I mentioned in the Introduction; there are clearly signs of such tension in the investment industry’s provisional attempts, through models, to render climate change graspable, practicable and actionable. If these models are—as seems to be the case with Mercer’s—imperfect, if they induce “mistakes” (which surely they are bound to do) or even just contain significant limitations, then the biggest significance of this is that essentially everyone is making the same mistakes and reproducing the same limitations.

Again, an example can help illustrate what I am getting at and why it matters. Another interviewee discussed her company’s use of off-the-shelf carbon-footprinting tools to pinpoint concentrations of exposure to carbon emissions in its portfolio. She explained that whenever the footprinting analysis is run, it shows carbon hotspots associated primarily with electrical utilities and cement companies and not with miners and oil and gas companies—that is, in her own words, “with those companies that burn fossil fuels, not those that take them out of the ground.” Sensing my confusion—how could oil and gas companies not generate hotspots?—she cleared up the mystery: “Footprinting is done on Scope 1 and 2 emissions, and not, at the moment, Scope 3. Scope 3 would give a very different risk profile to our portfolio.” Basing carbon footprinting on Scope 1 and 2 emissions might not be “wrong,” as such, but it certainly gives a very partial picture and certainly is potentially misleading as a guide to risk-based investing. Carbon footprinting is also widespread. Most investment institutions do it; most investment institutions, therefore, are, to one extent or another, enacting—or “performing”—the same model and the same partiality.

The clearest expression of convention-as-conformity within the global investment industry, of course, is index (or “passive”) investing. With the seemingly inexorable growth of index-focused fund management behemoths such as Vanguard (e.g., Flood 2017), an increasing proportion of global financial assets are today being managed passively rather than actively, in so-called tracker funds. A majority of the institutional investors I interviewed have some funds being managed passively, and some have significant proportions in trackers; all of these institutions are exposed to fossil fuel risk through their indexed portfolios as well as their active portfolios. Expressed in terms of the headline concern of this article—how institutional investors think about climate change and fossil fuel risk—indexing effectively represents, one might say, not thinking about fossil fuel risk. To the degree that it entails casting in one’s lot with the market, indexing amounts to an abdication of choice in favor of systematized convention. Knowingly or unknowingly, willingly or unwillingly, it is an institutionalization of herd mentality. Indeed, even active-only investment institutions are swayed to one extent or another by index benchmarks. One UK-focused active-only investor, for example, told me that “even if you aren’t benchmark targeting, you have to be benchmark aware. If your focus is UK equities, the FTSE is something like 5 percent oil and gas. You can’t ignore that. You’d need to have a very good reason to not have a significant oil and gas presence, even if it’s not 5 percent of your portfolio.” As research has shown, the growth of index investing has contributed to higher systemic market risk and higher market volatility and vulnerability (Sullivan and Xiong 2012). It remains to be seen what exactly will come of the convergence—in and through the herded space of indexed fossil fuel risk—of the world of passive investing with the world of climate change, but it seems unlikely to take the form of a smooth and painless encounter.

All of this leaves just one vital question to be answered: Why, in terms of the calculative devices employed, is the investment industry approaching climate risk in the ways it presently is? Why, in particular, does it remain as wedded as it clearly is to conventional methods and tools, even as the applicability and credibility of those methods and tools is called into question on a daily basis? Part of the answer, I think, can be found in the anthropological literature on corporate culture. Schoenberger (1997) showed that corporations generally find it incredibly
difficult to extricate themselves from forms and modes of reasoning and calculating on which they have historically relied, especially (although not only) if those approaches have proven successful in the past. Firms remain faithful to epistemological convention even when they find themselves in situations that, to outsiders, clearly require different forms and modes of reasoning—a scenario arguably akin to the one investors today face with climate risk. The issue, Schoenberger (1997) demonstrated, is, in short, that traditional approaches have become part of the fabric of the firm, integral to its very culture. To go against them would be to go against that culture. Schoenberger used this insight to explain what appeared, at first blush, to be various colossal corporate blunders. Her point was that although the decisions taken by those firms were not rational, neither were they irrational. Viewed in the context of deep-rooted corporate cultures, they made sense.

If Schoenberger was right—and I think she was—then one reason for investors’ reliance on conventional tools in the attempt to grapple with climate risk is that these tools are, simply, part of the institutional and mental furniture. They are fundamental to the very ways in which investors relate to, and seek to comprehend, the world around them. Indeed, in interviewing investors, I often had the feeling that they sensed that climate change might require wholly new ways of thinking and calculating but that they were—quite literally—incapable, culturally if not cognitively, of making that kind of leap.

However, I also think there is more going on than this. Another part of the puzzle can be explained by considering the analogous example of the failure of the financial sector more broadly, including central banks, to overhaul conventional ways of thinking and conventional models in the wake of the global financial crisis. As the Financial Times’ economics editor, Chris Giles, recently observed, central bankers are today still using conventional approaches to modeling pivotal macroeconomic dynamics such as the relationship between the economic cycle and inflation. Perhaps unsurprising, the models are producing problematic results, leaving central bankers stumped. The economy is “not behaving in the way economic models predicted. ... Their economic models are failing” (Giles 2017).

Cultural inertia of the type depicted by Schoenberger might be one reason for the ill-fated resort to analytical convention in the case discussed by Giles, but it is not the only one. One of the most notable features of mainstream economic readings of the financial crisis was the view that this crisis, even if “bigger” and “wider” than earlier financial crises, was not fundamentally different from them. Such was the central claim, for example, of perhaps the most influential economics book of the crisis period, by two of economics’ most orthodox commentators, Reinhart and Rogoff (2009). The main title, This Time Is Different, was a mocking one, denoting not the thesis of their book but rather the commonplace (mis)understanding of financial crisis that they sought to debunk. The rules of the financial game, Reinhart and Rogoff (2009) submitted, had not fundamentally changed. If they were right—as most orthodox economists, including those on the staff at the world’s central banks, assumed they were—then why should new ways of understanding that game be necessary? They should not.

During my interviews, it became clear that although some institutional investors believe that climate change represents a risk phenomenon without precedent and that climate risk is a special and unique form of risk, many do not. This was, in fact, one of the most striking themes to emerge from the research: that many, perhaps most (it would be hazardous for me to generalize), investors are adopting a Reinhart-and-Rogoffesque perspective: This time—this risk—is not different. Climate risk is, in other words, just risk: something to be taken extremely seriously, to be sure, but not something fundamentally different to risks that investors have had to face up to before and therefore not something requiring altogether new ways of thinking. This conviction that it suffices to think about climate change and fossil fuel risk in traditional—conventional—ways because risk per se has not changed was expressed particularly clearly and explicitly by one of the investors I spoke to. “We have,” she maintained, “been through this before. With asbestos, for example. Things like stranded assets are a concern for sure—will it be a bubble bursting, or a long slow decline?—but I don’t think we are going to treat this any differently.”

Convention, in other words, is rooted also in the belief that we are still living in the same old world. Right or wrong, this belief inevitably breeds over-confidence. If investors think that climate risk is ultimately not substantially dissimilar at the most
fundamental level from other types of risk, then of course they will tend to be confident that they can cope with it. We survived—perhaps even thrived—before, right? We are still standing. Indeed, one of my interviewees—not the one who referred to the asbestos precedent—admitted, in a roundabout way, to this overconfidence and suggested that it was pervasive. “If we remain heavily invested in oil and gas,” he said, in reference specifically to his firm, “there’ll come a point where we are taking on an event risk, the risk that global exit from oil and gas is sudden rather than gradual. And we, in the industry, tend to be overoptimistic about dealing with this kind of event risk, about spotting if and when it is coming.” Another of the most striking themes to emerge from my research, notably, was that although most investors believe that this “event risk” is eventually coming, none have much sense that it is coming any time soon and still less that it might already have arrived.

Conclusion

The central and most important inference of the various ways in which the institutional investors I spoke to think about climate change and fossil fuel risk is, quite simply, that they will remain invested in FFCs for as long as they believe it remains profitable, for them and their clients, to do so. In practice, this means that those individuals with the relevant decision-making power continue to believe that FFC investment remains profitable—using calculative devices that are currently far from being up to the task of “accurately” integrating climate risk into investment analysis and channeled by investment horizons that, for now at least, are considerably shorter than the horizons over which investors generally anticipate the effects of climate change even beginning to be experienced. Investors are only likely to exit FFCs en masse if other energy sources become relatively and reliably less costly and capable of being invested in at sufficient scale, or if they come to believe that substantial climate-related risks—biophysical, political, or regulatory—of remaining invested fall within the relevant investment horizon.

For governments and regulators, the findings enumerated in this article should be cause for considerable concern. There is, it seems to me, no reason to believe that the investment industry will react to changing informational indicators of climate-related risk in the way that regulatory approaches to such risk presently presume, which is to say, in the manner of the “rational” actors of orthodox financial economic theory. There are simply too many reasons to question the real-world applicability of this idealized “rationality.” Within actually existing investment institutions, whose individual voices actually get heard and acted on? Can significant calculative errors be avoided and the effects of human fallibilities, more generally, circumvented? Can the myriad risks relating to climate change ever be precisely factored into the models through which institutional investors read and rewrite the financial world? And so on and so forth. Everything about the ways in which institutional investors think about climate change and fossil fuel risk portends volatility—environmental beta—rather than stability. Yet governments and regulators are banking on risk disclosure enabling investors to effect a smooth financial-systemic transition to a low–fossil fuel economy. If financial authorities insist on relying on the market to manage change, surely they should understand how the market, in the shape of the investors populating and coding it, thinks. There is no evidence, for now, that they do or, indeed, that they are taking meaningful steps to do so.

Meanwhile, the article’s findings should make equally uncomfortable reading for environmental and other interest groups. There is clearly no reason for these groups to believe that any amount of advocacy and pressure will serve to wean the global investment industry at large off FFC investments. The majority of investors do not see it as their responsibility either to help pressure groups to discipline FFCs into cleaner forms of energy or indeed to invest “ethically.” Ethical investment, in the sense of fulfilling one’s duty to one’s clients, is simply profitable investment. This does not mean that such investment will always remain environmentally dirty, but it certainly does not imply energy cleanliness, either. Most investors are blind to the color of their energy footprint, not in the sense of not seeing it—they typically know a brown energy source when they encounter it—but rather of not seeing it as relevant except insofar as this color potentially constitutes a financial risk. Climate risk, in fact, is only a pertinent risk if it has a financial component. If environmental and other interest groups want to influence the investment patterns of the investment industry in a greener direction, the only way to do so consistently
and at scale is to appeal to cold, hard economic logic. Some, to be sure, have already sought to do so, but as my interviews show, the argument is a million miles from being won. To imagine that the investment industry can be won over by anything other than economic logic is, of course, to misunderstand not only how that industry thinks about risk but, more broadly, the very nature of the capitalist world within and through which climate change and its political economy continues to be internally produced.

Acknowledgments

My main thanks are to the individuals who took the time to be interviewed for this research. For extremely helpful comments on earlier versions of this article, I thank the Annals referees and editor, James McCarthy. I am also grateful to Isak Stoddard, Seema Arora-Jonsson, and Christian Berndt for invitations to discuss the ideas and arguments presented here in seminars at, respectively, the Centre for Sustainable Development in Uppsala, the Swedish University of Agricultural Sciences (also in Uppsala), and the University of Zurich and to the audiences at those seminars for helpful feedback. The usual disclaimers apply.

Funding

I gratefully acknowledge the financial support of the Swedish Research Council (Vetenskapsrådet) in the form of Grant Number 2015–01694, “Climate Change and Transformations of Financial Risk.”

Notes

1. All quotations in this article, unless stated otherwise, are taken directly from interviews carried out by the author. To ensure confidentiality, I provide the names neither of the companies I interviewed nor of the particular individuals to whom I spoke.
2. See Christophers (2017, 1113–18) for an extended discussion of these issues.
3. A third interviewee, operating largely in the fixed-income environment, said, “We have hundreds of clients, but I can count on one hand the number who are asking us detailed questions about climate risk, and on one finger the number really pushing us and holding us accountable on these questions.”
4. For an example of rankings of individual fund managers, see http://citywire.co.uk/wealth-manager/rated-fund-managers.
5. Sandberg (2013) wrote, “The law states that [pension fund managers] are required to manage their funds in the best (financial) interest of the beneficiaries and to do so without attending to personal biases. A vast amount of pension fund [managers] around the world interpret this legislation as precluding them from doing anything else than seeking maximum returns on investments” (437).
6. The three categories of GHG emissions were established by the Greenhouse Gas Protocol, a partnership between the World Resources Institute and the World Business Council for Sustainable Development. Scope 1 emissions are “direct GHG emissions”; Scope 2 emissions are “indirect GHG emissions from consumption of purchased electricity, heat or steam”; Scope 3 emissions are “other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.”

References

Andersson, M., P. Bolton, and F. Samama. 2016. Hedging climate risk. Financial Analysts Journal 72 (3):13–32.
Ansar, A., B. Caldecott, and J. Tilbury. 2013. Stranded assets and the fossil fuel divestment campaign: What does divestment mean for the valuation of fossil fuel assets? Accessed October 16, 2017. https://www.smithschool.ox.ac.uk/publications/reports/SAP-divest-report-final.pdf.
Aylng, J., and N. Cunningham. 2017. Non-state governance and climate policy: The fossil fuel divestment movement. Climate Policy 17 (2):131–49.
Bernstein, S., M. Betsill, M. Hoffmann, and M. Paterson. 2010. A tale of two Copenhagens: Carbon markets and climate governance. Millennium: Journal of International Studies 39 (1):161–73.
Calvello, A. 2009. Environmental alpha: Institutional investors and climate change. Hoboken, NJ: Wiley.
Carney, M. 2015. Breaking the tragedy of the horizon—Climate change and financial stability. Accessed October 16, 2017. http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech844.pdf.
Castree, N., and B. Christophers. 2015. Banking spatially on the future: Capital switching, infrastructure, and the ecological fix. Annals of the Association of American Geographers 105 (2):378–86.
Christophers, B. 2017. Climate change and financial instability: Risk disclosure and the problematics of neoliberal governance. Annals of the American Association of Geographers 107 (5):1108–27.
Clark, G. L. 1998. Pension fund capitalism: A causal analysis. Geografska Annaler: Series B 80 (3):139–57.
———. 2011. Myopia and the global financial crisis: Context-specific reasoning, market structure, and institutional governance. Dialogues in Human Geography 1 (1):4–23.
Diaz-Rainey, I., B. Robertson, and C. Wilson. 2017. Stranded research? Leading finance journals are silent on climate change. Climatic Change 143 (1–2):243–60.

Dietz, S., A. Bowen, C. Dixon, and P. Gradwell. 2016. Climate value at risk of global financial assets. Nature Climate Change 6 (7):676–79.

Flood, C. 2017. Vanguard closes in on BlackRock’s number-one spot. Financial Times, July 23. Accessed September 5, 2018. https://www.ft.com/content/074deede-6d69-11e7-bfeb-33fe0c5b7eaa.

Giles, C. 2017. Central bankers face a crisis of confidence as models fail. Financial Times, October 11. Accessed September 5, 2018. https://www.ft.com/content/333b3406-acd5-11e7-beba-5521c713ab4.

Haldane, A. 2014. The age of asset management? Speech given by Andrew G. Haldane, Executive Director, Financial Stability and member of the Financial Policy Committee, April 4. Accessed October 16, 2017. http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech723.pdf.

Hall, S. 2011. Geographies of money and finance I: Cultural economy, politics and place. Progress in Human Geography 35 (2):234–45.

Ho, K. 2009. Liquidated: An ethnography of Wall Street. Durham, NC: Duke University Press.

Hope, W. 2011. Crisis of temporalities: Global capitalism after the 2007–08 financial collapse. Time & Society 20 (1):94–118.

Institute and Faculty of Actuaries. 2015. Climate change: Managing risk and uncertainty. Accessed October 16, 2017. www.actuaries.org.uk/documents/climate-change-managing-risk-and-uncertainty-policy-briefing.

Johnson, L. 2013. Catastrophe bonds and financial risk: Securing capital and rule through contingency. Geoforum 45:30–40.

Kaminker, C., and F. Stewart. 2012. The role of institutional investors in financing clean energy. OECD Working Papers on Finance, Insurance and Private Pensions, No. 23. Paris: OECD Publishing.

Keynes, J. M. 1973. The general theory of employment, interest, and money. Vol. 7 of The collected writings of John Maynard Keynes. London: Macmillan and Cambridge University Press.

Konings, M. 2017. The time of finance. Los Angeles Review of Books, December 28. Accessed September 5, 2018. https://lareviewofbooks.org/article/the-time-of-finance/.

Liesen, A., F. Figge, A. Hoepner, and D. Patten. 2017. Climate change and asset prices: Are corporate carbon disclosure and performance priced appropriately? Journal of Business Finance & Accounting 44 (1–2):35–62.

MacLeod, M., and J. Park. 2011. Financial activism and global climate change: The rise of investor-driven governance networks. Global Environmental Politics 11 (2):54–74.

Mercer. 2015. Climate change: New investment risk demands action by investors, cautions new research. Accessed October 16, 2017. https://www.uk.mercer.com/newsroom/mercer-launches-new-global-climate-change-investments-report.html.

Pfeifer, S., and R. Sullivan. 2008. Public policy, institutional investors and climate change: A UK case-study. Climatic Change 89 (3–4):245–62.

Plender, J. 2017. Rapid changes in the climate for carbon-heavy investments. Financial Times, December 15. Accessed September 5, 2018. https://www.ft.com/content/c4a6f996-e003-11e7-a8a4-0a1e63a52f9c.

Reinhart, C., and K. Rogoff. 2009. This time is different: Eight centuries of financial folly. Princeton, NJ: Princeton University Press.

Sandberg, J. 2013. (Re-)Interpreting fiduciary duty to justify socially responsible investment for pension funds? Corporate Governance: An International Review 21 (5):436–46.

Schoenberger, E. 1997. The cultural crisis of the firm. Oxford, UK: Blackwell.

Sowerbutts, R. 2016. No smog without fire: The financial stability risks around carbon-intensive investments. Accessed October 16, 2017. https://bankunderground.co.uk/2016/07/06/no-smog-without-fire-the-financial-stability-risks-around-carbon-intensive-investments/.

Sowerbutts, R., P. Zimmerman, and I. Zer. 2013. Banks’ disclosure and financial stability. Bank of England Quarterly Bulletin 53 (4):326–35.

Sullivan, R., and J. Xiong. 2012. How index trading increases market vulnerability. Financial Analysts Journal 68 (2):70–84.

Tickell, A. 2003. Cultures of money. In Handbook of cultural geography, ed. K. Anderson, M. Domosh, S. Pile and N. Thrift, 116–30. London: Sage.

Zenghelis, D., and N. Stern. 2016. The importance of looking forward to manage risks: Submission to the Task Force on Climate-Related Financial Disclosures. Accessed October 16, 2017. http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/06/Zenghelis-and-Stern-policy-paper-June-2016.pdf.

BRETT CHRISTOPHERS is a Professor in the Department of Social and Economic Geography at Uppsala University, 75120 Uppsala, Sweden. E-mail: brett.christophers@kultgeog.uu.se. His research ranges across numerous aspects of the geographical political economy of Anglo-American capitalism, with particular interests in finance, competition, law, land, housing, and, increasingly, climate change.