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ARE WE AT THE INFLECTION POINT OF CLIMATE INVESTING?*

Yu (*Ben*) *Meng*[a]

Just as the ongoing pandemic demonstrates our vulnerability to the invisible hand of the COVID-19 virus molecule, the extreme climate events are constant reminders of our vulnerability to another molecule, carbon dioxide. As a result, all walks of society are asking for solutions, especially ones that involve the financial markets playing an important role. This emphasis is reflected in the proliferation of ESG investment funds and the massive capital inflows into such funds. This article examines both the demand for and supply of such climate investments and identifies two necessary conditions for private capital to become a meaningful part of the solution to climate change: mandatory data disclosure and alignment of interests via carbon pricing.

1 Overview

The rise of environmental, social, and governance (ESG) investing is nothing short of extraordinary. A decade ago ESG was a mysterious acronym to many and it had to compete with an alphabet soup of terms such as Corporate Social Responsibility (CSR), Responsible Investing (RI), and Impact Investing (II). ESG has risen to the top, but though popular, the acronym has suffered from varied and somewhat confusing definitions.

The difficulty this poses for investors partly reflects the lack of explicit inclusion of finance in the concept. In short, there is a missing letter F which could denote finance. I am not advocating that we revise the acronym, but rather we explicitly consider the role of finance in achieving sustainability and addressing the challenges that climate change poses (Bose *et al.*, 2019).

ESG spans a wide range of topics with varying degrees of readiness for the financial markets to play an effective role. This article focuses on climate investing, a component of E in ESG. Climate change is one of the most visible and quantifiable ESG topics. As we are constantly reminded by extreme climate events, climate change requires

*The views expressed herein are those of the author and may not represent the complete views of Franklin Templeton.
[a]Chairman of Asia Pacific, Franklin Templeton, 1 Franklin Parkway, San Mateo, CA.

urgent actions from all parts of the society and economy, including the financial markets.

This new model allows us to consider the drivers of demand for climate investing and the enablers of supply, to assess whether we are at an inflection point in finance. The example of climate change suggests that we are, but financial markets cannot respond efficiently to the risks and opportunities ahead without the information and alignment of incentives which drive both capital allocation and stewardship. There is an urgent need to close the gap in order that the inflection point for change does not become a tipping point into climate catastrophe.

2 Introduction

Received wisdom in financial markets is being challenged by rising concerns with sustainability as human economic activity stresses planetary boundaries and societal expectations for shared prosperity rise globally. The adoption of the UN Sustainable Development Goals by close to 200 nations in 2015 is one sign of the shared global ambition to tackle climate change, eradicate poverty, end hunger, foster productive work and education, ensure gender equality and protect the natural environment (UN Sustainable Development Goals, n.d.). Finance will play a vital role in achieving these goals. However, there is a gap between the demand for capital to respond to the risks and opportunities of sustainability, and the enablers of supply, which would allow the financial markets to allocate capital efficiently. The result is more noise than signal.

The breadth and depth of climate change issues test conventional appraisal of risk and return. The question for investors is whether capital markets are at an inflection point that could bring rapid, transformative and potentially disruptive changes. If so, how can investors ride the waves of change, which are driving both risk and opportunity in finance? In navigating the potential turbulence ahead, we need to close the gap between the demand for finance to address climate change, and the current constraints on supply capacity for markets to efficiently price those risks and opportunities. This article identifies two broad sets of constraints:

(1) lack of investment-grade climate-disclosure data and analytics (usually as part of the broader ESG data disclosure and analytics); and
(2) misaligned incentive (e.g., presence of fossil fuel subsidies and absence of carbon pricing).

This article conducts the gap analysis by mapping the drivers of demand for climate investment, identifying the gaps in capacity for supply needed for implementation and proposing a new framework for considering ESG investment which explicitly considers the role of finance in combating climate change.

3 The ESG Gold Rush

Despite the hazy definitions, the ESG trends in finance have brought a veritable gold rush to the capital markets. According to Morningstar, in the fourth quarter of 2020 alone, investors directed $152 billion into investments marketed as ESG, an 88% rise from the previous quarter (Hale, 2021). CNBC commented that by year end, sustainable investing of some variety now accounts for about a third of total assets under management in the US (Nason, 2020). A large portion of the asset management industry now claims ESG credentials, but this in turn has prompted questions as to whether the marketing claims are entirely credible. A study by Barclays concluded that the holdings and risk exposures of ESG-labeled funds are not really different from those of conventional funds (Barclays, 2020).

The concern that ESG suffers from "virtue signaling" which could mislead investors has prompted a risk alert from the SEC stating that "firms claiming to be conducting ESG investing need to explain to investors what they mean by ESG and they need to do what they say they are doing" so "investors know what they are getting when they choose a particular fund, advisor, strategy or product" (Peirce, 2021).

This warning shot from the US regulator has come alongside a new push to develop standards for reporting by companies on ESG, both internationally via the new International Financial Reporting Standards (IFRS) International Sustainability Standards Board and proposed rulemaking on climate change at the SEC. The SEC risk alert shows that the investment management industry itself will not be exempt from scrutiny.

Notwithstanding the uncertain status of ESG claims, the furious speed of money flooding into funds claiming sustainability credentials shows that financial markets could be recognizing an inflection point on the horizon.

What then, in financial markets, do we mean by an inflection point? Essentially it is when everything changes rapidly, at pace and scale. A vivid example is the energy transformation in transport, which has led to electric vehicle manufacturer Tesla, outranking competitors reliant on the internal combustion engine fueled by carbon heavy gasoline and diesel.

An inflection point denotes change, but it does not indicate how that change will unfold. Work from evolutionary science provides a useful model for considering the path ahead through the Darwinian Gradualism or Punctuated Equilibrium Model (Figure 1) first proposed by Eldredge and Gould (1972).

We can use the evolution of transportation to illustrate the concept of Punctuated Equilibrium and the importance of identifying the inflection point. In transportation, one can argue that the horse carriage represents *The First Equilibrium* which spans over a thousand years of human history until the invention of the first working internal combustion engine automobile by Karl Benz in 1885 when *The Second Equilibrium* began. The commercial rollout of Nissan Leaf in 2011 represents the first practical electric passenger vehicle and hence *The Third Equilibrium*. Now a decade later, we are about to enter *The Fourth Equilibrium*—the autonomous vehicle era. Each switch of the market equilibrium represents an inflection point.

Why does the inflection point matter? Inflection points often represent existential risks as well as

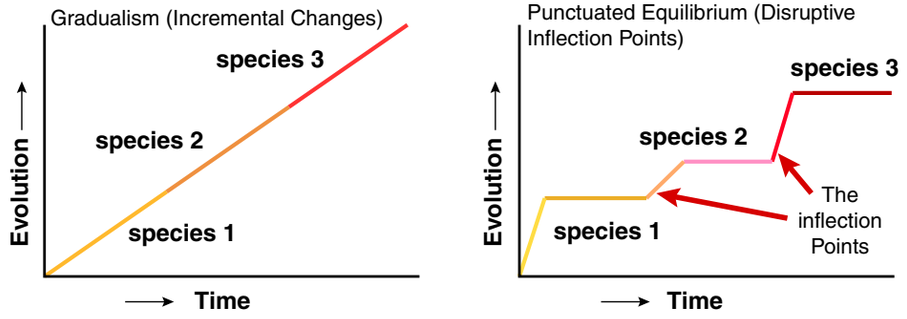


Figure 1 Gradualism and punctuated equilibrium models (Eldredge and Gould, 1972).

great opportunities. As in the example of transportation, the duration of each equilibrium is getting shorter and the disruption is happening faster. Market-leading incumbents lose out to new entrants not because they do not see risks and opportunities but because they focus on taking *incremental* steps in the *existing* framework or mindset.

With approaching the inflection point in a "punctuated equilibrium" situation, it is critical to identify the inflection point and adopt *drastic* measures when necessary, to mitigate risk as well as capture new opportunities.

Arguably, financial markets are facing an inflection point on climate change. The warning signs are coming from science, civil society, governments, and even the courts. The financial markets are rapidly responding but the efficiency of that response is being hindered by lack of information and by misaligned incentives.

4 The Science of Planetary Boundaries

An important signal to the markets came from the International Energy Agency (IEA) which is the global body appointed to advise world governments on progress in response to climate change.

Their most recent assessment offers a stark warning of the risks ahead for financial markets. They conclude that in order to have a 67% probability of limiting global warming to no more than 1.5 degrees Celsius, there can be no further investment in coal, oil, gas, and tar sands (Plumer, 2021).

The IEA conclusion is a profound insight into how the science of planetary boundaries translates into investment risk. The position is summed up by Bose *et al.* (2019) as follows:

> "There is a growing recognition that the unprecedented scale of human economic activity has caused stresses on natural ecosystems. These include global warming, fresh water scarcity, the diminished availability of arable land in the face of increasing global population, the collapse of pollinating insect colonies, plastic pollution and the degradation of fish stocks in oceans, and the potentially adverse impact of endocrine disruptors on human reproductive systems. The possibility that anthropogenic activity has already breached four out of the nine planetary boundaries and is in danger of breaching others infuses an urgency into calls for the financial system to be an immediate and active contributor to broad-based efforts to address sustainability." (Plumer, 2021)

5 Policy as a Driver

The landmark Paris Agreement on climate change was adopted in 2015 after 20 years of failed effort to establish a global policy framework for the transition to a low carbon economy, in response to the science on global warming. Under this landmark agreement each nation has set its own Nationally Determined Contribution to holding global warming to "well below two degrees Celsius". With the global economy currently on track for global warming at twice or three times that, there is a complex and daunting challenge ahead for transforming the world economy to low carbon. Ahead of the 26th meeting of the Convention of the Parties (COP 26th) significant commitments are being made, for example, by Japan, the UK, US, and Europe committing to net zero emissions by 2050 and China proposing the same for 2060. This rachets up the pace and scale of policy as a driver of demand for financial markets to respond.

Financial market regulators have been actively responding, across all major markets. The US Commodities and Futures Trading Commission Government appointed a special committee to examine financial risks due to climate change chaired by Wall Street veteran and eponymous

founder of the Black–Litterman global equilibrium asset allocation mode, Bob Litterman.

The recommendations of the CFTC report on climate change can be read as the emergency handbook for financial markets which need to price risk or respond to uncertainty. This requires information on climate risks which provides a true and fair picture of a company's finances. Likewise, the recommendations include addressing the skewed incentives which hamper market efficiency, notably to call for the removal of subsidies to fossil fuels and to introduce carbon pricing. These bold recommendations have now been endorsed by the G20 and will be a central topic of discussion at COP 26th bolstered by the commitments of the European Sustainable Finance Directive and China's Green Finance Taskforce.

6 Investors DIY

In response to the science and the changing regulatory landscape, investors have been gathering force both to call for regulatory action on corporate reporting and carbon pricing, whilst also taking to private ordering with the companies they invest in. One example is Climate Action 100+ which includes signatories investing over $60 trillion AUM which are tackling the systemically important carbon emitters that form the third largest source of greenhouse gas emissions on the planet after China and the US.

The investor focus goes beyond simply reporting, but includes board governance, through demands for directors to demonstrate their "climate competence," and ensure internal incentives are aligned with the Paris goals, through executive compensation targets and political lobbying policies to ensure a "just transition" that is financially viable and fair to workers and communities. An example is BP, one of the world's largest oil companies, which has put its top 14,000 executives into a new bonus scheme linked to emissions reduction, to drive further alignment of CAPEX with their net zero commitments.

The support of industry leaders, such as Hiro Mizuno, former chief of the world's largest pension fund, the Government Pension Investment Fund of Japan, has been critical to this work in overcoming the "tragedy of the commons" by recognizing that universal owners must understand and respond to risk which is both on and off the balance sheet. In so doing he has given practical effect to the concept of being a universal asset owner, first mapped by Hawley and Williams over 20 years ago (Hawley and Williams, 2000).

The demand from investors for the integration of climate risk and opportunity into corporate reporting is prompting a response from accounting standard setting bodies both internationally and in the US. Recognizing the need to ensure that corporate reporting is both true and fair, both SEC and IFRS are moving to develop the reporting standards, regulatory oversight, internal controls by audit committees and auditors that will be transformative in the financial markets' ability to price risk, allocate capital, and exercise stewardship.

Investors are taking matters into their own hands, not only calling on regulators to act with the urgency on information and incentives. The rise of asset aggregators comes with aggregated influence. A recent study published by Harvard Business Review estimates that the top 10 asset managers represent 34% of the global AUM (Eccles and Klimenko, 2019). The transition, from a large number of small individual investors to a small number of large asset aggregators with acquired shareholder rights, makes it possible for individual investors to exert influence collectively. This brings a private ordering force to bear which is

intersecting with the national and global policy measures that are speeding change.

The world of philanthropy is also moving rapidly to understand that they have a leading role as innovators, thought leaders, and catalysts for change. An elegant agenda for change is presented in Bill Gates' book "How to Avoid a Climate Catastrophe" (Gates, 2021). It provides a powerful call to action which is being heard by many in private family offices which direct philanthropic money to NGOs and community projects worldwide to realize the Sustainable Development Goals, which in themselves demonstrate the global consensus on the potential to care for humanity. In our model for sustainable finance, this is ensuring that human capital is taken care of.

These forces are bringing a sea of change to the capital markets.

7 Judgment in Court: Litigation Risk

From this powerful mix of science, policy, and finance, came a dramatic court case involving Shell in May this year, which demonstrates that litigation risk will become a powerful force in driving the energy transition. Client Earth is a UK-based project established to sue companies that are unwilling to take their existential externalities onto the balance sheet which could result in a multibillion write-downs of assets.

8 The Arc of History: Future Generations

Society has a long history of civilizing the financial markets and moving humanity forward. Over the time period in which we see the Anthropocene age breaching planetary boundaries through the impact of the industrial age, we have also seen the declaration of universal human rights and the setting of global Sustainable Development Goals that include an end to poverty, hunger, inequality, and environmental degradation. That vision of sustainability is championed not just by leaders but by a new generation calling for change and willing to challenge the slow pace of change.

Greta Thunberg's eloquent and powerful call for climate justice echoes the demands of the young for their elders to take charge and address an existential risk which threatens their future.

Greta Thunberg is not alone. There is a noticeable generational shift in the drive for climate investing. A recent Pew Research (Parker and Igielnik, 2020) finds that a majority of the younger generations (Gen Z and Millennials) agree that human activity is the cause of extreme climate events. The same survey finds that the younger generations are also more progressive in their views and more pro-government in seeking solutions.

We invest in a company for its future, not its past, and we can gauge the future of a company by how it responds to the coming generation and changing societal expectations. This poses the question not of why, but of how the financial markets can address climate risk. For this, we turn to the gap between demand and supply.

9 The Enablers of Supply of Financial Solutions

The forces driving demand for climate investing are complex and powerful; however, demand alone will not ensure transition to a low-carbon economy. This requires that financial markets have the capacity to respond. That response is currently limited by the following two constraints:

(1) Lack of standards, data, and analytics
(2) Misaligned incentives

Standards, data, and analytics are the foundations of any investment strategy. However, when it comes to ESG investing, these remain the biggest

hurdles. "Aggregate Confusion", a term coined by Berg *et al.* (2020) summarizes it well.

The study uses ESG scores from six prominent scoring agencies and found that there are significant levels of divergence among the ESG scores and the consequences include:

(1) ESG considerations are less likely to be reflected in security prices because investors are confused;
(2) Companies are less likely to improve their ESG performance because they are confused; and
(3) ESG analytics are less likely to develop because empirical researchers are confused

10 The Hope

IFRS Foundation announced in March this year that it is establishing an International Sustainability Standards Board. This important initiative is very timely (or arguably long overdue) and supported by other organizations such as International Organisation of Securities Commissions, which coordinates the world's financial regulators.

Hopefully, this new international reporting standard will consolidate various standards today (e.g., The Carbon Disclosure Project, The Value Reporting Foundation, and the Global Reporting Initiative) and address "aggregate confusion".

Likewise, the SEC has opened up consultation on a new set of climate risk reporting standards which at the time of writing had attracted several thousand comments from investors. The call for sustainability data disclosure to be fully integrated with and held to the same standards as financial data disclosure (e.g., timeliness, comprehensiveness, reliability, and auditability) is well argued by many, notably Lynn Forester de Rothschild for the Vatican-supported Council on Inclusive Capitalism:

> "measurement and disclosure that is comparable, consistent and material accelerates the sustainable investment necessary to drive needed structural changes. We are encouraged by the growing convergence of existing global reporting frameworks among the standard setters. . ."[1]

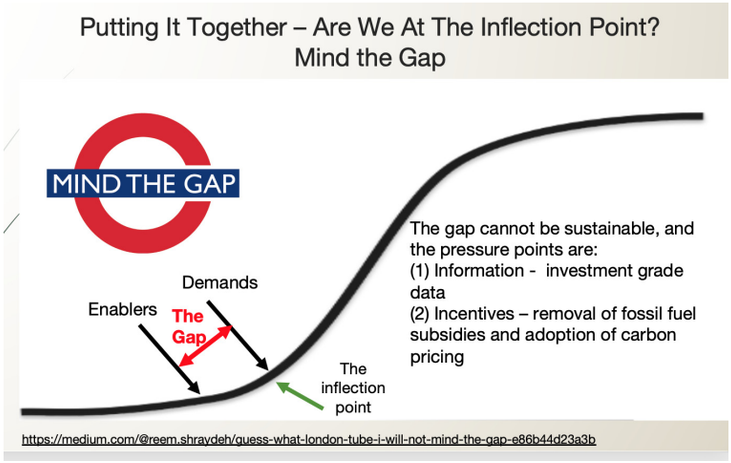
Due to potential litigation risk, companies in some markets may choose not to disclose incomplete or less accurate but material ESG data; the regulators have a role in requiring disclosure of decision-useful information to investors by adopting restatement and safe harbor rules.

If IFRS and SEC can get us past the data and standards challenges, this would be a game changer in ESG investing because with "investment grade" data, the financial market is able to quickly develop analytic tools, benchmarks, and performance attribution systems.

Market efficiency relies upon quality information and incentives being aligned. Quality data enables the financial markets while aligned incentives motivate the financial markets. We change behavior by changing incentives.

Incentives need to be aligned through removal of subsidies to fossil fuel and establishing carbon pricing to account for externalities. According to the Greenpeace (n.d.), fossil fuel subsidies come in two forms: direct subsidies (mainly in tax breaks and preferential accounting treatments) and indirect subsidies (such as benefits of Master Limited Partnerships). At the minimum, the subsidies to fossil fuel industry need to be removed, if not redirected to clean energy industry.

Removal of subsidies to fossil fuel industry levels the playfield. Adoption of a carbon pricing scheme incentivizes innovations and accelerates the transition to a low-carbon economy by explicitly pricing the environmental and social externalities of the fossil fuel industry. We may not yet know what the right price of carbon should be, but there are many encouraging signs. There are early



evidences that carbon pricing does reduce carbon dioxide emissions (Best *et al.*, 2020). On the policy front, it is likely that the US, under Biden administration, will adopt some carbon pricing measures while both EU and China indicate that they are ready for a border adjustment carbon tax. In July 2021, the Third Finance Minister and Central Bank Governors meeting of the G20 endorsed carbon pricing ". . . if appropriate, the use of carbon pricing mechanisms and incentives, while providing targeted support for the poorest and the most vulnerable"[2]

Carbon pricing is a market-based mechanism to change behavior of companies and individuals by changing incentives.

There also need to be aligned incentives at the micro level through ensuring corporate management is being rewarded for achieving emissions reduction and not just expansion of fossil fuel proven reserves, which has been a common measure in the oil and gas industry.

Similarly, incentives need to be aligned across the financial sector by ensuring that mandates for investment managers include performance targets for emissions reduction in line with Paris goals. Without this, a short-term financial success by a fund manager could be at the expense of undermining long-term sustainability of returns, as our stock of financial, human, and natural capital is degraded which will reduce future flows that are needed to pay long-term liabilities.

With these incentives in place, the financial markets will be motivated to address climate change crisis.

In climate investing, we need to "Mind the Gap", as London Transport reminds us when we disembark from an underground train. The gap that we need to mind in finance lies between the demand for climate investing, and the constraints on supply for enabling implementation. As with our example of equilibrium points and disruption, we can see that finance is at an inflection point, but the gap needs to be closed.

11 Conclusions

The "Why" for climate investing is very clear. It is driven by science, civil society, policy makers, and our desire to survive as a species. The "How" for ESG investing is very unclear. Investors do not have the tools nor the incentives to close the gap. Data standardization and measures to align incentives are the two leading indicators for approaching the inflection point.

The financial market is motivated and (mostly) efficient and the gap between demand and supply of ESG strategies is not sustainable, and we should be prepared for a disruption. The timing is evidently urgent. "Now" is the obvious answer. In addition to the financial debt, how much more climate debt do we want to leave to the future generations? As we see the raging wildfires across the Pacific North West alongside equatorial heat waves in temperate regions, and devastating floods in Europe, Japan and China, the physical impact of climate change is already with us. The question now is: can we do what is needed at the pace and scale? Can we close the gap?

12 The Future: We Rise to The Challenge

Both climate risk and the on-going COVID 19 viral pandemic represent a systematic risk to humanity and demonstrate our vulnerability. Climate change and the pandemic are driven by molecules whose transmission does not respect national borders, which in turn requires collaboration at a global scale. How we, humanity, mobilized all the resources to rise to the challenge and develop effective vaccines in such a short-time period is nothing short of extraordinary. Reading the book "The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race" by Walter Isaacson (2021) gives me goosebumps. How we developed effective COVID-19 vaccines so quickly shows the way. Science, policy, civil society, business, and finance are all playing a critical role, in partnership globally to tackle the pandemic. Similarly, the complex, urgent, and global challenge of climate change requires cross border, cross-sectoral partnership. With the advent of data driven by science, policy to remove fossil fuel subsidies (Environmental and Energy Study Institute, 2019) and adoption of carbon pricing (The World Bank, n.d.) transformation to a low-carbon economy is not only possible but necessary. We can rise to the challenge of combating climate change, just as how we rose to the challenge of COVID-19 crisis.

Yes, we can do it!

Notes

[1] Council for Inclusive Capitalism with the Vatican Statement (2021).

[2] https://www.g20.org/wp-content/uploads/2021/07/Communique-Third-G20-FMCBG-meeting-9-10-July-2021.pdf

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