

Aligning capital allocation with the carbon budget:
What role for climate-related financial
disclosures?



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To my supervisors, for their incisive guidance, thoughtful comments and timely encouragement.

To MB, for having more faith in this project than I ever did.

To my parents, for I only ever see further by standing on your shoulders.

Abstract

Global temperature warming is, to first order, a function of committed cumulative carbon emissions. However, investment into long-lived carbon-emitting infrastructure continues to grow. This suggests either an information asymmetry in the market and/or that policies to combat climate change lack credibility. This thesis assesses the role climate-related financial disclosures might play in addressing these market failures. It primarily serves two purposes; firstly, it critically examines the theoretical potential of disclosures. It asserts that disclosures in themselves will not alter capital flows as the economic incentives required do not currently exist. Instead, they may indirectly shift capital flows via influencing public opinion, policy and regulation and the resulting economic incentives faced by investors. Secondly, it empirically investigates this theoretical analysis. In doing this it draws on a thematic analysis of semi-structured interviews with key staff in order to construct a case study of how a large global bank – HSBC – is using disclosures in practice.

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Part I – Literature Review, Methodology and Research Questions

1.1 Introduction

At the 21st Conference of Parties, the Paris Agreement committed signatories to holding the increase in global average temperature to well below 2 °C above pre-industrial levels and to “pursue efforts” to limit the temperature increase to 1.5 °C (Article 2.1a). A further significant development was the inclusion of Article 4.1, which aims “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century”. The role that finance must play in achieving these objectives was explicitly referenced in Article 2.1c, which commits signatories to “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.” Over 120 investors and over 400 businesses, including several major banks, have made clear their commitment to achieving these targets through signing the Paris Pledge for Action¹ and other public statements. Despite this progress, significant barriers remain to the achievement of these objectives.

In order to have a 50% chance of meeting the 2-degree target, no new emitting electricity infrastructure, without carbon capture and storage, can be built after 2017 (Pfeiffer et al., 2016). However, total committed emissions relating to the power sector continue to grow at a rate of 4% per year (Davis & Socolow, 2014). This makes clear the gap between what politicians agreed in Paris and what markets and fossil fuel companies are assuming will happen. It suggests either an information asymmetry in the market or a lack of credibility in policies, or indeed both.

¹ By joining the pledge, *businesses, cities, civil society groups, investors, regions, trade unions and other signatories* promised to ensure that the ambition set out by the Paris Agreement is met or exceeded.

The response from many stakeholders across the investment supply chain has focussed on the role of climate-related financial disclosures. In November 2015 the G20 Financial Stability Board (FSB) convened the Task Force on Climate-related Financial Disclosures (TCFD) to explore what an effective global disclosure regime would look like. In some jurisdictions, companies face growing pressure to disclose climate-related financial information about their business practices. Externally, investors and shareholders are seeking more information about the risk climate change presents to the companies they are exposed to. Non-governmental organisations (NGOs) are pressuring both companies and investors to reveal how climate change is being integrated into their decision-making processes and, ultimately, whether their capital allocation decisions align with the goal of a stable climate.

This thesis sets out to explore the role climate-related disclosures might play in aligning capital with the climate objectives agreed to in Paris. It finds that climate-related disclosures have two potential roles to play. The first is to allow investors to correctly price climate risk and, ultimately, protect the financial system from future potential sharp, welfare-reducing adjustments. The first use is thus to address the information asymmetry.

The second is to address the current credibility of climate mitigation policies. It will be argued that climate-related disclosures will not directly cause capital flows to move, as the economic incentives to change investor behaviour are not currently in place (e.g. the lack of an effective global carbon price). However, through increasing transparency, disclosures may indirectly shift the public debate and philosophy around the climate change debate. Thus, by changing the ‘mood music’ to which policy is created, they may increase the likelihood that governments implement the policy mechanisms required to meet the objectives agreed in Paris.

I conclude that the logical derivation of the argument advanced is that the disclosures required for each use will be different. This matters as the TCFD is currently deliberating on what global disclosure regime it will recommend. Meanwhile the EU and other jurisdictions

are considering whether to implement their own mandatory disclosure requirements. Thus the thesis will conclude by outlining the implications of its findings for policy and the stakeholders involved in the current debate.

1.2 Structure

Following this introduction, the remainder of Part I reviews the literature, covering the scientific context and the importance of capital allocation decisions in committing society to further temperature warming. It then outlines how climate-related disclosures have emerged as a dominant response to this problem. The literature review is followed by the research questions and the methodology. In short, I employ a combination of theoretical methods and an empirical ‘thematic’ analysis of qualitative semi-structured interviews with stakeholders to assess how disclosures are being used in practice. Specifically, we examine the case study of a large, systemically important global bank – HSBC – along with evidence from NGOs prominent in the ongoing debate.

In Part II, I advance a theoretical critique of the logic of climate-related disclosures through the use of a ‘Theory of Change’ heuristic (Weiss, 1995; Connell & Kubisch, 1998). Despite commitment from a wide range of stakeholders, the literature has not, as yet, explicated a causal logic as to how disclosures will achieve their stated objective — the alignment of financial flows with climate objectives. This thesis fills that gap asserting that climate-related disclosures are not likely to directly influence capital flows as the economic incentives to do so are not yet in place. For example, without an effective carbon price in most parts of the world, companies are still able to emit GHGs without paying the full cost. From here I advance an alternative theory of change, arguing that disclosures may be considered important in influencing public opinion and shifting the terms of the policy debate. Thus, Part II concludes

that climate-related disclosures may indirectly shift capital flows via influencing public opinion, policy and regulation and the resulting economic incentives faced by investors.

Part III provides an empirical investigation of the theory advanced in Part II, through a thematic analysis of primary and secondary sources. Drawing on interviews with key decision-makers at HSBC it outlines how the bank plans to integrate climate-related disclosures into its operations. For HSBC, the most useful metrics for managing risk are dynamic and forward looking. This makes sense as ‘climate risks’ are expected to increase with time (IPCC, 2014). The vulnerability of companies will therefore depend on their future management strategies rather than simply historic performance. Thus investors require forward looking disclosures from companies. However, simply using disclosures to manage risk, whilst reducing the information asymmetry, will not shift the banks investments in align with the Paris targets, despite the bank giving the agreement its explicit support². Part III further contains a thematic analysis of the requirements of the NGO community. Here engagement was carried out with over 30 practitioners from leading NGOs from around the world through qualitative semi-structured interviews and attendance at workshops.

Part IV stitches the previous sections together and draws out the conclusions and wider significance of the research for the TCFD and other stakeholders.

1.3 Literature review and research context

This section reviews the relevant academic literature and sets out its research context. It first outlines the scientific context to the research questions, noting the imperative of reaching

² HSBC has signed the Paris Pledge for Action “demonstrating that they are ready to play their part to support the objectives of the Paris Agreement.”

net zero carbon emissions for stabilising global temperature. It then outlines the importance of capital allocation and investment in long-lived infrastructure that commits society to future CO₂ emissions. Finally, it reviews the responses that have emerged from both civil society and the finance sector. It will also review the responses of other actors with an interest in the investment supply chain, including NGOs, regulators and governments. This is a nascent and rapidly developing research area. Whilst the scientific understanding is robust, the academic analysis on the subject of appropriate climate-related disclosures is developing swiftly and is still largely being animated by practitioners and research-focused NGOs. Thus, this section of the literature review will inevitably draw also on practitioners' reports and other grey literature. Here it shows that strategies to combat the issue have focused predominantly on improving the quality of climate-related information as a first demand, highlighting the central role climate-related corporate disclosures are expected to play in achieving its proponents' commitment to the Paris Agreement objectives.

Before proceeding further, it should be noted that the term 'climate-related disclosures' often refers to a wide range of factors, such as water scarcity and quality, biodiversity, air pollution and others. In addition, climate-related disclosures are often bundled up into a wider framework of Environmental, Social and Governance (ESG) issues. While passing no judgement on the importance of these other issues, in order to provide practical limits on the extent of research, this thesis will focus exclusively on the role of carbon emissions in climate change.

1.3.1 The scientific context

There is robust scientific evidence that global temperature change responds approximately linearly to cumulative CO₂ emissions. In short, temperature warming is, to first order, a function of total cumulative committed carbon dioxide emissions. This relationship is seen in observations, as well as simple and complex models. Consequently, it is possible to define a quantity of permissible global cumulative emissions (a ‘carbon budget’) for a given temperature target (Allen et al., 2009; IPCC, 2014; Matthews et al., 2009; Millar et al., 2016; Raupach et al., 2011). It has been estimated that to have at least a 50 per cent chance of keeping warming below 2°C throughout the twenty-first century, the cumulative carbon emissions between 2011 and 2050 need to be limited to around 1,100 Gt CO₂ (IPCC, 2014; Meinshausen et al., 2009).

Importantly, the relationship between global temperature change and cumulative CO₂ emissions implies that the temperature change produced by a given amount of CO₂ emissions is largely irreversible (Solomon et al., 2009). Even if anthropogenic emissions of CO₂ were stopped, most of the realised temperature warming would persist for centuries and thus be irreversible on human timescales. However, a state of zero CO₂ emissions will lead to a near constant surface temperature. If zero emissions are achieved there is little additional future warming expected from CO₂ already in the atmosphere (Matthews & Solomon, 2013). Consequently, future global warming will be driven primarily by CO₂ emissions that have not yet occurred (Davis et al., 2010).

This understanding of how the earth system responds to CO₂ emissions highlights the critical importance of investment and policy decisions taken now that commit society to further CO₂ emissions and thus further warming.

1.3.2 The Importance of capital allocation in committed future cumulative emissions

The current dependence of society on fossil fuels and the intrinsic inertia associated with any transition to lower carbon technologies implies that we are already committed to a substantial quantity of future emissions and thus temperature warming. The concept of a finite carbon budget brings the importance of infrastructure construction and the role of those who allocate capital towards or away from such investments into sharp relief. Particularly significant are sectors in which capital spending assumes an extended, often multi-decadal lifespan. For example, cement manufacturing, an industry with high greenhouse gas emissions, anticipates a 40 to 50-year lifespan for its plants. Life expectancy of petroleum refineries are comparable (Boston Common Asset Management, 2014: p. 2). Capital allocation decision made in these industries today will effectively commit us to carbon emissions well into the second half of this century.

Davis et al., (2010) first quantified the emissions already committed by existing CO₂ emitting infrastructure. They estimated that existing infrastructure already commits global society to a substantial portion (496 Gts) of the 2-degree carbon budget. More recently, Pfeiffer, et al. (2016), defined a 2-degree capital stock as ‘infrastructure that gives a 50% chance of 2°C warming’. They show that, on our current trajectory, the ‘2-degree capital stock’ for electricity generation will be reached in 2017. In other words, no new carbon-emitting infrastructure, without carbon capture and storage or asset stranding, can be built after 2017 if the 2°C target is to be met. The 2017 deadline is also conditional on the optimistic assumption that all other sectors also decarbonise in line with a 2°C target. This deadline is unlikely to be met. In 2013, a total of \$1.6 trillion was invested worldwide in the energy sector. Of this, \$1.1 trillion was related to the extraction and transport of fossil fuels, oil refining and the construction of fossil fuel fired plants. By comparison, only \$260 billion was invested in low

carbon energy technologies (IEA, 2014). In a further study, Davis & Socolow (2014) find that total committed emissions related to the power sector are growing at a rate of 4% per year. On business as usual energy infrastructure trends, new CO₂-producing energy infrastructure is being built faster than the rate of retirement of old technology. Not only are annual emissions continuing to increase, but the future emissions commitment associated with this energy infrastructure is also increasing as a result of today's energy infrastructure investment and policy decisions. This has major ramifications for the financial and economic systems. Major infrastructure investments with long return times commit us to either releasing the GHG emissions associated with that infrastructure or decommissioning assets earlier than planned. This would lead to their effective stranding, *'where assets suffer from unanticipated or premature write-offs, downward revaluations or are converted to liabilities, [and] can be caused by a range of environment-related risks.'* (Ansar, Caldecott, & Tibury, 2013).

The stranded asset argument has raised new awareness of carbon risk in the energy sector. Proven fossil fuel reserves (i.e. resources that can be economically recovered) would release CO₂ in volumes high enough to breach the carbon budget. Coal reserves alone would exceed it by a factor of almost two. Fully exploiting all fossil fuel reserves is estimated to overshoot the carbon budget by a factor of five. However, fossil fuel companies continue to explore for further reserves. In 2012, the 200 largest publicly traded fossil fuel companies collectively spent an estimated \$674 billion on finding and developing new reserves (Carbon Tracker Initiative, 2015).

If carbon regulations strengthen and economies shift to low carbon models in order to limit global warming to 2°C, energy companies are likely to see a proportion of their fossil fuel assets remain in the ground (Carbon Tracker Initiative, 2013), effectively stranding them. Figure 1 below compares current listed fossil fuel reserves against the carbon budget for

different temperature limits at 50% and 80% probabilities of remaining within that temperature rise.

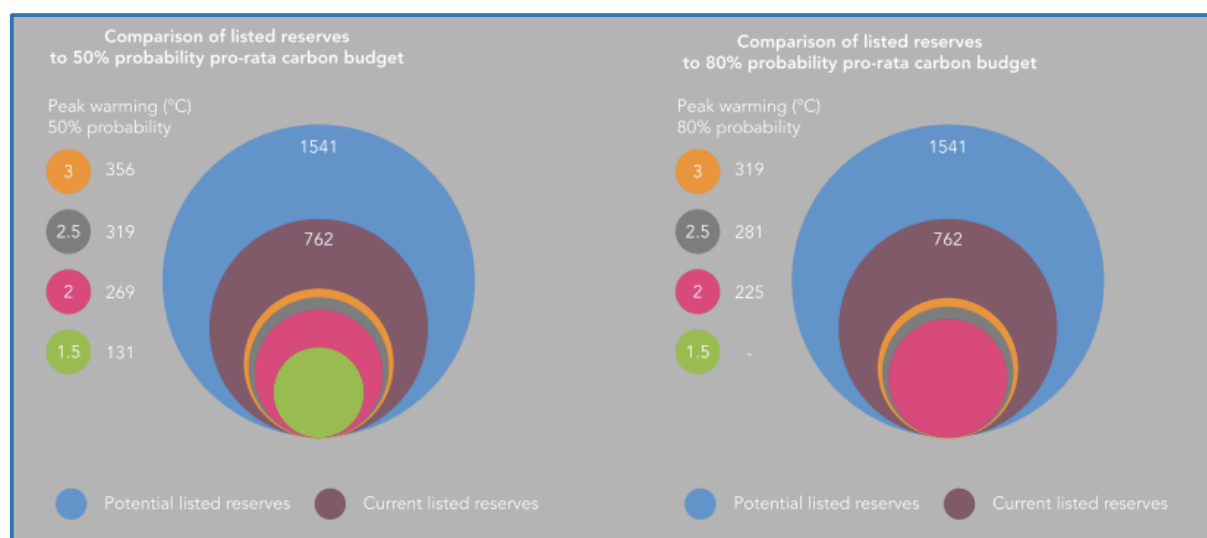


Figure 1: Comparison of listed fossil fuel reserves with the carbon budget (Carbon Tracker Initiative, 2013)

Further research has begun to quantify specifically which reserves cannot be burned. It is currently estimated that a third of oil reserves, half of gas reserves and over 80% of current coal reserves will have to remain unused from 2010 to 2050 in order to meet the target of 2°C (McGlade & Ekins, 2015). Figure 2 below provides further granularity to this showing the global distribution of ‘un-burnable’ reserves with and without the use of carbon capture and storage.

Country or region	2 °C with CCS						2 °C without CCS					
	Oil		Gas		Coal		Oil		Gas		Coal	
	Billions of barrels	%	Trillions of cubic metres	%	Gt	%	Billions of barrels	%	Trillions of cubic metres	%	Gt	%
Africa	23	21%	4.4	33%	28	85%	28	26%	4.4	34%	30	90%
Canada	39	74%	0.3	24%	5.0	75%	40	75%	0.3	24%	5.4	82%
China and India	9	25%	2.9	63%	180	66%	9	25%	2.5	53%	207	77%
FSU	27	18%	31	50%	203	94%	28	19%	36	59%	209	97%
CSA	58	39%	4.8	53%	8	51%	63	42%	5.0	56%	11	73%
Europe	5.0	20%	0.6	11%	65	78%	5.3	21%	0.3	6%	74	89%
Middle East	263	38%	46	61%	3.4	99%	264	38%	47	61%	3.4	99%
OECD Pacific	2.1	37%	2.2	56%	83	93%	2.7	46%	2.0	51%	85	95%
ODA	2.0	9%	2.2	24%	10	34%	2.8	12%	2.1	22%	17	60%
United States of America	2.8	6%	0.3	4%	235	92%	4.6	9%	0.5	6%	245	95%
Global	431	33%	95	49%	819	82%	449	35%	100	52%	887	88%

Figure 2: Regional distribution of reserves un-burnable before 2050 with and without CCS (reproduced from McGlade & Ekins, 2015: p. 189)

1.3.3 Stakeholder responses

Having outlined the scientific and investment context, we now turn our attention to the ways in which different stakeholders are responding. The most conspicuous response to the carbon budget concept has been the civil society fossil fuel divestment movement, which has expanded rapidly since 2009. To date over 554 institutions and over 50,000 individuals with a combined total of c. \$3.4 trillion under management have committed to divest (Fossil Free, 2016). Despite this rapid growth, the distance between activists' demands and the business reality remains large. The relatively simplistic call for outright divestment will appear drastic and is being met by many investors with scepticism (Aviva, 2015; MSCI, 2014; Paun et al., 2015). Indeed, the literature suggests that the movement is unlikely to be effective in directly impacting the valuation of fossil fuel assets or the ability of targeted companies to access debt and equity (Ansar et al., 2013; Baron & Fischer, 2015). Historical examples of divestment bear out this analysis. Figure 3 shows the continued rise in stock price of British American Tobacco, subject to a divestment campaign beginning in the 1980s. The tobacco industry more widely remains profitable for investors.

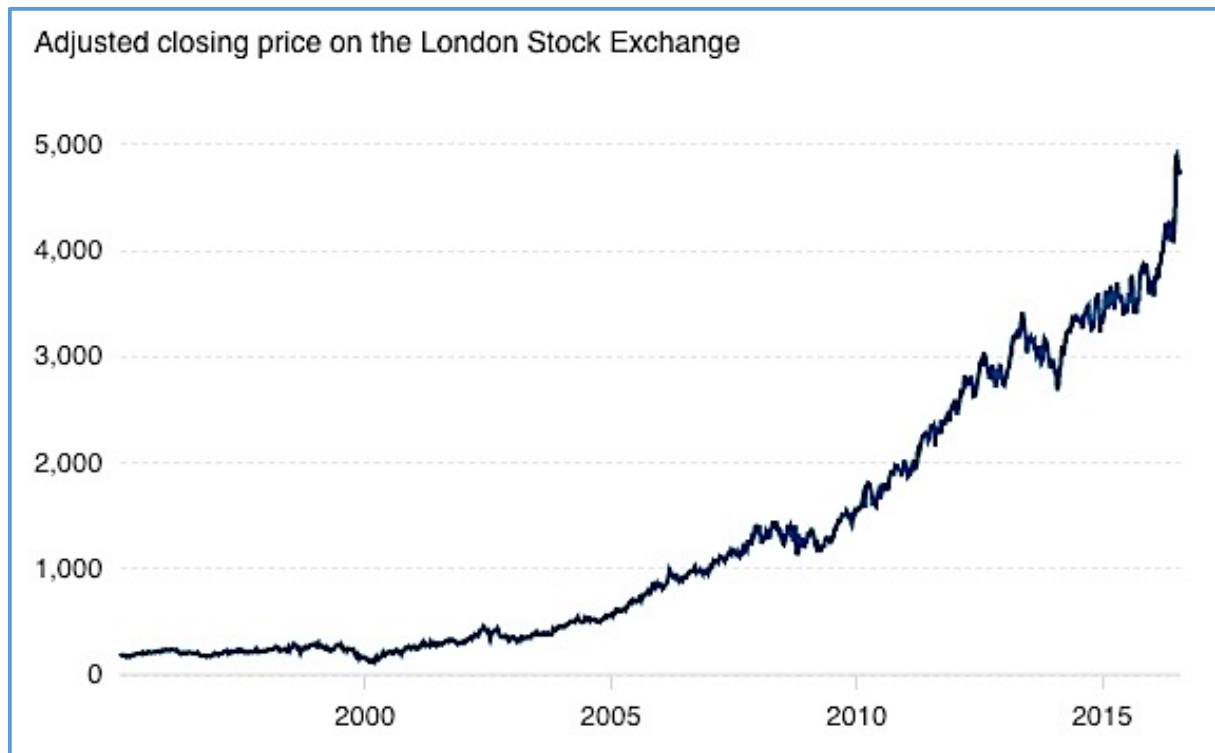


Figure 3: British American Tobacco, stock price, 1995-2016

Divestment by one investor, by definition, requires investment by another. Simply shuffling ownership around like this is unlikely to solve the problem. Indeed, it may actively exacerbate it, replacing conscientious engaged investors with those less willing to pressure fossil fuel companies on issues of environmental sustainability (Ansar et al., 2013). The most effectual outcome of the campaign is likely to be through a process of stigmatisation and the removal of companies' social license to operate. As with previous divestment campaigns such as the one against the Tobacco Industry (Devers et al., 2009; Teoh et al., 1996), the fossil free campaign is likely to be most successful through lobbying for restrictive legislation via the influence of public opinion. However, regardless of whether the divestment movement has any direct impact on fossil fuel valuations, the thesis which animated it and to which it has usefully drawn attention to – that the carbon stored in current proven and probable fossil fuel reserves must not be burned if we are to remain within 2-degrees - cannot be ignored. Along with the

weight of scientific credibility behind the concept and its powerful simplicity, the divestment movement has played an important role in raising the profile of the un-burnable carbon reality. It poses serious questions for those that allocate capital that now require productive and meaningful answers.

With a back drop of divestment, potentially stranded assets and wasted capital, climate-related disclosures have emerged as a lynchpin of the financial worlds response. Investors, regulators, stock exchanges, research focused NGOs and academics have begun attempting to identify and quantify the effect climate change might have on investment portfolios and wider economic stability (Clarke et al., 2015).

The early momentum regarding climate-related disclosures was generated largely by NGOs working on voluntary initiatives in partnership with ethical and institutional investors. Universal ownership theory states that institutional investors such as pension funds and sovereign wealth funds, by virtue of owning highly-diversified and long-term portfolios that are representative of global capital markets, have an interest in maintaining wider economic stability (Bauer, et al., 2013; Hawley & Williams, 2007; Urwin, 2011). It is unsurprising then that they were some of the early movers in attempting to identify risks to asset value posed by climate change. Two of the most prominent examples of such initiatives are the Investor Network on Climate Risk (INCR), a US based initiative of CERES, and the London-based Carbon Disclosure Project (CDP). The CDP is an international collaboration between institutional investors aiming to engage with companies worldwide “in order to disclose and ultimately manage climate change issues in order to create and sustain long term shareholder value” (CDP, 2016). Since its conception in 2000, it has grown rapidly and now manages almost one fifth of global emissions as reported by companies who represent over half of global market capitalisation (CDP, 2016). Originally aimed at assessing the climate risk of the FT500 firms it now engages with a larger and more international set of companies. Aside from carbon

accounting, the CDP surveys companies on a wide range of climate relevant information, including measurement of emissions, organisational preparations and climate strategy, technological investments and capex, and trading and offsets. Institutional investors can join CDP and gains access to company responses at no charge. At the time of writing (August 2016), more than 827 institutional investors representing in excess of US\$100 trillion in assets are signatories to the CDP.

Although smaller than the CDP, the INCR began life in 2003 with 10 investors (\$600 billion in assets) and has now grown to more than 120, representing \$14 trillion in assets, including the largest institutional investors in North America as well as leading religious and labour funds, asset managers and socially responsible investment funds (Ceres, 2016). As with the CDP, INCR encourages financial analysts, ratings agencies and investment banks to address climate risks and opportunities. Similarly, whilst focussing on the wider remit of ESG issues, principle three of the United Nations Principles of Responsible Investment (UNPRI) asks signatories to seek appropriate disclosures by the entities in which they invest. As of August 2016, the UNPRI boasts a total of 1558 signatories, including 317 asset owners, 1027 investment managers and 214 service providers (UNPRI, 2016).

Whilst certain NGOs have been pressing for greater transparency around climate-related financial risks for over a decade, the development of the carbon budget notion and noise around divestment has stimulated wider engagement. More recently institutions within the finance mainstream have joined the chorus of voices calling for greater disclosures. This includes both private entities and governmental institutions concerned with wider systemic economic stability (Gros et al., 2016: p. 2). In a land mark speech at Lloyds of London in 2015, the Governor of the Bank of England, Mark Carney, outlined his concerns and announced the creation of a Task Force on Climate-related Financial Disclosures (TCFD), overseen by the G20 Financial Stability Board (FSB). Headed by Michael Bloomberg, the TCFD published its

Phase One report in March 2016, having a remit to “*undertake a coordinated assessment of what constitutes efficient and effective disclosure and design a set of recommendations for voluntary company financial disclosures of climate-related risks that are responsive to the needs of lenders, insurers, investors, and other users of disclosures.*” (TCFD, 2016, p. 3). The TCFD will publish its Phase Two report before the end of the year.

In addition to the TCFD, various jurisdictions and stock exchanges around the world are beginning implement their own requirements for company and investor disclosures. In July 2015, France strengthened mandatory climate disclosure requirements for listed companies and financial institutions, introducing the first mandatory disclosure requirements as part of Article 173 of the Law for the Energy Transition and Green Growth. The law also aims to bring about the alignment of institutional investors’ portfolios with French and international climate policy. Sweden has similarly put forward proposals for mandatory climate risk reporting by asset managers (Bowen & Simon, 2016).

There is further evidence that demand from investors themselves for climate-related financial information is growing. A survey of over 200 institutional investors in 2015 found that 70.9% consider integrated reports (those containing both climate and non climate-related financial information), ‘essential’ when making investment decisions. This is up from 61% in 2014. However, only 37% currently implement a ‘structured, methodical evaluation of environmental and social impact information’ (EY, 2015).

This is hardly surprising. For investors concerned with the practicalities of protecting their portfolios from climate risk, a review of the literature reveals three main strategic choices for investors looking to manage their exposure; divest, hedge or engage (Baron & Fischer, 2015; Paun et al., 2015; Trucost, 2014; UNPRI, 2014;). Theoretically, these choices extend from Hirschman’s (1970) seminal analysis of the options open to stakeholders unsatisfied with the activities of a firm. He showed they have two basic responses available to them, ‘voice’

(engagement) or ‘exit’ (divestment). Hedging (sometimes referred to as ‘tilting’), involves partial divestment according to index classification, revenue criteria or breakeven prices (Paun et al., 2015). As Figure 4 illustrates, regardless of the strategy employed, all three begin with the collection of reliable, measurable data on the climate exposure of the companies and assets held in an investors portfolio (BlackRock, 2015).

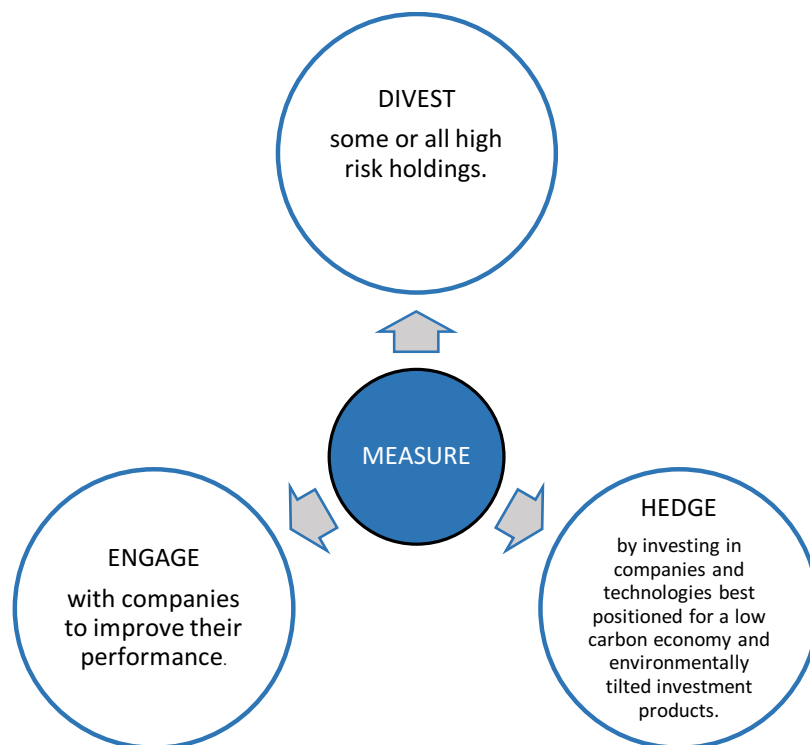


Figure 4: Strategic options open to investors

1.3.4 Summary

The relationship between cumulative carbon emission and temperature rise brings the role of capital allocation towards carbon-emitting infrastructure into sharp relief. The rate of investment in new CO₂ emitting infrastructure and fossil fuel reserve discovery highlights the gap between what politicians have signed up to in Paris and what markets and fossil fuel

companies are assuming. This gap suggests either asymmetric information or a lack of credibility in policies.

With the back drop of a noisy and rapidly growing fossil fuel divestment movement, climate-related financial disclosures have emerged as a key response to the scientific imperative, driven both by regulators, governments and financial industry voluntary initiatives. Notable developments include the French law on the Energy Transition (Article 173), the initiatives in California and Sweden, the TCFD process launched by the G20. Voluntary reporting initiatives have also proliferated, including the PRI Montreal Pledge at international level.

Better information has been clearly identified as of fundamental importance in an effective financial market response to climate change. As the Governor of the Bank of England states, “Any efficient market reaction to climate change risks as well as the technologies and policies to address them must be founded on transparency of information.” (Carney, 2015). Certain NGOs and other stakeholders have been quick to get on board. Jeremy Leggett (Carbon Tracker, 2015) of The Carbon Tracker for example states, “I view this new initiative [The TCFD] as potentially the carbon equivalent to the cracking of the enigma code.” Given their current salience, it is worth critically analysing the efficacy of climate-related financial disclosures; in simple terms, what are they likely to achieve? From a normative perspective, imbued with concern for a stable climate, what role do climate-related disclosures have to play in ensuring we bequeath a stable planet to future generations?

1.4 Research questions

Within this context, this thesis sets out to answer several explicit research questions and sub-questions:

Overarching research question: *What role might climate-related financial disclosures play in meeting the climate objectives outlined in the Paris Agreement?*

Intended research outcomes

- 1. To theoretically examine how the use of climate related disclosures by different stakeholders might lead to the alignment of capital allocation with the objectives of the Paris Agreement.*
- 2. To empirically examine how climate-related disclosures are likely to be used by the banking sector, assessed through a case study of HSBC.*
- 3. To empirically examine how the requirements of banks and investors compare to other stakeholders, specifically NGOs, in relation to climate-related financial disclosures.*

1.5 Methodology

In answering the key research questions this thesis employs a mixed-methods approach that utilises document analysis and thematic analysis of semi-structured interviews with employees to build a case study of how a major global bank – HSBC – is incorporating climate risk into its operations and processes. In addition, it draws on participation at a workshop convened by leading NGOs in the disclosures debate to discuss effective responses to the FSB TCFD, along with follow up semi-structured interviews with representatives of the NGOs present.

1.5.1 The HSBC case study

Within the financial sector, the banking industry provides a particularly interesting subject of study. Given the breadth of their engagement across the economy, banks are important both with regards to their ability to identify where climate-related risks exist within the financial system. They further hold systemic importance in relation to wider financial stability (G20 FSB, 2015). Through their activities in risk assessment, financing, profiteering and investment advisory, banks will be required to play a critical role in efforts to mitigate and adapt to climate change. With nearly \$6 trillion in market capitalisation, banks are the world's major capital providers and risk management experts. As such, the sector has a vital role in finding timely, practical and cost-effective solutions to mitigate climate change and adapt the economy to its already apparent effects. In addition, the activities of the banking sector have important knock on effects for the wider economic system. Through their roles as creditors, investors, advisers and heads of supply chains they have the potential to influence the business practices and GHG emissions of other corporate actors. Indeed, Bowman (2010) contends that

exponential corporate emissions reductions could potentially flow from bank practices that influence client and supplier networks in an ever-widening web. However, the industry has not yet succeeded in integrating climate change risk into its long-term strategic planning or fully understood its implications for their business operations (Boston Common Asset Management, 2015).

In choosing a specific banking case study, three main considerations were used to assess suitability; (1) whether the case study is likely to be representative, (2) whether the case study is large enough within the financial ecosystem to be worth analysing in its own right, (3) whether the case study is considered a norm setter and forerunner in its field, leading where others follow. As a case study on how actors in the financial sector are responding to the scientific context outlined in the literature review, the justification for HSBC will be based primarily on the second two criteria.

HSBC: a systemically important part of the financial ecosystem

HSBC is one of the world's largest banking and financial services organisations and was chosen chiefly as a case study due to its influential position in the market. While its direct scope 1 and 2 emissions are minimal, interest in the bank stems from its influence over the wider investment sector and economy. It serves more than 45 million customers through four global businesses: Retail Banking and Wealth Management, Commercial Banking, Global Banking and Markets, and Global Private Banking. The HSBC network includes 4,400 offices in 71 countries and territories in Europe, Asia, the Middle East and Africa, North America and Latin America. The bank is listed on the London, Hong Kong, New York, Paris and Bermuda stock exchanges, shares in HSBC Holdings plc are held by about 213,000 shareholders in 133 countries and territories. HSBC is the world's fourth largest bank by total assets and the only

bank in the top five that is not one of China's 'Big Four' state-owned commercial banks (the Industrial and Commercial Bank of China, the Bank of China, the Agricultural Bank of China, and the China Construction Bank). On the London Stock Exchange, it is the largest bank in the FTSE 100 by market capitalisation and the third largest company generally.

Thus by several measures, HSBC is objectively a large and important part of the global economy. Reports by organisations mandated to ensure global economic stability underscore HSBC's importance. A review of Global Systemically Important Banks (G-SIBs) by the G20 FSB (2015) placed HSBC, alongside JP Morgan Chase as the most important. A separate report by the IMF (2015) identifies HSBC as the second most important contributor to systemic financial risk. As a bank HSBC is globally connected with substantial influence extending not only to its own vast investments and business relations but to the wider systemic stability of the financial sector. The way in which it incorporates emerging threats to financial stability, such as climate risk, clearly matters, making it a salient and pertinent case study.

HSBC: as a market leader

HSBC was further justified as a case study based on its public commitments to environmental leadership. HSBC was one of the first banks to adopt the equator principles, a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects. It is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. Since their launch, a further 70 banks in 35 countries have joined the original 14 signatories in 2003.

In addition, the bank operates the highly regarded HSBC Climate Change Centre of Excellence, which took the first spot in the Thompson Reuters Emtel rankings in 2015. Meanwhile, the bank has trained over 1000 senior managers as sustainability leaders since

2009 (HSBC, 2015). In March 2016 HSBC, along with Credit Agricole, became the first bank to be accredited by the the UN Green Climate Fund (GCF). The GCF was established by 194 governments and is guided by the principles of the UN Framework Convention on Climate Change. It invests in projects designed to cut carbon emissions and help vulnerable societies adapt to the consequences of climate change. Thus in several key areas, HSBC appears to be taking, or at the very least aiming to take, a market leading role in climate-related risk management.

1.5.2 Mapping of NGO stakeholders

As noted in the literature review, NGOs were identified as key stakeholders in the debate on climate-related disclosures, indeed the CDP and others were some of its earliest pioneers. In addition, several of the most prominent voluntary disclosure regimes currently on the market were developed by NGOs, often in collaboration with private consultancies or international governmental organisations. They were thus identified as both influential players in shaping the debate on disclosures and important repositories of expert knowledge.

1.4.3 Data collection

1.4.3a Workshop and participant observation

The discussion below along with the design of interview questions benefited from the researcher's participation at a London gathering of NGO representatives in early July 2016. The day workshop was convened with the aim of bringing alignment between the NGOs present on their responses to the FSB Task Force. In total, over 30 representatives from 12 different organisations were present. My presence at the meeting was made known to all

participants and written notes were taken. The workshop was held under the Chatham House rule, allowing a franker discussion. For this reason, however, no direct quotes will be attributed to any of the participants although general views expressed will be used to inform the analysis below. In addition, several participants were later contacted and follow up interviews were conducted in order to flesh out topics of particular relevance.

1.5.3c Identification of participants

Interviewees at HSBC were chosen for the role they play in integrating climate-related disclosures and risk into the banks general activities and processes. NGO interviewees were identified on the basis of their seniority and decision-making ability within the organisation and their perceived expertise on climate-related disclosures. This was established both through attendance at the NGO workshop in July and through a review of the NGO literature on disclosures, with prominent authors targeted for follow up interviews.

Whilst no explicit attempt was made to ensure a gender or race balance in the interviewees, attempts to ensure participants represented both developed and developing countries were made. As a global organisation working across multiple jurisdictions, interactions with WWF were particularly relevant; in total, three interviews were conducted with WWF representatives working in France, Mexico and the UK as well as informal interactions with staff located in further European countries.

1.5.3b Semi-structured interviews

Semi-structured interviews were carried out with staff at HSBCs Climate Change Centre of Excellence and Senior Management in order to build a case study of how the bank is integrating climate risk into its processes. Semi-structured interviews were also carried out with leading decision-makers in NGOs.

Each interview lasted between 45 and 75 minutes and was conducted either in person or via Skype. Interviews contained a series of pre-determined questions and were semi-structured in nature. Semi-structured interviews are a well-established and effective technique in qualitative research (DiCicco-Bloom & Crabtree, 2006) allowing the interviewer to react flexibly to ideas being brought up by the interviewee in real time and enables the clarification of points of contention or confusion instantaneously (Barriball & While, 1994). The order of the questions was specific to each interview and questions were included or omitted as prompted by the flow of the conversation (Berg, 2012). The literature suggests that this form of questioning creates rapport between the interviewer and participant to support a more balanced discussion in which the participant can interject and offer relevant comments that might lie outside the original scope of questions. This provides a more comprehensive understanding of the issue being researched (Kitchin & Tate, 2000).

1.5.3c Ethics, rigour and limitations

For ethical reasons, the precise anonymity of interviewees is preserved where requested by the interviewee, as is the attribution of any direct quotes. However, an indication of whether they represent HSBC or an NGO will be given. In one case, explicit permission was sought and received from an interviewee, Francis Sullivan, Deputy Head of Global Corporate

Sustainability and Adviser on the Environment and Climate Change at HSBC, to refer to the source by name. An indication of the seniority of the interviewee was deemed valuable in order to substantiate the relevance of the data gathered.

Several techniques were employed to ensure rigour in the data collection process (DeWalt & DeWalt, 2002) including the use of a voice recorder when permitted, which minimised the potential for lost or misinterpreted data. Interviews were transcribed within 24 hours and the voice recording then deleted.

In order to fortify the cogency of data collected, triangulation was carried out both between interviewees and in cross reference with document analysis and with public sources of information. The process of triangulation – observing an issue from two or more distinct points – strengthens the validity of social research (Flick, von Kardoff, Steinke, & Jenner, 2004). Document analysis, which is the systematic review and evaluation of documents, in this case those produced by HSBC Climate Change Centre of Excellence and the relevant NGOs, “is often used in combination with other qualitative research methods as a means of triangulation” (Bowen A., 2009: 28).

1.5.4 Thematic Analysis

Following this a thematic analysis was conducted in order to pinpoint, examine, and record patterns (or "themes") within the data collected (Braun & Clarke, 2006). Thematic analysis is considered a ‘bridge’ between qualitative and quantitative research (Boyatzis, 1998). Following (Braun & Clarke, 2006: p. 93), the thematic analysis was performed through the process of coding in six phases to create established, meaningful patterns. These phases were: familiarisation with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes, and producing the final report. Initial codes

were generated using the heuristic provided by the ‘Theory of Change’ framework that will be applied in Part II. They were then adapted through an iterative process to create further ‘nodes’ relating to how stakeholders intend to use climate-related disclosures in practice.

1.6 Summary

When it comes to policy interventions, implementation matters. Transferring effective programs into real world settings and maintaining them there is a complicated, long-term and often iterative process. Policy makers and indeed businesses cannot be driven solely by concerns of theoretical purity, but rather must respond to a “whole host of social, political, economic and administrative concerns when selecting a particular technique by which to obtain their policy goals.” (Howlett, 1991: p. 1).

In many cases the “social, political, economy and administrative” concerns faced by practitioners will not exist in a series of quantitative data points. For example, in the case of climate-related disclosures, companies may have a very concrete disincentive to reveal too much information as it is considered to be of strategic value (Onishka, Liedtke, & Jordan, 2012). Often, the only way to elicit ‘knowledge’ such as this, and an understanding of how actors and policy will interact in the real world is through interviews and direct stakeholder outreach. In some cases, the information elicited during interview may only be held by one or a few people and would not show up in a quantitative analysis. However, it may still hold significance for policy success. In addition to the justification offered above, interviews were also found to be valuable because they were able to elicit information that would not be available in the literature. The speed at which the debate on climate-related disclosures is developing means that many developments have occurred too recently to be comprehensively reported in the peer-reviewed literature. For these reasons, along with the methodological

considerations identified in the literature, the building of a case study through the use of semi-structured interviews and thematic analysis was considered an appropriate methodology for answering the research questions.

Part II – Disclosures in Theory

2.1 Unpicking the causal logic of disclosures

This section advances a theoretical assessment of the potential role of climate-related disclosures in aligning capital with the Paris Agreement climate objectives. In short, I assert that a disclosure logic that diagnoses misallocated capital as resulting from an information asymmetry can be proven false. For disclosures to directly align capital with climate objectives, climate change must be creating real and tangible financial incentives for decision-makers. Here I provide evidence that this is not the case; simply providing more information on non-existent economic incentives will not shift capital. From here I advance a more holistic theory of change that outlines how climate-related disclosures might indirectly shift financial flows through influencing the terms of the policy debate and thus the construction of economic policy instruments that determine the economic incentives that investors respond to.

2.2 Applying a theory of change framework for climate-related financial disclosures

Weiss, (1995) elegantly defines a Theory of Change as a theory of how and why an initiative or intervention works. Building on this, Connell & Kubisch, (1998, p. 2), define it as a “systematic and cumulative study of the links between activities, outcomes, and contexts of the initiative.” First popularised as a method of assessing the efficacy of development programmes, the theoretical framework has grown in ubiquity. Theories of change frameworks are useful for strengthening monitoring, evaluation and improvement of interventions against their intended outcomes. In this case, whether enhanced disclosures will lead to an alignment of capital with the objectives set out in the Paris Agreement. It is focused in particular on mapping out the “missing middle” between what a programme or change initiative does (its

activities or interventions) and how these lead to desired goals being achieved. Connell & Kubisch (1998) state that the first step in applying the framework is to *determine the intended outcomes*. Secondly, outline *the activities* it expects to implement to achieve those outcomes, also described here as the *intervention*. Finally, incorporate an analysis of the *contextual factors* that may have an effect on implementation of activities and their potential to bring about desired outcomes.” Although relatively simple, it provides a useful heuristic for thinking critically through the causal logic of a change process, challenging the scholar to create a comprehensive and explicit description and illustration of how and why a desired change is expected to happen in a particular context.

Figure 3 below outlines a simple causal logic, whereby fixing the market information asymmetry leads to the alignment of capital with climate objectives. Using the Theory of Change heuristic as a guide, evidence will now be provided to show that this particular causal logic is unlikely to become reality.

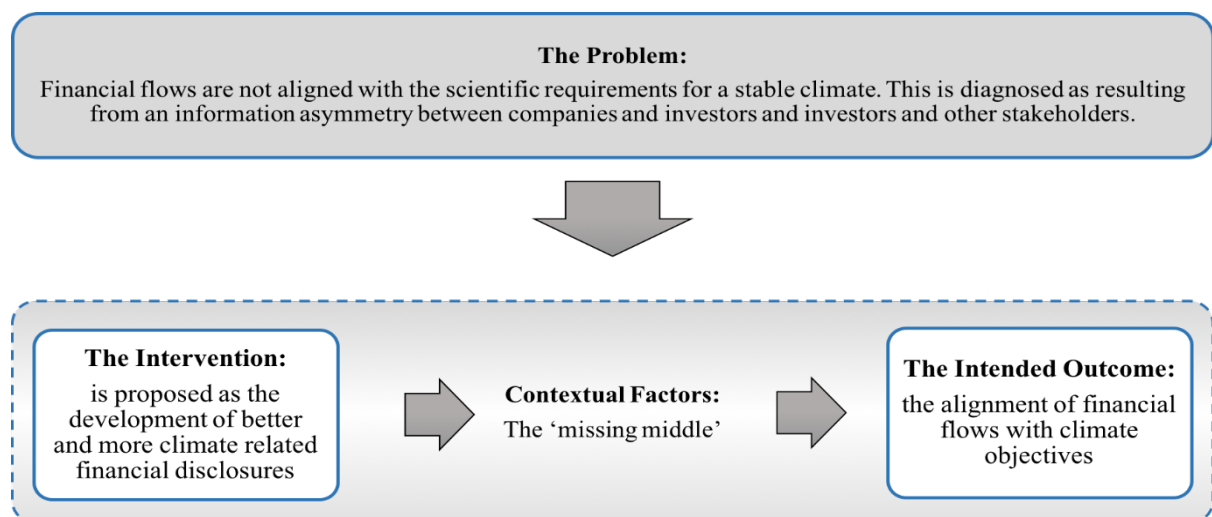


Figure 5: Theory of Change

2.2.1 The intervention and intended outcomes

Adequate corporate disclosures are considered critical for the efficient functioning of capital markets (Healy & Palepu, 2001). In economic terms, the explicit move towards greater disclosures identifies misallocated capital as the result of an information asymmetry whereby financial decision-makers do not have the correct climate information. Accordingly, market actors are unable to correctly price climate risk and allocate capital appropriately. Here, ‘appropriate capital allocation’ is that which meets the climate objectives set out in the Paris Agreement and which many stakeholders were shown to have explicitly committed to through the Paris Pledge for Action and other channels.

Having diagnosed the problem as such the logical solution is an intervention to improve the quality and quantity of information flowing to the market (Zenghelis & Stern, 2016). As the TCFD (2016: p. 3) states, “Better access to data will enhance how climate-related risks are assessed, priced, and managed ... [and] Investors will make better informed decisions on where and how they want to allocate their capital.”

The TCFD is not the only significant body focussing on this particular market failure. The OECD (2015) states that corporate climate change disclosures are required “to integrate climate considerations into [investors] analyses, and to help better align business practice with climate change mitigation and adaptation plans.” The INCR (2016) argues that the ability to collect and analyse consistent and comparable information and data is an essential part of integrating sustainability considerations (such as climate change impacts) into the investment process. Meanwhile, the CDP (2016) states that companies must disclose their environmental impacts in order to “give decision-makers the data they need to change market behaviour.”

There is a wealth of research in the financial accounting literature discussing the usefulness and limitations of corporate accounting information of various types (Chua, 1986;

Gaffikin, 2008; Hopwood, 2000). The logic of disclosure is based on a set of assumptions about how corporate information is used once it is placed in the public domain (Stanton, 1997). Kolk, Levy, & Pinkse (2008: 728-729) observe that the carbon disclosure initiatives seek to “translate corporate carbon profiles into assessments of risks and market opportunities with clear financial implications for firms and investors.” To be effective, disclosures need to convey information to investors that is financially relevant and impacts on the valuation of corporate assets (Hassel, Nilsson, & Nyquist, 2005).

The nature of the debate currently existent in the grey literature produced by practitioners support the academic underpinnings. The TCFD (2016: p. 30) recommends that “companies should provide disclosures to the extent the underlying aspects can have a significant impact on the business model, strategy risks, or future cash flows.” In essence, disclosures must be ‘financially relevant and impact on the valuation of corporate assets’. The peer-reviewed literature on climate-related disclosures and debate amongst practitioners has largely focussed technical disputes around information likely to fulfil these requirements and be decision-useful for investors, focusing on issues such as comparability, information quality, content and format. Kolk, Levy, & Pinkse, (2008) argue that climate-related disclosures will only have clear financial implications for investors if the data is commensurable and comparable, allowing comparisons of mitigation activities and progress between firms and assets. Andrew & Cortese, (2011) similarly focus on comparability of data, finding that the methodological diversity underpinning carbon disclosures may inhibit the usefulness of climate change-related data. For example, although the CDP requests that information be supplied with reference to the Greenhouse Gas Protocol, the many and varied carbon reporting methodologies that companies use to report their greenhouse gas emissions inhibit the comparability and usefulness of the information. These findings have been echoed elsewhere (OECD, 2015). More recent reports from NGOs and other leading NGO analysts in the field,

such as the 2-Degree Investing Initiative (2D ii) have similarly focused on reviewing the benefits and drawbacks of different reporting frameworks and developing best practice (2D ii, 2016). Other publications have echoed this research focus (UNEP, 2015; CDSB, 2012; Thistlethwaite, 2014)

Whilst the movement towards greater disclosures has focused its attention on designing the right form of intervention, it has failed to critically assess whether this intervention, however formulated, will in fact lead it to the intended outcomes that the world's governments and many in the private sector have committed themselves to.

The relevant question for our theory of change is, 'Will better access to climate information that is financially relevant (*the intervention*) lead investors to allocate capital in a way that is compatible with the climate goals politicians and many in the investment world signed up to in Paris (*the intended outcome*)?'

2.2.2 Contextual factors (the missing middle)

The Theory of Change challenges proponents of an intervention to be explicit and clear about the contextual factors required for the intervention to be successful. i.e. under what circumstances will the proposed intervention bring about the desired outcomes? It will now be shown that the factors required for climate-related disclosures to shift financial flows do not currently exist, although this is not to say that they will not at some point in the future. Climate change has been described as the worlds largest market failure (Stern, 2007). Companies who extract, refine, transport and burn fossil fuels do not have to pay for the full costs of the climate change that results from their contribution to the accumulation of those GHGs in the atmosphere. Should legislation be introduced that forces emitters to internalise the full cost of CO₂ emissions, the value of GHG emitting assets will fall. As reviewed above, this may lead to stranded assets and capital. However, at the moment the GHG externality exists largely unchecked.

Modern financial theory rests on the principle that markets are dominated by rational, risk-averse investors, who seek to maximise satisfaction from returns on their investments (Mullins, 1982). Inevitably, investors care about wealth and prefer more to less. In addition, the hypothetical investors of modern financial theory demand a premium in the form of higher expected returns for the risks they assume. Ultimately then, finance theory dictates that investors will only allocate capital if they believe it will maximise the prospect of making an acceptable return on investment at an appropriate level of risk (Fama & Miller, 1972). If climate-related disclosures are to shift capital flows towards alignment with climate objectives they must reveal information to the market that is material enough to alter the risk/reward calculation for investors. The primary contextual factor is thus identified as whether climate change creates the financial incentives that alter investment decisions, should the right

information be available to the market. The evidence, presented below, strongly suggests that this is not currently the case.

2.2.3a Failure of effective carbon prices

Emissions trading has emerged as one of the favoured policies of governments and economists in internalising the GHG externality (Hepburn, 2007; Qi & Weng, 2016; Spash & Clive, 2010). Since their inclusion in the 1997 Kyoto Protocol, carbon permits have developed as a serious financial instrument in markets turning over billions of dollars a year.

However, their track record in addressing the GHG externality is not an admirable one. Strong uncertainty, complexity, the pervasiveness of GHG emissions, the potential for manipulation for financial gain and corporate lobbying power in their design and operation combine to prevent the theoretical claims about the cost effectiveness of carbon trading being borne out in reality (Spash & Clive, 2010). Currently only 12% of the world's emissions are currently covered by a carbon price (World Bank, 2015), although this is set to double in the next couple of years, not least with China's launch of a national cap-and-trade programme involving six of its largest carbon-emitting industrial sectors, beginning with coal-fired power generation in 2017. However, Perdan & Azapagic, (2011) identify considerable technical and non-technical obstacles to the further expansion and linking of current and emerging trading schemes, including clear regulatory and policy signals, continuing political support and a more stable economic environment.

The EU Emissions Trading Scheme (ETS) was the world's first carbon market and remains the largest. It is considered the cornerstone of the EU's policy to combat climate change and its key tool for reducing industrial greenhouse gas emissions cost-effectively (European Commission, 2015).

The cap-and-trade scheme in which permits to emit carbon— covering roughly half the European Union’s total carbon emissions—are allocated to firms and can then be traded between them. Its effectiveness has been lessened by oversupply of permits, partly because of economic recession and partly because too many permits were issued in the first place.

As Figure 6 shows, the EU ETS’ effectiveness has been blunted by low and highly volatile prices. The academic literature largely concludes that the EU ETS has failed on it’s theoretical promise as a policy to reduce emissions (Berghmans, et al, 2014). While its development is clearly iterative and effectiveness will likely improve over time, historically it has not sent adequate signals to the market to re-align financial flows.

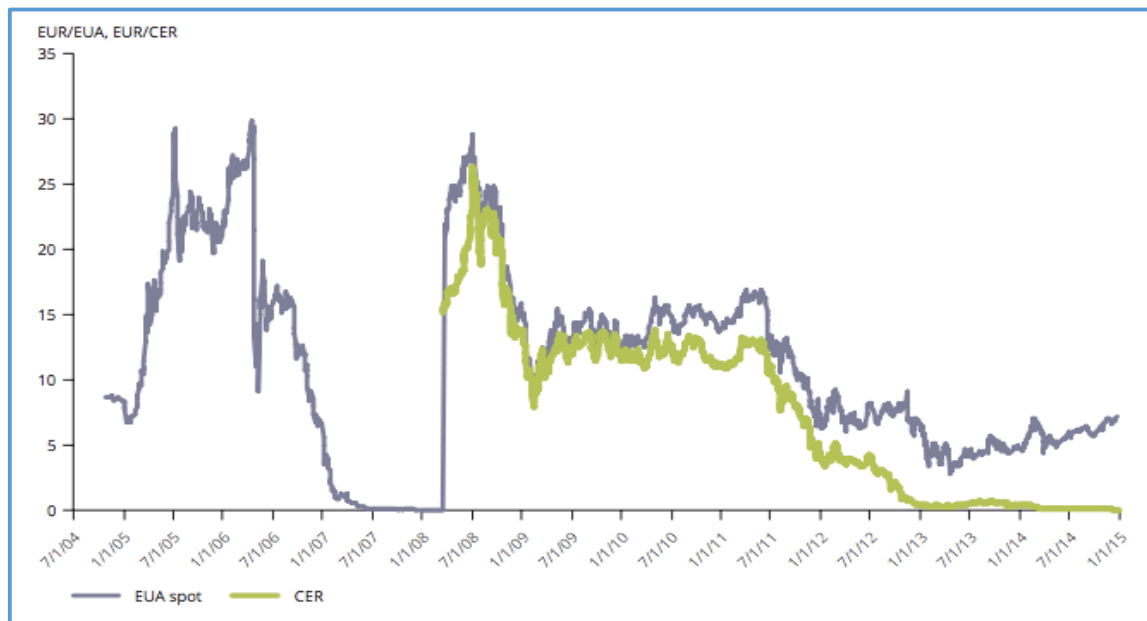


Figure 6: Price trends for EUAs and CERs, 2004-2015 (European Environment Agency, 2015, p. 22)

2.2.3b Fossil fuel subsidies

Multiple international organisation and academic studies have shown that fossil fuel extraction, refining, supply and combustion continue to be subsidised by governments on the global market. The IEA (2015) calculates that the value of fossil-fuel subsidies worldwide

totaled \$493 billion in 2014. This is a growth of over 25% since 2009 when such subsidies amounted to \$390 (in 2014 dollars). By comparison, global subsidies for non-CO₂ emitting energy generation technologies were US\$121 billion in 2013. A report by the IMF (2015) projected post-tax fossil fuel subsidies for 2015, which include an estimate of the negative environmental costs of emissions, at US\$5.3 trillion, 6.5% of global GDP. The IMF (2015: 5) finds that this trend is pervasive globally and sizable in “almost all countries, advanced and developing alike”, with many committing more than 5% of their GDP towards subsidising the creation of GHG emissions (McKinsey Global Institute, 2011). Eliminating post-tax fossil fuel subsidies in 2015 would have cut global CO₂ emissions by more than 20 percent (Coady et al., 2015).

Leaders of the G20 committed to phasing out fossil fuel subsidies in 2009. However, the evidence shows fossil fuel subsidies have remained stable over time and that this commitment has not yet translated into action. Until this happens, the effective signal to the rational investor is that fossil fuels remain an attractive investment with their waste product effectively subsidised by society. Many governments are reluctant to remove subsidies to reflect the full costs of carbon-intensive fuels as the move can be inflationary (HSBC, 2014).

2.2.3c Inadequate support for fossil fuel alternatives

To achieve the IEA's 450 Scenario, annual investments in low-carbon technologies and energy efficiency need to double to reach almost \$790 billion by 2020 and rise by a factor of six to reach £2.3 trillion by 2035 (IEA, 2015). However, this investment is heavily dependent on monetary or policy support to stabilise or lift revenues and make returns sufficiently commercially attractive. It is estimated that current energy efficiency investments are self-financed to the extent of about 60% from the budgets of governments, industry or households.

The IEA (2015: p. 47) states that *"successful financing of the transition to the 450 Scenario requires the financial community to be convinced that low-carbon and energy efficiency investments offer a sufficiently attractive risk-adjustment return. This has not yet been achieved."* In addition, abrupt changes and withdrawal of support policies for renewable energy generation in several countries, not least the UK, has reinforced investor caution. Market analysis from accountancy firm Ernst and Young, (2016) shows that the the UK's attractiveness for renewable energy investment has fallen to its lowest level in history due to the "noncommittal approach" taken by the government.

It is undeniable that low carbon technologies continue to become more cost competitive. However, continued subsidies for fossil fuels and inadequate or unpredictable support for renewables poses a challenge for 2°C financing since it creates the perception amongst investors that returns are lower for low-carbon energy investment and will likely remain so in the immediate future (Knight, 2016).

2.2.3d Oil and gas investments continue to satisfy investors requirements

As the divestment movement has shown there will of course be investors who shun fossil fuel investments for ethical or moral reasons. However, as rational actors seeking the maximum return at an acceptable level of risk, the current global policy architecture continues to make fossil fuels an attractive prospect. In analysing whether the incentives currently exist to shift capital away from fossil fuel heavy assets, it is also important to analyse what fossil fuel investments offers in a portfolio. The main concerns for most investors, in particular large institutional investors who allocate capital on the largest scale, are scale, liquidity, growth and yield (Bullard, 2014).

Scale

Fossil fuel extractives companies are an exceptionally large asset pool: \$4.9trn in nearly 1,500 listed oil and gas companies, and a further \$230bn in 275 coal companies (Bloomberg Finance, 2014). They form a significant portion of global stock markets – particularly in the UK and Australia – and as a consequence feature ubiquitously throughout global investment portfolios. Oil & gas companies account for about 11% of S&P 500 – the broad index for US equities – and 20% of the FTSE 100 (Ansar et al., 2013: p. 53). In addition, companies connected to fossil fuels, such as power utilities or energy intensive mining and steel production, also account for large segments of global equity markets. For investors looking to allocate large amounts of capital fossil fuel companies are some of the most attractive options.

Liquidity

High liquidity assets are characterised by a high level of trading activity and allow investors to convert their investments back into capital quickly. Oil, gas and coal companies exhibit very high churn of shares, with a combined trading volume of more than a billion shares a day over the past five years (Bullard, 2014: p. 13).

Growth

Oil and gas stocks have continued to outperform other major sectors over the past five years. As Figure 7 shows however, coal stocks, on the other hand, have been noticeable underperformers. This reflects a fall in international coal prices as the US shale boom caused

a switch to gas-fired generators rather than any concerted intentional shift towards a lower carbon pathway.



Figure 7: Oil & gas and coal stock performance, July 2009 – June 2014 (Bloomberg, 2014)

It is true that in the past 18 months, analysis has begun to show indexes that exclude fossil fuels outperforming those that include them, apparently boosting the business case for a low carbon investment strategy. In 2014 the Fossil Free Indexes US (FFIUS) outperformed the S&P 500 benchmark by 1.5%. However, this trend is largely explained by slowing global economic growth, the continuing dramatic increase in shale oil production in the United States and OPEC's decision not to prop up oil prices with production cuts, rather than any change in the underlying attractiveness of fossil fuel stocks due to climate regulatory initiatives.

Yield

Reflecting the fact that fossil fuel firms tend to distribute a high proportion of post-tax profits, and that their profitability is protected against competition by their ownership of mineral extraction rights, oil, gas, and coal firms are historically high-yield companies compared to other equities. The top 100 companies in each sector averaging dividend yields of more than 2%. Of other major sectors, only real estate has a higher yield amongst its largest companies (Bloomberg Finance, 2014).

2.2.4 Summary

In the absence of an effective CO₂ pricing mechanism, the fossil fuel sector continues to remain an attractive prospect for the ‘rational investor’ motivated by an impassionate analysis of risk and reward. More importantly, despite the momentum created by the COP21 process, policy analysis and energy investment trends predict that this will remain the case at least for the foreseeable future. Much of what determines the possibility of making returns in the energy sector, by and large, are economic policy instruments; financial flows in this regard will follow on from economic interventions (Tietenberg, 1990). Without pre-empting the empirical analysis below, it can be noted that the evidence taken in interviews reinforces this assertion. A senior executive at HSBC stated that in their view “[companies risk from climate] is largely going to be driven by regulation” (personal interview, 2016). In a market economy, simply providing more information will not, itself be enough to directly shift capital flows if the risk/reward calculations do not stack up for investors.

The argument advanced so far concludes that climate-related disclosures will not directly alter capital flows towards the Paris objectives. If increasing information to the market will not in itself shift financial flows, how else might they have an impact?

2.3 A holistic theory of change

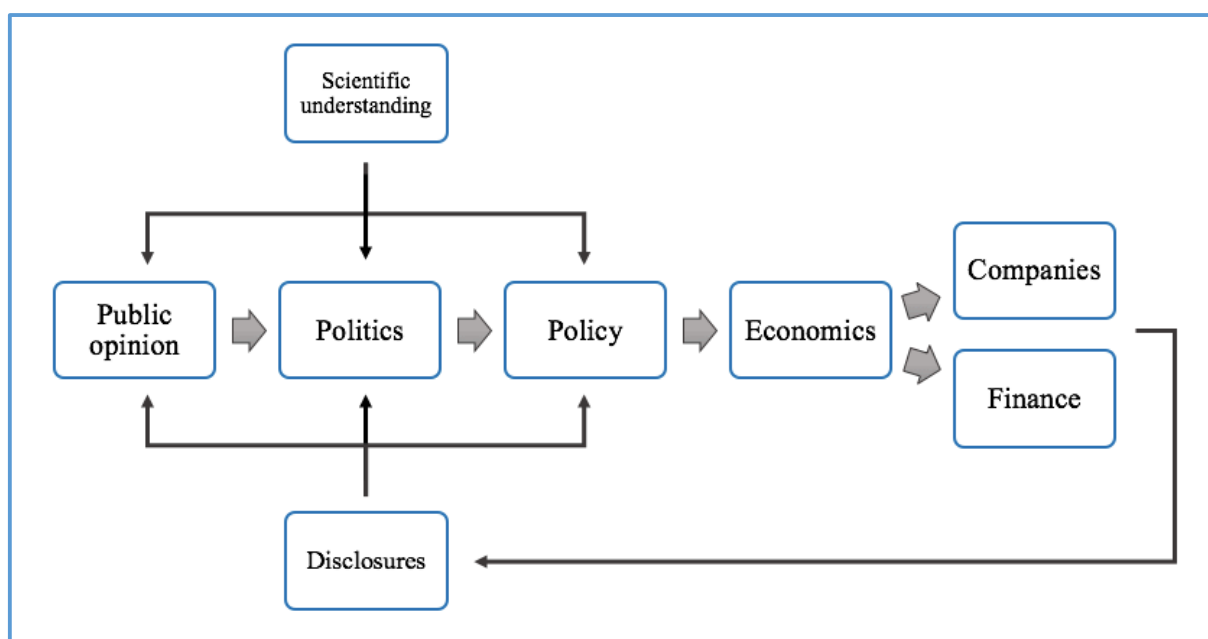


Figure 8: A Holistic Theory of Change

In Figure 8 above, I advance a more holistic theory of change. The causal logic here takes account of the fact, as argued previously, that capital allocation in energy markets is effected strongly by regulatory policy and government financial support.

Disclosures remain important, but indirectly so, influencing public opinion, politics and policy rather than financial flows directly. The development of this Theory of Change draws on evidence presented in the public policy literature. Information, transparency and awareness are considered the first step in producing change in institutions and centres of power (Holzner and Holzner, 2006). The IEA (2015) has, for example, established an on-line database to

increase the availability and transparency of energy subsidy data. It states that “Improved access to data on fossil-fuel subsidies will raise awareness about their magnitude and incidence” and is “an essential step in building momentum for global fossil-fuel subsidy reform.” Thus, information is seen as a prerequisite for influencing the terms of the debate to then change government policy and reform fossil fuel subsidy regimes.

With regards to the next link in the chain, there is strong evidence that public opinion strongly influences public policy in democratic countries (Drews & van den Bergh, 2015). A meta study of the peer-reviewed literature finds that in the majority of studies the impact of public opinion on policy outcomes is substantial; that salience enhances the impact of public opinion; that the impact of opinion remains strong even when the activities of political organisations and elites are taken into account; and finally, that responsiveness appears not to have changed significantly over time (Burstein, 2003). Agnone, (2007) further finds that the impact of public opinion on environmental policy outcomes is amplified by environmental movement protests. The effect that increasing public awareness about the risks of misaligned capital poses to the climate, financial stability and society may be amplified by associated protest movements such as the currently prominent fossil fuel divestment movement. Indeed, as noted previously, reviews of the divestment movement have shown that its most tangible effect will be to pressure governments into introducing more restrictive climate legislation (Ansar et al., 2013).

Scientific understanding also takes its place, and can be considered the bedrock on which progress in the rest of the model sits, feeding into public opinion, politics and policy through multiple channels. It was the publication of scientific articles identifying and quantifying the carbon budget in 2009 that stimulated the un-burnable carbon thesis that has so caught the public’s imagination through and upon which the fossil fuel divestment movement is based.

As was argued earlier in this section, financial flows will only shift once the incentives to do so are in place. In order to internalise the GHG externality, government regulation and carefully designed economic instruments are required to provide the economic incentives to which investors will respond. Griffin et al., (2015) analysed stock market response to release of scientific papers documenting the carbon budget in 2009, showing that the market reacted only very weakly to the provision of this information. Simply increasing awareness of a *potential* carbon bubble is not enough. Investors must believe governments commitments to acting on the scientific imperative.

This theoretical analysis has thus begun to answer the main research question and first intended research outcome. For stakeholders hoping to use climate-related disclosures to align capital with the Paris Agreement it advises a focus on deploying them indirectly, altering economic incentives through changing public opinion, politics and policy. We will now move on to the second and third research outcomes, examining the empirical evidence in relation to the theory presented thus far.

Part III – Disclosures in Practice

As outlined in the methodology, this section applies a thematic analysis to primary data collected through semi-structured interviews with key decision-makers at HSBC and secondary data including publications produced by the bank's Climate Change Centre of Excellence. It further draws on evidence supplied through attendance at an NGO workshop convened to discuss effective disclosures and follow up interviews conducted with NGO representatives. Initial thematic coding was based on the theory of change heuristic outlined by Connell & Kubisch, (1998). Interviews were assessed to establish the following:

1. *Intended outcomes*: What outcomes do stakeholders intend to achieve through the use of climate-related disclosures?
2. *Intended intervention to achieve the outcome*: What form of intervention do stakeholders require the intervention to be, in order to achieve the intended outcome?
3. *Contextual factors*: What factors do stakeholders identify that will lead the intervention to result in the intended outcome?

Thematic analysis is an iterative process (Braun & Clarke, 2006). From the initial analysis it became clear that the way in which stakeholders intended to use disclosure information was critical to understanding the likely outcomes. *Intended use of disclosures in practice* thus became a fourth node in the thematic analysis. In order to explore this, the next section provides a critical analysis of the HSBC climate risk rating methodology being developed by HSBC in order to better assess climate risk faced by companies it is exposed to.

3.1 Thematic analysis of the use of climate-related disclosures in the banking sector

The justification for focusing on the banking sector and HSBC in particular was given in Section 1.4. The data on which the following analysis is based was described to the researcher by the Deputy Global Head of Sustainability at HSBC. It is important to note that the following methodology is not currently in use by HSBC and is still under development. However, it provides a useful and significant forward indicator of the way in which HSBC is proposing to use climate-related disclosures to incorporate climate risk into its lending activities. The proposed Climate Risk Rating (CRR) is intended for assessing the climate risk faced by companies and projects the bank intends to provide services to. It is determined on the basis of four different inputs.

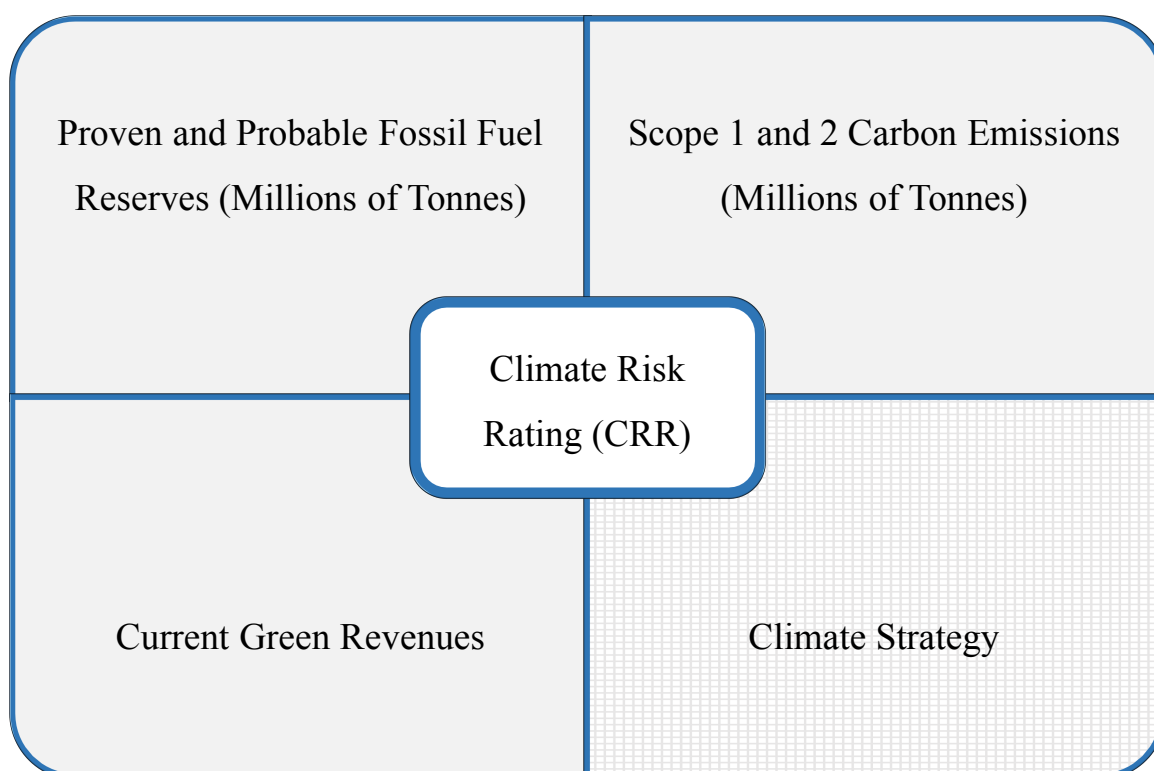


Figure 9: The Climate Risk Rating (CRR) proposed by HSBC

The first three elements (proven and probable fossil fuel reserves; scope 1 and 2 emissions; and current green revenues) are quantitative metrics. The fourth (climate strategy) is a qualitative assessment of the company's future business plans in relation to a given climate transition scenario. Combined, the inputs provide a CRR which, for comparability purposes, would be expressed as a percentage or rating on e.g. a scale of 1 to 10. The interviewee noted that the exact computation and weighting of each input is yet to be determined. This next section will now critically assess the rationale behind each input into the CRR in turn. Along with further evidence from interviews it will assess how the planned use of disclosures in practice impacts the likely role they will play in aligning capital with the Paris objectives.

In order to test the robustness of the metrics included in HSBC's potential CRR, we will now proceed by way of example, thinking through how the methodology might be applied to hypothetical companies in the fossil fuels sector.

3.2.1 Proven and Probable Fossil Fuel Reserves

Proven and probable reserves are a large determinant of fossil fuel companies' value. It informs what their likely revenues are going to be, which therefore drives the potential dividends investors will receive to pay back their investment. However, in relation to climate risk, these assets may reduce in value or even become liabilities as climate regulation or market trends prevent the extraction of a reserve. Logically then, the more reserves a company has, the greater the potential value of assets at risk of stranding by potentially restrictive climate legislation. However, on its own, a metric based solely on quantity of reserves faces severe limitations.

Companies with large reserves but a low marginal cost of production

As Figure 9 shows, the marginal cost of production per unit of oil, gas and coal extracted differs dramatically between different reserves and producers. Unless the jurisdiction in which the company is operating introduces a blanket ban on all extraction, from an investment perspective, the relevant metric would not be total reserves at risk, but the marginal cost of production for each reserve owned by the company; i.e. the total cost that comes from extracting one additional unit. A simple calculation bears this out. Consider two companies: Company A has proven reserves of one million barrels of oil and extracts at a price of \$100/barrel. Company B has proven reserves of 10 million barrels and can extract at \$10/barrel. Despite the fact that company B has ten times as many reserves, it is at far less risk than company A as its marginal cost of extraction is much lower. It would require much more restrictive climate legislation to endanger company B's operations as it would company A's.

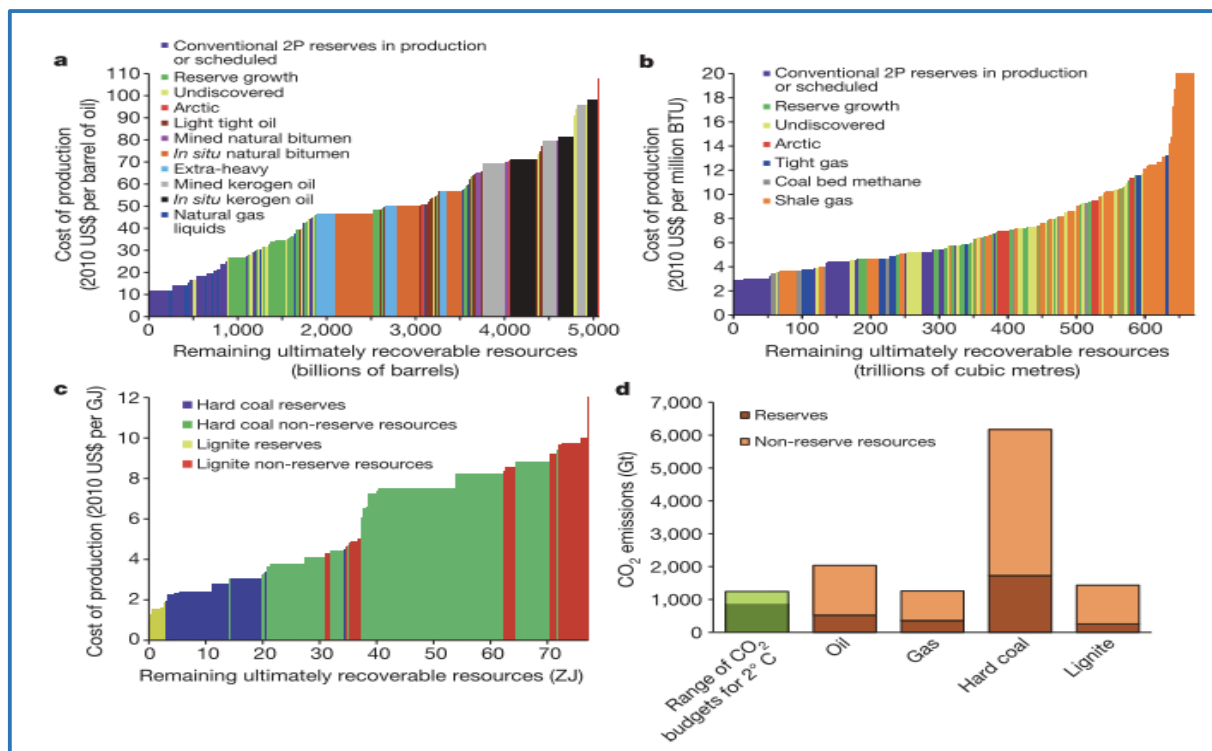


Figure 10: Production cost curves for oil, gas and coal and the combustion CO₂ emissions for these resources (McGlade & Ekins, 2015: p. 1).

A more useful metric would be the total amount of proven and probable reserves owned by a company that would become uneconomical to extract under different regulatory conditions e.g. differing levels of carbon prices. Figure 3, from McGlade and Ekins (2015) (presented on page 16) shows a geographic spread of un-burnable carbon reserves if we are to stay within 2 degrees of warming. A metric that accounted for where, geographically, a company's reserves were listed would thus be more relevant. Investors interviewed similarly back up this point, stating that the nature of the reserve matters as much as its sheer size. As one interviewee states, *“Is it conventional gas? Is it conventional oil? Is it oil sands? Because of the type of extraction and the nature of reserves matters. I think you can make your model more sophisticated. Are they in countries where there is going to be continued development or where they are likely to be closed down through regulation?”* (HSBC employee, personal interview, 2016).

The case of a company that has little left to earn from a reserve, despite that reserve being large

Companies with a diversified portfolio and reserves of different raw materials will not face the same risk as companies that are all in on a certain fossil fuel e.g. coal. Take for example, a company with reserves in coal, copper, and iron. The marginal cost of production for the company's coal is already the same or higher than the market price for coal. The value of that company would be driven by the value of its copper and iron reserves. The company's risk from its coal reserves is thus low, regardless of how large those reserves are as there is very little profit left to earn from its extraction.

3.2.2 Scope 1 and 2 Carbon Emissions

Again, this metric provides a useful starting point for assessing risk, but, as with total listed reserves, it requires further detail in order to become financially relevant. A single time-slice of emissions in any year will not adequately reveal future risk the company might face. With regards to aligning capital investments with climate objectives, what matters is getting emissions to zero before the carbon budget is breached. Thus, the trajectory a company's carbon emissions are on is as important as their emissions in a single year.

This information may provide some indication of the future risk a company faces under various future scenarios. However, on its own it will not directly shift financial flows. Indeed, information on Scope 1 and 2 emissions is already available to the market both through voluntary reporting initiatives such as the CDP and under mandatory regimes such as in the UK. From 1 October 2013, all UK quoted companies are required to report on their greenhouse gas emissions as part of their annual Directors' Report. The requirement affects all UK incorporated companies listed on the main market of the London Stock Exchange, a European Economic Area market or whose shares are dealing on the New York Stock Exchange or NASDAQ (UK Department for Environment Food & Rural Affairs, 2013). As noted, climate risks are expected to rise further into the future. The risk a company faces thus depends on its future trajectory of emissions, not necessarily its historic performance. It is disclosures on forward looking strategies to achieve this that are most financially relevant.

3.2.3 Current Green Revenues

This provides a potentially useful metric to assess the trajectory a company is on with regards to meeting its climate obligations. Again, a disclosure taken at a single point in time

would not reveal much. However, taken over several years as intended by HSBC, this metric would reveal the scale and velocity of the structural shift to a green economy across public companies. Correctly formulated it would provide portfolio managers, research analysts and product managers with consistent, transparent data to track green revenue exposure and support their investment in companies that stand to benefit from a shift in the global economy. Take, for example, a company in power generation. If its revenues from renewable generation (e.g. solar and wind) grew year on year compared to revenue from CO₂ power generation, this would provide a useful way of quantifying the progress a company is making to diversify its revenue streams away from income that is at risk from a low carbon transition. In order to make the metric comparable between differently sized firms, green revenues would have to be judged as a percentage of overall revenues. Take, for example, an oil and gas major (Company X) who decides to buy out a solar company. Their green revenues from that acquisition now stand at \$50 million per year. However, their overall revenues are \$5bn, making their green revenues only 1% of their total income stream. Meanwhile Company Y, a dedicated solar company has total revenues of \$25 million, in real terms far less than company X, however their green revenues represent 100% of their total income.

At present this metric faces several challenges before becoming operational. Interviewees were undecided on how ‘green revenues’ would be defined in practice, although several possibilities are under consideration. The first would be revenues that were judged to be compatible with an agreed upon 1.5 or 2-degree transition scenario, measured in millions of dollars. Interviewees noted that many companies are not yet disclosing data that would allow an investor to judge whether a particular revenue stream is compatible with a given transition scenario. However, if applied it would provide useful information on the balance of revenues and the future direction of travel. This metric however, requires work in order to establish universally accepted definitions of ‘green revenues’.

3.2.4 Climate Strategy

Whilst the first three elements of the equation can be expressed as quantitative metrics, the fourth is entirely qualitative. Although it would likely be expressed as a percentage or ranking from e.g. 1-10 as a proxy quantitative indicator for comparability purposes, the qualitative nature of the analysis would inevitably make comparisons more difficult between companies.

Both interviewees and the literature recognise the potential problems associated with a qualitative metric. However, it is also seen to hold significant value in terms of assessing a companies forward looking ability to manage climate-related risk. Interviewees noted that a qualitative analysis of a company's climate transition strategy is not an entirely new demand for an investment industry that likely already has many of the skills required to carry out such an assessment. It was noted that it is not, for example, entirely different from an assessment that might be carried out on the management quality of a company, an almost entirely subjective measure, but one that analysts are regularly asked to perform (HSBC employee, personal interview, 2016). Indeed, HSBC already conducts assessments of a managements ability to achieve their environmental targets based on three different factors: commitment; capacity; and past record.

For investors interviewed the inclusion of this metric was important. It was noted that a company might perform poorly in the three quantitative metrics, i.e. it would have large fossil fuel reserves, large scope 1 and 2 emissions and a low amount of current green revenues, but could still have a low transition risk due to the high scope of its forward looking ambition. For investors and asset managers, qualitative indicators were as important a tool for engaging with a company's management as for assessing investment risk.

As noted in the theoretical critique, for disclosure information to be effective once placed in the market they must convey information to investors that is financially relevant and impacts on the valuation of corporate assets (Hassel et al., 2005). A review of the CRR put forward by HSBC shows that the granularity of disclosures required by investors in order to make disclosure information ‘decision-relevant’ is high. For, example, with regards to fossil fuel reserves, information is required not just on size but on reserve location, marginal cost of production, climate regulations and future likely climate regulations of the jurisdiction of operation.

Having drawn out some of the implications for the way in which HSBC might use disclosure information, we will now continue the thematic analysis of how HSBC intends to make use of disclosure information in specific relation to the theories of change explicated in part II.

3.2.5 Calculating risk appetite

CRR methodologies such as the one in development by HSBC will provide use in allowing investors to assess what their risk appetite should be, and where it is not willing to expose itself to risk:

“[With CRRs,] you start to say, where do we want to position ourselves as a lender? Because the safest lending you could possibly do would be to an asset owner with a very good climate risk rating. The most dangerous lending you could do would be to a first order company with a very low climate risk rating. You can start to build a picture, particularly if you build it for those high carbon sectors, as to how climate adjusted our portfolio is and how it’s changing over time.” [HSBC Executive, personal interview, 2016].

Naturally, banks will have different risk appetites. If one bank deems a project too risky, another will be willing to lend. As one interviewee stated, *“If we don’t lend another bank will. There are 11,000 banks in the world. Just because the big ones don’t, the local ones will.”* (HSBC Executive, personal interview, 2016). Thus in relation to the theory of change, the specific *intended outcomes* can be identified as using disclosures to position HSBC competitively within the market. This begins to draw out the limits of investor use of disclosures in directly shifting financial flows. While HSBC considers itself a risk-averse bank, it was noted that some banks may in fact distinguish themselves in the market as specialist lenders to the fossil fuel sector (HSBC employee, personal interview, 2016).

3.2.6 Engagement with companies

As outlined in the literature review (Figure 4, Page 22), investors have three main options open to them in mitigating climate risk: divest, hedge and engage. For those not planning to use disclosure information to inform divestment, they may be used instead as a tool to engage potential customers to help them reduce their climate risk exposure. As one executive stated:

“We’re not using this simply to stop lending to companies that one might think are part of the problem. We want to use it as a decision making tool. To be able to help companies understand how they can be part of the solution. In the same way, you don’t use a credit risk rating with a commercial customer to simply say no. You say, currently your strategy isn’t compatible because we don’t think you’re able to grow your revenues in the way you say you

can. Perhaps you need to think about new products.” (HSBC Executive, personal interview, 2016).

Thus, disclosures would be used more as a tool of engagement than as a stock picking method. Metrics designed around increasing the productivity of this dialogue are seen as the most useful. As picked up in the above analysis of the CRR, the most useful metrics tend to be forward looking disclosure information that are dynamic allowing the identification of trends over time. This may include, for example, future capital expenditure plans or future emissions trajectories. For HSBC, future climate strategy and management plans of customers took on an extra significance:

“This metric [climate strategy] provides a way of getting to the heart of the overall ambition for the exercise. That is, to provide a way of engaging with companies and allowing them them to productively develop a way to transition and play their role in the move to an economy that supports a stable climate.” (HSBC Executive, personal interview, 2016).

Focussing on dynamic future looking metrics is sensible as ‘climate risks’ are expected to increase with time. The vulnerability of companies will therefore depend on their future management strategies rather than historic performance. However, currently, mandatory and regulatory frameworks generally do not include such forward-looking disclosures or a framing in terms of risk assessment and strategic decisions to cope with risks (TCFD, 2016). It may be the case that fossil fuel companies do not think governments will implement the policies necessary to meet the objectives of the Paris Agreement. As outlined in Section 2.2.2, the historic record is not a good one. However, for banks looking to manage climate risk to their investments, the question their clients must be able to answer is, “what strategy is in place to ensure that your business model remains profitable *should* ambitious climate policies come

into place?” As noted in relation to the divestment movement and above, simply shuffling ownership around between investors or refusing to finance a project only to see another bank step in, will not solve the issue. Influencing capital allocation within companies is more productive, for example pressuring oil and gas majors to focus on lower carbon projects at the low end of the capex cost curve. Engagement is one way in which this can be achieved. However, at present companies are able to respond that they will remain profitable under future scenarios. Indeed, several oil and gas companies have given such a response when asked by shareholders to stress test their business models under future low carbon scenarios. Shell (2014: p. 1) for example states, “The world will continue to need oil and gas for many decades to come, supporting both demand and oil and gas prices”. The Carbon Tracker Initiative (2014: p. 2) argues that Shell’s stance rests on “dismissing potentially weaker demand for its oil due to tougher climate policies”. However, the other side of this coin is that Carbon Trackers position relies on tougher climate policies actually coming into force. Just as investors cannot be expected to respond to economic incentives that do not currently exist, nor can the companies in which they invest. Thus forward looking disclosures that outline the risk companies will only become directly potent when the economic incentives to shift investments actually exist.

This thematic analysis of the way in which HSBC plans to use disclosures thus supports the theoretical critique laid out in part II, which highlighted the limited role they will likely play in directly shifting financial flows.

3.3 A second role for climate-related disclosures

If the likely use of climate-related disclosures by the financial community supports the assertion that they will not directly alter capital flows, what other role might they play? This next section draws on a thematic analysis of semi-structured interviews conducted with leading

NGOs working at the face of the climate-business-investment nexus. It empirically investigates the holistic theory of change outlined in Figure 8, asking how disclosures might be used to shift the public debate, political landscape and ultimately policy that creates economic incentives that might shift financial flows.

NGOs have engaged extensively with the climate-related disclosure movement. As noted earlier, a central motivation for establishing an online database of fossil fuel subsidies by the IEA was the belief that transparency is the first step to changing the debate and thus moving reforming policy. Similarly, transparency around disclosures are viewed by NGOs as an important stage in building a public case in favour of stronger climate policy: *“Transparency per se won’t affect financial flows, but it is the first step towards asking them to change. Without transparency there is no questioning. Pushing transparency is the first step.”* (NGO Representative, personal interview, 2016).

For activists, being able to tell a story was important. The disclosures required for this were different from those required from investors, *“For activists, carbon footprint disclosures are an easy story and rhetoric. You can compare it to the carbon footprint of the country or the carbon budget the country has left. This feeds into the carbon bubble, which is an easy story.”* (NGO representative, personal interview, 2016).

Regarding the *intended use* of disclosures, NGOs also expressed concern over the use of disclosures in proprietary models. Recently financial technology companies such as Carbon Delta and Mercer are using proprietary models that make use of climate-related disclosures to identify ‘climate value at risk’ for specific companies and portfolios. This has benefits and may reduce the financial systems exposure to sharp re-adjustments. However, several sources in the NGO sector have argued that ‘open source’ models are required to ensure comparability between disclosures for public bodies (personal communication, 2016). Thus the proliferation

of commercial proprietary risk models may in fact hinder the successful use of climate-related disclosures to indirectly affect capital flows through the second theory of change.

Evidence taken from NGOs shows some empirical support for the holistic theory of change advanced theoretically in Part II. However, establishing cause and effect in public policy is inevitably complex (Dunn, 2015; Howlett, et al., 1995) and would require an analysis much more comprehensive than can be provided here.

Part IV - Conclusions

4.1 Summarising the potential roles for climate-related disclosures

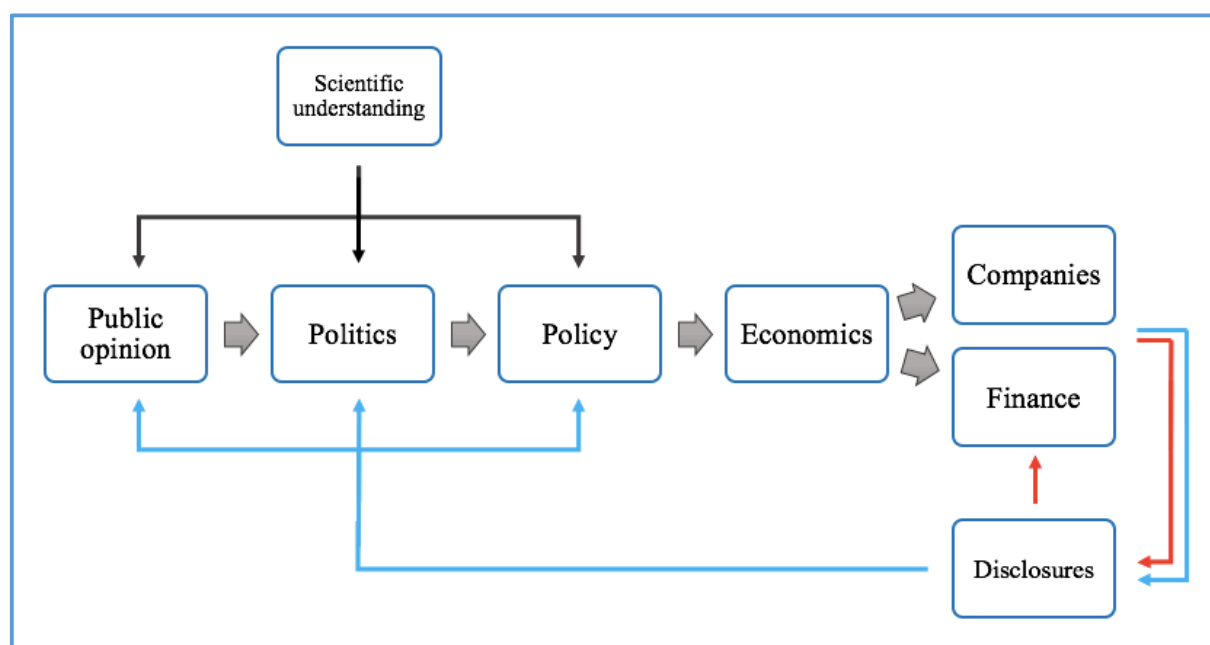


Figure 11: A Theory of Change incorporating the dual potential roles of climate-related financial disclosures

Figure 11 shows the holistic theory of change presented in Part II (Figure 8, page 44) with modifications based on the empirical investigation conducted in Part III. It thus incorporates both potential uses of disclosure information identified through the course of this study.

The red line shows the likely use of disclosure information by the banking sector, feeding back into their relationship with the market and companies. As outlined above, disclosures will primarily be used by HSBC to position itself in the market in relation to their risk appetite and competitors. They will also be used to engage companies in order to help them mitigate their exposure to climate risk. It has been argued both theoretically and through an empirical exposition, that this use of disclosures is not likely to align capital flows with the Paris Objectives directly as it does nothing to change the economic incentives that ensure fossil fuel companies remain attractive investment prospects.

The blue line shows a second role for climate-related disclosures. As outlined in Part II, they may indirectly re-align capital by shifting the terms of the policy debate and influencing governments to implement effective economic incentives. It is the blue line that should be of interest to those concerned with using disclosures to align capital with the carbon budget. The red line shows the way in which climate-related financial disclosures might address the information asymmetry problem. The blue line shows how it might address the climate policy credibility problem.

4.2 Implications for policy and stakeholders

The logical derivation of the argument advanced is that the intended use of disclosures will affect the nature of the disclosures required. The information required by NGOs to hold companies to account is different from the information required by investors to make stock picking decisions or to integrate climate risk into their operations. The information required by investors regarding fossil fuel reserves, GHG emissions and forward looking metrics is of a high granularity. A simple carbon footprint is not useful for making investment decisions. However, this detailed information may not be the most useful for advocates hoping to use

climate-related disclosures to influence the policy debate. The un-burnable carbon theory partly gained ground so quickly due to its relative simplicity and easy to understand nature.

Ultimately the role climate-related disclosures might play will be limited by the fact that capital allocation will only align with the carbon budget when regulation and economic instruments create the right and stable incentives to satisfy capital owners requirements for risk and return. Simply provisioning further information will do little to directly change this. As a senior HSBC Executive stated, *“Investors and the financial sector itself will only have a limited role to play, because, there will always be another, potentially, investor or lender, that will support those companies... It has to be governments that create the environment that do that [where it is not profitable to invest in companies that are not compatible with a stable climate]”* (personal interview, 2016).

The dual potential role of climate-related disclosures challenges stakeholders to think explicitly about how they intend to use the information to achieve their intended outcomes. This matters because the TCFD is currently engaging with a vast number of stakeholders in order to recommend a format for voluntary climate-related financial disclosures. Stakeholders may thus wish to review the explicit way in which they intend to use disclosure information to achieve their intended outcomes as the efficacy of the information gleaned from reporting will likely vary depending on the route they intend to take to reach their stated objectives. Once they do this, it may change the nature of the disclosures they wish to encourage companies to provide and the way in which they engage with the TCFD and other bodies currently developing policy in this area.

4.3 Final remarks

Given their current salience, this thesis set out to analyse what role climate-related financial disclosures might play in meeting the objectives established in the Paris Agreement. It approached the subject using a combination of theoretical methods and an empirical ‘thematic’ analysis of interviews conducted with prominent stakeholders in banking and the third sector.

Theoretically, this thesis repudiated the notion that climate-related disclosures might directly shift capital flows to align with the Paris Objectives. Instead, it advanced a second theory of change in which transparency around climate-related disclosures indirectly shift financial flows through influencing economic policy. It then empirically investigated these theoretical assertions, adapting them in the light of evidence relating to how disclosures will likely be used by the banking sector in practice.

It thus concludes that climate-related disclosures have two potential roles to play. Firstly, they may correct the current information asymmetry and allow markets to correctly assess prices in relation to their climate risk. Secondly, through increased transparency disclosures they may begin to shift public opinion and politics around climate change. Thus, by changing the ‘mood music’ to which policy is created, disclosures may increase the likelihood that governments implement the policy mechanisms required to change the economic incentives to align capital flows with the Paris objectives.

Whilst debate on climate-related disclosures will continue at pace, ultimately, the science is robust. Temperature warming is, to first order, a function of committed cumulative carbon emissions. However, these future emissions and subsequent warming remain a choice: a commitment made in society, not in the climate system.

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