



Research article

Climate change litigation as financial risk

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Abstract: Climate change litigation has been increasing rapidly and steadily for the past ten years, yet our understanding of the costs associated with this litigation are still very poor: policy frameworks are too shallow, estimations of these costs in the private sector are scarce and simplistic, and the academic literature on this issue is still very incipient and has a very fragmented focus. This essay provides a comprehensive analysis of the different types of costs that can arise from climate change litigation. Financial institutions provide an ideal focal point for this analysis because their role as enablers of some of the activities that contribute to aggravate the climate emergency make their exposure to the risk of climate change litigation unique and complex: they can be directly exposed to the risk of litigation as potential defendants in a case, facing potential pay-outs and fines, legal and administrative costs, insurance costs, financing costs, and reputational costs; but they can also be exposed indirectly, through litigation that targets their counterparties, especially their clients, which can lead to losses if the client's solvency is affected, and can impose additional reputational costs. This typology, as well as the exploration of several methodological challenges, can support the incipient efforts to estimate the costs of climate change litigation for financial institutions that we observe among financial supervisors, credit rating agencies, and financial institutions themselves. It can also help guide attempts to estimate these costs in other industries that are particularly vulnerable to climate change litigation.

Keywords: climate change; climate change litigation; climate-related financial risks; TCFD; litigation costs

JEL Codes: G200, G320, K220, K410, Q540

1. Introduction

Climate change litigation is on the rise.¹ As of 11 August 2020, there have been 1614 cases documented worldwide.² The vast majority of these cases have been filed within the past ten years and there is a clear growing trend (Setzer and Byrnes, 2020).

Despite the growing number of cases, however, our current understanding of the financial impact of climate change litigation is very poor. In many jurisdictions, financial regulators do recognise that climate change litigation can be a source of financial risk. For example, the Network for Greening the Financial System (NGFS)³ identifies the risk associated with emerging legal cases related to climate change for governments, firms and investors, which the NGFS defines as “liability risk”, as a subset of physical and transition risks, the two main drivers of financial impact (Network for Greening the Financial System, 2019). Nevertheless, the work of the NGFS does not examine the nature of the so-called “liability risk” nor does it examine how exactly liability risk can be a source of financial risk other than identifying it as a potential “operational risk” (Network for Greening the Financial System, 2019). Financial regulators that rely on the work of the NGFS to develop their own approaches to climate-related financial risks do not go any further.⁴

Today, the most elaborate articulation of the potential financial impact of climate change litigation is that provided by the Task Force on Climate-related Financial Disclosures (TCFD), an initiative of the Financial Stability Board (FSB), an international body that monitors and makes recommendations about the global financial system, to develop consistent climate-related financial risk disclosures for use by companies, banks, and investors. In its Final Recommendations, the Task Force on Climate-related Financial Disclosures (2017) illustrates the financial impact of climate change litigation by identifying three potential costs: any amounts payable as a result of regulatory fines or court orders, increased insurance premia, and reduced demand for products and services, which hints at some kind of reputational cost. Yet this articulation is very shallow (these costs are only listed on a table with no further explanation of how they might unravel) and is very narrow in scope. As I shall explain below, climate change litigation is a complex phenomenon that is likely to give rise to many more types of costs other than those identified by the TCFD.

¹I understand “climate change litigation” in a broad sense to encompass any case of an adversarial nature that has climate change as a central issue and that is presented before a judicial authority or an administrative body with regulatory enforcement powers and the authority to issue binding decisions. For a detailed discussion of this definition and how it fits with definitions used in the climate change litigation literature, see Solana (2020).

²The Sabin Center for Climate Change Law at Columbia University runs two climate change litigation databases that are updated regularly: one that covers cases in the United States (1245 cases) and another one that covers cases outside the U.S. (369 cases). Both databases are available at <http://climatecasechart.com/>. Governments and public authorities have attracted the highest levels of climate change litigation, but litigation against private companies is also on the rise. See Setzer and Byrnes (2019).

³The NGFS is a consortium of financial supervisors committed to contributing to the development of environment and climate risk management in the financial system and to mobilising mainstream finance to support the transition towards a sustainable economy.

⁴See e.g. BaFin (2019); De Nederlandsche Bank (2020); European Central Bank (2020). Analyses of liability risks in the insurance sector are a notable exception. See e.g. Prudential Regulatory Authority (2015).

There are at least three reasons why this very poor understanding of the financial impact of climate change litigation is a cause for concern.

First, academic research into corporate litigation has signalled the ability of litigation to influence almost every aspect of a firm's operations: from equity issuance decisions and the firm's cost of capital to its corporate governance.⁵ In light of the growing trend of climate change litigation, companies who ignore their potential exposure to climate change litigation might see their operations, value and profitability severely affected.

Second, there is a growing number of regulatory initiatives that are pushing companies to disclose their exposure to climate-related financial risks. Most of these initiatives require firms to disclose those risks in line with the Final Recommendations of the TCFD.^{6, 7} The Final Recommendations of the Task Force on Climate-related Financial Disclosures (2017) include a firm's exposure to climate change litigation as an example of the type of transition risk that firms may face. One of the recommendations invites firms to "[d]isclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning *where such information is material.*" (Task Force on Climate-related Financial Disclosures, 2017).⁸ To be able to determine whether its exposure to climate change litigation risk is material and therefore requires disclosure in line with the TCFD Final Recommendations,⁹ a firm would need to have as comprehensive an understanding of the potential costs that might arise from that exposure as possible. Firms that ignore those costs will be at risk of breaching their disclosure obligations under the relevant applicable law, which will in turn increase their litigation risk.¹⁰

Third, and perhaps most importantly, frameworks that fail to provide a comprehensive analysis of the potential costs of climate change litigation will lead to an underestimation of climate-related

⁵Arena and Ferris (2017) provide a survey of the academic literature that explores litigation in corporate finance, including the types of costs that may arise. Their survey, however, focuses mainly on corporate lawsuits and predominantly, on claims brought under U.S. securities laws.

⁶For a survey of disclosure requirements with regard to environmental and climate change risk under the securities laws of 25 countries, see Raudel and Hammer (2016). Recently, however, regulators have begun to introduce explicit requirements for companies to disclose their exposure to climate-related financial risks. For example, in the U.K., the Financial Conduct Authority (2020) has recently proposed to introduce a new rule for commercial companies with a UK premium listing, requiring them to state whether they comply with TCFD-aligned disclosures and to explain any non-compliance. In the E.U., the European Commission (2019) recently published a set of guidelines to companies that is consistent with the Non-Financial Reporting Directive and the recommendations of the TCFD.

⁷The Task Force on Climate-related Financial Disclosures (2017) does not impose new disclosure obligations. Instead, it intends to help organizations meet existing disclosure obligations, e.g. as applicable under the relevant domestic laws, more effectively.

⁸(Emphasis added.)

⁹The TCFD Final Recommendations do not define what ought to constitute material information worthy of disclosure. They point to the relevant applicable laws instead. For a comparison of the different materiality standards in different jurisdictions, see Task Force on Climate-related Financial Disclosures (2017). Despite the differences in formulation, all materiality standards seem to rely on the same core idea: information will be deemed to be material if it is necessary for investors to understand the value of the company, broadly understood.

¹⁰I have argued elsewhere (Solana, 2020) that one of the largest drivers of climate change litigation in financial markets is a firm's breach of climate-related disclosure obligations and that, in light of recent regulatory initiatives, this is likely to remain the biggest driver of climate change litigation in financial markets in the near future.

financial risks. For example, Weyzig et al. (2014) estimated potential losses of between €350 billion and €400 billion for European financial institutions, even under an orderly transition scenario, but they did not take into account climate change litigation risk. Similarly, the International Renewable Energy Agency (2017) estimated that losses from asset stranding could amount to USD 6 trillion for the EU-28 in a delayed policy action scenario; but their very definition of stranded assets, which focuses on the idea of assets' "unrealisable value", excludes the potential costs that asset stranding might impose on the asset holder as a result of liability, e.g. for having failed to adapt its investment policies to avoid the losses that the company would face if the assets were to become stranded. In the future, studies that aim to estimate the impact of physical and transition risks on the financial system should take into account the cost of climate change litigation.

Moreover, estimations of the costs of climate change litigation that are publicly available are scarce and simplistic. For example, Carbon Delta (2019), an environmental fintech and data analytics firm specializing in climate change scenario analysis, has built a database of climate-related cases that identifies any fines imposed on the defendants, where applicable. As I shall argue below, however, fines are only one of the potential costs that can arise from climate change litigation and may actually account for a relatively small proportion of the total costs.¹¹ Although these estimations provide a useful first approximation to the costs of climate change litigation, future estimations should aim at broadening their scope by including other types of costs.

Any attempts to provide a comprehensive estimation of the potential costs of climate change litigation will require an understanding of what it is that needs to be estimated. Although, in recent years, a growing body of academic literature has begun to examine the different types of climate change litigation cases and the potential role of litigation as a tool to govern climate change,¹² we still lack a framework to understand the costs that can arise from climate change litigation.¹³ This essay provides a comprehensive analysis of the different types of costs that can arise from climate change litigation, and it uses financial institutions as a focal point. Although companies in other industries have attracted higher levels of climate change litigation, e.g. those in the fossil fuels and cement industries, sometimes also known as the "Carbon Majors" (Setzer and Byrnes, 2019), the financial services industry presents certain characteristics that are particularly interesting for this type of analysis.

¹¹Indeed, Haslem et al. (2017), for example, have found that legal penalties explain very little of the change in market value around the date when the lawsuit is filed relative to the procedural costs of the lawsuit.

¹²For an overview of the main lines of enquiry in the literature that explores climate change litigation, see Osofsky and Peel (2012).

¹³Some academic studies have estimated the cost of violations of environmental regulations. For prominent examples, see Jones and Rubin (2001); Karpoff et al. (2005); Haslem et al. (2017). These studies, however, have a broad focus on violations of environmental regulations, therefore capturing regulations that may not be directly relevant to climate change. They also focus on a very specific type of cost, reputation, which they measure as the residual drop in market value after taking into account any pay-outs or fines. They do not explore other potential costs such as insurance costs and financial costs. But perhaps more importantly, the sample period in these studies predates the surge in climate change litigation. For example, the sample in Haslem et al. (2017) consists of 83,260 corporate lawsuits filed against US publicly traded firms in US federal courts from January 1, 1995 to December 31, 2006. Almost all reported climate change litigation cases have been filed after 2006.

First, given the central role that finance plays in the development of projects in those and other industries, financial services companies are also exposed to the risk of climate change litigation.¹⁴ Indeed, although the number of climate change cases in financial markets is relatively small, these cases also show a growing trend: as of 31 December 2018, there had been 46 documented climate change litigation cases in financial markets. 14 out of those 46 cases had been filed in 2018 alone (Solana, 2020).

In addition to exposing the financial services industry to the risk of climate change litigation, the central role that finance plays in economic development also makes that exposure somewhat idiosyncratic. For example, financial regulation may impose unique obligations on financial institutions, such as the obligation to perform an environmental due diligence before extending finance, that will result in unique costs.¹⁵ Moreover, financial institutions may face reputational costs even when they are not directly involved in climate change litigation: most evidently, if one of its client debtors is the defendant in a climate change litigation case and the public associates the client debtor's activities with the financier,¹⁶ the latter's reputation may be affected. This idiosyncrasy makes the potential costs arising from climate change litigation in the financial services industry very complex compared to other industries that may attract greater volumes of litigation. Examining and classifying these costs in an industry whose exposure to climate change litigation risk is so diverse will enrich the resulting theoretical framework. A rich theoretical framework could be a useful tool to inform the evaluation of costs in other industries with a relatively simpler exposure to the risk of climate change litigation.

Besides an idiosyncratic exposure to the risk of climate change litigation, the financial services industry has also proved particularly vulnerable to the cost of litigation. Recent scandals in the retail banking market illustrate this well. For example, between 2000 and November 2014, U.K. banks had paid out £38.5 billion in fines and customer redress relating to their retail operations (Spicer et al. 2014). According to New City Agenda (Date unknown), "This meant that £1 in every £4 of pre-tax profits earned by the banks had been paid out in redress and associated administrative costs."

The mis-selling of payment protection insurance (PPI) to retail clients is, by far, the most costly financial scandal in UK retail banking. According to New City Agenda (Date unknown), the total costs of PPI claims amounted to £53.8 billion.¹⁷ Between 1996 and 2012, U.K. banks sold over £44 billion of PPI. These products were meant to repay people's borrowings if their income fell as a result of income or unemployment. In the early 2000s, complaints about these products not providing effective cover to customers began to arise (Wearden, 2011). In 2006, the Financial Services Authority began imposing fines on U.K. banks for mis-selling PPI. At the end of August 2019, estimations of the total cost of the PPI scandal for UK banks had risen to £53.8 billion (New City Agenda, n.d.).¹⁸ At the time, Lloyds Banking Group, the largest seller of PPI, had set aside more than £22 billion to cover potential

¹⁴For an overview of the different types of climate-related claims that can arise in financial markets, see Solana (2020).

¹⁵For example, in 2018, Chinese financial supervisory authorities imposed a fine on Ping An Bank for failing to conduct pre-loan investigations in relation to its customers' compliance with environmental standards. See Ming (2018). Litigation costs arising from a breach of industry-specific regulation may also arise in other industries. The diversity of the regulatory environment in different industries, however, will probably justify the need to develop separate cost assessments for every industry.

¹⁶Institutions financing controversial projects deemed to aggravate the current climate emergency have faced considerable criticism and been the target of growing social protests. See e.g. Mooney and Nauman (2020).

¹⁷The second costliest financial scandal was the mis-selling of Interest Rate Hedging Products, the total costs of which amounted to £4.85 billion.

¹⁸The total amount mainly covers redress paid to consumers and administrative costs.

charges resulting from PPI claims (Farrell, 2019), approximately 2.78% of its total assets. This amount is far larger than the combined annual profits reported by the bank since it first started taking claims in 2011, approximately £15 billion (Makortoff and Kollwe, 2019). The economic impact of this litigation highlights the importance of understanding the potential economic cost of other sources of litigation risk for the industry, such as climate change.

Financial institutions that may be targeted in climate change litigation have an evident interest in gaining a better understanding of the potential costs involved. So will private companies offering services to estimate and manage these costs, such as law firms, credit rating agencies, and consultancy firms. In addition to the private sector, public authorities have also begun to show an interest in estimating the costs of climate change litigation. For example, some financial supervisors are beginning to explore possible ways of capturing the risk of climate change litigation as part of their supervisory activities, showing a growing concern with the potential effect that this litigation might have on the financial services industry.¹⁹ My hope is that the framework that I present in this essay will raise awareness amongst these and other actors about the importance of better understanding the potential costs of climate change litigation and that it can help guide future attempts to estimate these costs.

The essay proceeds as follows. In Section II, I present a typology of costs that may arise from climate change litigation against financial institutions.²⁰ I differentiate between direct and indirect costs of climate change litigation. In Section III, I explore some of the challenges that may arise when attempting to estimate these costs for any given firm. Section IV concludes with a reflection on the most important points of the analysis and a recommendation on which types of costs financial institutions and their supervisors should aim to understand first.

2. Types of costs in climate change litigation

The academic literature that explores the costs of corporate litigation often distinguishes between direct and indirect costs of litigation. In this literature, direct costs are those imposed expressly by a court order or an administrative decision: mainly, disbursements made to settle a dispute or to pay any damages,

¹⁹For example, in a recent discussion paper, the Bank of England (2019b) has described how it intends to use its 2021 biennial exploratory scenario to explore the financial risks posed by climate change. One of the specific questions that supervised institutions will have to answer is whether they “judge legal liability to be a material risk in [a specific] scenario to [them] or [their] counterparties”.

²⁰The analysis does not include potential costs that may arise in the financial system more generally. It focuses on costs to *individual participants* in the financial system. It does not explore the potential costs of systemic effects that may arise from climate change litigation, e.g. the costs associated with the possible reduction in credit to the real economy if financial service providers have to set aside cash resources to make indemnity pay-outs or to pay administrative fines. Moreover, the essay focuses on a specific group of participants: financial service providers. It does not focus on public authorities that operate in the financial system, for example; most notably, central banks and financial supervisory authorities. These public authorities, however, are also exposed to climate change litigation risk (Solana, 2020). For example, in addition to the costs of the proceedings, if a policy measure is invalidated, these authorities would have to face the cost of unwinding the original measure and designing and implementing a new one, e.g. cost of time of staff and, in certain cases, like monetary policy measures, potential economic losses arising from operational and market risk. Unwinding the original measures might also have an indirect effect on the financial services industry, or the real economy more generally, if a delayed implementation undermines the efficacy of the measure.

and lawyers' fees (Arena and Ferris, 2017). All other costs are deemed to be indirect. They typically include the loss of a firm's credibility, an increase in the perceived uncertainty about a firm's prospects, the loss of customers and suppliers, and diversion of managers' time and resources (Arena and Ferris, 2017).

This criterion is useful to identify the costs that litigation might impose on the parties involved in the dispute and, particularly, the costs imposed on the defendant; but it fails to capture important systemic effects. For example, it fails to capture the costs that any given case might impose on actors that are not parties to the litigation. In this essay, I adopt a different definition of direct and indirect litigation costs in order to capture those systemic effects. I shall refer to direct costs as those faced by a given institution when it is a party in the litigation, regardless of whether those costs are imposed expressly on the relevant court order or administrative decision,²¹ and to indirect costs as those faced by the same institution when a third party is involved in the litigation.

2.1. Direct costs

2.1.1. Main categories

Pay-outs and fines

Perhaps the most evident cost that financial institutions can face from climate change litigation is any amount that a court or an arbitral tribunal will require the defendant to pay to the claimant.²² The nature of these pay-outs will depend on the type of remedy sought by the claimant. For example, a court might order a financial services firm to compensate its clients for damages in claims relating to false advertising, or it may require the firm to compensate a third party in a nuisance claim.²³ Moreover, an administrative authority may also impose a fine on a financial services firm for failure to comply with relevant regulatory provisions.²⁴

Costs arising from pay-outs and fines can manifest themselves in different forms. Most evidently, financial institutions that are required to pay the amounts expressed in court orders and administrative decisions will need to find the necessary cash resources to comply with their obligation to pay. In anticipation of these costs, an institution may set aside a provision to recognise the probable yet uncertain obligation to pay before the court or administrative body has issued a decision. These provisions will affect the institution's profits (Makortoff, 2019). A reduction of the institution's profits can prompt investors to adjust their expectations and they may sell their shares in the institution, thus leading to a reduction in market valuation.²⁵

²¹As a result, the direct costs that I identify in this essay would probably capture both direct and indirect costs as framed in the corporate litigation literature referred to above.

²²For example, settlement disbursements or damages and legal fees are the two main direct costs identified in the growing literature that looks at litigation risk under U.S. securities law. For a review of this literature, see Arena and Ferris (2017).

²³For a detailed analysis of the potential climate-related claims that might arise in financial markets, see Solana (2020).

²⁴See *supra* n 15.

²⁵For example, the shares of CYBG, a bank group comprising Clydesdale Bank, Yorkshire Bank and Virgin Money, fell up to 22.6% on 4 September 2019, when it announced that it would be setting aside £450m to meet potential charges from new PPI-related claims (Press Association, 2019). At the time it was announced, the provision represented more than 20% of the group's stock market value (Gompertz, 2019).

Legal and administrative fees

There are several costs associated with the litigation process itself. First of all, financial institutions will need to hire an attorney to represent them. Firms do have in-house legal departments, but these normally do compliance and transactional work and do not represent their employers in court (Langevoort, 2012; Schwarcz, 2007). Firms normally hire outside law firms to do that.²⁶ Although lawyer's fees can be structured in different ways, there are three main types of contractual forms: contingent fees, conditional fees, and hourly fees (Emons, 2017).

It can be difficult to obtain granular details about the legal fees that firms pay in specific litigation cases, which are protected by confidentiality agreements between the lawyers and their clients. Nevertheless, aggregate data can give an indication of the significance of legal costs for firms. For example, Haslem et al rely on a survey of Fortune 200 companies by the Lawyers for Civil Justice (LCJ) which reveals that:

The average annual expenditures in outside legal counsel were \$66 million in 2000 and increased to nearly \$115 million in 2008. The same sample of firms reported that in major litigation events, defined as litigation events with legal costs exceeding \$250,000, their expenditures averaged \$1.8 million in outside legal fees and \$1.2 million in discovery costs per lawsuit. These figures exclude firms with an unusually high number of lawsuits. Legal costs are even greater if we take into account expenditures on in-house counsel (Haslem et al., 2017).

In addition to hiring lawyers that will represent them in court, firms may also need to hire new employees to handle all the complaints. This can either be in the form of additional back-office personnel to assist the external counsel in the preparation of the case, for example managing documentation, or in the form of customer services personnel to handle complaints.²⁷

Lastly, depending on the nature and the outcome of the proceedings, if it is unsuccessful, the defendant may also be required to pay for the costs of the proceeding, including, among others, court fees and the fees of the lawyers representing the opposing party.²⁸ On the same grounds, if the claimant is unsuccessful, the court may require that the claimant covers the cost of the defendant's legal representation.²⁹ Nevertheless, in this latter case, the court's order on costs may

²⁶One of the possible explanations for this is that litigation can be even more manpower and process intensive than transactional lawyering (Schwarcz, 2007). Moreover, outside counsel can offer a level of specialisation that is well suited for litigation work. Arguably, outside counsel also add the value of objectivity (Langevoort, 2012).

²⁷For example, in September 2019, shortly after the deadline to submit any PPI claims had passed, The Guardian estimated that Lloyds had "about 6,000 staff—most of whom are contractors—processing PPI claims on its behalf" (Makortoff and Kollewe, 2019).

²⁸In the U.K., for example, making an order about costs falls under the discretion of the court, but "the general rule is that the unsuccessful party will be ordered to pay the costs of the successful party". See Rule 44.2(2)(a) of the Civil Procedure Rules. Other fees include experts' fees and translators' and interpreters' fees, when applicable. For a general definition of "costs", see Rule 44.1(1) of the Civil Procedure Rules.

²⁹Legal costs in adversarial litigation can be substantial and, as such, may represent a considerable barrier to access to justice (Pain and Pepper, 2019).

not cover all of the defendant's lawyers' fees,³⁰ thus leaving the defendant to bear part of the cost of its own legal representation, even when being successful.³¹

Insurance costs

It is common for companies to purchase liability insurance as part of their risk management strategies. Financial institutions are no exception. Liability insurance protects the policyholder against the risk of being held legally liable for any loss and/or damage suffered by other parties as a result of the policyholder's actions, including any potential pay-out resulting from the claim.

Insurance and reinsurance companies have reacted to the aggravation of climate change by adjusting the terms of their commercial general liability policies to reduce their exposure.³² For example, they have begun to exclude certain claims from the coverage of their policies to limit their liability for damages suffered by policyholders as a result of extreme weather events (Prudential Regulatory Authority, 2015), which are associated with the aggravation of climate change (Intergovernmental Panel on Climate Change, 2018). Moreover, most commercial general liability policies have exclusions that seem to apply to claims that could arise in climate change litigation (Reeves and Umbert, 2019).³³ If climate change litigation continues to rise, insurers and reinsurers may begin to expressly exclude climate change claims from their policies.³⁴ Even if they do not exclude these types of claims from their policies, they may reduce the total coverage provided by reducing the sums insured or lowering policy limits. These changes will expose policyholders to the risk of having to meet a larger proportion of any potential pay-outs with their own resources.³⁵

³⁰When making an order about costs, courts will take into account several factors to determine the amount of costs, including the reasonableness and proportionality of the costs incurred. See e.g. Rule 44.4 of the Civil Procedure Rules.

³¹Indeed, Haslem et al. (2017) find that the market value of a defendant firm drops even when the case is settled or when the defendant is successful, which suggests that legal costs are also reflected in stock prices. Variations in stock prices, however, are different depending on the type of case. Securities litigation shows the sharpest declines. They also find that the defendant's procedural costs are more economically significant than court-imposed penalties to explain changes in the defendant firm's market value.

³²Several voices have already warned about the potential "un-insurability" of many risks if the current climate crisis continues to aggravate. See e.g. UNEP FI (2018).

³³Indeed, there is at least one reported case where a policyholder sued its provider of liability insurance after the latter rejected a claim for indemnification in underlying litigation seeking climate change-related damages. The Virginia Supreme Court affirmed that the insurance company had no duty to defend or indemnify the energy company. See *The AES Corporation v. Steadfast Insurance Company*, Virginia Supreme Court, Record No. 100764, 20 Apr. 2012.

³⁴The Bank of England (2019b) has identified reductions in the coverage of legal liability cover as a potential risk. Reeves and Umbert (2019) provide a succinct description of how insurers and reinsurers may introduce these exclusions.

³⁵I am grateful to Iain MacNeil for pointing out to me that, in addition to changes in their general commercial liability policies, insurance companies might also introduce similar changes in their Directors and Officers (D&O) insurance policies. These policies cover the personal liabilities of the directors and officers of a company that result from acts (or omissions) committed or allegedly committed while acting in their capacity as directors or officers. "The 'loss' covered commonly includes awards of damages, judgements, settlements and defence costs. Typically, losses arising from dishonest conduct, criminal fines or penalties, taxes, punitive exemplary and aggravated damages are excluded from cover." (Prudential Regulatory Authority, 2015) Although those insured under D&O policies are primarily individual directors and officers, coverage is also available to the corporate entity

In addition to adjusting the terms of their policies, insurance companies have also raised their premia to reflect the increased vulnerability of a company to climate change litigation.³⁶ When premia will rise will ultimately be determined by the terms of the relevant policies, but it is very common for liability insurance policies to be renewed on a yearly basis, which allows insurance companies to adapt to new circumstances on a relatively short notice (Prudential Regulatory Authority, 2015).

If the volume of climate litigation continues to grow, we can expect to see more insurance companies introducing this type of changes. Companies that attract high volumes of litigation or very large claims will be more vulnerable to these changes and the costs associated with them. Those companies who lose a case will be particularly vulnerable, especially if the case sets a precedent for other claimants. The existence of a precedent would increase the probability of other claimants being successful, which would increase the defendant's potential pay-outs and, as a result, the claims that the defendant would make under its liability insurance policy. In order to protect itself against its increased exposure, the insurance company may adapt its policy documents to exclude certain claims or may increase the premium that it charges to the defendant company. Nevertheless, as I shall explain in section II.B, a company that does not attract any climate change litigation may still be exposed to the costs that can arise from these changes.

Financing costs

Climate change litigation can increase financing costs. Perhaps the most evident example is that of sustainability linked financial products, where financing conditions are tied to the borrower's environmental performance. Sustainability linked loans (SLLs) are a prominent example.³⁷ SLLs aim to align the terms of the loan, including the interest rate, to the borrower's performance against a set of predetermined sustainability performance targets. Climate change litigation can affect the borrower's ability to meet those targets. For example, the Sustainability Linked Loan Principles prepared by the Loan Market Association (LMA), the Asia Pacific Loan Market Association (APLMA), and the Loan Syndications and Trading Association (LSTA), identify ten common categories of sustainability performance targets. One of them refers to "Global ESG assessment", which includes "[i]mprovements in the borrower's ESG rating and/or achievement of a recognised ESG certification" (Loan Market Association et al., 2019). Indeed, some of the world's leading ESG rating companies regard lawsuits related to key ESG issues as incidents that might affect a company's ESG performance and include litigation risk as one of their key indicators to assess the magnitude of the potential impact that an ESG issue may have on the financial performance of a company.³⁸

But climate change litigation can also increase the cost of financial products that are not linked to sustainability performance. For example, if the costs identified in the previous sub-sections are so

in relation to its liability to indemnify the directors and officers for the losses described above, to the extent that law permits such indemnity (Prudential Regulatory Authority, 2015). It is unclear, however, whether prohibitions on this type of indemnities would apply when the individual is not found guilty, as it is often the case with "neither admit nor deny" settlements, which have become increasingly common in the U.S. (MacNeil, 2015).

³⁶See e.g. Prudential Regulatory Authority (2015). In relation to premia in homeowner's insurance policies, see Regelink et al. (2017).

³⁷As of 12 June 2019, the utilities and the financial services industry were the largest borrowing industries in the SLL market with 41% and 19%, respectively, of aggregate volumes of announced SLLs since 2017 (Linklaters, 2019).

³⁸In the case of Sustainalytics, see e.g. van Schaik et al. (2015); Garz et al. (2014).

significant as to affect an entity's creditworthiness, climate change litigation could affect the borrower's credit ratings,³⁹ which might trigger similar interest rate increases as those described for sustainability linked financial products.⁴⁰ Indeed, credit rating downgrades often trigger contractual mechanisms that impose stricter financing conditions on the borrower.⁴¹ Moreover, there is evidence to suggest that banks may change the terms of their loan contracts in reaction to an increase in the borrower's litigation risk even if that increase does not have an impact on the borrower's credit rating.⁴²

Reputational costs

There are several financial scandals in recent years that evidence the potential for litigation to undermine the reputation of financial institutions.⁴³ For example, the 2007 crisis in the U.S. subprime mortgage market led U.S. regulators to sue some of the largest financial institutions in the market on grounds that these institutions had mis-sold subprime mortgage-related investments (Braithwaite et al., 2011). In the U.K., several banks now face millions of complaints from customers who had been mis-sold PPI. Mis-selling financial products has also generated a lot of litigation against banks in other

³⁹There are recent precedents that evidence the potential impact of litigation costs on the credit rating of a financial institution. For example, several banks in the UK have incurred substantial provisions over the past few years to cover for potential pay-outs resulting from customers' claims in relation to the mis-selling of payment protection insurance (PPI). In 2013, S&P downgraded the credit rating of Royal Bank of Scotland on the basis of high litigation risk related to the mis-selling of subprime mortgage-related investments in the U.S. (Armitage, 2013). In a more recent decision, Moody's changed the outlook on the long-term deposit and senior unsecured debt rating (where applicable) of eight banks to negative from stable to reflect a weakening operating environment affected, largely, by the volatility of PPI-related charges (Moody's, 2019).

⁴⁰Indeed, stricter financing terms normally respond to a perceived deterioration of a firm's creditworthiness (European Central Bank, 2020). There is evidence of firms with a recent history of securities litigation being less likely to seek external debt and equity financing (Autore et al., 2014).

⁴¹For example, if an institution's credit rating is downgraded, its counterparty under a derivatives contract will have the right to request that the former transfers additional collateral to secure its financial obligations under the contract (ISDA, 2001). If these collateral calls are triggered under numerous contracts they can put considerable liquidity pressure on the institution and prompt its collapse (Brunnermeier and Pedersen, 2009).

⁴²For example, Deng et al. (2014) find that following the filing of a class action lawsuit under U.S. securities law, defendant firms experience an increase in loan spreads, higher up-front borrowing charges, and more financial covenants and collateral requirements. Similarly, Yuan and Zhang (2015) find that banks charge 19% higher interest spreads on loans to firms facing class action lawsuits after litigation. These studies focus on the U.S. legal system, but there are patterns and practices observed in the U.S. that do not apply globally (Arena and Ferris, 2018). Moreover, these effects may be a direct effect of litigation that is better captured as a reputational cost. For example, Karpoff et al. (2008) define reputation loss as "the present value of the higher costs of financing and/or the diminished cashflows from operations that result when lenders, investors, customers, and suppliers alter the terms of exchange with a firm that has been discovered cooking its books". I explore reputational costs in section II.A.1.e below.

⁴³The corporate reputation literature has focused predominantly on the positive end of the reputation spectrum. On the negative end of the spectrum, "bad reputation" can sometimes be conflated with "organisational stigma". These two concepts, however, operate through different mechanisms: while reputation entails a unique assessment of an organization, stigma is, by nature, "deindividuating": it eradicates any existing positive or negative reputation (Mishina and Devers, 2012). In this essay, I use the term "reputation" to refer to the negative end of the reputation spectrum, not to stigma.

countries.⁴⁴ The financial services industry has expressly acknowledged the impact that these scandals have had on the sector's reputation. For example, in 2013, a few years after the PPI scandal erupted, Mr Antony Jenkins, then CEO of Barclays, said that it would take "probably 5 to 10 years" for the bank to rebuild public trust after the PPI scandal.⁴⁵

Arguably, this reputational damage is not linked to the litigation itself but to the questionable business culture that underpinned those practices. Nevertheless, one could also argue that a formal decision by a court or an administrative body imposing a fine or a compensatory obligation on the relevant financial institution has a confirmatory effect.

The cost of this reputational damage can manifest itself in various forms.⁴⁶ Traditionally, reputational costs have been circumscribed to the relationship between a firm and its customers (Klein and Leffler, 1981). In the case of climate change litigation, customers who are particularly sensitive to environmental sustainability may decide to change providers. In the financial services industry, depositors are a typical example.⁴⁷ Similarly, lawsuits based on false advertisement of sustainable finance products could lead to a loss of market share as both existing and prospective customers turn to different providers.⁴⁸

In recent years, however, academic studies have pointed to other stakeholders. Haslem et al. (2017) argue that reputational costs may also take the form of increased contracting costs between suppliers, employees, and shareholders who interact with the firm following litigation. For example, investors might react to the news of litigation by selling shares⁴⁹ or bonds⁵⁰ issued by the defendant company in anticipation of potential reputational losses. Indeed, there is anecdotal evidence of financiers changing their mind about subscribing to the issue of new shares as a result of the potential reputational costs associated with the project's impact on climate change.⁵¹

⁴⁴ For example, the sale of preference shares by several banks in Spain in the early 2010s.

⁴⁵ In his remarks, Mr Jenkins also referred to the impact of the Libor-rigging scandal (Monaghan, 2013).

⁴⁶ Karpoff et al. (2005) conclude that environmental violations are disciplined largely through legal and regulatory penalties, not through reputational penalties, but their analysis may not be very informative for understanding the costs of climate change litigation. See *supra* n 13.

⁴⁷ Recent empirical analyses suggest that depositors also discipline banks based on non-financial information, including environmental reputation (Homanen, 2018).

⁴⁸ Previous research shows that false advertising, product recalls, lack of safety, deceptive bidding practices, and financial misrepresentation can lead to large losses of market share (Haslem et al., 2017). On the reputational effect of financial fraud on sales revenues in the Chinese product market, see Xin et al. (2018).

⁴⁹ For example, examining the impact of the enforcement of financial regulation by the U.K. regulatory authorities on the market price of penalised firms, Armour et al. (2017) Armour et al find that stock price reactions are, on average, nine times larger than the financial penalties imposed by the FSA. These reputational losses, however, seem confined to misconduct that directly affects "second parties", i.e. those who trade with the firm, such as customers and investors. They report that the announcement of a fine for wrongdoing that harms "third parties", i.e. those who do not trade with the firm, such as money laundering, has no impact on stock prices.

⁵⁰ There is also evidence of corporate bond prices reacting negatively to information about lawsuits that have an adverse effect on a firm's reputation (Gu et al., 2018).

⁵¹ For example, according to Tsleil Waututh Nation, Union of British Columbia Indian Chiefs, Treaty Alliance Against Tar Sands Expansion (2017), a group of NGOs, Kinder Morgan's decision to pursue an IPO to finance the Trans Mountain

Banks could also be regarded as stakeholders that may impose reputational costs on a firm. For example, Deng et al. (2014) regard banks' hardening of the terms in their loan contracts with borrowers with high litigation risk as evidence of the reputational cost of litigation. Similarly, Gong et al. (2020) find evidence of regulatory sanctions having a detrimental effect on the cost of bank finance for listed companies in China. This type of reaction from banks, however, could also respond to a perceived deterioration of the borrower's creditworthiness, e.g. as a result of the perceived impact that future litigation could have on the firm's cash resources. In those cases, increasing financing costs should probably be categorised separately from reputational costs, as I describe in section II.A.1.d.

Reputational costs can also contribute to investors' decisions to reduce their exposure to the affected company indirectly. For example, investment funds use internal Environmental, Social and Governance (ESG) scoring systems and external sustainability indexes to guide their investment policy.⁵² As in the case of SLLs discussed in section II.A.1.d, a detrimental decision in a climate change case can cause the defendant's ESG score to drop or it can lead to its failure to meet the criteria to be included in reference sustainability indexes. This could prompt investors to sell their investments in the company.⁵³ If different investors use similar ESG scoring systems and indexes, the impact on the company's market value could be significant.

Haslem et al. (2017) also suggest that employees might discipline a defendant company too. This type of reaction, however, is normally associated with labour litigation. In the context of climate change litigation, one of the possible ways in which employees in the financial services industry might react to their employer's negative environmental reputation is by quitting their jobs to either join another firm with a more positive environmental reputation or to set up their own. Nevertheless, given the attractive salaries offered in the industry, affected firms may be able to replace those employees relatively quickly, thus minimising the potential reputational cost.

Lastly, reputational costs may also manifest themselves in the form of remedial actions taken by defendants to clean up their corporate image. Some of these remedial actions include the removal of key managerial figures, which may trigger expensive compensatory packages, and increases in the amounts dedicated to corporate social responsibility.

Stages in the litigation process

When examining the direct costs of climate change litigation, it is useful to think about the different stages of the litigation process. In general terms, we can identify at least three stages: i) a pre-filing stage, spanning the time period preceding the commencement of the legal proceeding, ii) the legal proceeding itself, which will span the time period between the actual filing of the claim and the issuance of a final judgment, award or decision by a court, an arbitral tribunal or an administrative

pipeline system and other Canadian assets only came after other financing strategies had failed. If investors' discipline is strong enough, their reactions can have an impact on the institution's financing costs, e.g. by having to raise the coupon in a bond issue to attract enough investors. The Financial Times recently reported on Peabody Energy, a US coal company, failing to secure a refinancing to facilitate a joint venture with ArchCoal and quoted a Moody's analyst who attributed part of the failure to banks beginning to change their attitudes towards climate change as a result of actions taken by shareholders and campaigners (Mooney and Nauman, 2020).

⁵²At the moment, the three most prominent sustainability indexes are: the Domini 400 social index, in the U.S., and the Dow Jones Sustainability Indexes and FTSE4Good in Europe.

⁵³Particularly in passive investment funds that track external sustainability indexes (Riding, 2019).

authority, or the parties reaching a settlement;⁵⁴ and iii) a final stage that spans the period following the final judgement, award or decision.

Most of the costs identified above will be contained within the second stage. In particular, any pay-outs or fines, lawyer's and administrative fees, and any potential increase in the cost of capital will arise at some point during the development of the legal proceeding. The judgment, award or decision being final is important for our classification purposes. If an administrative authority issues a decision in the first instance and the affected financial institution decides to appeal the decision, effectively, the litigation ensues. This will mean that some costs, e.g. pay-outs or fines, may not arise at all if a higher court or administrative authority does not confirm the decision in first instance. Importantly, however, other costs, e.g. lawyers' fees, will continue to accrue until there is a final judgment, award or decision, or until the parties have settled the claim. Indeed, the duration of litigation is one of the key factors in determining the procedural cost of civil litigation (Lee and Willging, 2010).

Pinpointing exactly at which stage of litigation the borrower's financing conditions may be affected can be very difficult. For example, the provisions in the relevant loan contract may specify the type of judgement, award or decision that will trigger an increase in the applicable interest rate. In practice, however, such interest rate increases, even if they are applied automatically upon the issue of the judgement, award or decision, may not actually affect the defendant borrower until a later moment, when the next instalment is due, for example. In this case, the actual effect on financing conditions may materialise past the end of legal proceedings. Similarly, if the contractual provisions do not expressly cover climate change litigation, the actual effect of litigation on the defendant's financing conditions may only materialise through a revision of the defendant's credit ratings,⁵⁵ which, again, may only arise after the legal proceedings have finished.

The same could be said of insurance costs: the ultimate impact of litigation will be determined by the specific terms of the insurance contract. In the case of insurance, however, determining the stage of litigation at which the impact materialises can be even more difficult than in the case of the defendant's borrowing conditions. For example, a particular judgement, award or decision against a financial institution may not lead the insurer to adapt the terms of the policy in the first instance; but if the case sets a precedent that motivates other potential claimants to consider the possibility of filing similar claims, the insurer may reassess its exposure to the risk that the defendant will make further claims under the relevant insurance policy. In this case, an increase in the defendant's premium for liability insurance, for example, could fall under the post-filing stage of the original case, or under the pre-filing stage of upcoming cases.

Reputational costs may also arise at any of the three stages of litigation. Intuitively, it will be the announcement of a detrimental judgement, award or decision that will affect the defendant's reputation more clearly.⁵⁶ But investors may react to reputational costs before a decision is issued. For example,

⁵⁴The parties might reach an agreement to settle the dispute before a decision is issued, the given entity facing a similar payment (possibly lower, given the nature of a settlement) as they will have faced had the dispute proceeded to its final stage.

⁵⁵See *supra* section II.A.1.d.

⁵⁶According to Armour et al. (2017), however, a significant problem with most attempts that aim at quantifying reputational costs is that information about misconduct and associated penalties for offending firms is normally revealed at several instances and over a long period of time. This is characteristic of enforcement processes in U.S. financial markets. In the U.K., the entire enforcement process involves only one public announcement, which includes information about associated

while, in some cases, financial supervisors may not disclose the initiation of a supervisory investigation and only announce its final outcome,⁵⁷ the initiation of court proceedings may be made public from a very early stage.⁵⁸ If the initiation of proceedings is made public, it might expose a potential connection between the entity's activities and the aggravation of the climate emergency, which might negatively affect the entity's reputation. In fact, mere speculation about the possibility of a suit being filed or an investigation being initiated could lead the public to precipitated conclusions about the entity's contribution to the climate emergency that could undermine its reputation.⁵⁹

The following graphic depicts the different types of direct costs that can result from one climate change case and their evolution throughout the different stages of litigation as described above.

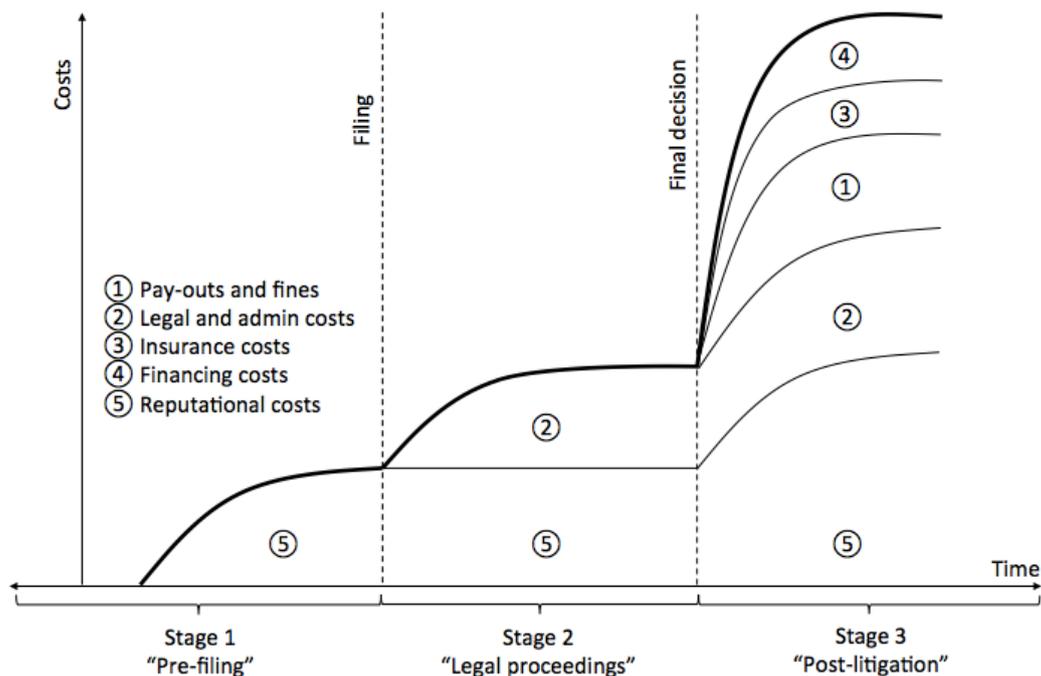


Figure 1. The evolution of direct costs arising from climate change litigation⁶⁰.

legal penalties. At a point shortly after their sample period, however, U.K. authorities changed their practices and a preannouncement of investigations seems commonplace now. According to Haslem et al. (2017), media coverage aggravates the decline in a firm's market value around the date when the lawsuit is filed.

⁵⁷That used to be the case in the U.K., for example. See supra n 56.

⁵⁸ In some cases, claimants themselves will strategically publicise the filing of the suit in an attempt to put public pressure on the defendant.

⁵⁹ Bauer and Braun (2010) have found shareholder litigation to drive share prices down as early as one month before the filing. Moreover, Haslem et al. (2017) have found that the market reaction around the date of a pre-filing disclosure is significantly more negative than the market reaction around the date when the lawsuit is filed. Interestingly, their findings indicate that securities litigation and environmental litigation are the two types of litigation that lead to the sharpest declines in firm value. Pre-filing information leakage in environmental lawsuits, however, seems rare (Haslem et al., 2017).

⁶⁰ This is a graphic representation of the conceptual framework. It is not based on cost estimations. The purpose of having a vertical axis measuring costs is to illustrate the accumulation of different types of costs as the litigation process develops.

To complicate things further, a detrimental decision against a given financial institution may set a precedent that could usher in similar claims from other claimants, threatening to increase the direct costs of litigation in a feedback loop. For example, a precedent against a given financial institution could lead to an increase of direct costs in the first and second stages of litigation, mainly in the form of lawyers' fees and reputation costs. If the new claimants are successful, additional direct costs may arise in the second and third stage: mainly, pay-outs or fines, and reputation costs. The higher the number of precedents against the financial institution, the greater the incentive for new claimants to file their claims, and thus the greater the feedback effect.⁶¹

2.2. *Indirect costs*

In addition to being affected by direct claims, financial institutions may also be affected by claims filed against third parties. For example, a financier will have an interest in understanding the potential costs that one of its client debtors might face as a result of litigation and, in particular, the extent to which climate change litigation might affect the client debtor's ability to meet its obligations with the financier.⁶² In order to do that, the financier will need to assess its client debtor's exposure to climate change litigation risk and the costs that the client might face as a result. The financier might need to hire experts to conduct such a risk assessment; but, more importantly, the financier may face losses arising from the client's default if the costs that the latter faces from climate change litigation are high enough to compromise its solvency. These costs relate to the financier's counterparty credit risk.

Moreover, a detrimental decision against an oil company, for example, might have a negative effect on its reputation, but its financier's reputation may also be negatively affected if the public associates the latter's activities with those of the clients it funds.⁶³ The creditors and investors of the relevant financial institution may discipline the latter in very different ways: from withdrawing deposits from banks or money from investment funds, to selling investment securities issued by the relevant financial institution. In some cases, investors' reactions can have an impact on the firm's financing costs.⁶⁴

⁶¹Indeed, Haslem et al. (2017) have observed that the presence of subsequent litigation significantly increases the loss of a firm's market value as the market capitalises the costs of future lawsuits.

⁶²It is interesting to note that, in a recent study, the ECB found that, in a relatively large sample of EU banks (€720 billion in assets), 15% of the exposures were to the most carbon-intensive firms (Giuzio et al., 2019). Banks in the EU may soon be "expected to conduct a proper climate-related and environmental due diligence, both at the inception of a client relationship and on an ongoing basis", which "may take into consideration the quality of the clients' own management of climate-related and environmental risks" (European Central Bank, 2020).

⁶³See supra n 16.

⁶⁴See supra n 51.

A detrimental decision against a given financial institution may also have a “wake up call” effect and prompt investors⁶⁵ and banks⁶⁶ to reevaluate their expectations of the litigation risk that similar firms face. This provides another example of potential feedback effects: a successful precedent against a given financial institution could increase the probability of claimants filing similar claims against other institutions providing similar services. Nevertheless, it can be difficult to discern whether investors and banks are reacting to anticipated reputational costs or to the expectation that litigation might impose direct costs (most evidently, potential pay-outs or fines as well as lawyers’ fees) that will affect the company’s profits.⁶⁷

A detrimental decision against a given financial institution may also have a “wake up call” effect on insurance companies providing liability insurance to firms in a similar situation as the defendant. A detrimental decision might lead insurance companies to reassess the probability of similar financial services firms facing similar claims. As I described above, insurance companies may react to increases in the perceived risk of litigation by adapting the terms of their policies to exclude certain types of claims or to reduce the total coverage provided, or by raising their premia.⁶⁸

The speed at which these indirect costs might arise, or whether they will arise at all, can be difficult to determine. Investors’ reactions to negative shocks such as a detrimental decision respond to very different stimuli. The history of financial crises contains many examples of negative shocks that did not lead to widespread market reactions as well as examples of negative shocks that did. One possible explanation for this type of behaviour is that investors often react to the accumulation of

⁶⁵The concept of a “wake up call” effect was first introduced by Goldstein (1998) as a possible explanation of financial contagion from Thailand to other Asian countries in the Asian crisis of the late 1990s. In essence, a “wake up call” describes the phenomenon by which a particular event in one country (e.g. Thailand) can lead investors to pay increasing attention to countries featuring similar domestic fundamentals (e.g. similar structural and institutional weaknesses) and eventually reduce their exposure to the latter countries even before any crisis event has taken place. After Goldstein (1998), the wake-up call hypothesis has been tested in crisis episodes in other markets, including banking markets and capital markets, to explain the contagion of financial and credit risk. I propose that the same concept be used to examine whether litigation risk propagates in a similar way. Indeed, in their examination of a comprehensive sample of security class action lawsuits filed between 1996 and 2003, Gande and Lewis (2009) concluded that shareholders partially anticipate these lawsuits based on lawsuits against other firms in the same industry capitalize part of these losses prior to a lawsuit filing date.

⁶⁶In their analysis of class action lawsuits, Yuan and Zhang (2015) find that banks do change the terms of their loan contracts based on their perceptions of the borrower’s litigation risk. The assessment of such risk is often informed by the litigation risk faced by similar firms in the same industry.

⁶⁷Identifying the different drivers of investor’s reactions is important. Corporate reputation research relies on the assumption that market reactions to a detrimental court decision include the amount of any pay-outs (Karpoff, 2012). But financial institutions “yet-to-be-sued” will not incur pay-outs or fines, nor will they incur any lawyer’s fees, unless an actual claim is brought against them. Comparing the evolution of share prices between institutions who did face litigation and those who did not might reveal reputational costs in the latter group, but concluding that investors will have ruled out litigation risk for certain institutions can be difficult, particularly if the number of cases in the industry continues to rise. “Not-sued” institutions may always remain “yet-to-be-sued” institutions.

⁶⁸Indeed, there is evidence of “wake up call” effects leading to changes in the terms of bank loan contracts. See n 66.

negative shocks, refining their expectations at every turn;⁶⁹ but it is impossible to predict what level of accumulation will prompt a widespread market reaction.

Table 1. Costs of climate change litigation for financial institutions.

		Pay-out/fine	Legal and admin costs	Insurance costs	Financing costs	Reputational costs	Credit risk
DIRECT	Pre-filing					✓	
	Legal proceedings		✓			✓	
	Post-litigation	✓	✓	✓	✓	✓	
INDIRECT	Client					✓	✓
	Same industry			✓		✓	

3. Challenges

Attempts to quantify the costs described in Section II will face several challenges. First, all the academic studies that have attempted to estimate the costs of litigation were backward-looking exercises: they relied on historical data, be it court decisions or regulatory sanctions.⁷⁰ In recent years, the number of climate change litigation cases has been growing rapidly, with public authorities and companies in the fossil fuels and cement sectors having attracted the highest volume of climate change litigation (Setzer and Byrnes, 2019). The number of cases against financial institutions, albeit growing, is still relatively low,⁷¹ particularly to sustain any meaningful attempt to draw general conclusions about the costs of litigation in the industry.

Unfortunately, however, the lack of legal precedents is not a reliable indication of future climate change litigation risk. Climate change litigation is a complex phenomenon. There are many factors at play that determine whether a suit will be filed before a court or an arbitral tribunal, or whether a supervisory authority will initiate an investigation.⁷² But, perhaps more importantly, even if legal proceedings commence, the legal rules and standards on which a court, an arbitral tribunal, or a supervisory authority will base their decisions, are not static: they evolve with social and political sentiments,⁷³ and, in the specific context of climate change, they evolve as scientific knowledge

⁶⁹This relies on the assumption that capital markets are efficient, at least, in a semi-strong form, i.e. prices reflect past information and they react to publicly available information (Fama, 1970).

⁷⁰For a review of the academic literature that explores the costs of corporate litigation, with a particular focus on litigation under U.S. securities laws, see Arena and Ferris (2017).

⁷¹See *supra*, Introduction.

⁷²Some of these factors include financial considerations, such as the claimant's financial capacity to face all the costs that could potentially arise from litigation, and strategic considerations, such as the claimant's evaluation of the effectiveness of alternative mechanisms to put pressure on the defendant, or, more simply, the parties' abilities to reach a solution without the need to resort to a court or arbitral tribunal to solve the dispute or to initiate an investigation.

⁷³On the adaptive scope of fiduciary duties of pension fund trustees under Australian law, for example, Barker et al. (2016) note: The sharp evolution in the relationship between climate change and wealth-based interests suggests that, as with any

advances.⁷⁴ Therefore, the relatively low number of climate change cases against financial institutions does not exclude the possibility of a sudden surge in this type of litigation, particularly as the effects of climate change continue to aggravate. The empirical evidence of significant costs that companies, and, in particular, financial institutions, have faced as a result of non-climate related litigation is an indication of the potential risks associated with climate change litigation.⁷⁵

This puts financial supervisors in a difficult position. For the past four years, they have repeatedly expressed their concerns with the risks that climate change poses to financial stability, including the risks arising from legal liability (Carney, 2015); but in the face of a relatively low number of legal precedents, they will find it difficult to understand the potential costs of climate change litigation for the institutions they supervise if they rely on backward-looking exercises.⁷⁶ Forward-looking exercises based on scenario analysis would seem better suited. Some financial supervisors have already developed credit risk assessments to size the financial impact of climate-related risks to micro-prudential objectives, particularly in relation to insurance companies.⁷⁷ But these exercises have not gone beyond pointing to an increase in climate-related claims against insurance companies as a result of climate change under all the different scenarios (Regelink, 2017). Moreover, these estimations only cover one type of cost, the pay-outs that insurance companies will have to make to their policyholders; they do not cover all the costs that can arise from litigation, as described in section II. Perhaps more importantly, given the different nature of the services they provide, the types of climate-related claims that insurance companies and other financial institutions, such as banks or investment funds, can face will be very different (Solana, 2020).

If financial supervisors want to include climate change litigation risk in forward-looking exercises such as these, they could rely on the methodology used to estimate the costs of other types of litigation; especially to estimate costs such as legal and administrative costs, insurance costs, financing costs and reputational costs. But estimating the pay-outs and fines that a financial institution or one of its counterparties might have to pay can be very challenging because these estimations will be very sensitive to legal variables such as the type of claim, the type of remedy being sought or the type of sanction, and the court or administrative authority issuing the decision. The legal variables covered in existing academic studies of the costs of other types of litigation do not coincide with the legal variables that are relevant for climate change litigation. Approaches and findings in those studies may therefore not be transferrable. Moreover, pay-outs and fines will have a direct impact on some of the other costs,

material financial risk, an inactive or passive approach to its governance may be inadequate to satisfy trustee directors' SIS Act duty of due care, skill and diligence.

⁷⁴Marjanac and Patton (2018) argue that improvements in attribution science will have an impact on the scope of legal duties and will increase the likelihood that courts will be willing to issue both traditional and novel injunctive relief restraining actions, and rulings that require defendants to pay damages to claimant parties adversely affected by the impacts of climate change.

⁷⁵Claims arising from mis-selling PPIs are a prominent example of the significant impact that pay-outs and fine can have on financial institutions' balance sheets. Moreover, Armour et al. (2017) find that reputational losses, on average, are nine times larger than the sanctions imposed by U.K. financial regulators.

⁷⁶ Indeed, the Bank for International Settlements recently recognised the importance of assessing the risks and costs associated with climate change litigation in the insurance industry, but it also warned of the difficulty of accurately estimating litigation costs in the absence of legal precedents (Cleary et al., 2019).

⁷⁷See e.g. Bank of England (2019a); Regelink et al. (2017). Moreover, the Network for Greening the Financial System (2020) has very recently published a set of physical and transition pathways to calibrate different scenario variables to inform exercises that will test the impact of climate-related financial risks on financial institutions.

most notably, reputational costs and counterparty credit risk. This could affect supervisors' ability to rely on the estimations made in the academic studies that examine the costs of other types of litigation. An accurate estimation of all these legal variables would require an in-depth legal analysis. This analysis will have to be carried out in all the relevant jurisdictions where a given entity operates.⁷⁸ For entities with a wide international presence, the exercise can become very complex and costly.

If financial supervisors were able to estimate all of those costs despite the challenges of a multi-jurisdictional legal analysis, a forward-looking exercise would face the additional challenge of estimating the probability of a suit being filed or an investigation being initiated. Even if we were able to narrow down the number of potential claimants as a result of the legal analysis described in the previous paragraph, a claimant's decision to file a case will depend on a myriad of elements that can be very difficult to measure, e.g. its ability to fund the litigation⁷⁹ or its subjective assessment of the suitability of initiating litigation.⁸⁰

Estimating the indirect costs of climate change litigation will also be challenging. If the growing trend of this type of litigation continues, investors might revisit their expectations about climate change litigation as financial risk, especially if the continuation of that trend is underpinned by decisions imposing considerable direct costs on companies. A sudden revision of investors' expectations in relation to climate litigation across a given industry could also impose an indirect cost on those institutions that have not been sued. Anticipating when and how these indirect costs would arise will be difficult (Will insurance costs rise? If market valuations change, will they do so through credit ratings, ESG ratings or share prices? Or perhaps through all?), let alone estimating the amount of these costs in advance. To complicate matters further, indirect costs could also spur an increase in direct costs through feedback effects, as described in section II.B.⁸¹

Lastly, estimations of certain costs might face problems of double counting. For example, if financial institutions have liability insurance policies in place, estimating the costs of pay-outs and fines, and the cost of liability insurance premia may lead to an overestimation of the total costs: if the cost of pay-outs and fines are covered by the relevant policy, financial institutions will effectively avoid those costs. Nevertheless, insurance companies may challenge the coverage of costs arising from

⁷⁸Although the laws of two jurisdictions may include rules that are very similar in principle (e.g. a regulatory rule imposing a fine for failure to disclose environmental information to investors), the courts, arbitral tribunals and administrative authorities of different jurisdictions may approach the application of that rule very differently, for example by relying on different standards of compliance (What counts as sufficient disclosure?) or by interpreting key concepts (e.g. "environmental information") differently.

⁷⁹In the case of an administrative investigation, e.g. in the context of financial supervision, the same problem arises when attempting to estimate the administrative authority's capacity to launch an investigation given its limited financial and human resources.

⁸⁰A claimant's decision to initiate litigation may be motivated by factors beyond the probability of the case succeeding. For example, a claimant may decide to use a case strategically to build up social and political support for its cause, placing greater emphasis on the media coverage of the filing than on the actual outcome of the case. The most common measures to estimate litigation risk under U.S. securities law, as in Arena and Ferris (2017), do not take these factors into account and use firm characteristics, industry indicators or a mixture of both as proxies for the probability of litigation.

⁸¹For example, a decision requiring a financial institution to pay compensatory damages or imposing a fine might set a precedent that could incentivise other claimants to file suits against other entities operating in the same sector.

climate change litigation.⁸² If the costs are not covered under the relevant policy, financial institutions will end up facing both the cost of pay-outs and fines, and the cost of liability insurance premia. Similarly, some reputational costs at one institution (such as the cost of clients' withdrawing money and deposits) may be compensated by inflows at other institutions (those attracting the money and deposits from clients dissatisfied with the first institution). While reputational costs may net out at the system level, it may be worth calculating these costs at the firm level. For example, firm-level data will allow those financial institutions disciplined by their clients, as well as their supervisors, to monitor the impact of those reputational costs on the institution's solvency. Different stakeholders will have different interests. Any cost analysis will need to provide clear justifications for the methods used in the estimations, including potential double counting issues such as these.

4. Conclusion

Climate change litigation is on the rise, including litigation in the financial services industry.⁸³ Nevertheless, despite the considerable growth in the number of climate change cases, our understanding of the potential costs arising from climate change litigation is very poor. This essay presents the first comprehensive analysis of the different types of costs that can arise from climate change litigation. It focuses on financial institutions, whose exposure to climate change litigation risk is somewhat unique as a result of the central role that these institutions play in the development of economic activities that aggravate climate change.

The analysis reveals several important facts. First, contrary to popular understanding, not all direct costs will arise at the end of legal proceedings. Most direct costs are likely to arise at that point, following the publication of the judgment, award or decision that culminates the case; but some of these costs may take longer to materialise. Perhaps more importantly, the analysis indicates that direct costs can also arise before the conclusion of legal proceedings, and even before legal proceedings have commenced at all. Any attempts to estimate these direct costs may take the publication of a final decision as a reference, but they should look beyond the period immediately following the conclusion of the legal proceedings to the post-litigation and even pre-filing stages.

Second, the total costs arising from climate change litigation go beyond direct costs. Financial institutions can also be affected by climate change litigation against third-parties. In particular, financial institutions can incur indirect costs when one of its client debtors is involved in climate change litigation. Climate change litigation against companies in the same industry can also give rise to indirect costs as a result of "wake up call" effects.

Third, reputational costs are pervasive. They can arise at different stages of the litigation process and they can do so in the form of direct or indirect costs. Whether they are also the most significant type of cost is an empirical question. In principle, the other type of cost that could have a significant economic impact on financial institutions is pay-outs and fines. As described in section III, an empirical analysis would require a very detailed analysis based on each of the legal remedies available under specific jurisdictions.

The analysis presented in this essay can support the efforts of various actors who have an interest in gaining a better understanding of the costs associated with climate change litigation. Financial

⁸²See e.g. *The AES Corporation v. Steadfast Insurance Company*, Virginia Supreme Court, Record No. 100764, 20 Apr. 2012.

⁸³See *supra* Introduction.

institutions may be required by law to estimate and disclose the potential impact that climate change litigation can have on their income statements and balance sheets. Poor data availability and other methodological challenges will not be an excuse.⁸⁴ The authorities tasked with the supervision of those institutions will also have an interest in gaining a better understanding of how these costs could potentially affect the solvency of these institutions and the stability of the broader financial system.⁸⁵ The recent PPI scandal in the UK illustrates that the economic impact of litigation on financial institutions can be considerable. Credit rating agencies do include litigation risk as part of their credit risk assessment,⁸⁶ but they do not include climate-related financial risks, which suggests that their understanding of the costs arising from climate change litigation may be incipient. A better understanding of these costs will also help policy makers and legislators to better assess the effectiveness of new regulations, including reforms to existing climate change laws.⁸⁷ Potential claimants could also use cost analysis to inform and support their litigation strategies. I hope that the categorisation of these costs, presented in Section II, and the identification of several methodological challenges, presented in Section III, will facilitate many of these exercises.

Any progress in the estimation of the costs of climate change litigation for financial institutions could help advance similar exercises in other industries, most notably the fossil fuels and cement industries, which have concentrated the highest volume of climate change litigation to date.⁸⁸ Certain cautions must be borne in mind, however, since climate change litigation may give rise to specific costs in specific industries. Most evidently, some claims may be exclusive to specific industries. For example, there may be regulatory provisions that only affect institutions in specific industries, e.g. the requirement of banks to perform environmental due diligences before extending finance.⁸⁹ Moreover, the same costs may manifest themselves differently in different industries. For example, financial institutions may face indirect costs as a result of their client debtors being involved in climate change litigation (effectively, indirect costs flowing “upstream”), whereas companies in other industries may face indirect costs as a result of suppliers being involved in litigation (effectively, indirect costs flowing “downstream”). Similarly, climate change litigation might give rise to different effects in different industries. For example, Carbon Majors may be more exposed to direct costs that predate the actual filing of a suit, and financial institutions may be more exposed to indirect costs resulting from a client facing a climate lawsuit. Different industries will therefore require different approaches to the analysis of the costs of climate change litigation.

I would like to conclude with two specific recommendations. The first recommendation is about terminology. In his landmark speech at Lloyd’s of London, Mark Carney, then Governor of the Bank of England, articulated how the current climate emergency could pose a risk to financial stability. He described three risks: 1) “physical risks” deriving from climate- and weather-related events, 2) “transition

⁸⁴A recent ECB statement leaves no room for doubt: “[climate-related and environmental] risks are not expected to be excluded from the assessment because they are difficult to quantify or because the relevant data are not available.” (European Central Bank, 2020).

⁸⁵See supra n 19.

⁸⁶Moody’s, for example, accounts for litigation costs as “conduct related costs”.

⁸⁷For example, if the total costs of climate change litigation are not very high, regulators and legislators may prefer not to rely on litigation as a governance tool, or to complement it with additional regulatory strategies.

⁸⁸See supra Introduction.

⁸⁹See supra n 15 and 62.

risks”, which could result from the process of adjustment towards a lower-carbon economy, and 3) “liability risks”, which could arise “if parties who have suffered loss or damage from the effects of climate change seek compensation from those they hold responsible” (Carney, 2015). This framework has informed many of the regulatory and industry initiatives aiming at managing climate-related risks, although it is now common practice to include liability risks as an example of physical and transition risks (Network for Greening the Financial System, 2019).

This understanding of “liability risks”, however, is very narrow. First, the term “liability risk” is typically regarded as a risk that will primarily affect insurers (Prudential Regulatory Authority, 2018), since companies will typically have liability insurance policies in place that will cover any pay-outs and fines resulting from climate change litigation.⁹⁰ Yet this assumption is highly debatable. Most commercial general liability policies have exclusions that seem to apply to claims that could arise in climate change litigation.⁹¹ Indeed, policyholders have been unsuccessful in claiming compensation under their liability insurance policies for costs incurred as a result of climate change litigation.⁹² If companies have to face the pay-outs and fines that may result from climate change litigation, these direct costs can pose significant pressure on the firm. Moreover, the term “liability risks” only focuses on one particular cost (i.e. pay-outs and fines) associated with a detrimental decision. As evidenced by the categorisation of direct and indirect costs, presented in section II, the total costs of climate change litigation can go well beyond pay-outs and fines.

Such a narrow conception understates the complexity of climate change litigation and threatens to underestimate the financial risks of the current climate emergency. A first step to acknowledge the complexity of climate change litigation would be to discard the term “liability risk”. This term only captures one of several costs potentially arising from climate change litigation. The term “climate change litigation risk” seems to better capture the complexity of the phenomenon and the diversity of costs associated with a potential climate suit.⁹³ In the future, a complete analysis of climate-related financial risks will require financial institutions and supervisors to understand the complex effects of climate change litigation. They should begin to work on addressing the methodological challenges identified above to update their current risk assessment and supervisory frameworks as early as possible.

The second recommendation suggests a possible avenue for future research. Based on the earlier remarks in this section, pay-outs and fines, and reputational costs, are perhaps the most important costs in terms of potential financial impact. Yet they are probably the ones facing the most methodological challenges too. Future attempts to estimate the costs of climate change litigation should make these

⁹⁰The term “liability risks” was first coined as a result of regulators’ concerns with the exposure of insurance companies to the risk of their insured seeking compensation from climate change related events. Indeed, the first (and only) comprehensive analysis of liability risks conducted by a financial regulator to date was part of an exploration of the impact of climate change on the insurance sector (Prudential Regulatory Authority, 2015). Anecdotally, Mark Carney’s landmark speech on “Breaking the tragedy of the horizon” was delivered at Lloyd’s of London, an insurance and reinsurance market, on the date the PRA’s analysis of the insurance sector was published. It is possible that regulators may have simply extended the term “liability risks” to other financial institutions without considering whether the nature of the climate-related legal risks faced by insurance companies may differ from those faced by other financial institutions.

⁹¹See supra n 33.

⁹²See *The AES Corporation v. Steadfast Insurance Company*, Virginia Supreme Court, Record No. 100764, 20 Apr. 2012.

⁹³Anecdotally, in its Final Recommendations, for example, the TCFD uses the term “litigation risk” instead of “liability risk” (Task Force on Climate-related Financial Disclosures, 2017).

two costs a priority. I have argued elsewhere that, in the near future, disclosure of climate-related financial risks will attract most of the climate change litigation against financial institutions (Solana, 2020). Indeed, in the first few weeks of 2020, shareholders at some of the largest banks in the U.K. and the U.S. have filed climate change resolutions calling for the banks to improve their disclosure of climate-related financial risks and to publish a plan to phase out financing energy companies not aligned with the Paris agreement (As You Sow, 2019; Crow and Mooney, 2020). In fact, the number of climate resolutions that went to a vote at a financial company annual general meeting has risen from just 4 in 2015 to 19 in 2019 (Mooney and Nauman, 2020). This suggests an obvious avenue for new academic research: what is the economic cost of failing to disclose climate-related financial risks?

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Conflict of interest

The author declares no conflicts of interest in this paper.

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