



## Effect of Climate Change Litigation and Court Decision on Corporate Stock Price

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**Abstract:** climate litigation rulings are widely viewed as the ultimate tool to enforce climate compliance. The objective of this paper is to evaluate whether a ruling on climate litigation has an impact on corporate share price and the direction of the effect. Prior work inclination is on the concept of climate law entropy and the recent case ruling on Lufthansa's climate litigation. The methodology is mixed with a review of relevant literature and mini-quantification of value difference using a t-test to analyse difference in mean share price before and after climate litigation ruling on Lufthansa, and finally a formulation of framework. Findings show that unlike previous ubiquitous literature findings, the share price of Lufthansa experienced a significant increase in value after the climate litigation ruling with a significant p-value of less than 0.01 (which indicates high significance level of difference in share price). The paper has practical and theoretical implications, for business law academics and for practitioners. Climate litigation may serve a dual role of enforcing climate law compliance and instilling corporate legitimacy. The paper contributes original value to corporate climate litigation literature by proposing a novel conceptual framework for understanding the diverse differential impact of climate litigation on corporate share price.

**Keywords:** climate litigation; climate offence; climate law; environmental law; business law; environmental compliance; climate regulation

### 1. Introduction

Climate change is no more a folk tale, the reality and danger to humans is being felt around the world – with unprecedented floods, wildfires, and intense heat waves amongst others. The judiciary is the only tool to force human compliance to climate change laws required to reduce negative effects of climate change. To this end,

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international climate change legal experts, world leaders and NGOs gathered in UAE in December 2023 for the United Nations Framework Convention on Climate Change 28th Conference of the Parties (COP) in Dubai. The parties reemphasize the centrality of the legal systems in assisting with the needed urgency for the reduction of negative climate change impacts. One amongst other important deliberations is a call for new climate laws:

*“At the core of the issue is the urgent requirement for countries to have laws that address climate change. Climate litigation is a symptom of a breakdown of trust – it’s a last course of action when companies and governments fail to deliver on their commitments and obligations. Given the slow progress, it’s become clear that meaningful climate action will require a legal foundation. This is why we believe new climate laws must be legally binding and science-based at the national level to be truly effective”.* (ClientEarth, 2023, p. 2).

Climate litigations have assumed a rising trajectory around the world; as of end of 2022, about 2,180 climate litigation cases around the world had been recorded (UN EP, 2023), which is an indication that individuals and organisations are increasingly becoming aware of the dangers of climate change and the need to step up legal actions towards assisting to ameliorate the rising scourge of climate change.

Climate litigation is being viewed as a game-changer in the fight against climate change since it provides an innovative approach (UN EP, 2023, p. 1). The Global Climate Litigation Report 2023 Status Review states that more people are turning to the legal system to address the climate catastrophe. Accordingly, the 2,180 cases (as of December 2022) pertaining to climate change had been filed in 65 different jurisdictions (UN EP, 2023, p. 1). These included regional and international courts, tribunals, quasi-judicial bodies, and other adjudicatory bodies such as arbitration tribunals and Special Procedures at the UN. There is growth in climate litigation around the world, from 884 instances in 2017 to 1,550 cases in 2020, this shows a steady increase. Notably, local communities, women’s organizations, Indigenous Peoples, and children and youth are crucial in starting these cases and advancing climate change governance reform in many different countries across the globe (UN EP, 2023, p. 1).

The United Nations Environmental Programme (UN EP) recognises the rising trend of climate litigation on government and corporate entities:

*“The amount of climate change litigation is increasing, the range of legal theories is expanding, and it has become clear that climate cases can contribute in*

*meaningful ways to compel governments and corporate actors to pursue more ambitious climate change mitigation and adaptation goals.”* (UN EP, 2020, p. 5).

The quantity, breadth, and importance of laws that codify national and international responses to climate change have increased significantly over the last ten years. Due to the increased duties and rights imposed by these laws, there are growing litigations contesting the legitimacy and applicability of these laws. Litigation aiming at persuading legislators and officials to embrace more extensive and ambitious measures to addressing climate change has also increased (UN EP, 2017, p. 1).

Accordingly, the rise in climate lawsuit cases in recent years is thus indicative of the courtroom’s increasing importance in the worldwide battle to combat climate change. Research released by the UN Environment Programme (UNEP) highlights that in the last three years, the number of climate-related cases has nearly doubled. The instances are generating increased pressure on governmental bodies and corporate organizations to meet their climate obligations and aim for more audacious targets concerning the mitigation and adaptation of climate change (UN EP, 2021, p. 1).

One amongst diverse avenues of correcting different forms of corporate environmental damage is through the court of environmental justice to assist in redressing corporate environmental injustices (Konisky, 2015, pp. 1-28), and to protect fundamental environmental rights of people, including fauna and flora (McCallion & Sharma, 1999, pp. 351 - 365). Some researchers have engaged in the analysis of the effect of climate litigation on climate action; but this paper looks at the effects of climate litigation on the stock price. This is important because corporate, given the need to protect their investments, shareholders have a role to play toward helping the corporate management through shareholder activism to comply with climate regulations (Sjöström, 2008, p. 141).

## **2. Problem of Paper**

The literature on climate litigation and firm performance reports more negative results, which show that following court decisions on climate litigation, the share price of defendants (the offending companies) respond negatively through a plummeting of share values if the defendant losses the case (Kolaric, 2023, p. 1; Sato et al, 2023). However, it is possible that in isolated cases of court decision on climate litigation, the share price of the defendant may gain in value even after losing the case. This may inter alia, occur when the defendant commits climate offense

inadvertently, which might demonstrate inevitable existence of entropy in climate laws. Additionally, a related opinion by Muradoglu and Clark (2008, p. 1) indicate that stock markets may possess the sensitivity to differentiate between minor and major climate offences. Therefore, this paper contributes to the literature on climate litigation and firm value by demonstrating a case of rise in defendant's stock value after a loss in climate litigation.

### **3. Objective of Paper**

Therefore, the objective of this paper is to demonstrate the possibility of a rise in firm's stock price following a court decision on climate litigation. The aim is to prove that in some cases, court decision on climate litigation may serve as a demystification of entropy in climate laws, which thus provides the defendant with additional strategic information for corporate climate strategy.

### **4. Literature Review**

Kolaric (2023, p. 1) evaluated the impact of climate litigation and activism on the stock prices of major leaders in the oil and gas industry, with a particular focus on North American and European companies. The results showed a notable decline in these companies' stock values, pointing to a major detrimental effect. These findings highlight the negative effects on the firms' total value that increased climate lawsuit and climate activism risk can have.

In their research, which focussed on US and European-listed firms, Sato et al. (2023, p. 1) carried out comprehensive research and assembled a large database containing files and rulings relevant to 108 global climate change litigation from 2005 to 2021. Based on their causative analysis, they found that the average drop in company value, relative to projected values, was -0.41% when a lawsuit was filed, or an adverse court decision was received in a climate-related case (Sato et al, 2023, p. 1). Remarkably, the cases brought against Carbon Majors had the most effect on stock market reactions; as a result, the firm's value dropped by -0.57% at the time of filing and -1.50% after adverse rulings. Furthermore, they saw more significant market responses in cases labelled as "novel," meaning they had creative legal defences or took place in uncharted territory. On the other hand, litigation brought against companies that were not Carbon Majors revealed no statistically significant impact on business value. Accordingly, based on their research findings, Sato et al. (2023,

p. 1) highlight that lenders, financial regulators, and governments should see the possibility of climate lawsuit as a relevant financial risk, especially considering the likelihood of global warming (Sato et al. 2023, p. 1).

An analysis of the effects of legal enforcement proceedings by the Securities and Exchange Commission (SEC) on share prices was carried out by Muradoglu and Clark (2008, p. 1). Their study findings indicate that SEC cases negatively impact share value. Finding the precise elements of the legal enforcement process that have the biggest impact on business value, however, was the primary goal of their research. Therefore, their findings suggest that corporations who engage in proactive communication with the market regarding their enforcement matters are treated more favourably than those that choose to stay silent Muradoglu and Clark (2008, p. 1). Furthermore, their analysis also shows that the market can differentiate between minor and major climate law infringements, with fraud and insider trading cases having more severe negative effects than procedural infractions and incorrect accounting. Additionally, they found that the market's responses change according to the nature of court decision on climate litigation (if favourable or unfavourable). Owing to the increased degrees of uncertainty surrounding them, pending, and partially settled litigations typically have bigger short-term negative returns than cases with known results of a similar sort (Muradoglu & Clark, 2008, p. 1).

In their related research, which sought to evaluate the effect of environmental justice reform on environmental governance at the firm level, Zhang et al (2019, p. 1) uncovered some noteworthy discoveries by using a difference-in-differences estimation model. First, they noted that environmental courts are essential in increasing businesses' environmental investment, and that this link holds true for a variety of specifications and substitute measures. Second, they identified three possible pathways by which this effect manifests itself: enhanced standards of justice and environmental protection enforcement, along with the reduction of local government intervention. Overall, Zhang et al.'s (2019) paper provides insightful information for regulators who are concerned with environmental protection by illuminating the fundamental mechanisms that underpin the actual effects of environmental justice on business environmental investment.

However, there is a dearth of existing literature, which has paid attention to a case where a climate litigation decision (even when the defendant losses) provides an added value to the company, which may result from where the court decision provides a demystification of entropy in climate laws and codes. Scholars describe entropy within the sphere of legal systems as the quantity of uncertainty which exists

in a set of given laws, legal doctrines, or legal systems (Sichelman, 2022, p. 1; Katz & Bommarito, 2014, p. 337). This is an important area of study, which may benefit scholars in business or commercial law because according to Katz and Bommarito (2014, p. 337) legal codes and/or doctrines are entwined with linguistic complexity. This, therefore, makes it possible that environmental offences may be committed with no obvious premeditation, and the legal system – through litigations and court decisions brings clarity to such apparent entropy. Sichelman (2022, p. 12) opines as follows:

*“the legal system can in effect reduce legal entropy by reducing the uncertainty and related information costs in delineating, interpreting, and applying the law”* (Sichelman, 2022, p. 12).

Therefore, this paper contributes by demonstrating that in some cases, court decision on climate litigation may serve as a demystification of entropy in climate laws, which thus provides the defendant with additional strategic information for corporate climate strategy.

## **5. The Case of Climate Litigation on Lufthansa**

This section provides a summary of Lufthansa’s climate litigation as provided in the Climate Case Chart by Sabin Centre for Climate Change Law (2023, p. 1).

Summary of The Advertising Standards Authority (ASA) Ruling on Lufthansa:

The issue: The case was *“whether a poster for Lufthansa made misleading claims about the airline’s environmental impact”* Sabin Centre for Climate Change Law (2023, p. 1)

Jurisdiction: United Kingdom - Advertising Standards Authority (ASA)

*“A poster for Lufthansa, seen in June 2022, featured an image of the front of a plane in flight. The underside of the plane was represented by an image of the earth from space. The ad included text which stated, “LUFTHANSA GROUP. CONNECTING THE WORLD. PROTECTING ITS FUTURE. #MakeChangeFly”. The Advertising Standards Authority (“ASA”) challenged whether the ad gave a misleading impression of Lufthansa’s environmental impact. By ruling of Mar. 1, 2023, the ASA upheld that challenge. The ASA told Lufthansa to ensure that the basis of future environmental claims was made clear and did not give a misleading impression of*

*the impact caused by travelling with the airline, and that robust substantiation was held to support future claims”* Sabin Centre for Climate Change Law (2023, p. 1).

Given the above climate litigation and following from the prior literature results which found negative effect of climate litigation on defendant’s share price, the following section presents the analysis of share price data collected on Lufthansa before and after the climate litigation decision to ascertain whether there is a significant difference in Lufthansa’s share price and to check if the difference (if any) is negative or positive.

## **6. Method and Result**

This paper inclines on a mixed approach of qualitative review and a mini-numerical presentation of statistical t-test of mean difference in stock price of companies before and after decisions on climate litigation on Lufthansa to check whether the climate litigation decision had some differential effect on stock price of the company’s stock price. Albeit the fact that the world of law and legal proceedings is a “world of words” Reagan (1999, p. 835), the brief statistical section of this analysis is in alignment with the clarification on the importance of the usage of statistical numbers in some instances of legal proceeding (Royal Society, 2020, p. 6), which notes as follows:

*“Fact-finding and the assessment of expert evidence in court cases often requires an understanding of probability, statistics and numbers”* (Royal Society, 2020, p. 6).

However, the need for numbers may depend on the type of legal questions at hand, as an instance of this, The Royal Society (2020, p. 6), provides an example of such question such as:

*“Did the exposure to the emissions from an incinerator raise the risk of birth defects?”* The Royal Society (2020, p. 6)

In another dimension, Whitten (1978, p. 1030) emphasized the importance of statistics disparity in court decisions on rebuttals against a prima facie case of discrimination. Reagan (1999) provides a furtherance of application of statistical numbers in court decision in his excerpt as follows:

*“the world of law is a world of words, but numbers have a way of sneaking in, ... certain numerical laws, such as the law of probability, permeate our legal systems ... from time to time, legal questions decided by the supreme court either require or*

*merit quantitative analysis. For example, Baye's theorem can be helpful in determining whether statistical evidence supports a claim of discrimination"* (Reagan,1999; p. 835)

Accordingly, the question being asked in this paper is whether the court decision on climate litigation on Lufthansa had any differential effect on Lufthansa's stock price before and after the court decision. This inquiry on differential effect of court decision was analysed in this paper using a t-test for mean difference on Lufthansa's stock price before and after the climate litigation decision (Table 1).

Although many decided cases on climate litigations have been presented in the above sections, but for succinct illustration, this paper uses a single sample with data from Lufthansa's stock price to demonstrate that a decision on a case of climate litigate may have the propensity to bestow an implicit confidence from shareholders and/or investors that the defendant company (in this case Lufthansa) is still a trusted going concern by investors and stakeholders.

Table 1 provides the result of t-test analysis for mean difference in the share price of Lufthansa before and after the decision on climate litigation. The results show a high significant mean difference in share price of Lufthansa (before and after the climate litigation decision) at a p-value of 0.01 for both one tail and two-tail analysis. Furthermore, the results show a positive difference given that the mean share price in Table 1 is higher than the mean share price before the climate litigation decision. The rise in the share value of Lufthansa is contrary to majority of prior literature findings which show a negative share price following climate litigation rulings. However, this finding appears to corroborate the prior finding of Muradoglu and Clark (2008, p. 1) which indicates that the stock market can differentiate between minor and major climate infringements and respond accordingly in their value preference for firm's stocks (Muradoglu & Clark, 2008, p. 1).

**Table 1. t-Test of Paired Sample Stock Prices for Mean Difference (before and after Decision on Climate Litigation on Lufthansa**

t-Test: Paired Two Sample for Means		
	<i>Stock Price After Cour Decision</i>	<i>Stock Price Before Court Decision</i>
Mean	8.845466667	6.853222222
Observations	45	45
Hypothesized Mean Difference	0	
df	44	
t Stat	8.451067897	
P(T<=t) one-tail	0.00001	



t Critical one-tail	1.680229977	
P(T<=t) two-tail	0.00001	
t Critical two-tail	2.015367574	

Source: Author's analysis with data from Fusion Media-Investing (2023)

## 7. Postulating a Framework for Climate Litigation and Corporate Value

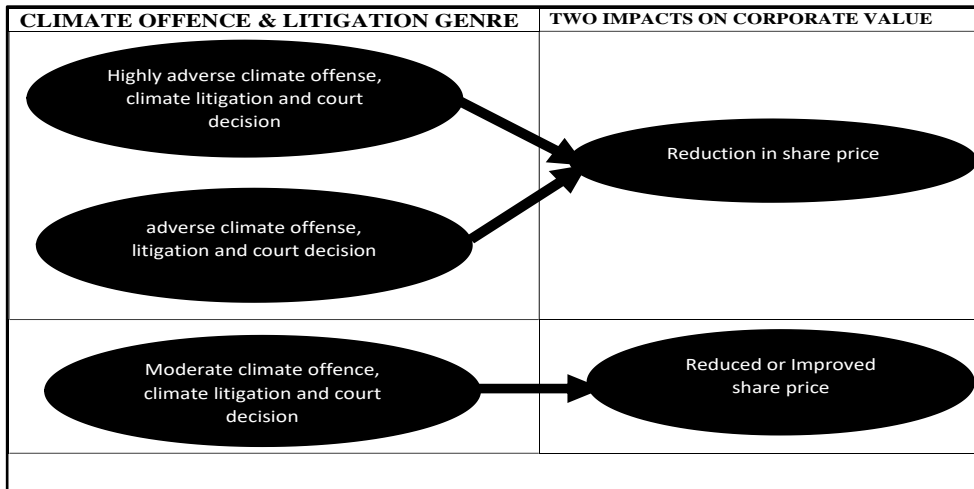
From the example of Climate Litigation on Lufthansa and the differential results in Table 1, this paper proceeds to propose a maiden postulate for further research. This postulation is foreground on ubiquitous previous research, with findings that show decreasing corporate value after corporate climate litigation. Accordingly, the result of this paper's analysis using a single case of climate Litigation on Lufthansa postulates that it is not in all conditions that climate litigation may adversely affect a corporate value. Decided climate litigation cases such as infringement against a code of conduct like code of advertisement (as in the case of Climate Litigation on Lufthansa), which has posed no immediate known threat to human health may not be comparable to proven oil spill environmental litigations with dangers to human health, flora and fauna. This distinction is apparent in the BBC report:

*"The Niger Delta communities of more than 40,000 people say decades of pollution have severely affected their lives, health and local environment"* (BBC, 2023, p1).

Therefore, this paper proposes a framework, whereby climate or environmental litigations may affect corporate value depending on whether the climate offense is highlight adverse (immediate impact on health and lives of humanity); adverse (affecting the flora and fauna – with potential future impact on health and life of humanity), and moderate (breach of codes, such as advertisement or information codes of conduct with likelihood of misleading the public). A decided climate litigation on infringement of a code of conduct such as advertisement code (with warnings to remove contentious advert contents or wordings and/or payment of minimal fines) may have a implicit environmental legitimisation of a company after such litigation decisions. This paper contends that similar court decisions may serve as a demystification of corporate climate entropy – given the complexity of climate related codes and/or laws (Beckmann et al, 2023, p. 17-59; Beck, 2009, p495, Roberts, 1991, p. 32). According to the literature on probability theory, such decisions may serve as additional information that may assist corporate current and future risk analysis and strategy thereof (Roberts, 1991, p. 32). This is because, such decisions, which may appear as corrective justice, may likely be perceived by

shareholders and/or investors as climate responsibility corrections and directive, with no forceable risk to their investments.

Accordingly, this paper views climate litigation and attendant court decision as an enhancement of clarity in climate laws and codes (Minnerop & Rostgaard, 2020, p. 44; Setzer & Benjamin, 2020, p. 77; Macchi, 2021, p. 93; Minnerop, 2020, p. 215 - 226). As an example, a close deconstruction of Lufthansa’s ASA decision on the climate litigation shows that in some cases of climate litigation, court decisions may be analogous to a demystification of corporate climate law entropy. Therefore, such court decisions become an additional information (a clarity) for formulation and adherence to future corporate climate strategy. This becomes of value since climate aware and climate-sensitive investors could place value on and develop more trust and/or confidence on the corporate. Such apparent endearment would have a potential value increase on corporate share price as investors hold onto their shares and/or buy more shares following similar corrective decisions on climate litigation. Hence this framework (Figure 1) holds that some climate litigation decisions may provide an implicit value to the corporate (Muradoglu & Clark, 2008, p. 1).



**Figure 1. A Frame of Climate Litigation Decisions and Plummeting or Increasing Share Value**

*Source: Author*

## 8. Conclusions

This paper inclined on the objective of demonstrating the prospect of a rise in share value following a ruling on climate litigation. The paper used the recent decided case of Lufthansa to show that in some cases, a ruling on climate litigation may serve as a demystification of entropy in climate laws, of which investors in stock market may see such decision as a confirmation of corporate legitimacy for continuous operation whilst complying with the ruling directive. Such decision, which the stock market might regard as minor climate offence may provide the defendant (the company in this case) with additional strategic information for corporate improvements in their climate strategy. Accordingly, Climate avid investors may interpret the case of Lufthansa's climate litigation ruling as posing no risk to their investments, hence the rise in stock price after the climate litigation ruling by ASA. This finding provides a preliminary corroboration of earlier research finding, which indicate that the market may be able to differentiate between minor and major climate law infringements and to reflect same in their valuation and continued patronage of corporate stocks (Muradoglu & Clark, 2008, p. 1). The significance of this paper lies in its practical implication, for business law academics and for practitioners where climate litigation may be theorised as in Figure 1 – to serve both the purpose of enforcing compliance with climate law and covertly bestowing legitimacy for the defendant. The originality and value of this paper is rooted in the provision of a conceptual framework in Figure 1, which conceptualises climate litigation and decisions genres with attendant impact on either reducing or increasing share value. This conceptual framework contributes as it provides an agenda for further research discussions.

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