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The Psychology of Effective IEAs: Beyond Rational Choice Theory

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Abstract

International environmental law suffers from poor compliance and participation, hindering its ability to address global climate issues effectively. Efforts to improve this have been borne out of a rational choice framework, in which it is assumed that states are rational actors that seek to maximize their utility. This theory has dominated international legal scholarship for decades, but it cannot adequately capture the reality of state decision-making. This work argues that rational choice theory must incorporate psychological factors in its analysis of state behaviours to strategically form effective international environmental agreements – specifically by using rewarding mechanisms as positive incentives. Using the Montreal Protocol as an example of effective rewarding mechanisms, this paper provides an alternative strategy for increasing participation and compliance with international environmental agreements.

Keywords

International Environmental Agreements, Rewarding Mechanisms, Psychology, Behaviour, Compliance, Participation, Montreal Protocol.

Summary for Lay Audience

The urgency of the climate crisis demands a re-evaluation of international environmental agreements. Despite a long history of coordinated efforts, environmental challenges continue to grow more dire. While attempts have been made to establish an effective international climate regime, its efficacy continues to be hampered by limited state participation and compliance. As environmental degradation accelerates, a critical evaluation of current agreement design is essential to identify and address the shortcomings of international environmental law.

For decades, the study of international law has been dominated by rational choice theory, which posits that states function as rational actors driven by maximizing potential benefits. While rational choice theory remains influential, it has been criticized for neglecting the impact of emotions and psychology on decision-making. This work argues that expanding the scope of rational choice theory to incorporate these considerations is vital for enhancing the effectiveness of international environmental agreements. By leveraging insights from psychology and behavioural science, strategic tools like rewarding mechanisms can be employed to incentivize state participation and compliance. Rewarding mechanisms are internal and external benefits that entice states to participate and comply with treaty obligations. They can take the form of financial rewards, reputational gains, and exclusive trading benefits, among others.

The Montreal Protocol is a compelling testament to the effectiveness of such mechanisms. The inclusion of exclusive trade provisions, club goods, financial assistance, and reputational gains helped the Protocol become one of the most effective international environmental agreements of all time. This success demonstrates how strategic treaty design that incorporates both utility and psychology can bolster the international environmental regulatory regime. By adopting a more nuanced approach to international cooperation, we can pave the way for the development of stronger environmental agreements, ultimately safeguarding the health of our planet.

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Preface

[I]f the agreement is well-designed – sensible, comprehensible, and with a practical eye to probable patterns of conduct and interaction – compliance problems and enforcement issues are likely to be manageable, [and therefore strong enforcement mechanisms are unnecessary].¹

I confess that at the beginning of this research project, I had no intention of going near theoretical frameworks. My research comfort zone lay firmly in environmental law and sustainability, where theory existed in the occasional whisper but never dominated discussions. I knew environmental scholarship as a place for solving real, concrete challenges that threatened to destabilize our current socio-political structures, not as a forum for discussions about appropriate theoretical framings. It wasn't until I began researching for this project that this perception began to change.

As a law student, exposure to theoretical scholarship is slim. The letter of the law rules all, and 'thinking like a lawyer' becomes a mantra beating in your head. I read more case law than I could ever hope to quantify, but I was confident I finally understood the law at the end of my final year. It took one day of graduate studies to recognize how foolish I had been. I quickly learned that legal scholarship wasn't about echoing familiar answers but about unearthing hidden questions. I might have known how to describe international environmental law, but could I explain the nature of it? Could I unravel it? What question hadn't yet been asked?

It has been clear to me since my undergraduate degree that something is wrong with international environmental law. Despite a long history of global action, the better part of my adult life has been contending with mounting fears of climate collapse and an uninhabitable planet for future generations. The more research I did for this project, the more I came to realize I wasn't interested in explaining what environmental law was, but

¹ Abram Chayes & Antonia Handler Chayes, "On Compliance" (1993) 47:2 *International Organization* at 183.

what it had the potential to be. This research unfolds as more than a project – it reflects a personal journey of self-reflection and transformation. I encourage all of us to take the time to reflect on what we think we know, discover what questions we need to ask, and be brave enough to try new things.

Chapter 1

1 Introduction

The year 2023 proved to be the hottest ever recorded.² At almost 1.2 degrees Celsius, Earth's average surface temperature is rapidly approaching the 2 degrees Celsius threshold established by the Paris Agreement in 2012.³ The future doesn't look much more promising, with a 99% chance that 2024 will rank among the top five warmest years on record.⁴ What's more, environmental crises and extreme weather events are being recorded across the globe in severities we have seldom seen. Resource depletion, species extinction, ecosystem disruption, heatwaves, floods, droughts and wildfires are just some of the consequences we can directly tie to the Anthropocene.⁵ "The extremes we have observed," warns Carlo Buontempo, Director of the Copernicus Climate Change Service, "provide a dramatic testimony of how far we are from the climate in which our civilizations developed...we need to urgently decarbonize our economy whilst using climate data and knowledge to prepare for the future".⁶

In the face of a rapidly deteriorating global environment, international environmental law (IEL) has emerged as the preferred framework for tackling these ecological challenges. This evolving body of law governs relations between states and, increasingly, non-state actors to protect the environment and promote sustainable development.⁷ IEL seeks to foster international cooperation and establish legal obligations for environmental protection through treaties, customary international law, and principles. While decades of international collaboration have yielded a significant number of environmental

²Copernicus, "2023 is the hottest year on record, with global temperatures close to the 1.5°C limit" (9 January 2024), online: *Copernicus* <<https://climate.copernicus.eu/copernicus-2023-hottest-year-record>>.

³ Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104 [Paris Agreement].

⁴ NOAA, "2023 was the world's warmest year on record, by far" (12 January 2024), online: *NOAA* <<https://www.noaa.gov/news/2023-was-worlds-warmest-year-on-record-by-far>>

⁵ Copernicus, *supra* note 2.

⁶ *Ibid.*

⁷ Philippe Sands, *Principles of international environmental law*, 2nd ed. (New York: Cambridge University Press, 2003).

agreements, a concomitant rise in environmental crises and extreme weather temperatures indicates that despite global efforts, IEL struggles to be effective.⁸

There are many factors through which this effectiveness might be measured, but in IEL, where collaboration is prioritized, it is particularly shaped by participation and compliance. To bring about significant change, IEL must have a sufficient number of states signing international agreements and complying with the obligations attached. Despite a general indication of state interest in international climate action and collaboration, unequal power dynamics and capacity gaps among states can limit full participation,⁹ while weak enforcement mechanisms and the prioritization of short-term economic gains over long-term environmental benefits further complicate compliance.¹⁰ The failure to entice sufficient participation and compliance necessitates a re-examination of IEL, particularly its theoretical frameworks and treaty design.

Rational choice theory (RCT) has dominated as the preeminent theoretical framework within international legal scholarship for many years. Rooted in the assumption that actors (primarily states) make decisions based on a cost-benefit analysis to maximize their utility, RCT offers a distinct lens through which international legal behaviour is examined.¹¹ The influence of RCT on international law is deeply intertwined with the field of law and economics, which itself is heavily grounded in RCT principles.¹² It applies economic models of rational decision-making to analyze legal issues, shaping how RCT is utilized within the study of international law. Despite its prominence in international legal studies, RCT has been criticized for its oversimplification of states' motivations.¹³ Critics point to ideology, historical grievances, and domestic political

⁸ Jan G. Laitos & Lauren Joseph Wolongevicz, "Why Environmental Laws Fail" (2014) 39:1 Wm & Mary Envtl L& Pol'y Rev at 1.

⁹ Sands, *supra* note 7.

¹⁰ Daniel Bodansky, *The Art and Craft of International Environmental Law*, (Cambridge, MA: Harvard University Press, 2010); George Downs, "Some realistic reflections on the nature of international cooperation" (1994) 19(1) International Security 75.

¹¹ Karl-Dieter Opp, "Rational Choice Theory and Methodological Individualism." in Peter Kivisto (ed) *The Cambridge Handbook of Social Theory*, (Cambridge: Cambridge University Press, 2020) 1 at 2.

¹² See generally, Herbert Hovenkamp, "Rationality in Law and Economics" (1992) 60 Geo Wash L Rev 293.

¹³ Raymond Boudon, "Limitations of Rational Choice Theory" (1998) 104:3 Am J Soc 817 at 818.

pressures as factors that can significantly influence state decisions and consequently outweigh a calculation based purely on self-interest.¹⁴ Notwithstanding these criticisms, RCT (and, by extension, economics) continues to dominate international scholarship.

Theoretical frameworks offer valuable insights for designing IEAs that account for and leverage state behaviour. Incentives, penalties, and specific provisions can be strategically employed based on these insights. However, a survey of existing International Environmental Agreements (IEAs) demonstrates a general incoherence in design and mechanism choice.¹⁵ This is particularly surprising given the amount of research analyzing the formation and stability of IEAs using RCT methods.¹⁶

This thesis is concerned with identifying ways in which compliance and participation can be maximized to improve the effectiveness of IEAs. I focus on the potential of theoretical frameworks in analyzing and creating IEL, with particular attention to how they may influence IEA design. I aim to provide a perspective that demonstrates the limitations of dominating legal theories like RCT and how expanding them to broader disciplines can positively impact the effectiveness of environmental agreements. The practical implications of such an expansion are explored by analyzing the strategic use of rewarding mechanisms in IEA design, specifically in the 1987 Montreal Protocol.¹⁷

International legal scholars have debated the suitability of different theoretical frameworks for decades, yet few have made a clear connection between these frameworks and their effectiveness in IEA design specifically. This thesis attempts to contribute to this field by not only making these connections explicit but also by demonstrating how these conclusions can be utilized as a tool for more effective treaty design.

¹⁴ John G. Ruggie, "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic System." (1982) 47:1 *International Organization* 195-231.

¹⁵ See Chapter 3.

¹⁶ See generally, Michael Finus, "Game Theoretical Research on the Design of International Environmental Agreements: Insights, Critical Remarks, and Future Challenges" (2008) 2:1 *Intl Rev Envir & Resource Econ* 29.

¹⁷ Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, S. Treaty Doc. No 100-10, 1522 UNTS 29.

1.1 Research Design

1.1.1 Methodology

Fisher et al. argue that the only realistic way the methodological challenges of environmental law scholarship can be met is “through a widespread and honest discussion among environmental law scholars about [them], and how they present in particular scholarly endeavours.”¹⁸ To that end, I would like to delve into the methodological challenges I faced during this project and the ways in which I sought to overcome them.

Environmental issues are not solely legal or scientific; they involve human behaviour, economic considerations, and social justice concerns. Their regimes tend to be complicated mixtures of established legal concepts, *sui generis* reforms, non-legal regulatory ideals, policies, and legal norms from a range of different jurisdictions.¹⁹ In their article, “Maturity and Methodology: Starting a Debate about Environmental Law Scholarship” Fisher et al. argue that “[e]nvironmental law scholarship can only come of age when scholars face the methodological challenges of environmental law research head on”.²⁰ For my research, this was grappling with what methodologies suited my topic and the scope of my analysis.

Finding the right methodology

My thesis questions and methodology evolved in tandem. Initially, I set out to analyze the language used in IEAs to see how it evolved during negotiations. I wanted to make the argument that compromised language (as in language in IEAs that is agreed upon by states through compromises) affected the enforceability of IEAs. My assumption was that vague language took away from the clarity that stricter provisions could provide in enforcement situations, and as such, compromising on treaty language led to ineffective

¹⁸ Elizabeth Fisher et al, “Maturity and Methodology: Starting a Debate about Environmental Law Scholarship” (2009) 21:2 J Envtl L at 243.

¹⁹ *Ibid* at 226.

²⁰ *Ibid* at 214.

agreements. Doctrinal analysis (my initial methodology) is “research which provides a systematic exposition of the rules governing a particular legal category, analyses the relationship between rules, explains areas of difficulty, and, perhaps predicts future development.”²¹ This type of research involves textual analysis, practical argumentation, and principled or structured reasoning and interpretation.²² For my initial thesis, this methodology was particularly suited to the task of analyzing the linguistic choices of IEAs. However, as my area of research moved from linguistic analysis to theoretical framings, doctrinal analysis became an inadequate analysis on its own. The voluntary nature of IEL and the relative scarcity of primary sources of law limited the effectiveness of this approach, and the tools of this methodology became ill-suited to the interdisciplinary nature of my research.

Without an enforcement body in the international sphere, the letter of the law does not hold the same significance as it might in a domestic system. This realization spurred a shift in my research focus towards a topic and methodology that better suited the question I was trying to define. As Fisher et al. argue, environmental law scholars must “address more explicitly the reflexive relationship between methodology and the research questions we ask... We must not only broaden our frame of analytical possibilities but also try and determine what we are trying to achieve.”²³

Embracing this notion, I shifted my focus from language analysis to one of IEL effectiveness more broadly. This led me to explore more scholarship on RCT and its dominance in international legal studies. Here, I encountered another challenge: interdisciplinarity. As Fisher et al. suggest, IEL itself is interdisciplinary, and its scholars are expected to be the same.²⁴ Understanding the connection between RCT models, economics, and the social reality of law became crucial to my research on effectiveness.

²¹ David Weisbrot, *Australian Lawyers* (Longman Cheshire, 1999) at chapter 5.

²² Matyas Bodig, “Legal Doctrinal Scholarship and Interdisciplinary Engagement” (2015) *Erasmus L Rev* at 46; On the role of interpretation, see Rene Brouwer, “The Study of Law as an Academic Discipline” (2017) *13:3 Utrecht L Rev* at 45.

²³ *Ibid* at 231.

²⁴ *Ibid*.

As I came to understand these frameworks further, they struck me, as they have others, as overly rigid. Having recently done some work related to law and emotions, I was inclined to the opinion that all law is influenced by its human actors, whether implicit or explicit. My previous work in psychology, sociology, and behavioural science naturally influenced my approach to this research. Perhaps unintentionally, I brought an interdisciplinary lens to the project. While Fisher et al. might see interdisciplinarity requirements as a barrier to scholastic growth, I believe it has the potential to significantly improve environmental scholarship.

In developing my ideas I have relied on concepts from social sciences, specifically psychology and economics, to better understand IEL in practice, moving beyond theoretical application. As Etty et al state, “[T]he threads of interdisciplinarity and law-in-action run in parallel...as theories and concepts from social science disciplines are mobilized to better understand the reality of legal processes and to search for practical solutions.”²⁵ The “Philosophy of Economics” is a methodological approach that applies theoretical models, mathematical and statistical techniques, data analysis, observation and experimentation, and logic and reasoning.²⁶ For my research specifically, I was influenced by the theories and observations from microeconomics and game theory, which employ rational assumption models to study the relations among individuals and strategic interactions.²⁷ Similarly, the observational methods and analysis employed by behavioural science (drawing from disciplines like psychology, economics, and anthropology) were instrumental in developing my methodology and arguments.²⁸

Interdisciplinary methodology is better suited not only to my topic but also to my audience. IEAs are not exclusively designed by legal scholars. They are the collaborative

²⁵ Thijs Etty et al, “The Methodologies of Transnational Environmental Law Scholarship” (2023) 12:2 *Transnat’l Envtl L* at 236.

²⁶ See broadly, Daniel M. Hausman, “Philosophy of Economics” in *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.), URL <<https://plato.stanford.edu/archives/win2021/entries/economics/>>.

²⁷ *Ibid.*

²⁸ See generally, Gneezy, Charles S. Gneezy & John A. List, *A Primer on Behavioural Methods* (Princeton University Press, 2009).

effort of a collection of interdisciplinary professionals with various levels of legal expertise. To approach this topic from an overly legal methodology would not only hinder the breadth of my research but likely alienate potential readers. Based on a foundation of doctrinal analysis, mainly in its survey of IEAs, this research topic was informed by an interdisciplinary approach to its inquiries.

Determining Scope

Determining the scope of my research was a continuous challenge. Although I think that the interdisciplinary nature of environmental legal studies is beneficial, it also introduces an overwhelming amount of scholarship to IEL. While exploring these diverse perspectives can be enriching, the sheer volume of material necessitates a focused approach for a project of this scale. Significantly, I chose participation and compliance as the only factors I would measure in my analysis of IEA effectiveness. This was to ensure a meaningful discussion within my page limits but also because these two factors are particularly complementary to environmental regimes. IEL focuses on fostering cooperation and collaboration, which can be directly impacted by poor participation or compliance rates.²⁹

I further limited my research to a manageable number of IEAs. There are thousands of agreements related to environmental governance and nearly as many topics covered. Given my focus on the benefits of widespread engagement, I prioritized those with the potential for broad global participation and impact. While I may have wished to expand the scope of my project further, I acknowledge that my research is more valuable when limited to fewer topics. The limitations of my research are detailed in Chapter 6.

1.1.2 Research Questions

This thesis is primarily interested in answering how insights from theoretical framings can be used to better design IEAs. I am particularly focused on the relationship that can exist between theory and practical application, which can be manipulated to maximize participation and compliance.

²⁹ Joseph S Nye Jr, *Soft Power: The Means To Success In World Politics*, (Public Affairs Books, 2005).

The following research questions organize this thesis:

1. Which legal theories dominate IEL discourse, and how can they be enriched?
(Chapter 2)
2. How do we define an effective IEA, and what are the barriers to creating one?
(Chapter 3)
3. What are the shortcomings of RCT when applied to international environmental law? (Chapter 4)
4. How can rewarding mechanisms be used to increase compliance and participation with IEAs? (Chapter 4)
5. What lessons can be learned from the Montreal Protocol, and how can they apply to the creation of future agreements? (Chapter 5)

All of these questions underpin the research problem at hand. In short, the fundamental concern of this work is to address the lack of explicit discourse surrounding the limitations of RCT when applied to IEL. The objective here is to demonstrate how broadening the theoretical framework of IEL can contribute to the increased effectiveness of IEAs through the strategic use of rewarding mechanisms.

1.2 Thesis Structure

Having established the critical importance of addressing ineffective IEAs, this work unfolds as follows:

- Chapter 2 provides an overview of the theoretical foundations of this project, particularly RCT. It touches on the relationship between RCT, law and economics, and practical applications of the law. It concludes that RCT cannot adequately capture the reality of international environmental governance and, therefore, must broaden its analysis to include psychology and behavioural law for an accurate framing of state behaviour.

- Chapter 3 describes the evolution of IEL and the principles that underlie it. It then provides a brief history of significant IEAs to demonstrate how international efforts continue to be ineffective in the face of a deteriorating climate. It concludes with a discussion of some of the barriers to creating effective IEAs.
- Chapter 4 outlines how an effective IEA can be created. It discusses how to determine what an effective IEA looks like, specifically through greater participation and compliance. It then outlines rewarding mechanisms and how they can be used to bolster both participation and compliance. Finally, this Chapter concludes with a discussion of the relationship between rewarding mechanisms, RCT, psychology, and compliance theory.
- Chapter 5 uses the Montreal Protocol to demonstrate how rewarding mechanisms can bolster both participation and compliance. Importantly, it also reviews how these mechanisms have been applied in situations of non-compliance to encourage re-entry. It concludes with a discussion of how lessons from the Montreal Protocol can be applied to future IEAs.
- Chapter 6 collates the information from Chapters 4 and 5 and uses it to draw conclusions on rewarding mechanisms and effective IEAs. The discussion develops against a background of insights uncovered in Chapter 2, ultimately making recommendations for future avenues of research.

Chapter 2

2 Theoretical foundations

This work is guided by several theories related to decision-making, the behaviours of states, and how law can influence behaviour. Using the theoretical perspectives discussed below, the ultimate aim of this chapter is to identify common theoretical framings of IEL and offer alternative perspectives that can be strategically used to improve the effectiveness of IEA design. This Chapter seeks to outline and critique the relevant theoretical frameworks that underlie this research project.

2.1 The State of International Law

When we discuss the concept of law, in reality “[t]here is no one concept of law, and when we refer to the concept of law we just mean our concept”.³⁰ The exact nature and purpose of the law is a topic of continuous debate, and scholarship in international law faces the additional hurdle of proving its own existence. International law is unlike the domestic systems we may compare it to; There is no single authority directing states, no enforcement body ensuring compliance, and complicated systems of exchange. When compared to our familiar domestic legal systems, the unique structure of international law forces us to question its validity, its status as a legal system, and the feasibility of its enforcement.³¹

The debate on international law’s existence and effectiveness has created an environment in which legal theories have proliferated. For the uses of theory in international law, Colin Warbrick distinguishes between “grand theory” (which asks the question, of what part, if any, international law plays in the actual conduct of international relations), “nature theory” (which asks what international law is like), “sources theory” (which asks about the basis of obligation), “technical theory” (which asks questions about the various legal concepts and rules), and “justice theory” (which asks questions about what

³⁰ Joseph Raz, “Can There Be a Theory of Law?” in M. Golding and W. Edmundson (eds), *Blackwell Guide to Philosophy of Law and Legal Theory* (New Jersey, USA: Blackwell, 2004) 324 at 331.

³¹ Malcolm N. Shaw, *International Law*, 8th ed (Cambridge: Cambridge University Press, 2017).

international law is for, its ends and values).³² In principle, theories of or about international law seek to unfold and elaborate on the nature of law, legal reasoning, and institutions; theories which have emerged through countless systematic or rebellious schools of thought, movements and trends.³³ As Dame Rosalyn Higgins has observed,

“[h]ow one differentiates international law from related disciplines depends in large part on one’s views of law as rules or process, as neutral or value-free, as response to or distinct from external factors, as authority or power interlocked with authority. The answers to these questions depend upon alternative perceptions of the theory of international law”.³⁴

All of this to say, international law is complicated at best and unnavigable at worst. Unfortunately for some legal theory enthusiasts (but fortunately for me), the purpose of this paper is not to debate the very nature of international law. I only endeavour to address some of the dominant theories in international scholarship to explore their suitability to international environmental governance.

2.2 Rational Choice Theory

For decades, RCT has dominated as the preeminent theoretical framework in international legal studies. While legal RCT is not based on a specific set of sources, it is influenced in large part by various scholars in the field of economics, notably Posner,³⁵ Becker,³⁶ Calabresi,³⁷ and Cooter.³⁸

³² Colin Warbrick, “The Theory of International Law: Is There Any English Contribution?” in Philip Allott, Tony Carty et al. (eds), *Theory and International Law: An Introduction* (The British Institute of International and Comparative Law, 1991) 49 at 50-52.

³³ Emmanouël Roucouas, *A Landscape of Contemporary Theories of International Law* (Leiden : Brill Nijhoff, 2019) at 11.

³⁴ Rosalyn Higgins, “The Identity of International Law” in R. Higgins, *Themes and Theories: Selected Essays, Speeches, and Writings in International Law* (Oxford: Oxford University Press, 2009) at 107.

³⁵ Richard A. Posner, *Economic Analysis of Law*, 5th ed (Aspen Publishers, 1998).

³⁶ Gary S. Becker, “Irrational Behaviour and Economic Theory” (1962) 70:1 J Political Econ 1.

³⁷ See generally, Guido Calabresi & A. Douglas Melamed, “Property rules, liability rules, and inalienability: One view of the Cathedral” (1972) 85:6 Harv L Rev 1089.

³⁸ Robert Cooter & Thomas Ulen, *Law and Economics*, 6th ed (Pearson, 2016).

Thomas Ulen explains that there is no widely accepted definition of “rational choice”, but there are two important ways in which the term is used. The first is more informally: choice is said to be rational when it is deliberate and consistent, and one expects rationality to lead to consistent (and relatively stable) choices.³⁹ The second way in which rational choice is used is more formally:

[C]onsumers have transitive preferences and seek to maximize the utility that they derive from those preferences, subject to various constraints. Transitive preferences are those for which, if some good or bundle of goods denoted *A* is preferred to another good or bundle of goods denoted *B* and *B* is preferred to a third good or bundle of goods denoted *C*, then it must be the case that *A* is preferred to *C*. By contrast, if it were the case that *A* were preferred to *B*, *B* were preferred to *C* and *C* were preferred to *A*, we would find that distinctly odd – indeed, irrational.⁴⁰

This formal use of the term rational choice assumes that the decision maker in these scenarios seeks to maximize utility subject to various constraints (money, time, cognitive resources, etc.).⁴¹ Rational choice *theory* can be conceived as an empirical theory that addresses the causes of behaviour. It consists of three propositions. First, that preferences or goals determine behaviour. Second, whether these goals can be achieved depends on behavioural constraints or opportunities. Third, that actors are rational and seek to maximize their utility.⁴²

RCT is inescapably tied to economics and, as such, has always been a popular tool for analyzing market behaviour and decisions. This has led some scholars to question the validity of its application to legal scholarship; however, it has largely been accepted as a suitable tool of analysis. While often framed as non-market decisions, it can be argued

³⁹ Thomas Ulen, “Rational Choice Theory in the Law,” in *Encyclopedia of Law and Economics* (1998) 790 at 790.

⁴⁰ *Ibid* at 710.

⁴¹ *Ibid.*

⁴² Karl-Dieter Opp, “Rational Choice Theory and Methodological Individualism.” in Peter Kivisto (ed) *The Cambridge Handbook of Social Theory*, (Cambridge: Cambridge University Press, 2020) 1 at 2.

that legal dilemmas are, in fact, quite market-like. Many legal rules create implicit prices on different behaviours, and legal decision-makers confirm their behaviour to those prices in much the same way as they confirm their market behaviour to the relative prices there.⁴³ Legal RCT assumes that rational actors weigh the potential gains and losses when deciding whether to engage in legal behaviour. It focuses on the idea that individuals act rationally and attempt to maximize their utility, considering factors like the probability of legal sanctions, the severity of potential punishments, and the perceived benefits of legal action.⁴⁴ Microeconomic theorists originally formulated and developed rational choice models to mathematically analyze the pure theory of individual consumer behaviour. As the theory has evolved, rational choice theorists have applied this approach to numerous seemingly non-economic or nonmarket settings.⁴⁵ A particular type of RCT, namely, game theory,⁴⁶ has found many applications in political science and legal studies, particularly in analyzing legal rules and institutions.⁴⁷ In the last few decades, RCT has become the dominant approach in international environmental law scholarship, particularly for analyzing the formation and stability of IEAs.⁴⁸ There seems to be a somewhat commonly held opinion that the rational actor model is particularly suited to the study of law, where judgements can be provided by an allegedly neutral body.

Legal RCT seeks to understand how actors make decisions regarding legal matters by analyzing the costs and benefits associated with different legal choices. Rational choice began to take root as a framework of analysis as early as the 1960s, becoming an established subfield of law in the early to mid-1970s.⁴⁹ It has since made contributions to almost every area of domestic law but was slower to influence international legal

⁴³ See generally Thomas S. Ulen, "Rational Choice and the Economic Analysis of Law" (1994) 19:2 L & Soc Inquiry 797.

⁴⁴ See generally, Cooter *supra* note 38.

⁴⁵ See generally Jack Hirshleifer, "The Expanding Domain of Economics" (1985) 75:6 Am Econ Rev 53.

⁴⁶ Game theory is the study of mathematical models of strategic interactions among rational agents where the outcome for each participant or "player" depends on the actions of all. For a discussion of game theory in international relations, see James D. Morrow, *Game Theory for Political Scientists* (New Jersey: Princeton University Press:1994); Scott Gates & Brian D. Humes, *Games, Information, and Politics: Applying Game-Theoretic Models to Political Science* (Michigan: University of Michigan Press, 1997); Bruce Bueno de Mesquita, *Principles of International Politics: People's Power, Preferences, and Perceptions* (Sage, 2000).

⁴⁷ See Douglas G. Baird et al., *Game Theory and the Law* (Harvard University Press, 1994).

⁴⁸ Finus, *supra* note 16.

⁴⁹ Posner, *supra* note 35.

scholarship.⁵⁰ This can perhaps be attributed to the unique nature of international law; its lack of central power most significantly. RCT focuses on how the law, as enforced, affects behaviour. While there is a presumption of enforcement bodies within the domestic legal system, the same cannot be said for the international sphere. Enforcement is more complex in the international context and perhaps explains why RCT was so slow to infiltrate international legal scholarship.⁵¹

An example to illustrate this argument is the use of monetary fines to dissuade actors from violating parking laws. These fines are the price of engaging in this behaviour, and the amount is determined based on what will be dissuasive to actors. Under the rational choice model, actors will comply with the law if they calculate that doing so is less costly than the penalty. For example, if parking in a municipal parking spot for three days would cost \$150, but a parking ticket would cost \$500, then presumably the rational decision maker would choose to pay for three days of parking rather than risk the higher cost of the ticket.⁵² It is important to note that consequences need not be monetary, and other forms of legal sanctions can be more persuasive deterrents. If the cost of violating parking laws was a \$150 fine and 4-day imprisonment, potential violators would likely be less inclined to violate the law. This is not only because there are additional consequences but also because different kinds of punishment are generally considered more severe than others. Paying a fine is less disruptive to an individual than imprisonment and usually has fewer long-term consequences. It also may mean significantly less to someone with an abundance of money. The parameters of domestic legal systems provide a certain level of predictability that international law does not have, complicating its application to the international sphere.

Further criticisms of RCT relate to its oversimplification of decision-making, narrow scope, and inability to model long-term considerations, all of which will be addressed in section 2.2.1 below. Despite RCT's potential limitations, its empirical approach can still

⁵⁰ See generally Jack L Goldsmith & Eric A. Posner, "Introduction." (2002) 31:1 J Leg Stud S1 at S3.

⁵¹ *Ibid.*

⁵² This conclusion assumes that the actor expects the area to be monitored and the law to be enforced.

offer valuable insights. Utilizing economic models, RCT can determine the effectiveness of different provisions and help determine state priorities. This allows us to identify potential areas for cooperation and design more effective treaties. In this sense, RCT provides a complementary lens to law and economics.

Law and economics is an interdisciplinary field that applies economics, primarily microeconomics or price theory, to understand and analyze legal rules and institutions.⁵³ Herbert Hovenkamp argues that law and economics could not exist as a theory without the assumption of rationality, firmly placing RCT as the foundational assumption on which the theory is built.⁵⁴ Economic analysis rests on the basic assumption that economic actors are rational decision-makers who consistently choose the best means for achieving given preferences or ends.⁵⁵ At a minimum, the theory requires that a majority of participants act or react to market conditions in a rational and predictable manner.⁵⁶

Economic analysis has enjoyed widespread influence within legal scholarship over the last few decades. Scholars in a variety of interdisciplinary fields have increasingly used economic models to study human behaviour.⁵⁷ Generally, economics is often conceived of as a study of money and markets, but in actuality, it can be described much more broadly. Pivotaly, it provides that people respond to incentives (a generalized statement of price theory), and therefore, the law can serve as a powerful tool to influence conduct.⁵⁸

⁵³ *Ibid.*

⁵⁴ See generally Hovenkamp, *supra* note 12.

⁵⁵ The economic assumption that individuals behave rationally can be defined in descriptive or normative terms. In descriptive terms, rationality is simply taken to mean consistently choosing the best means for achieving given ends. In normative terms, rationality sets limits on available ends by reference to substantive norms such as happiness, goodness, or profit. See Kenneth J. Arrow, *Preface*, in Kenneth Arrow et al, eds, *The Rational Foundations of Economic Behaviour* (London: Palgrave Macmillan London, 1996) xiii at xiii.

⁵⁶ Becker, *supra* note 36.

⁵⁷ See generally Robert C. Ellickson, "Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics" (1989) 65:1 Chicago-Kent L Rev 23.

⁵⁸ Russell B Korobkin & Thomas S Ulen, "Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics" (2000) 88:4 Cal L Rev 1051 at 1062.

Social science disciplines differentiate themselves less by their chosen topics and more by their methodological approaches. Economics stands out from its social science peers for the popular belief in *methodological individualism* – the tenet that explanations of social phenomena should be built by the study of individual behaviour. Legal authors like Posner,⁵⁹ Becker,⁶⁰ and Devlin⁶¹ highlight the use of legal RCT within the law and economics framework to analyze how individuals make choices within legal systems and how legal rules and institutions can influence economic behaviour and outcomes.

This focus on individual behaviour is an obvious obstacle in its application to international law. It is one thing to make observations about individual decision-making; it is another to apply these observations to states. While it may seem like rational choice and economic models would be unsuitable for applications on such large scales, game-theoretic models can overcome this in two ways. First, the models can analyze states as if they had transitive preferences, even though it is known that they cannot or do not have such preferences. Second, analysts can treat states as unitary actors and assume that the state aggregates all domestic preferences and acts as if it were a single actor.⁶² Although states neither can nor do have such preferences, individuals within them do and can have such preferences, whether these individuals are organizational leaders, citizens, consumers, regulators, etc.⁶³ These methods are not infallible, and it could be argued that the unitary-actor assumption is a methodological convenience.⁶⁴ While there are potential problems in its application,⁶⁵ for this research I will be working under the assumption that RCT can be applied to the behaviour of states to at least some degree of success. Although their exact nature may be unclear, states generally exhibit predictable

⁵⁹ See generally, Posner, *supra* note 35.

⁶⁰ See generally Becker, *supra* note 36.

⁶¹ Alan Devlin & Michael Jacobs, “The Empty Promise of Behavioral Antitrust” (2014) 37:3 Harv JL & Pub Pol’y 1009.

⁶² Alexander Thompson, “Applying Rational Choice Theory to International Law: The Promise and Pitfalls” (2002) 31:1 J Leg Stud S285 at S291.

⁶³ Peter H. Huang, “International Environmental Law and Emotional Rational Choice” (2002) 31:S1 J Leg Stud S237 at S243.

⁶⁴ Thompson, *supra* note 62 at S291.

⁶⁵ For a thorough analysis of rational choice theory’s applicability to international law see generally *Ibid.*

behaviours in their responses to international law. This indicates that there is at least some semblance of identifiable preferences that can be utilized in an RCT framework.

Law and economics, informed by RCT, provides a quantitative and analytical framework to evaluate the costs and benefits associated with legal rules, to consider the distributional effects of legal decisions, and to propose legal reforms that may enhance economic efficiency and social welfare. As Friedman explains, law and economics “asserts that in order for academics to fully understand what they are doing, they must first learn economics”.⁶⁶ This offers a particular perspective of law, and thus, law and economics can be understood as economics applied to law, rather than law applied to economics. Friedman has speculated that the theory’s insistence that economics is central to the understanding of law has contributed to some legal academics’ hostility towards the theory.⁶⁷ Legal theorists may struggle with the fact that to best understand legal concepts, they must use an analytical lens from another academic discipline.⁶⁸

2.2.1 The Rational Actor Problem.

"The premise of 'rational behavior' is a potent one for the production of theory. Whether the resulting theory provides good or poor insight into actual behavior is...a matter for subsequent judgment."⁶⁹

While rational choice has dominated much of international politics, in the last few decades there has been an increase in the number of qualifications, refinements, or criticisms of rational actor models, largely from economists, but also philosophers, political scientists, and psychologists.⁷⁰ Critics of RCT and economic analysis in law

⁶⁶ David D Friedman, *Law's Order: What Economics Has To Do With Law and Why It Matters* (Princeton: Princeton University Press, 2000) at 12.

⁶⁷ *Ibid.*

⁶⁸ Interdisciplinary legal theories are not uncommon; and in fact, have arguably come to dominate contemporary scholarship in law. See generally Richard A Posner, “The Decline of Law as an Autonomous Discipline” (1987) 100:4 Harv L Rev 761.

⁶⁹ Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1980) at 4.

⁷⁰ The relevant work is extremely diverse. See, for example: Richard Thaler, *Quasi Rational Economics*, (Russell Sage Foundation, 1991); Richard Thaler, *The Winner's Curse* (New Jersey: Princeton University Press, 1991); Thomas Schelling, *Choice and Consequence* (1986); George Ainslie, *Picoeconomics: The Interaction of Successive Motivational States within the Individual* (Cambridge: Cambridge University Press, 1992); Elster, Jon, *Sour Grapes: Studies in the Subversion of Rationality* (Cambridge: Cambridge University Press, 1983); Gary M. Becker & Kevin

have argued that rational utility or the profit-maximizers of microeconomic theory bear little correlation to the reality of human behaviour, and therefore cannot be depended on for an accurate analysis of decision-making.⁷¹ This limitation is perhaps most easily demonstrated by expected utility theory, which studies how decision-making is influenced by the concept of utility maximization. It estimates the utility of an action when the outcome is uncertain and recommends the action or event with the maximum expected utility. The theory says nothing about *what* people want, but *how* people act based on these wants.⁷² In other words, it explains how people choose to satisfy their preferences without explaining what led to these preferences in the first place.

In his article, *Rational Choice Theory in Law and Economics*,⁷³ Thomas Ulen questions the reliability of rational choice assumptions by analyzing literature and experimentation that challenges RCT in major ways. In large part with the work of Richard Thaler,⁷⁴ Ulen advocates for a more critical analysis of RCT with the inclusion of factors from external disciplines. Thaler's work, as discussed by Ulen, is able to demonstrate four ways in which psychological experimentation challenges basic assertions of RCT. First, subjects in carefully designed experiments seem to reject mutually beneficial exchanges when they believe that the proposed division of the cooperative surplus violates widely accepted norms of fairness. RCT predicts that this will not happen. Second, despite what rational theory assumes, subjects in a different series of experiments in which multiple stages of bargaining are involved do not devise rational strategies for themselves. Third, most decision-makers have cognitive limitations that cause systematic deviations in their behaviour away from that predicted by the theory of rational choice. Fourth, experiments have shown that people do not make decisions about uncertain outcomes in the way that

Murphy, "A Theory of Rational Addiction" (1988) 96:4 J Political Econ 675; Amartya Sen, *Inequality re-examined* (New York: Russell Sage Foundation, 1992); Daniel Kahneman & Amos Tversky, "Prospect theory: an analysis of decision under risk" (1979) 47 Econometrica 263.

⁷¹ See generally Daniel Kahneman, *Thinking Fast and Slow*, (New York: Farrar, Straus and Giroux, 2009); Cass R. Sunstein, *Why Nudge?: The Politics of Libertarian Paternalism*, (Yale University Press, 2014).

⁷² Daniel M. Hausman & Michael S. McPherson, *Economic Analysis, Moral Philosophy and Public Policy*, 2nd ed (New York: Cambridge University Press, 2006) at 49.

⁷³ Ulen, *supra* note 43.

⁷⁴ Thaler, *supra* note 70.

the theory of rational choice predicts.⁷⁵ The intricacies of these experiments are beyond the scope of this paper, but they serve to demonstrate how law and economics' (and by extension RCT's) core assumption of rationality is not infallible. It can provide significant empirical insights but cannot act as the sole theoretical framework in IEL.

Despite the permeation of RCT in international law, Thaler and Ulen are not the only scholars to question the appropriateness of this framework in modern legal scholarship.⁷⁶ Although RCT was beneficial to law and economics in its earliest days of study, there is too much credible experimental evidence that individuals frequently act in ways that would be seen as irrational for it to have continued dominance in its purest form.⁷⁷ An often-made criticism is that “[f]actors such as personal characteristics of the decision-makers or social values prevailing in their community, which may affect the decision-maker’s choices, are exogenous to game theoretical analysis.”⁷⁸ Further to this point, Korobkin and Ulen argue:

[t]he longer...that [law and economics] delays in elaborating [a] richer theory of behaviour – the longer...it fails to take the “law” part of “law and economics” seriously...[and becomes] less relevant to the making of legal policy, one of the ultimate ends of legal scholarship.⁷⁹

Applying RCT to IEL specifically presents significant challenges. Environmental issues often have long-term consequences that can be difficult to quantify in purely economic terms. The benefits of environmental protection, like maintaining healthy ecosystems or mitigating the effects of climate change, might not be readily apparent in the short term, making them less appealing from a cost-benefit perspective. Additionally, many environmental problems are often transboundary, requiring collective action from

⁷⁵ See Ulen, *supra* note 43 at 801.

⁷⁶ Tomer Broude, “Behavioral International Law” (2015) 163:4 Penn LRev 1099.

⁷⁷ Korobkin, *supra* note 58 at 1055.

⁷⁸ See Moshe Hirsch, “Game Theory, International Law, and Future Environmental Cooperation in the Middle East” (1998) 27:1 Denv J Intl L & Pol’y at 118.

⁷⁹ Korobkin, *supra* note 58 at 1056.

multiple states. The "prisoner's dilemma" becomes a real concern, where individual states might hesitate to enact costly environmental regulations for fear of being undercut by others who prioritize short-term economic gains.⁸⁰

As the shortcomings of RCT have become more apparent, the need for an alternative framework of study for IEL has become more dire. This dissatisfaction has led to some abandoning economic analysis altogether, while a growing number of economists have turned to a broader framework of analysis that builds on the core insights of law-and-economics scholarship but takes seriously the flaws of RCT. While there is a potential that broadened frameworks can complicate empirical analyses, the advantage gained is an analysis that better reflects the concerns and realities of IEL. Korobkin and Ulen call this movement "law and behavioural science."⁸¹

2.3 Law and Behavioural Science

Law and behavioural science emerged in response to the increased criticism of RCT's applicability to the non-market decisions of legal dilemmas. The movement lacks a single coherent theory of behaviour however, Korobkin and Ulen argue that this is not necessary for the approach to be effective.⁸² They argue that the attractiveness of this approach is not a grand theory of behaviour, but its regard for the relevant decision-making capabilities of the actors involved.⁸³ It is an approach that borrows heavily from sociological theories and cognitive psychology to better understand the incentive effects of law by incorporating considerations of those governed by the law and how they attempt to achieve their ends.⁸⁴

2.3.1 Sociology

⁸⁰ George Downs, *supra* note 10.

⁸¹ Korobkin, *supra* note 58 at 1057.

⁸² *Ibid* at 1057-58.

⁸³ *Ibid.*

⁸⁴ *Ibid* at 1058.

The central assumption of the sociological perspective is that behaviour and normative choices are significantly affected by social factors.⁸⁵ Social inquiry generally emphasizes that norms and roles constrain human behaviour, and under this conception roles encode norms and conformity to norms becomes a motive of behaviour.⁸⁶ Therefore, the readiness to abide by norms depends largely on the internalization of the relevant social norm, not on a rational calculation of utility maximization.⁸⁷ The sociological core assumptions regarding the role of social factors are extended to law and economics by economic sociology, which studies the social causes of various economic phenomena. Marc Granovetter argues that an adequate analysis of human behaviour requires the avoidance of theoretical extremes of ‘under-socialization’ and ‘over-socialization’ conceptions. He makes the point that actors do not make decisions completely isolated from any social influence, while at the same time, they are not ruled by the social categories they happen to occupy. Rather, “their attempts at purposive action are embedded in a concrete, ongoing system of social relations.”⁸⁸ The interaction between sociological approaches and behavioural sciences is complex and multi-level but offers a broader view of how social pressures can influence states’ actions and identities.⁸⁹ While sociology is a significant part of behavioural science and invites further investigation in the future, my research is more concerned with the influence of psychological research methods in international law.

2.3.2 Cognitive Psychology

Cognitive psychology got its start by criticizing expected utility theory for its limited understanding of how human behaviour is influenced by psychological factors.⁹⁰ It is best known as the science of human information processing, and this process’ role in thinking,

⁸⁵ Moshe Hirsch, “The Sociology of International Economic Law: Sociological Analysis of the Regulation of Regional Agreements in the World Trading System” (2008) *J Intl Law* 19:2 277 at 280.

⁸⁶ Shaun Heap et al., *The Theory of Choice: A Critical Guide*, 1st ed (Wiley-Blackwell, 1992) at 63 – 64; John Scott, *Sociological Theory: Contemporary Debates*, 2nd ed (Cheltenham: Edward Elgar Publishing Limited, 1995) at 63

⁸⁷ *Ibid* at 68.

⁸⁸ Mark Granovetter, “Economic Action and Social Structure: The Problem of Embeddedness” (1985) 91:3 *Am J Sociology* 481 at 487.

⁸⁹ Hirsch, *supra* note 85 (describing how the social constructivist approach posits that states’ interests and identities are constructed by social structures and acknowledges that states are embedded in a set of social relations where their identity is defined by their interaction with other international actors).

⁹⁰ Eric Posner, “Law and the Emotions” (2001) 89:6 *Geo L J* 1977 at 1980 [Emotions].

feeling, and behaving.⁹¹ Cognitive psychology studies to understand “the kinds of information we have in our memories and the processes involved in acquiring, retaining, and using that information.”⁹² It is a relatively new science that didn’t gain popularity until World War II brought advances in communications, engineering, computer programming, and linguistics which spurred its study.⁹³

Cognitive psychology is a mental science that views individuals as essentially rational beings.⁹⁴ Although researchers study the effects of risk, uncertainty, imperfect knowledge, and other variables on the decision-making process, these variables establish parameters for asking “*given them*, how individuals will behave rationally.”⁹⁵ This is not to say that researchers in this field are oblivious to the existence of irrational behaviour, but they treat most of what might be deemed “irrational” as malfunctionings in cognitive processes brought about by mental biases, heuristics, computational limitations, and informational barriers that prevent actors from taking in and processing information from the world.⁹⁶ Cognitive psychology can account for decisions that may seem irrational to RCT and economic models but can actually be explained with a broader set of variables. This framing of IEL can help provide a more complete perspective on state behaviour and IEA compliance.

2.3.3 Behavioural International Law

Behavioural legal theories seek to incorporate insights from empirical research in the field of cognitive psychology regarding human rationality as it is observed in reality and

⁹¹ See Karl Haberlandt, *Cognitive Psychology*, (Allyn & Bacon, 1994); Michael G. Wessells, *Cognitive Psychology*, (Harper & Row, 1982).

⁹² Wessells, *Ibid* at 1-2.

⁹³ John Robert Anderson, *Cognitive Psychology and Its Implications*, 2nd ed (Worth Publishers, 1985).

⁹⁴ Cognitive psychology and psychoanalysis both offer purposive models of human nature in contrast to behaviourism and some social psychologies that tend to view individual behaviour as the product of environmental influences. See Anne C. Dailey, “The Hidden Economy of the Unconscious” (2000) 74 *Chicago-Kent L Rev* 1599.

⁹⁵ Neil J. Smelser, *The Social Edges of Psychoanalysis*, 1st ed (University of California Press, 1998).

⁹⁶ For the seminal work in this area, see Herbert A. Simon, “A Behavioral Model of Rational Choice” 69:1 *Quarterly J Econ* 99. Some of the biases and heuristics referred to most often in the economic literature include the confirmatory bias, the hindsight bias, the status quo bias, and framing effects. See, e.g., Jon D. Hanson & Douglas A. Kysar, “Taking Behavioralism Seriously: The Problem of Market Manipulation” 74:3 *NYUL Rev* 630 at 45-72.

practice.⁹⁷ Experimental research like that conducted by Richard Thaler has shown that in many cases human behaviour deviates from the theoretical assumptions of RCT,⁹⁸ consequently, the goal of behavioural law is to explore the implications of actual human behaviour.⁹⁹ After decades of significant experimental research, it is well-acknowledged that human action is not only “shaped by relevant economic constraints but is highly affected by people’s endogenous preferences, knowledge, skills, endowments, and a variety of psychological and physical constraints”.¹⁰⁰ Simplified, the central concept of behavioural theory is the idea of bounded rationality, which recognizes that human cognitive capabilities are not perfect or infinite.¹⁰¹ The growing body of literature on cognitive psychology promises to transform rational analysis into a more powerful tool for understanding and regulating the reality of decision-making, rather than the proposed hypotheses of rationality.¹⁰²

This is not to say that the rational choice framework should be rejected in its entirety. In fact, cognitive psychology incorporates many elements of the rational actor assumptions. Like RCT, a behavioural-economic approach is, first and foremost, a theory of judgment. Rather than emphasizing models based upon objective methods of utility maximization, behavioural economics strive to understand how decision-making works in reality.¹⁰³ RCT need not be torn down but rather revised to address its limited understanding of how law affects society.¹⁰⁴ By considering behavioural science and psychology, we can better understand why individuals deviate from pure rationality,¹⁰⁵ make suboptimal choices, or

⁹⁷ Broude, *supra* note 76 at 1112.

⁹⁸ Thaler, *supra* note 70.

⁹⁹ Christine Jolls, Cass R. Sunstein & Richard H. Thaler, “A Behavioral Approach to Law and Economics” (1998) 50 *Stan L Rev.*

¹⁰⁰ Francesco Parisi & Vernon L. Smith, “Introduction” in Francesco Parisi & Vernon L. Smith, eds, 1st ed, *The Law and Economics of Behaviour* (Stanford Economics and Finance, 2005).

¹⁰¹ Broude, *supra* note 76 at 1114.

¹⁰² Dailey, *supra* note 94 at 1604.

¹⁰³ Broude, *supra* note 76 at 1113.

¹⁰⁴ Korobkin, *supra* note 58 at 1144.

¹⁰⁵ Jon Elster offers the definition of what might be called “pure rationality”. “An action, to be rational, must be the result of three optimal decisions. First, it must be the best means of realizing an individual’s desires, given his beliefs. Next, these beliefs must themselves be optimal, given the information available to him. Finally, the person must collect an optimal amount of evidence—neither too much nor too little”. (Jon Elster, *Nuts and Bolts for the Social Sciences*, (Cambridge University Press, 1989).

engage in behaviour that seemingly contradicts their self-interest.¹⁰⁶ Combining the insights offered by both these perspectives working in tandem can increase our ability to account for and manipulate state behaviours to increase the effectiveness of IEAs.

2.3.4 Is Psychology Enough?

A discussion of the limitations of RCT is not a revolutionary idea, but arguably it has yet to break the hold that RCT has on law. By incorporating psychological principles and insights into the framework, we can gain a greater comprehensive understanding of how actors make their decisions, beyond an exclusively economic framework. Psychological factors such as cognitive biases, emotions, social influences, and moral considerations can significantly impact decision-making, even within the context of RCT.

While the potential benefits of incorporating cognitive psychology seem quite clear, scholars such as Anne Dailey question whether scholarship has gone far enough.¹⁰⁷ She argues that cognitive psychology gives us important information about how actors process information and make decisions but fails to provide a full or satisfying account of human decision-making or human behaviour overall.¹⁰⁸ Further, the cognitive model overlooks the central role that unconscious affects and motivations play in human decision-making.¹⁰⁹ Cognitive psychologists typically argue that what might look like the effect of motivation and its effect on reasoning can be explained in information processing terms, yet this perspective can minimize the fact that people are often driven by emotional factors.¹¹⁰ It is important to make a distinction between cognitive psychology and emotions. Posner posits that cognitive psychology is concerned with studying errors in judgement, and that “some psychologists have recently argued that cognitive biases are best analyzed as the result of emotional dispositions or feelings.”¹¹¹

¹⁰⁶ Kahneman, *Supra* note 63 at 3.

¹⁰⁷ Dailey, *supra* note 94 at 1604.

¹⁰⁸ *Ibid.*

¹⁰⁹ *Ibid.*

¹¹⁰ *Ibid* at 1605.

¹¹¹ Posner [Emotions], *supra* note 90 at 1979.

In contrast, it could be argued that emotion is a psychological phenomenon that is usually stimulated by the world, either via the mediation of cognition or through a more primitive stimulus-response.¹¹² This is not to say that these are the definitive definitions of these terms, but useful distinctions for the discussion that follows.

For decades, legal scholars and philosophers have argued that law and its underlying principles should be free from emotion, allowing rationality and logic to prevail.¹¹³ This neglect may be attributable to the fact that dominant strains of normative legal-theory-economic analysis, moral-philosophical analysis, and constitutional analysis rely on methodologies that are not well suited to emotion.¹¹⁴ Alternatively, this dearth may be attributable to the perception that the law is impartial, and this cannot be questioned for fear of tarnishing its legitimacy. It is common to think of emotions as an “outside” force that compels individuals to act inconsistently with their interests of the self or, in more relevant terms, irrationally.¹¹⁵ Anne Dailey argues that it is these important factors that cognitive psychology fails to capture in its analysis.¹¹⁶ Because it remains “explicitly concerned with the fashion in which incoming stimulus information is processed in order to extract meaning from it,”¹¹⁷ it cannot grapple with the effect that unconscious emotions, motivations, or conflicts have on everyday behaviour.¹¹⁸ In essence, while it is attempting to broaden the rational choice framework, cognitive psychology (and by extension, behavioural science) is not without limitations of its own. I doubt there will ever be a perfect framework for international negotiations, but that shouldn’t preclude us from improving them. The purpose of this project is not to provide a perfect framework for analyzing state behaviour but to advocate for one that more accurately depicts the reality of IEL.

¹¹² *Ibid.*

¹¹³ Martin L. Hoffman, “Empathy, Justice, and the Law” in Amy Coplan and Peter Goldie (eds), *Empathy: Philosophical and Psychological Perspectives* (Oxford: Oxford University Press, 2011) 229 at 230.

¹¹⁴ Posner, *supra* note 90 at 1980.

¹¹⁵ *Ibid* at 1980.

¹¹⁶ Dailey, *supra* note 94 at 1605.

¹¹⁷ Jeremy D. Safran & Leslie S. Greenberg, *Affect and the Unconscious: A Cognitive Perspective*, in Raphael Stern, ed., *Theories of the Unconscious and Theories of the Self* (Hillsdale, N.J: Analytic Press, 1987) 191 at 196.

¹¹⁸ Dailey, *supra* note 84 at 1606.

2.4 Conclusion

The theoretical foundations of this paper are themselves part of the argument. While researching why states act in the way that they do, I discovered a rich area of literature that made me question how theoretical frameworks can impact the effectiveness of laws. International law, and by extension international environmental law, has been dominated by the concept of perfect rationality for too long. In the face of repeatedly disappointing IEAs, my research led me to the very foundations of our legal frameworks. How we understand decision-making will affect how we seek to influence it. Recognizing that our current framing of law is limited is the first step to improving its relationship with efficacy. International environmental law is facing a crisis of ineffectiveness, and a proliferation of theoretical considerations must be utilized to identify and address why this is the case. While economists and like-minded researchers may like to think of individuals and states as perfectly rational actors, this is not always reality. Our legal system operates in a world—and is the product of a world—that is not always rational and where meaning is not always obvious. In an attempt to recognize this, I have taken each of the theories above as directives for my research.

Chapter 3

3 International Environmental Law

Although a relatively young field, IEL has undergone a rapid transformation in the last few decades, emerging as a distinct and critical area of legal practice. IEL was developed in response to a growing recognition that many environmental issues (acid rain,¹¹⁹ biological diversity loss,¹²⁰ global climate change,¹²¹ ozone depletion,¹²² etc.) cross national boundaries and legal systems and, therefore, necessitate a coordinated international response. As science develops and different social patterns emerge, what exactly constitutes an environmental concern has shifted significantly.¹²³ IEL's focus lies on environmental issues that stem from human action, and as we have come to better understand the extent of our impact, the scope of these issues has grown dramatically.¹²⁴ The Anthropocene is a proposed term for a geological epoch that highlights the profound impact human activities have had on Earth's systems. Unlike previous geological epochs defined by natural phenomena, the Anthropocene is distinguished by the significant influence of human activities.¹²⁵ It signifies a new chapter in Earth's history, one where humans are a major geological force. As our impact on the planet increases, so too does the scope of IEL. Entering a geological epoch defined by the impact of human beings has significant implications for the future of environmental law.

As with international law more generally, IEL is based on general principles, customs, treaties, and judicial decisions.¹²⁶ International legal instruments and laws operate in two

¹¹⁹ John, McCormick, *Acid earth: The global threat of acid pollution* (London: Earthscan, 2009).

¹²⁰ Christopher D. Stone, "Land Use and Biodiversity" (2001) 27:4 *Ecology L Q* 967.

¹²¹ Graciela Chichilnisky & Geoffrey Heal, "Global Environmental Risks" (1993) 7:4 *J Econ Persp* 65.

¹²² Edward A. Parson, "Protecting the Ozone Layer" in Peter M. Haas, Robert O. Keohane, & Marc A. Levy, eds, *Institutions for the Earth: Sources of Effective International Environmental Protection* (Cambridge MA, London: MIT Press, 1993) 27.

¹²³ Bodansky, *supra* note 10 at 10.

¹²⁴ *Ibid.*

¹²⁵ Paul J. Crutzen, "Geology of mankind" (2002) 415:23 *Nature* 23.

¹²⁶ Traditional international law identifies its sources of law in Article 38(1) of the Statute of the International Court of Justice (Stat. I.C.J., art. 38). Although applying only to the Court, Article 38 represents the authoritative listing of processes that states identified at the time as capable of creating rules binding on them. These include general or

different forms: hard and soft. Hard law generally refers to instruments and laws with legally binding obligations. Examples include international treaties and customary international law.¹²⁷ Soft law, by contrast, is legally non-binding. Declarations adopted by international conferences,¹²⁸ resolutions of international organizations,¹²⁹ recommendations,¹³⁰ and best practices are all examples of soft law that play a significant role in IEL relations. Frequently, soft laws in IEL are expressed as terms of aspirations, goals, or vague guidelines that parties seek to achieve. Although these types of commitments are not legally binding, international actors habitually comply with them.¹³¹

IEAs are agreements between states aimed at addressing global environmental challenges that serve as frameworks for cooperation and establish guidelines for various environmental goals.¹³² These goals can include a broad range of issues, including reducing greenhouse gas emissions, protecting endangered species, conserving ecosystems, and promoting sustainable development.¹³³ International organizations like the United Nations Environment Programme (UNEP) play a critical role in facilitating the development, implementation, and monitoring of IEAs. Although not an enforcement

specialized international conventions (treaties), international custom as evidence of a general practice accepted as law, general principles of law recognized by civilized nations, and as subsidiary sources, international judicial decisions and doctrine. The Article outlines the accepted minimum but does not completely reflect the current international practice or the diverse activities that can contribute to the development of a new rule of law. Specifically, it omits all texts, other than treaties, that are adopted by international organizations, which play a significant role in the formation of international law, environmental law in particular. See Alexandre Kiss & Dinah Shelton, "Chapter 3 The Sources of International Environmental Law" in *International Environmental Law*. (Leiden, The Netherlands: Brill Nijhoff, 2004) 69.

¹²⁷ Kenneth W Abbott & Duncan Snidal, "Hard and Soft Law in International Governance" (2000) 54:3 *International Organization* 421 at 421.

¹²⁸ For example, the 1972 Stockholm Conference on the Human Environment or the 1992 U.N. Rio Conference on Environment and Development. (Stockholm Declaration on the Human Environment, in Report of the United Nations Conference on the Human Environment, UN Doc. A/CONF. 48/14, at 2 and Corr. 1 (1972)).

¹²⁹ For example, United Nations General Assembly. (1982, October 28). World Charter for Nature [Resolution A/RES/37/7]. This premise excludes Security Council resolutions adopted under chapter VII of the Charter of the United Nations.

¹³⁰ For example, the adaptation of the "polluter pays" principle by The Organization for Economic Co-operation and Development (OECD). OECD (1992). The Pollute-Pays Principle: OECD analyses and recommendations Doc. OECD/GD(92)81, Paris: OECD.

¹³¹ Huang, *supra* note 63 at 239.

¹³² Natalia Escobar-Pemberthy & Maria Ivanova, "Implementation of Multilateral Environmental Agreements: Rationale and Design of the Environmental Conventions Index" (2020) 12:17 *7098*.

¹³³ *Ibid.*

body, the UNEP can assist countries in fulfilling their obligations under agreements by providing scientific expertise and a platform for international discussions.

IEL has achieved significant progress in recent decades. However, it continues to fall short of its ambitious climate goals. To understand the reasons behind this gap, this chapter will look more critically at the nature of IEL. First, it will discuss the core principles of IEL to better understand its legal structure. It will then provide a brief history of some of the most significant IEAs to see how progress has been made over time. Finally, it examines some of the key challenges that hinder IEL's ability to achieve effective environmental governance.

3.1 State Sovereignty

The Peace of Westphalia of 1648 is often seen as laying the groundwork for the concept of the sovereign state.¹³⁴ Traditionally, international law guaranteed the freedom of a state to act in any manner it chose so far as its territory and people were concerned. In the environmental context, this meant unfettered national sovereignty over natural resources within a state.¹³⁵ By the late 1960s and early 1970s this began to change, and there was a general recognition that a coordinated international approach was needed to address the “continuing and accelerated impairment of the quality of human environment”.¹³⁶ This recognition influenced the early development of international environmental law, which was primarily concerned with delineating the rights and interests of states to use or enjoy natural resources within and outside their territorial limits. More recently, states have universally accepted limitations on these behaviours in the interest of the international community.¹³⁷

¹³⁴ Nico Schrijver, “The Changing Nature of State Sovereignty” (2000) 70:1 Brit YB Intl L 65 at 65.

¹³⁵ Edith Brown Weiss “Global Environmental Change and International Law: The Introductory Framework” in Edith Brown Weiss (ed) *Environmental Change and International Law* (United Nations University Press, Tokyo: 1992) 3 at 7.

¹³⁶ UNGA Resolution 2398 (XXIII) 1968.

¹³⁷ I.A. Shearer, *Starke's International Law* 11th ed (Butterworths, London: Oxford University Press, 1994), 144.

3.1.1 Duty to Prevent Environmental Harm

Modern IEL has its origins in the 1941 Trail Smelter Arbitration between the United States and Canada.¹³⁸ The dispute was over air pollution damages in Washington State from an ore smelter in Trail, British Columbia. The resolution of this dispute established the norm of customary international law that a state has to avoid letting its activities produce harm in other states. In 1972, the Stockholm Declaration on the Human Environment codified the norm established in *Trail Smelter*:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction.¹³⁹

Customary law dominated IEL up until the 1970s, at which declarations like the Stockholm Declaration began to codify previously established customary norms. The scope, complexity, and magnitude of IEL treaties continued to grow into the 1990s, establishing duties and standards for states and other actors.¹⁴⁰ As noted by Birnie and Boyle in 1994, “[i]nternational law is no longer a system of transboundary relations among neighbours, but has moved decisively in favour of a model which emphasizes the fiduciary or custodial relationship of states with the environment.”¹⁴¹ Following this transformation of IEL, management of the environment within a state’s territory increasingly became a matter for international scrutiny.¹⁴² Many subsequent treaties have expanded the duty to prevent transboundary harm to a more general duty to protect the global commons and areas beyond the national jurisdiction, such as the high seas, deep

¹³⁸ Trail Smelter Arbitration Tribunal. (1938, April 16). Trail Smelter Case (United States, Canada). Report to the Government of the United States of America and to the Government of the Dominion of Canada under the Convention Signed at Ottawa, April 15, 1935.

¹³⁹ Stockholm Declaration, *supra* note 128.

¹⁴⁰ Huang *supra* note 63 at 238.

¹⁴¹ Patricia Birnie & Alan Boyle, *International Law and the Environment* (Oxford: Clarendon Press, 1994) at 85.

¹⁴² *Ibid.*

sea bed,¹⁴³ and the global atmosphere.¹⁴⁴ Unlike Principle 21 of the Stockholm Declaration, which indicates that states should avoid causing external environmental harm, the duty to protect the global commons is one of due diligence and requires states to take positive preventative steps to protect the global environment from harm.¹⁴⁵

3.1.2 Precautionary Principle

As a result of this principle of prevention, the precautionary principle was developed and has generally been accepted in IEL. The Rio Declaration defines the precautionary principle as: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."¹⁴⁶ However, the exact meaning and breadth of the principle remain uncertain.¹⁴⁷ What constitutes "serious or irreversible damage" is unclear, and there will always be differing views as to what measures are cost-effective. Agius argues that "at the basic level, the Principle means states agree to act carefully and with foresight when making decisions about activities that may adversely impact the environment."¹⁴⁸ Following the United Nations Conference on Environment and Development (UNCED) in 1992, there is sufficiently broad evidence to suggest that the precautionary principle reflects a principle of customary international law.¹⁴⁹ On this basis, sovereign states have agreed to develop domestic policies and modify their behaviour in an effort to achieve a primarily global environmental goal.

3.1.3 Sustainable Development

Sustainable development is a relatively new concept in IEL. It is generally understood to mean "development that meets the needs of the present without compromising the ability

¹⁴³ 1982 United Nations Convention on the Law of the Sea (UNCLOS) (1982) 21 ILM 1261, Arts. 209 and 210.

¹⁴⁴ United Nations Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc No. 102-38, 1771 U.N.T.S. 107, Art. 3. [UNFCCC].

¹⁴⁵ Birnie, *supra* note 141 at 195.

¹⁴⁶ Rio Declaration on Environment and Development, Report of the United Nations Conference on Environment and Development, U.N. Doc. A/CONF.151/26/Rev.1 (1992) [Rio Declaration] Principle 15.

¹⁴⁷ Judson Agius, "International environmental law and state sovereignty" (1998) 3:3 Asia Pac J Envtl L 269 at 275.

¹⁴⁸ *Ibid.*

¹⁴⁹ Birnie, *supra* note 141 at 213.

of future generations to meet their own needs”.¹⁵⁰ It has become a central concept of international environmental policy, reflected in the creation of the 2030 Agenda for Sustainable Development which was adopted by all United Nations members in 2015.¹⁵¹ The Agenda created 17 Sustainable Development Goals (SDGs) that act as an urgent call for action by all countries to work towards “ending poverty and other deprivations hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests” by 2030.¹⁵² The SDGs advocate that development must balance social, economic, and environmental sustainability. The conflation of economic and social concerns with sustainability has been criticized by many as fundamentally incompatible with ecological sustainability.¹⁵³ Jason Hickels argues that the amount of global growth per year outlined in Goal 8 of the SDGs (3%) makes it empirically infeasible to achieve any reductions in aggregate global resources or reductions in CO2 emissions that are rapid enough to stay within the global carbon budget for 2°C.¹⁵⁴

The debate around the SDGs demonstrates the constant tension between effective environmental action and effective international regimes. On the one hand, international agreements must address environmental concerns, on the other they must incentivize a large number of states to participate and comply. This balancing act can often go awry, and an agreement may be widely adopted because it lacks teeth, while another might not be because it is too restrictive.¹⁵⁵ The need to compromise these two objectives has resulted in a long history of environmental agreements that have ambitious goals tempered by forgiving language and concessions to economic concerns.

¹⁵⁰ World Commission on Environment and Development, *Our Common Future* (Oxford University Press, Oxford: 1987).

¹⁵¹ UN General Assembly, *Transforming our world : the 2030 Agenda for Sustainable Development*, A/RES/70/1, 21 October 2015.

¹⁵² *Ibid.*

¹⁵³ See generally, Sam Adelman, “The Sustainable Development Goals, anthropocentrism and neoliberalism” in *Edward Elgar Publishing eBooks* (United Kingdom: Edward Elgar Publishing, 2018) 15; Viktoria Spaiser et al, “The sustainable development oxymoron: quantifying and modelling the incompatibility of sustainable development goals” (2017) 24:6 *Intl J Sustainable Dev & World Ecology* 457; Jason Hickel, “The contradiction of the sustainable development goals: Growth versus ecology on a finite planet” (2019) 27:5 *Sustainable development* 873.

¹⁵⁴ *Ibid.*, Hickel at 873.

¹⁵⁵ Bodansky, *supra* note 10 at 243.

3.2 A Brief History of IEAs

The evolution of international environmental law reflects an increasing recognition of the need for collective action. Although the shared global responsibility of environmental challenges is largely well known, IEAs continue to suffer from poor compliance (in which they fail to meet agreed-upon targets).¹⁵⁶ An examination of past agreements shows that while demand for action grows, so too does the criticism of international efforts. An analysis of every IEA would likely require several books and therefore this section does not intend to present an exhaustive list of relevant IEAs. Instead, it provides a brief overview of some significant developments throughout the short history of IEL.

Table 1: History of International Environmental Agreements

Year and Name	Accomplishments and Public Reception
<p>1972: Stockholm Conference on the Human Environment: Stockholm Declaration and Action Plan for the Human Environment</p>	<p>⇒ The Stockholm Conference,¹⁵⁷ organized by the United Nations, was the first major global conference on environmental issues. It addressed a wide range of environmental concerns and laid the groundwork for future IEAs. The Convention raised global awareness about environmental issues, leading to the establishment of the United Nations Environment Program (UNEP) and the creation of national environmental agencies in many countries. The Conference resulted in the adoption of the Stockholm Declaration on the Human Environment and the Action Plan for the Human Environment, which outlined strategies for addressing various environmental issues, including pollution, conservation, and resource management.¹⁵⁸</p> <p>⇒ The Stockholm Declaration laid down 26 principles concerning the environment and sustainable development, emphasizing the need for global cooperation to protect the Earth’s natural resources. In particular, Principle 21 which provides that “States have...the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage the environment of other</p>

¹⁵⁶ Cynthia Giles, “Noncompliance with Environmental Rules is Worse Than You Think” in *Next Generation Compliance: Environmental Regulation for the Modern Era* (New York: Oxford Academic, 2022) 45.

¹⁵⁷ Stockholm Declaration on the Human Environment, in Report of the United Nations Conference on the Human Environment, UN Doc.A/CONF.48/14, at 2 and Corr.1 (1972) [Report on the Human Environment].

¹⁵⁸ Edith Brown Weiss, "The Evolution of International Environmental Law" (2011) 54:1 Japanese YB Intl L 1 at 5.

	<p>States or of areas beyond the limits of national jurisdiction” which sets forth a basic obligation for signatory states.¹⁵⁹</p> <p>⇒ The Stockholm Conference marked a significant milestone in global environmental governance by raising awareness about environmental issues and fostering international cooperation. However, its non-binding nature limited its ability to enforce any environmental policies.</p>
<p>1987: The Montreal Protocol on Substances that Deplete the Ozone Layer</p> <p><u>Rewarding Mechanisms:</u></p> <ul style="list-style-type: none"> -Multilateral Fund -Technology Transfer -Trade Measures <p><u>Penalizing Mechanisms:</u></p> <ul style="list-style-type: none"> -Trade restriction 	<p>⇒ The Montreal Protocol¹⁶⁰ is a landmark multilateral environmental agreement adopted in 1987 as a response to the growing concern over the depletion of the ozone layer, primarily caused by the use of ozone-depleting substances (ODS), such as chlorofluorocarbons (CFCs) and halons. The Montreal Protocol demonstrated effective international cooperation in addressing a specific environmental issue, and it has been successful in reducing the use of CFCs and allowing the ozone layer to recover. It has been estimated that the Montreal Protocol is saving nearly two million people each year from skin cancer.¹⁶¹</p> <p>⇒ The treaty is largely considered one of the most successful IEAs of all time. Chapter 5 will discuss the rewarding mechanisms in the Montreal Protocol at length.</p>
<p>1992: The United Nations Rio Conference on Environment and Development: Rio Declaration and the United Nations Framework Convention on Climate Change (UNFCCC)</p>	<p>⇒ In June 1992, countries met in Rio de Janeiro to commemorate the twentieth anniversary of the Stockholm Conference. The Rio Conference produced four important documents: The Rio Declaration on Environment and Development,¹⁶² the UNFCCC,¹⁶³ the Convention on Biodiversity,¹⁶⁴ and Agenda 21, which set forth a comprehensive list of actions that states were to take.</p> <p>⇒ The UNFCCC is a landmark agreement that aims to stabilize greenhouse gas concentrations in the atmosphere to prevent dangerous anthropogenic interference with the climate system. It was adopted at the Earth Summit in Rio de Janeiro as a response to growing concerns about climate change. It established a global framework for addressing climate change, fostering international cooperation, and recognizing the</p>

¹⁵⁹ Report on the Human Environment, *supra* note 157 at 5.

¹⁶⁰ Montreal Protocol, *supra* note 17.

¹⁶¹ United Nations Environment Programme (UNEP), “The Montreal Protocol” online: *UN Environment Programme* <<https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol>>

¹⁶² Rio Declaration, *supra* note 146.

¹⁶³ UNFCCC, *supra* note 144.

¹⁶⁴ Convention on Biological Diversity, June 5, 1992, United Nations Treaty Series, Vol. 1760, p. 79 (No. 30619).

	<p>principle of common but differentiated responsibility.¹⁶⁵ The treaty called for ongoing scientific research and regular meetings, negotiations, and future policy agreements designed to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable development to proceed in a sustainable manner.¹⁶⁶ The establishment of the annual Conference of the Parties (COP) as the supreme decision-making body and the facilitator of future agreements is considered one of the agreement's greatest accomplishments.¹⁶⁷</p> <p>⇒ The UNFCCC and The Convention on Biodiversity encourage technology transfer and acknowledge the need for financial support for developing countries but do not establish these as explicit rewarding mechanisms within their frameworks.</p> <p>⇒ While the UNFCCC is seen as a crucial framework for addressing climate change on a global scale, unfortunately, the non-binding nature of commitments and the lack of specific emission reduction targets has limited its success in achieving tangible outcomes.</p>
<p>1997: United Nations Framework Convention on Climate Change: Kyoto Protocol</p> <p><u>Rewarding Mechanisms</u></p> <ul style="list-style-type: none"> -Emissions Trading -Clean Development Mechanism/Technology Transfer 	<p>⇒ The Kyoto Protocol,¹⁶⁸ an extension of the UNFCCC, set binding targets for developed countries to reduce greenhouse gas emissions, incorporating market-based mechanisms such as emissions trading and the Clean Development Mechanism, which allowed for emission reduction projects to be implemented in developing countries.¹⁶⁹ The purpose of the Kyoto Protocol was to operationalize the UNFCCC by committing industrialized countries and economies in transition to limit and reduce greenhouse gas emissions in accordance with individual targets.¹⁷⁰</p>

¹⁶⁵ Common but differentiated responsibility (CBDR) is a principle of international law establishing that while all states are responsible for addressing global environmental issues, this responsibility is not equal. The principle balances the need for all states to take responsibility, and the need to recognize the wide differences in economic development between states. These differences should, in turn, affect states' contributions and their ability to address climate issues. CBDR was formalized in international law at the United Nations Conference on Environment and Development. (Charlotte, Epstein "common but differentiated responsibilities". *Encyclopedia Britannica*, 20 Mar. 2023, <https://www.britannica.com/topic/common-but-differentiated-responsibilities>.)

¹⁶⁶ UNFCCC, *supra* note 144.

¹⁶⁷ Antto Vihma, "Climate Consensus: Managing Decision Making in the UN Climate Change Negotiations" (2014) 24:1 Rev Eu Comp & Intl Enviro L 58.

¹⁶⁸ Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 2303 U.N.T.S. 162 [Kyoto].

¹⁶⁹ UNFCCC, "What is the Kyoto Protocol?" online: *United Nations Climate Change* https://unfccc.int/kyoto_protocol.

¹⁷⁰ *Ibid.*

<p>-Adaptation Fund</p> <p><u>Penalizing Mechanisms</u></p> <p>-Compliance Mechanism</p>	<p>⇒ The Protocol established an emissions trading system that allowed developed countries who exceeded their emission reduction target to purchase emission reduction credits from developing countries that undertook projects to reduce greenhouse gases. In theory, this system allowed developed countries to meet their targets more flexibly while providing a financial incentive for developing countries to reduce emissions</p> <p>⇒ The Clean Development Mechanism (CDM) was a specific program under the emissions trading system. It allowed developed countries to invest in emission reduction projects in developing countries to earn tradable credits in return. These projects could involve technology transfers, promoting the diffusion of cleaner technologies in developing nations.¹⁷¹</p> <p>⇒ The Adaptation Fund was established to finance adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol.¹⁷²</p> <p>⇒ The effectiveness of these rewarding mechanisms has been debated. Some critics have argued that the emissions trading system led to loopholes and inefficiencies.¹⁷³ However, these mechanisms did represent an innovative approach to incentivize emissions reductions and promote sustainable development in developing countries.</p> <p>⇒ The Protocol established a compliance mechanism with two branches: Facilitative and Enforcement. In the event of non-compliance, the enforcement branch could recommend consequences such as suspension of emission trading (limiting a state’s ability to meet its targets) and public exposure (leading to “naming and shaming”).¹⁷⁴</p> <p>⇒ The Kyoto Protocol was the first international agreement to legally bind developed countries to emission reduction targets. Unfortunately, limited participation by major emitters like the United States and China, undermined its effectiveness.¹⁷⁵</p>
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¹⁷¹ Ben Pearson, “Market failure: why the Clean Development Mechanism won’t promote clean development” (2007) 15:2 J Cleaner Production 247.

¹⁷² David Cipler, J. Timmons Roberts & Mizan Khan, “The Politics of International Climate Adaptation Funding: Justice and Divisions in the Greenhouse” (2013) 13:1 Glob Environ Polit 49.

¹⁷³ F. T. Luebering, “A critique of emissions trading as a method to reduce CO2 emissions” (2011) 1:3 Nature Reports Climate Change 200; K. Harrison, “Understanding Kyoto’s failure” (2011) 10:2 International Development Law 1.

¹⁷⁴ Andries Nentjes & Ger Klaassen, “On the quality of compliance mechanisms in the Kyoto Protocol” (2004) 32:4 Energy Pol’y 531.

¹⁷⁵ Aarth S. Anand, “The Importance of Being Factual: The U.S., China, and the Future of the Kyoto Protocol” 24 Duke Envtl L & Pol’y Forum 1.

<p>2009: Conference of the Parties to the UN Framework Convention on Climate Change (COP15): The Copenhagen Accord</p>	<p>⇒ The Copenhagen Accord¹⁷⁶ was a political agreement negotiated during COP 15. It recognized the need to limit global temperature rise to 2 degrees Celsius above pre-industrial levels and acknowledged the importance of developing countries' efforts in reducing emissions. It also established a goal of mobilizing \$100 billion annually by 2020 to support climate action in developing countries.¹⁷⁷</p> <p>⇒ The Accord was not legally binding and did not replace the Kyoto Protocol. Instead, it outlined the political will of participating countries and encouraged voluntary emission reduction commitments. It invited countries to submit their mitigation targets and actions, known as “nationally determined contributions” (NDCs), which later became a key component of the Paris Agreement.¹⁷⁸</p> <p>⇒ The Copenhagen conference faced challenges in reaching a comprehensive agreement due to divisions between developing and developed nations. The negotiations were marked by disagreements over emission reduction targets, financing commitments, and the overall structure of a new climate agreement.¹⁷⁹ The accord was met with mixed reactions, with some countries expressing disappointment over its limited outcomes, as participants failed to reach a legally binding agreement.¹⁸⁰ While it may not have met all expectations, it did acknowledge the need for ambitious climate action and financial support for climate change mitigation and adaptation.</p>
<p>2015: Conference of the Parties to the UN Framework Convention on Climate Change: The Paris Agreement</p> <p><u>Rewarding Mechanisms:</u></p>	<p>⇒ The Paris Agreement¹⁸¹ is a landmark global climate agreement that aims to combat climate change by limiting global warming to well below 2 degrees Celsius and pursuing efforts to limit it to 1.5 degrees Celsius. The agreement also emphasizes national contributions and transparency.¹⁸² It has achieved near universal ratification, with the EU and 194 states (which represent over 98% of greenhouse gas emissions)</p>

¹⁷⁶ United Nations Framework Convention on Climate Change (UNFCCC). (2009, December 18). Copenhagen Accord [Copenhagen].

¹⁷⁷ *Ibid.*

¹⁷⁸ *Ibid.*

¹⁷⁹ John Vidal, Allegra Stratton & Suzanne Goldenberg, “Low targets, foals dropped: Copenhagen ends in failure” (19 December 2009) online: *The Guardian* <theguardian.com/environment/copenhagen>

¹⁸⁰ *Ibid.*

¹⁸¹ Paris Agreement, *supra* note 3.

¹⁸² *Ibid.*

<p>-Recognition and Reputation</p>	<p>having ratified or acceded to the agreement.¹⁸³ The Paris Agreement requires all parties to determine, plan, and regularly report on the nationally determined contribution (NDC) that they undertake to mitigate climate change. Parties are also required to submit aggregate progress on mitigation, adaptation, and means of implementation, which are reviewed every five years through a Global Stocktake.¹⁸⁴</p> <p>⇒ The monitoring, verification, and public reporting measures operate as both rewarding and penalizing mechanisms. The requirements are aimed at making the progress of individual nations easy to track, which can be beneficial or detrimental, depending on the performance of the state. States with ambitious climate targets and demonstrated progress can gain recognition from the international community, while states with poor performance may consequently suffer from poor reputation.</p> <p>⇒ The Paris Agreement was hailed as a historic achievement in international climate diplomacy, signaling a strong commitment to collective action on climate change. However, criticisms remain regarding the lack of binding enforcement mechanisms and the adequacy of countries' NDCs to meet the agreement's temperature goals. Furthermore, critics pointed to the limited progress on key issues such as climate finance and adaptation.¹⁸⁵</p>
<p>2021: Conference of the Parties to the UN Framework Convention on Climate Change (COP26): Glasgow Climate Pact</p>	<p>⇒ The Glasgow Climate Pact was agreed to during the 2021 UN Climate Change Conference in Glasgow (COP26). It is a series of decisions and resolutions that build on the Paris Agreement aimed to secure global net zero by mid-century and to keep a maximum of 1.5 C degrees of warming within reach.¹⁸⁶ It aimed to enhance global climate action and increase ambition to limit global warming. Other goals included accelerating the phase-out of coal, adapting to protect communities and natural habitats, mobilizing at least \$100bn in climate finance per year, and finalizing the Paris Rulebook, which gives the guidelines on how</p>

¹⁸³ United Nations, "The Paris Agreement" online: United Nations <<https://www.un.org/en/climatechange/paris-agreement>>.

¹⁸⁴ ISSD, "UN Framework Convention on Climate Change – UNFCCC" (2004) online: *ISSD* <<https://enb.iisd.org/negotiations/un-framework-convention-climate-change-unfccc>>.

¹⁸⁵ Anju Sharma, "Precaution and post-caution in the Paris Agreement: adaptation, loss and damage and finance" in Joanna Depledge, Jorge E Viñuales, Emma Lees, David Reiner, eds, *Climate Policy after the 2015 Paris Climate Conference*, (London: Routledge, 2021).

¹⁸⁶ Fiona Harvey, "COP26 draft text annotated: what it says and what it means" (10 Nov 2021), online: *The Guardian* <<https://www.theguardian.com/environment/ng-interactive/2021/nov/10/cop26-draft-text-annotated-what-it-says-and-what-it-means>>.

	<p>the Paris Agreement is delivered. A focus of COP26 was to secure agreement between all Paris signatories on how they would set out their nationally determined contributions (NDCs) to reduce emissions.¹⁸⁷</p> <p>⇒ Loss and Damage finance aims to provide financial resources to developing countries to address the losses and damages they are experiencing due to climate change. The Glasgow Climate Pact established a new work program dedicated to operationalizing loss and damage finance. Its goal is to explore difference sources and funding, as well as ways to deliver financial assistance to developing countries.¹⁸⁸</p> <p>It must be noted that this is not explicitly a rewarding mechanisms, in that it does not guarantee funding to compliant states. I include it in the discussion here for its potential rewarding benefits in the future.</p> <p>⇒ The Glasgow Climate Pact was met with mixed reviews. The UN Secretary-General António Guterres stated that the approved text took important steps, but “unfortunately the collective political will was not enough to overcome some deep contradictions”.¹⁸⁹ Commentary also focused on the need to act quickly, highlighting the sense of urgency surrounding modern climate agreements.</p> <p>⇒ While the Pact saw countries commit to more ambitious reduction targets and to enhancing adaptation and finance efforts, the lack of concrete plans and deadlines for achieving emission reductions prompted comments like those detailed above.</p>
<p>2022: Conference of the Parties to the UN Framework Convention on Climate Change (COP27): The Sharm el-Sheikh Implementation Plan</p>	<p>⇒ The four key themes identified at COP27 were mitigation, adaptation, finance, and collaboration.¹⁹⁰</p> <p>⇒ The final decision text reaffirms the commitment of the parties to limit global temperature rise to 1.5 degrees Celsius above pre-industrial levels.</p> <p>⇒ A dedicated fund for loss and damage due to climate events was established. It aims to provide financial assistance to countries most</p>

¹⁸⁷Dominic Carver, “What were the outcomes of COP26?” (27 January 2022), online: *House of Commons Library*, <https://commonslibrary.parliament.uk/what-were-the-outcomes-of-cop26/#:~:text=A%20focus%20of%20COP26%20was,transparency%20framework%20for%20reporting%20emissions>.

¹⁸⁸ Rosemary Lyster, “The Glasgow Climate Pact: Is It All Just ‘Blah, Blah, Blah?’” (2023) 4:1 YB Disaster L 382.

¹⁸⁹ António Guterres, “Secretary-General’s statement on the conclusion of the UN Climate Change Conference COP26” (13 November 2021) online: *United Nations*, <<https://www.un.org/sg/en/content/sg/statement/2021-11-13/secretary-generals-statement-the-conclusion-of-the-un-climate-change-conference-cop26>>.

¹⁹⁰ *Ibid.*

<p><u>Rewarding Mechanisms:</u> -Loss and Damage Fund</p>	<p>vulnerable and impacted by the effects of climate change.¹⁹¹ Creating a specific fund for loss and damage marked an important point of progress for IEL, although serious concerns were expressed that the goal of developed country Parties jointly mobilizing USD 100 billion per year by 2020 had not yet been met.¹⁹² I include this as a potential rewarding mechanism based on the assumption that financing can be achieved.</p> <p>⇒ Although there was some success throughout negotiations, critiques of the final decision text point to a large gap between current national climate plans and what is needed to reduce global emissions.¹⁹³ While COP27 delivered significant progress on financing, the lack of progress on mitigation and adaptation was seen as worrisome. In failing to deal with the central challenge of reducing fossil fuel use and further reducing carbon emissions, critics argued COP27 had not addressed the key challenge of climate change.¹⁹⁴ Furthermore, despite the establishment of the fund, no decisions were made about who should pay into the fund, where the money should come from, or which countries would benefit.¹⁹⁵</p>
<p>2023: Conference of the Parties to the UN Framework Convention on Climate Change (COP 28)</p> <p><u>Rewarding Mechanisms:</u> -Improved Access to Climate Finance</p>	<p>⇒ COP28 was focused on implementing the Paris Agreement and accelerating climate action. Some of the highlighted topics included finalizing details of the loss and damage fund (established at COP27), driving a global goal on finance that could help fund green transitions in developing countries, closing the emissions gap, and accelerating an energy and just transition.¹⁹⁶</p> <p>⇒ Securing adequate financial resources was a crucial point of negotiations. Discussions focused on innovative financing mechanisms,</p>

¹⁹¹ Dominic Carver, “What was agreed at COP27?” (05 January 2023), online: *House of Commons Library*, <https://commonslibrary.parliament.uk/what-was-agreed-at-cop27/#:~:text=Four%20key%20themes%20were%20identified,time%20food%20security%20was%20recognised>.

¹⁹² *Ibid.*

¹⁹³ Natalia Alayza et al, “COP27: Key Takeaways and What’s Next” (8 December 2022) online: *World Resources Institute* <<https://www.wri.org/insights/cop27-key-outcomes-un-climate-talks-sharm-el-sheikh>>

¹⁹⁴ The Conversation, “COP27 key outcomes: progress on compensation for developing countries, but more needed on climate justice and equity” (21 November 2022) online: *The Conversation* <<https://theconversation.com/cop27-key-outcomes-progress-on-compensation-for-developing-countries-but-more-needed-on-climate-justice-and-equity-195017>>.

¹⁹⁵ UNEP, “COP27 ends with announcement of historic loss and damage fund” (22 November 2022) online: *UN Environment Program* <<https://www.unep.org/news-and-stories/story/cop27-ends-announcement-historic-loss-and-damage-fund>>.

¹⁹⁶ United Nations Climate Change, “About COP28” online: *United Nations* <<https://unfccc.int/process-and-meetings/conferences/un-climate-change-conference-united-arab-emirates-nov/dec-2023/about-cop-28#What-will-be-discussed-at-COP-28>>.

	<p>mobilizing private sector investment, and ensuring equitable distribution of funds.¹⁹⁷</p> <p>⇒ Significantly, the first Global Stockade of the implementation of the Paris Agreement will conclude at COP28. Each stockade is a two-year data collection process, occurring every five years. The outcome called for parties to take actions to achieve ambitious targets, including tripling renewable energy capacity and doubling energy efficiency improvements by 2030.¹⁹⁸ Although each state submits individual reports, the Global Stocktake does not detail information on individual actors.</p> <p>⇒ The conference emphasized the need to scale up climate finance for developing countries, acting as an incentive for them to participate more actively and increase their climate ambitions.¹⁹⁹</p> <p>⇒ Despite some positive outcomes, challenges remain. Ensuring all countries contribute fairly to emissions reductions is an ongoing discussion, and securing sufficient climate finance remains a critical issue.</p>
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As evidenced by the brief timeline above, although IEAs play a vital role in addressing environmental challenges, their effectiveness can vary drastically. Despite universal acknowledgement and recognition that the climate crisis must be addressed collaboratively, and despite a growing list of laws and agreements designed to do so, the reality is that environmental issues continue to worsen.²⁰⁰ While these agreements have made substantial progress in bringing attention to global climate issues, we can see some common criticisms emerge. The non-binding nature of agreements, lack of specific targets and timelines, limited participation by major emitters, lack of enforcement mechanisms, limited political will, lack of funding, and divisions between developed and developing countries are just some of the reasons that IEAs continue to be criticized for

¹⁹⁷ *Ibid.*

¹⁹⁸ United Nations Climate Change, “Global Stocktake” online: *United Nations* <<https://unfccc.int/topics/global-stocktake>>.

¹⁹⁹ It is important to note that the potential for financial gain is always dependent on provided funding. As evidenced by some of the agreements mentioned in this list, securing funding is a continuous issue for IEAs. While the concept of financial support is an attractive reward, the continuous inability to adequately fund any is detrimental to the impact these provisions might have on participation and compliance.

²⁰⁰ Laitos, *supra* note 8 at 1.

their ineffectiveness. In the face of such obvious international effort, it behooves us to discuss what barriers IEL faces that make the creation of effective laws so difficult.

3.3 Challenges in International Environmental Law

Within the last 50 years, there have been more than a dozen climate agreements that have been formally adopted— showing an ostensible shared willingness to address the climate crisis.²⁰¹ The problem is that compliance with such treaties has proved to be extremely fragile.²⁰² After an extensive review of 20 years of IEA research, Pouw, Weikard and Howarth concluded that “at the international level, universal coalitions are more cost-efficient and effective than fragmented regimes, but more difficult to negotiate and less stable”.²⁰³ Competing interests, lack of enforcement, and a stubborn devotion to the notion of sovereignty over natural resources have complicated IEA negotiations since their inception. The following sections will explore some of the factors that have hampered the ability of IEL to effectively address global environmental challenges.

3.3.1 International Enforcement

One of the most striking limitations of international law remains its lack of an automatic and compulsory enforcement mechanism.²⁰⁴ Unlike domestic legal systems with dedicated enforcement bodies, IEL lacks a supranational authority to oversee the behaviour of states. The challenge lies in crafting effective enforcement mechanisms within a framework that lacks a central enforcement authority. Implementing harsh penalties risks alienating states and hindering cooperation. Thus, we must depend on the desire of states to voluntarily participate in IEAs.²⁰⁵ Environmental action is often costly and may require significant alterations to a state’s behaviour and national

²⁰¹ Klaudijo Klaser, Lorenzo Sacconi, & Marco Faillo, “John Rawls and Compliance to Climate Change Agreements: Insights from a Laboratory Experiment” (2021) 21:3 Intl Envtl Agreements: Politics, L & Economics 531 at 534.

²⁰² *Ibid.*

²⁰³ Nicky R.M. Pouw, Hans-Peter Weikard & Richard B. Howarth, “Economic Analysis of international environmental agreements: lessons learnt 2000-2020” (2022) 22 Intl Envtl Agreements 279 at 279.

²⁰⁴ Elena Katselli Proukaki, *The Problem of Enforcement in International Law*, (Oxfordshire: Routledge, 2010) at 1.

²⁰⁵ Omri Ben-Shahar & Anu Bradford, “Efficient Enforcement in International Law” (2012) 12:2 J Intl L 375 at 377.

infrastructure.²⁰⁶ The level of action required can be dissuasive to many states, and without an enforcement body, this can translate to weak international environmental action.

3.3.2 Free-Riding

IEL faces a persistent challenge known as the “free-rider problem”. This economic concept occurs when a party receives the benefits of a public good, like a healthy environment, without contributing to the costs of maintaining it.²⁰⁷ In the context of IEL, this translates to states reaping the economic benefits of environmental exploitation while other states bear the burden of addressing global environmental issues. Game theoretical studies on the formation and stability of IEAs have pointed out that strong free-rider incentives exist in IEL and that these can threaten the stability of IEAs.²⁰⁸ Studies in this area highlight the strong incentives for states to free-ride within IEAs, potentially destabilizing these agreements. The very nature of environmental problems, with their transboundary effects, fuels this incentive. States may be tempted to rely on the emission reductions by others while delaying their own domestic actions, as the benefits of a clean environment are enjoyed by all, regardless of who takes the initiative. From a purely rational perspective, it can be more attractive for a state to avoid the costs of pollution control and enjoy the benefits of others’ efforts.

Beyond the immediate economic benefits, another layer of complexity is “temporal free riding.” This occurs when the current generation enjoys the consumption benefits of high carbon emissions while future generations bear the consequences through reduced consumption opportunities or a degraded environment. Motivating states to prioritize potential long-term benefits for future generations over short-term economic gains within their borders is a significant challenge.²⁰⁹

²⁰⁶ William Nordhaus, “Climate Clubs: Overcoming Free riding in International Climate Policy” (2015) 105:4 *American Economic Review* 1339 at 1399.

²⁰⁷ *Ibid.*

²⁰⁸ Achim Hagen et al, “The influence of political pressure groups on the stability of international environmental agreements” 391:16 *University of Oldenburg Discussion Papers in Economics* at 2.

²⁰⁹ Nordhaus, *supra* note 206 at 1399.

Free-riding behaviour can weaken the effectiveness of IEL in two ways. Firstly, it creates a disincentive for participation. Countries may be less willing to commit to strict environmental regulations if they perceive others gaining an economic advantage by not participating. This can lead to a “race to the bottom,” where states weaken their environmental standards to compete for industries that might otherwise be located in countries with weaker regulations.²¹⁰ Secondly, free riding can undermine trust and cooperation between nations. Countries that consistently free-ride can breed resentment among those who uphold their commitments. This can weaken the overall institutional framework of IEL and make it more difficult to address future environmental challenges.²¹¹ While contemporary IEAs benefit from high levels of participation, they continue to lack a commitment to aggressive climate action from many of the participating states.

Later chapters will explore how rewarding mechanisms, like those employed in the Montreal Protocol, offer a promising path forward. By creating incentives for participation and compliance, these mechanisms can address the free-riding problem and encourage states to contribute fairly to a healthier planet for all.

3.3.3 Common but Differentiated Responsibility

The principle of Common but Differentiated Responsibility (CBDR) is generally accepted as one of the guiding principles in regulating the international standards and rules related to climate change.²¹² CBDR establishes that all states must contribute to the protection of the global environment and the construction of sustainable development, but that consideration must be given to the fact that some states have historically played a greater role in environmental degradation, and as a result, that disparities exist in the

²¹⁰ S Bernauer, “Multilateral environmental agreements and effectiveness: Estimation of a dynamic participation model” (1995) 47:4 World Politics 614.

²¹¹ *Ibid.*

²¹² Yuli Chen, “Reconciling common but differentiated responsibilities principle and no more favourable treatment principle in regulating greenhouse gas emissions from international shipping” (2021) 123:1 Marine Policy 1.

resources available to states for the pursuit of this goal.²¹³ How exactly these groups are differentiated has evolved over the last few decades but continues to be a point of contention in IEL.

The first unambiguous adoption of the exact wording “common but differentiated responsibilities” was in 1992 at the Earth Summit in Rio de Janeiro where countries declared:

States have common but differentiated responsibilities in view of their different contributions to global environmental degradation. Developed countries acknowledge the responsibility they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.²¹⁴

Consequently, CBDR was enshrined as a basic principle in Article 3(1) of the UNFCCC.²¹⁵ In accordance with Article 3(1), the Convention evolved to allocate different responsibilities among different groups of parties. The Kyoto Protocol translated this principle by defining two categories of countries: the developed countries (Annex 1) and the developing (Non-Annex 1). Annex I parties were obligated to reduce their collective greenhouse gas (GHG) emissions at least 5 percent below 1990 levels by 2008-2012, while the non-Annex I countries were under no such obligation.²¹⁶ This differentiation acknowledged that developed countries had reached economic prosperity earlier than developing and, therefore, contributed more significantly to historic emissions during their industrialization. Thus, they had a greater responsibility to reduce them.²¹⁷ This differentiation, in particular the failure to extract reduction commitments from large emitters like China and India, became a basis for the United States (the largest emitter of CO₂ in 1992) to sideline itself from Kyoto and, therefore, from much of the UNFCCC regime's progress.²¹⁸ Disputes over the scope of CBDR were a significant

²¹³ Christopher D. Stone, “Common But Differentiated Responsibilities in International Law” (2004) 98:2 Am J Intl L 98.2 276.

²¹⁴ Rio Declaration, *supra* note 146.

²¹⁵ UNFCCC, *supra* note 144.

²¹⁶ Kyoto, *supra* note 168.

²¹⁷ Farhana Sultana, “Critical climate justice” (2022) 188:1 Geo J 118 at 118.

²¹⁸ P. G. Harris, “Common but Differentiated Responsibility: The Kyoto Protocol and United States Policy” (199) 7:1 N.Y.U. Envtl LJ 27.

cause of tension throughout the UNFCCC regime, and some argue one of the primary causes of its collapse.²¹⁹

The fundamental question regarding the application of CBDR has always been how to differentiate between parties. For many years, the division outlined in the Kyoto Protocol dominated CBDR discussions. Recently, however, there has been a shift towards classifications of “developed” and “developing” countries, which gives more flexibility to state categorization.²²⁰ The continuous debate over the application of CBDR is due to the ambiguous nature of the principle (especially following its more recent shift towards flexibility) and to growing concerns over fast-growing carbon emissions from developing countries.²²¹ As the carbon emissions from developing states continue to grow, concerns over emission regulation and reduction have become greater concerns for developed countries. Developed countries argue that CBDR should be based on “capabilities,” while developing countries continue to emphasize “responsibility.”²²² This has ushered in a shift away from “historic responsibility” to “future responsibility,” which puts greater obligations on major emerging economies.²²³ An argument for this kind of recontextualization is that the significant increase in emissions from major developing economies today would retrospectively be their historical responsibilities in the future. As such, addressing them now will save significant work and environmental damage in the years to come.²²⁴ Ultimately, this debate resulted in the compromise of “Common but Differentiated Responsibilities and Respective Capabilities” (CBDR-RC) as the basis for

²¹⁹ See generally David G. Victor, “The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming” (2001, Princeton University Press); Speaking at the closing plenary meeting of COP-8, Steen Gade, who headed the European Union delegation, quoted a statement from Samoa's representative: “We cannot just sit here through meeting after meeting, year after year, with one side of the room saying we cannot act alone, and the other side saying we cannot accept obligations.”

²²⁰ Yanzhu Zhang & Chao Zhang, “Thirty years with common but differentiated responsibility, why do we need it ever more today?” (4 May 2022) online: *Blavatnik School of Government, University of Oxford* <<https://www.bsg.ox.ac.uk/blog/thirty-years-common-differentiated-responsibility-why-do-we-need-it-ever-more-today>>.

²²¹ *Ibid.*

²²² Daniel Bodansky, Jutta Brunnée & Lavanya Rajamani, *International Climate Change Law* (Oxford: Oxford University Press, 2017) at 27.

²²³ Zhang, *supra* note 220.

²²⁴ *Ibid.*

differentiation.²²⁵ The Paris Agreement adopted an approach to CBDR-RC with what has been called “dynamic differentiation,” which considers different national circumstances, capacities, and vulnerabilities and tailors differentiation to the specificities of mitigation, adaptation, finance, capacity building, and transparency.²²⁶

It is evident that the principle of CBDR-RC has had a profound and enduring impact on international environmental negotiation. As a core principle of IEL, it has significantly shaped the development of IEAs, particularly as the urgency for robust international cooperation on climate change continues to intensify. Despite a recent shift towards flexibility, CBDR-RC continues to be a point of contention in negotiations. The ongoing debate surrounding the attribution of responsibility for climate change and the degree of differentiation applied are likely to continue impeding the development of effective IEAs.

3.4 Conclusion

Although a younger area of law than most, IEL has demonstrated transformative change throughout its short lifetime. Given the rapidly changing needs of the global environment, it is unsurprising that IEL has demonstrated an equal willingness for flexibility. While IEL may share common characteristics with international law more broadly, the transboundary nature of environmental issues demands a softening of rigid state sovereignty and a greater responsibility to the international community. Principles like the precautionary principle and sustainable development have encouraged collaboration between states, yet the history of IEAs demonstrates an inability to utilize these insights strategically. Issues of free-riding, enforcement, and differentiating responsibility continue to hinder the effectiveness of IEAs. Faced with the stark reality of contemporary IEL, we must ask ourselves how we can overcome the barriers of our past to save the environment of our future.

²²⁵ Stellina Jolly & Abhishek Trivedi, "Principle of CBDR-RC: Its Interpretation and Implementation Through NDCS in the Context of Sustainable Development" (2021) 11:3 Wash J Envtl L & Poli'y 309 at 320.

²²⁶ Christina Voigt & Felipe Ferreira, "“Dynamic Differentiation”: The Principles of CBDRRC, Progression and Highest Possible Ambition in the Paris Agreement" (2016) 5:2 Transnat'l Envtl L 285 at 303.

Chapter 4

4 Crafting Effective Environmental Laws

The previous chapter explored the history of major IEAs and some of their key challenges, particularly the deep divisions within the global community and the lack of strong accountability mechanisms. The purpose of this research is not to propose a single solution to these issues, but rather an alternative framework in which to address them. I've discussed the theoretical frameworks of IEL and the history of underwhelming IEAs in detail but not what an effective agreement might actually look like. This chapter will focus on how we can determine what makes an IEA effective and what strategies can be employed to create one.

4.1 What is an Effective IEA?

IEL scholarship tends to conflate terms like 'effectiveness,' 'success,' and 'influence', amongst others. Initially, I thought little of this terminology and felt no reason to address its ambiguity. However, closer scrutiny made me realize that the terminology we use can significantly change which elements of IEAs we consider when measuring impact. In the past I readily described IEAs as successful or unsuccessful, but never explicitly defined the criteria underlying such judgements. This realization underscored the importance of carefully defining our criteria and acknowledging the multifaceted nature of evaluating IEAs.

Determining how to measure the impact of an IEA is complicated by its scale and purpose.²²⁷ If an agreement aims to bring together the majority of global emitters under one regulatory umbrella, then the number of participants is an important metric. By contrast, if an agreement's purpose is to protect a specific area of land, we might look at the regulatory progress that has been established or quantitative benchmarks that have been reached. In recent years, large IEA negotiations like the Paris Agreement have

²²⁷ By scale I am referring to both the number of participants involved as well as the scope of the topic being regulated, both of which are connected to the purpose of an agreement.

focused on limiting global temperature rise. The scale and multifaceted nature of these challenges make it difficult to directly attribute consequences to specific actions. When the goal of the Paris Agreement is to hold the increase in global temperature to ‘well below 2°C above pre-industrial levels’,²²⁸ the benchmarks for success are rather unclear. When can we decide if the Paris Agreement is successful when its goal is to never reach a quantifiable threshold?

These complexities led my research away from the binary concept of “success.” Such a framing suggests a more readily measurable outcome than most IEAs provide. Environmental agreements often have nuanced effects stemming from broad mandates and the interplay of social and economic factors.²²⁹ Therefore, I propose to analyze IEAs through the lens of ‘effectiveness’. While this term itself lacks a single definition, for this research, I define treaty effectiveness as the agreement’s ability to fulfill the aims outlined in its purpose and objectives.²³⁰ Although there is no single formula for determining effectiveness, identifying factors conducive to positive outcomes is certainly possible.

4.1.1 Participation

When addressing domestic environmental problems, economists often discount the issue of participation²³¹ because the existence of an effective government with operative coercive powers is assumed.²³² However, as previously discussed, in the international domain, national sovereignty precludes a central enforcement authority. This absence, coupled with the pervasive challenge of free-riders, complicates participation in IEAs. Without an enforcement body, state participation becomes entirely voluntary. While the

²²⁸ Paris Agreement, *supra* note 3.

²²⁹ See a broader discussion of this in Chapter 6.

²³⁰ David S. Jonas & Thomas N. Saunders, “The Object and Purpose of a Treaty: Three Interpretive Methods” (2010) 43:1 *Vand J Transnat’l L* 565.

²³¹ For the purposes of this paper, I will be using participation to describe states’ initial participation in a treaty’s negotiation and ratification. This is differentiated from compliance, which I will use to refer to the point at which a state actually complies with the obligations it has under the treaty. Note that some academics will use participation to refer to both of these instances.

²³² Scott Barrett & Robert Stavins, “Increasing Participation and Compliance in International Climate Change Agreements” (2003) 3:4 *International environmental agreements : politics, law and economics* 349 at 350.

pitfalls of such a system seem evident, some scholars have observed a surprisingly high level of participation among countries in IEAs.²³³ This apparent paradox defies economic theory, which suggests that free-riding behaviour should impede or severely limit the formation and participation in IEAs.²³⁴ The proliferation of environmental agreements suggests that there are alternative reasons to participate in negotiations beyond a rational analysis of utility. To that end, I will attempt to explore some alternative benefits to participation below.

Benefits to Participation

It can be argued that the inherent nature of environmental problems, namely their transboundary nature, provides a strong incentive for states to participate in initial negotiations. Failure to participate in a widely supported global agreement may risk regulatory regimes that fail to account for a non-participating state's interests.²³⁵ Given the voluntary nature of IEAs, there is greater flexibility for the inclusion of a variety of state priorities in the final text of an agreement. Therefore, states may be motivated to participate, knowing it can ensure their priorities are heard at very little cost to themselves.

IEAs can also foster a sense of cooperation and goodwill between states on environmental issues, creating a platform for states with potentially conflicting interests to find common ground.²³⁶ This type of diplomatic engagement often involves joint projects, capacity-building initiatives, and technology transfer between states. These types of interactions can create trust and foster long-term partnerships between states, leading to broader benefits for international relations overall.²³⁷ A state's decision to participate in an IEA can also be interpreted as a signal of its commitment to environmental governance. By engaging in negotiations and adhering to the agreement's

²³³ Marco Battaglini & Bård Harstad, "Participation and Duration of Environmental Agreements" 124:1 (2016) J Journal of Pol Econ 160 at 161.

²³⁴ Ibid.

²³⁵ Alan Boyle, *International Law: Processes, Contents, and Consequences* (Oxford University Press, 2020), 582.

²³⁶ David Hunter, *International Environmental Law and Policy*, (West Academic Publishing, 2021) at 138

²³⁷ Philippe Sands, *Lawless World*, (Allen Lane, 2003) at 384.

provisions, a state demonstrates its willingness to cooperate with other countries on environmental issues.²³⁸ This not only fosters international collaboration but also sends a message to its domestic and international constituencies about its environmental priorities.

Furthermore, participation provides opportunities for low-cost information sharing and capacity-building that can help parties discover or redefine their own interests. Negotiations are often open to some form of public scrutiny along with iterative revisions, fostering agreements that are grounded in well-considered and developed conceptions of national interests. This process itself involves the sharing of scientific data, best practices, and technological advancements that can shape these national interests to some extent.²³⁹ This can be particularly valuable for developing countries, helping them build capacity to address environmental issues within their own borders.²⁴⁰ This means that in addition to allowing states to articulate their priorities, negotiations can provide a forum for the cost-effective dissemination of information and knowledge.

Measuring Participation

While participation rates might initially seem like a straightforward measure of effectiveness (more participating states imply a more effective treaty), this is not necessarily true. The composition of states in IEAs and the respective capabilities of each can play a significant role in the effectiveness of an agreement. Consider an environmental agreement designed to attract broad participation. Let's say it only secures the adherence of one-third of all potential signatories. This may seem detrimental to the effectiveness of the agreement, but it is important to consider the composition of the participating states.²⁴¹ Say for example, that the treaty aims to reduce the global use of plastic toothbrushes. In this scenario, one of the signatories uses 20% of the world's plastic toothbrushes due to a national proclivity for the feeling of polypropylene. The

²³⁸ David Hunter, James Salzman & Durwood Zaelke, *International environmental law and policy*, 6th ed (Foundation Press, 2021).

²³⁹ Hunter, *supra* note 236 at 183.

²⁴⁰ Edith Brown Weiss, *International Environmental Law: Basic Principles, Cases, and Documents* (Oxford University Press, 2010) at 102.

²⁴¹ Salzman, *supra* note 238 at 152-153.

remaining signatories collectively account for another 40% of the global usage. Although only one-third of potential signatories participated in the agreement, 60% of global usage is now under an IEA regime. In terms of effectiveness, scholars might find this treaty rather impressive and statistically, despite the smaller number of participants, there would likely be progress toward the goal of reducing the global usage of plastic toothbrushes.²⁴² Conversely, the impact of a single significant state can derail negotiations entirely. Negotiations are heavily impacted by the structure of the international system, where significant power disparities exist. For instance, the Convention on the Law of the Sea, the product of more than a decade of international negotiations, was ultimately derailed when the United States administration (who had initially sponsored negotiations) objected to provisions on deep-sea mining.²⁴³

Equally, however, multilateral negotiating forums can foster cooperation and provide opportunities for weaker states to form coalitions and wield influence. Perhaps the most significant example of this is the Alliance of Small Island States (AOSIS), a collection of states that are disproportionately vulnerable to the adverse effects of climate change.²⁴⁴ Rising sea levels pose a significant environmental threat, but particularly for states that face complete erasure if water levels rise too quickly. Consequently, in 1990 AOSIS was established to provide a collective voice in international climate negotiations.²⁴⁵ The alliance has consistently advocated for more ambitious climate action, and its persistence, alongside least-developed countries, has played a crucial role in elevating adaptation as a priority on the UNFCCC agenda.²⁴⁶

Although participation can create opportunities for smaller states' advocacy, it can also lead to a potential dilution of the agreement's ambitious goals. Creating a forum for sharing diverse and conflicting priorities often necessitates compromises, which can

²⁴² *Ibid* at 134-135.

²⁴³ Chayes, *supra* note 1 at 183.

²⁴⁴ Pieter Pauw et al., *A State-of-the-Art Review of the Notion of Common but Differentiated Responsibilities in International Negotiations* (Discussion Paper, German Development Institute, 2014) 1-66 <https://www.idos-research.de/uploads/media/DP_6.2014..pdf>.

²⁴⁵ *Ibid*.

²⁴⁶ *Ibid*.

weaken an agreements' initial ambitions. This is especially true when powerful coalitions like the BRICS group (Brazil, Russia, India, China, and South Africa) are involved. BRICS countries identify as developing nations yet possess rapidly industrializing economies. Although their historical per capita GHG emissions were lower than industrialized countries, the high economic growth rates combined with large populations have resulted in substantial emissions increases.²⁴⁷ The rise of the BRICS economies has also challenged the traditional dominance of Western economies, signalling a shifting power balance in the global order. According to the World Bank, BRICS states account for roughly 42 percent of the world's population and contributed 45 percent of the world's CO2 emissions in 2018.²⁴⁸ Developing country status generally translates to less stringent obligations for GHG reduction under the CBDR-RC principle. However, the economic strength and rapid emissions growth of BRICS countries challenge this traditional differentiation. Their large economies and growing populations suggest a greater capacity for implementing emissions reduction efforts and heightened responsibility.²⁴⁹ This discrepancy between development status and emissions trajectory contributes to growing tensions between developed and developing countries, particularly regarding the interpretation of CBDR-RC. This tension often means that negotiations within IEAs will necessitate compromises on ambitious goals to maintain broad participation from both developed and developing countries. This criticism of insufficiently ambitious targets in IEAs is common, as discussed in section 3.2.

Why Measure Participation?

While participation can be tempting to view as a straightforward indicator of effectiveness, a more critical analysis is required. High levels of participation can indicate a general interest and willingness to address a particular environmental challenge but may not translate into concrete action by all parties. Conversely, lower levels of participation

²⁴⁷ Ian Bailey & Hugh Compston, "Introduction" in Ian Bailey & Hugh Compston, Eds, *Feeling the Heat: The Politics of Climate Policy in Rapidly Industrializing Countries*. (London: Palgrave Macmillan, 2012) at 1.

²⁴⁸ World Bank, "World Development Indicators" (2021) online: *The World Bank* <<https://databank.worldbank.org/source/world-development-indicators> <https://infobrics.org/post/39051/#:~:text=Their%20collective%20influence%20has%20reshaped,percent%20to%20the%20world's%20trade.>>

²⁴⁹ Oliver Stuenkel, *The BRICS and the Future of Global Order*, (London: Lexington Books, 2020).

may limit the reach and scope of a regulatory regime, but the composition of participants can mitigate this concern. A limited number of highly committed and influential countries can still drive significant progress. Participation offers a valuable measure of the breadth and inclusiveness of a regulatory regime but, more importantly, serves as a necessary precursor to more compliant states. Compliance rates are directly limited by the number of states in a way that participation rates are not. If only 4 states participate in an agreement, there is only the potential for 4 states to be compliant. Participation establishes the foundation for compliance and, as such, is a necessary companion to compliance.

4.1.2 Compliance

Measuring participation in IEAs serves as a valuable indicator of an agreement's breadth and inclusiveness. However, a complete understanding of an IEA's effectiveness necessitates a concurrent analysis of compliance rates. While a positive correlation between compliance and effectiveness may seem intuitive, the reality is more nuanced. High compliance rates with weakly designed agreements containing easily achievable targets may not translate to significant environmental improvements.²⁵⁰ Therefore, assessing effectiveness through compliance requires critical scrutiny. Conducting a critical analysis of compliance rates presents its own set of challenges. Measuring compliance is not a straightforward exercise, and various factors can complicate the assessment process.

Coincidental Compliance

Adding to the complexity of analysis, compliance is not always the direct result of an IEA regime. International scholars often assume that compliance translates to a higher level of behavioural constraint and, consequently, a higher level of effectiveness.²⁵¹ However, this is not always the case. Compliance can be achieved coincidentally with the agreement itself, diminishing the actual influence and effectiveness of an IEA.

²⁵⁰ Edith Brown Weiss et al. "Measuring Effectiveness of International Environmental Agreements" (1992) 3:4 Euro J Intl L 620 at 631.

²⁵¹ Ibid.

In his book *How International Law Works*, Andrew T. Guzman argues that to truly understand the impact of international law on states, “[i]t is necessary to determine if and when international law changes the behaviour of states. When law does so, it can be considered effective”.²⁵² To illustrate this argument, consider an agreement between the United States and Canada to maintain peaceful relations. Given their historic ties, peaceful coexistence is likely regardless of the treaty. In this instance, compliance wouldn’t indicate a change in behaviour, therefore rendering the agreement ineffective in terms of altering state conduct.²⁵³ Conversely, a peace treaty between warring nations that successfully halts conflict may be perceived as effective because it shifts their expected behaviour. Compliance must be examined contextually to better understand its relationship to effectiveness.

Empirical challenges

Measuring compliance with IEAs is critical for assessing their effectiveness, but it presents a number of significant empirical challenges. Limited access to reliable data from member states can hinder the ability to measure compliance accurately. Many developing states lack the resources or infrastructure for comprehensive environmental monitoring.²⁵⁴ Furthermore, inconsistent reporting methodologies and data formats across countries can create challenges in comparing and analyzing compliance data.²⁵⁵ Additionally, weak, or under-resourced monitoring and enforcement mechanisms can make it difficult to address and detect non-compliance if data isn’t voluntarily provided. Limited funding or a lack of political will can hinder effective monitoring efforts.²⁵⁶ These limitations highlight the complex task of accurately measuring compliance with IEAs and underscore the need for innovative solutions to bridge these empirical gaps.

²⁵² Andrew T. Guzman, *How International Law Works: A Rational Choice Theory* (Oxford: Oxford University Press, 2008) at 22.

²⁵³ *Ibid.*, at 26.

²⁵⁴ United Nations Environment Programme (UNEP). Report of the Ad Hoc Working Group on Environmental Monitoring and Assessment (UNEP/EA.4/4, 2001).

²⁵⁵ *Ibid.*

²⁵⁶ Bodansky, *supra* note 10.

Capacity

A critical factor influencing compliance with IEAs is the capacity of member states to meet their obligations. Capacity refers to the financial resources, technical expertise, and infrastructure a state possesses to implement the agreement's provisions.²⁵⁷ While low compliance rates may indicate an ineffective agreement, capacity can play a crucial role in states' abilities to comply with their obligations. Developing countries often face significant capacity gaps that hinder their ability to comply with IEAs. Limited financial resources can make it difficult to invest in the necessary infrastructure or technologies required to meet environmental targets. A lack of technical expertise in areas like environmental monitoring and data collection can further complicate implementation.²⁵⁸ This is highlighted in a report by the United Nations University For Advanced Studies, titled *Bridging the Gap: Capacity Building for Effective Participation in International Environmental Agreements*.²⁵⁹ The report emphasizes the importance of capacity building initiatives and financial assistance to support developing countries' compliance efforts.

Even with good intentions, states lacking sufficient capacity may struggle to achieve full compliance. This can create a situation where a state may seem non-compliant, even while making good-faith efforts within its limitations. Conversely, a developed country with ample resources might find compliance easier to achieve. This raises concerns about equity and the potential for developed countries to hold developing nations to the same standard despite their resource constraints.²⁶⁰

Low compliance rates with IEAs can be a misleading indicator of effectiveness if capacity issues are not considered. Developing countries with limited resources might struggle to meet ambitious targets, leading to non-compliance that doesn't reflect a lack

²⁵⁷ Hunter, *supra* note 236.

²⁵⁸ Duncan French, "Developing States and International Environmental Law: The Importance of Differentiated Responsibilities" (2000) 49:1 Intl & Comp L Quart 35.

²⁵⁹ *Ibid.*

²⁶⁰ S. Wunder, "The interplay of accountability, capacity, and fairness in international environmental law" (2001) 12:1 Euro J Intl L 1.; A. Lacy, "Capacity-building for developing countries in international environmental law" (2004) 13:2 Rev Euro Community & Intl Envir L 230.

of commitment. This exposes a fundamental weakness in IEAs that lack capacity-building provisions. If an agreement sets ambitious goals but fails to equip developing countries with tools to achieve them, high compliance rates might simply reflect weak targets, ultimately undermining the effectiveness of the IEA in achieving its environmental objectives.

Why Measure Compliance?

Measuring compliance with IEAs, despite its challenges, remains a crucial exercise for several reasons. Firstly, it provides a baseline for assessing progress and identifying areas where states may be struggling.²⁶¹ Even with capacity constraints, some level of compliance demonstrates a commitment to the agreement's goals. Secondly, compliance data can inform the development of targeted capacity-building initiatives.²⁶² By identifying areas of difficulty for developing countries, resources can be directed towards specific capacity gaps, ultimately improving overall compliance rates and environmental outcomes. Finally, without compliance, there is little possibility that an IEA can be effective. Unless the outlined goals of an agreement are somehow unrelated to the compliant actions of states, it is a requirement for achieving effective action.

While acknowledging the limitations of compliance as a measure of effectiveness, it remains a valuable tool for monitoring progress, informing capacity-building efforts, and ultimately contributing to achieving the environmental objectives of IEAs.²⁶³

4.1.3 Conclusion

Both compliance and participation can offer valuable insights about state behaviours, international interests, and commitments to emerging environmental norms. These metrics, while not the only measures of effectiveness, serve as a crucial starting point for evaluation. While I concede that more does not always mean more *effective*, for the

²⁶¹ Bodansky, *supra* note 10.

²⁶² French, *supra* note 258.

²⁶³ Oran R. Young, *The Effectiveness of International Environmental Regimes*, (MIT Press:1994).

purpose of this paper, I will assume that encouraging participation and compliance generally contributes to a more effective IEA.

4.1 Compliance Theory, Rational Choice Theory and Cognitive Psychology

The complex web of IEAs ultimately depends on the compliance of states to be effective. Ensuring that member states adhere to their obligations within an agreement is complex, influenced by a multitude of factors that extend beyond a rational calculation of utility. While previous sections in this work addressed how measuring compliance rates can indicate an IEAs relative effectiveness, understanding the very drivers of compliance remains crucial.

The question of why states comply with agreements is a cornerstone of international governance. Traditionally, international law has relied heavily on RCT to answer this debate. RCT posits that states, acting like rational actors, will only comply with agreements when doing so maximizes their utility. In the context of compliance with IEAs, these benefits could include access to financial aid, technology transfer, or improved trade relations. Conversely, costs might involve implementing expensive pollution control measures or forgoing profitable industries.²⁶⁴ However, as this paper has shown, RCT is limited in IEL, where cooperation and compliance with IEAs seem economically irrational. Understanding compliance solely through a RCT lens neglects the complex interplay of motivations, perceptions, and internalized norms that shape state behaviour. By exploring these perspectives, we can gain a more nuanced understanding of the factors that drive compliance with IEAs, and, in turn, inform the design of more effective agreements for a sustainable future. This project argues for an approach to compliance theory and IEA design that can combine insights from both RCT and behavioural science to gain a deeper understanding of state behaviour that can aid in more effective IEA design.

²⁶⁴ R.O Keohane & D.G.Victor, *Cooperation among nations: Governance in a globalized world*, 3rd ed, (Princeton University Press, 2011).

4.1.1 Compliance Theory

Compliance theory broadly refers to the study of why individuals or groups adhere to rules, regulations, or expectations and seeks to understand the factors that influence them to do so.²⁶⁵ Put simply, compliance theory in international law can be understood as answering the question, “Why do states comply with laws?”. This section will draw on this field to explore why states comply with IEAs, moving beyond a purely RCT perspective to explore norm internalization as well as regime theory and institutional design.

Norm Internalization

Cognitive psychology acknowledges the limitations of pure logic in human decision-making. It emphasizes the role of emotions, biases, and social influence in shaping behaviour.²⁶⁶ Norm internalization, a key concept of this framework, suggests that states may comply with agreements not solely out of self-interest but also because they internalize the underlying environmental norms.²⁶⁷ It posits that states come to believe in the intrinsic value of environmental protection and the importance of upholding the principles enshrined in treaties. Public pressure, domestic environmental movements, and a growing sense of global environmental responsibility can all contribute to this internalization.²⁶⁸ Repeated exposure to environmental messages, coupled with participation in international dialogues, can foster a sense of responsibility and a commitment to upholding the agreement’s goals.

This sense of responsibility is encompassed further by the fundamental principle of law, *pacta sunt servanda*, which holds that treaties or contracts are binding on the parties that entered into them.²⁶⁹ As codified under Article 26 of the Vienna Convention on the Law

²⁶⁵ Andrew T. Guzman, “A Compliance-Based Theory of International Law” (2002) 90:6 1823 at 1830.

²⁶⁶ Dailey, *supra* note 94 at 1604.

²⁶⁷ M Finnemore & K. Sikkink, “International norm dynamics: Does socialization matter?” (1998) 40:4 Intl Stud Quarterly 387 at 388.

²⁶⁸ M.E. Litfin, “Ozone discourses: The hegemonic transition of international environmental norms” (1994) 48:3 Intl Org 539 at 539.

²⁶⁹ Hans Wehberg, “*Pacta Sunt Servanda*” (1959) 53:4 Am J Intl L 775 at 755.

of Treaties 1969, “[e]very treaty in force is binding upon the parties to it and must be performed by them in good faith.” Put simply, it is through *pacta sunt servanda* that treaties create legally binding obligations upon those states which are party to them. Hans Wehberg, a professor of international law, argues that “[f]ew rules for the ordering of Society have such a deep moral...influence as the principle of the sanctity of contracts.”²⁷⁰ Like all other rules of international law, this principle derives from and is kept in force by the general consent of states.²⁷¹ Therefore, norm internalization posits that states do not only comply with agreements because of the obligation they have under international customary norms like *pacta sunt servanda*.

States may also participate and comply with agreements due to a desire to establish or maintain their perception as an environmental leader, allowing normative pressures of leadership to encourage the fulfillment of IEA commitments.²⁷² Historically, leadership on climate change has primarily been exercised by the US and the EU.²⁷³ The EU particularly has invested significant time and effort to brand itself as a climate change leader. Its goal, as it states in its own words, is nothing short of “leading global action” against climate change.²⁷⁴ In the last few decades the landscape of international environmental governance has changed, and new actors like China and the BASIC coalition have been vying for leading roles in IEL.²⁷⁵ The RCT argument that state actions are solely driven by self-interest is essentially a denial that normative pressures have any influence on international affairs. It assumes that non-compliance is always a premeditated and calculated violation to maximize utility. However, studies suggest that

²⁷⁰ *Ibid.*

²⁷¹ I.I. Lukashuk, “The Principle *Pacta Sunt Servanda* and the Nature of Obligation Under International Law” (1989) 83:3 *Amer J Intl L* 513 at 513.

²⁷² Mitchell, Ronald B. Mitchell, ‘Compliance Theory’, in Lavanya Rajamani, and Jacqueline Peel (eds), *The Oxford Handbook of International Environmental Law*, 2nd edn, Oxford Handbooks (Oxford Academic, 2021) 887 at 895. Although I do not discuss the relationship between state policy and non-state actors, the normative importance of meeting international commitments can influence the compliance of states. These normative forces are particularly influential within corporations that promulgate and train personnel in procedures that reflect domestic and international laws.

²⁷³ Christer Karlsson et al, “The Legitimacy of Leadership in International Climate Change Negotiations” (2012) 41:1 *Ambio* 41 at 42.

²⁷⁴ Council of the European Union, “Presidency Conclusions” 9 March 2007, Brussels 10-11.

²⁷⁵ B. Carin & A. Mehlenbacher, “Constituting global leadership: Which countries need to be around the summit table for climate change and energy security?” (2010) 16:1 *Global Governance* 21; P. Christoff, “Cold climate in Copenhagen: China and the United States at COP15” (2010) 19:1 *Enviro Politics* 637.

treaty violations are rarely deliberate acts.²⁷⁶ As scholar Jon Elster argues, “I have come to believe that social norms provide an important kind of motivation for action that is irreducible to rationality or indeed to any other form of optimizing mechanism”.²⁷⁷

Regime Theory and Institutional Design

Regime theory and institutional design offer a perspective that emphasizes the role of international environmental institutions and agreements in fostering compliance. IEAs provide a structured framework for collaboration, monitoring, and dispute resolution, fostering a sense of collective responsibility and accountability among participating states. By joining these regimes, states gain access to valuable resources, expertise, and a platform for addressing environmental challenges collectively.²⁷⁸ This sense of participation fosters a vested interest in upholding the rules of the regime, as states directly contribute to shaping the terms of these agreements.²⁷⁹ Investing significant time and resources in negotiating environmental treaties demonstrates a willingness of states to abide by the provisions they helped design. Regime theory and institutional design, therefore, highlight the power of cooperative institutions to shape state behaviour and encourage adherence to environmental norms.

4.2 Rewarding Mechanisms

For decades, international scholarship has focused on penalties as the primary tool for ensuring compliance with international agreements. Sanctions are readily imposed to address non-compliance, while the potential of rewards remains largely unexplored. Rewarding mechanisms refer to various incentives and benefits provided to countries or entities that participate in and comply with the terms of agreements. They aim to make the benefits of compliance outweigh the advantages a country might gain by not

²⁷⁶ Keohane surveyed two hundred years of U.S. foreign relations history and identified only forty "theoretically interesting" cases of "inconvenient" commitments in which there was a serious issue of whether or not to comply. See the chapter entitled "Commitments and Compromise," in Robert O. Keohane, "The Impact of Commitments on American Foreign Policy," manuscript, 1993, pp. 1-49.

²⁷⁷ Jon Elster, *The Cement of Society: A Study of Social Order* (Cambridge: Cambridge University Press, 1989) at 15.

²⁷⁸ Young, *supra* note 263.

²⁷⁹ Chayes, *supra* note 1 at 180.

following rules.²⁸⁰ In simpler terms, a well-designed reward system can make compliance more attractive than non-compliance. Although this might sound like a rational actor argument, it is important to distinguish between maximizing utility and prioritizing benefits. The difference between these two may seem negligible, however, I argue that benefits can encompass a broader range of factors than maximizing utility. Rational choice theory is limited in what it can categorize as beneficial to a state, and, as argued in this paper, this is limiting to its analysis. Rewards are powerful tools that can be utilized to not only appeal to the empirical analysis of RCT, but the behavioural one of cognitive psychology.

Rewarding mechanisms represent a shift in perspective from deprivation (penalties) to value creation. Rewards improve a target's value position relative to a baseline of expectations. In contrast, penalties are deprivations relative to the same baseline. It is important to note that the baseline of expectations is dynamic.²⁸¹ Once a reward (or penalty) is expected, it becomes a part of the baseline and can influence the perception of other rewards or penalties. For instance, if an employee is promised a raise of \$200 but only gets \$100, they will interpret this as a penalty based on their baseline of expectations (which was an anticipated \$200 raise). Conversely, an employee who is told that their pay will be cut by \$200/month will perceive a loss of only \$100/month as a reward. This highlights the importance of utilizing behavioural insights to strategically design rewarding mechanisms. It is important to create positive baselines that incentivize continuous compliance and participation in IEAs.

Rewarding mechanisms are designed to encourage and reward positive behaviour, foster cooperation, and promote the achievement of the agreement's objectives.²⁸² Some examples of rewarding mechanisms used in international agreements include:

²⁸⁰ Aaken, Anne van & Betül Simsek, "Rewarding in International Law" (2021) 15:2 American J Intl L at 197.

²⁸¹ *Ibid* at 196.

²⁸² *Ibid*.

- ❖ Financial support: Providing financial assistance or grants to countries that commit to and implement the agreed-upon actions. In the IEL framework, all countries might have similar responsibilities toward mitigation but developing countries might be entitled to financial compensation for environmental restraint while pursuing their humanitarian and development goals.²⁸³ This support can help countries overcome capacity issues like financial barriers and facilitate the adoption of more sustainable practices or technologies. The Loss and Damage Fund established at COP27 is a good example of using financial support as a rewarding mechanism in IEAs.
- ❖ Technology Transfer: Facilitating the transfer of environmentally sound technologies from developed to developing countries, technology transfer enables them to adopt more sustainable practices and reduce their environmental impact. This can involve sharing knowledge, expertise, and resources.²⁸⁴ This is especially significant for developing countries seeking to transform their economies in compacted timeframes.
- ❖ Capacity building: Assisting countries in enhancing their institutional, technical, and human capacities to effectively implement the provisions of the agreement. Capacity building may include training programs, workshops, technical assistance, and knowledge sharing to support the development of skills and expertise. (talk about its connection to tech transfer).²⁸⁵
- ❖ Access to Markets: Providing preferential access to markets for goods and services produced in compliance with the environmental standards or sustainability criteria outlined in the agreement. This can encourage countries to adopt environmentally friendly practices and facilitate the trade of sustainable products.²⁸⁶
- ❖ Recognition and Reputation: Recognizing and highlighting the achievements of countries that demonstrate substantial progress or exemplary performance in meeting the objectives of the agreement. Positive recognition can enhance a country's reputation and increase its standing with the international community.²⁸⁷ It can also

²⁸³ Pauw, *supra* note 244 at 15.

²⁸⁴ United Nations Environment Programme (UNEP). (2010). *Technology Transfer for Climate Change*. <<https://unepccc.org/wp-content/uploads/2023/06/tech-transfer-policy-brief-oecd.pdf>>.

²⁸⁵ United Nations Development Programme (UNDP). (2009). *Capacity Development: A UNDP Glossary*.

²⁸⁶ International Institute for Sustainable Development (IISD). (2013). *Market Mechanisms for the Environment: A Primer*.

²⁸⁷ Aaken, *supra* note 280 at 201.

- encourage cooperation between states that recognize the achievements of one another.²⁸⁸
- ❖ **Collaborating and Networking:** Facilitating collaboration, exchange of best practices, and networking among participating countries or entities. This can promote knowledge sharing, learning, and peer-to-peer support fostering a sense of community and joint efforts toward achieving the agreement's goal.²⁸⁹
 - ❖ **Legal Reciprocity:** Compliance by one state may lead to reciprocal compliance by other states, fostering a cooperative environment and encouraging shared adherence to international rules. Stefan Borsky and Paul Raschky conducted empirical research to analyze how intergovernmental interaction affects state compliance with IEAs. The results of their research show that the compliance efforts by other participants have a systematic positive effect on a country's own compliance.²⁹⁰ They argue that these findings provide empirical evidence that intergovernmental relations can improve the performance of voluntary IEAs where other formal sanction mechanisms are absent. This is especially significant on the international level, where formal enforcement methods are largely unavailable.²⁹¹

Rewarding mechanisms in international relations are not isolated tools, but rather interwoven threads in a complex tapestry. Collaboration and networking, fostered through rewards, can lead to a cascade of benefits. Technology transfers, capacity building, and preferential market access all become more likely with positive relationships between states. Legal reciprocity can not only incentivize compliance but also build strong reputations. Similarly, financial support can act as a gateway to specific markets. This is a key strength of rewarding mechanisms: they can generate further rewards simply by being implemented. However, it is crucial to recognize that the specific mechanisms employed will vary depending on the agreement's nature and goals. Each IEA presents a unique context and set of challenges that will be suited by specific

²⁸⁸ *Ibid.*

²⁸⁹ *Ibid.*

²⁹⁰ Stefan Borsky & Paul A. Raschky, "Intergovernmental Interaction in Compliance with an International Environmental Agreement." (2015) 2:2 *J Assoc Env'tl & Resource Economists* 161.

²⁹¹ *Ibid.*

incentives and rewards. Not every type of reward will be suited to every type of IEA and, therefore, must be employed strategically to be effective.

In their article, Aaken and Simsek outline four basic types of rewards based on two distinctions: where the benefit is realized (internally or externally) and when it is received (upon entry or at the time of compliance).²⁹² Internal rewards are those attached to the treaty in question and are often the benefits of cooperation and participation provided by the treaty. External rewards refer to benefits outside the bargain of the base treaty (like improved reputation). Time rewards make the distinction between benefits that are received when a state enters into an agreement and those that are awarded at the time of compliance. Aaken and Simsek use compliance as an overall term to describe what I have defined separately as participation and compliance. My analysis can be easily understood as a two-step process for treaty action. Step one is participating in the agreement, step two is complying with its obligations. Using Aaken and Simsek's temporal framework, rewards given at the time of entry affect step one (participation) and those given at the time of compliance step two. Given that this project is concerned with the increase of both compliance and participation, this generalized use is largely a non-issue.

Aaken and Simsek argue that the timing of rewards is important because a state's incentives at the treaty-negotiating stage may be different from those it faces when the time for compliance arrives. A good example of this is Russia's eventual noncompliance with the Montreal Protocol, which will be discussed in Chapter 5. At the time the Montreal Protocol was signed, Russia was still part of the USSR. Following the dissolution of the Soviet Union, Russia's interests and capabilities changed dramatically. What was attractive to the state at the time of participation varied drastically from what was attractive at the time of compliance.

²⁹² Aaken *supra* note 280 at 196.

Table 2: Types of Rewards

	Internal	External
Rewards	<u>Entry rewards</u> <ul style="list-style-type: none"> access to financial and assistance within the objectives of the treaty cooperative gains 	<u>Entry rewards</u> <ul style="list-style-type: none"> linkage between treaties or promise of benefits outside bargain (e.g. development aid or trade treaty) positive reputation for entering a treaty generating future gains of cooperation
	<u>Compliance rewards</u> <ul style="list-style-type: none"> redemption (prospect of inclusion after previous exclusion) use of mechanisms within the treaty (e.g., Kyoto Protocol: use of flexibility mechanism) 	<u>Compliance rewards</u> <ul style="list-style-type: none"> access to finance and assistance promoting objectives outside the treaty positive reputation for compliance with the treaty generating future gains of cooperation
Penalties	Outcasting and negative reciprocity: withholding cooperative or other benefits within the treaty limited to treaty parties nonperforming their obligations	Retaliation, fines, and negative reputation, termination/suspension of linked treaties

Anne van Aaken & Betül Simsek, "Types of Rewards" (2021) 15:2 American J Intl L at 206.

An important distinction between internal and external rewards lies in their flexibility and predictability. Internal rewards, embedded within the treaty itself, offer greater predictability. They're directly tied to the agreement's wording, ensuring clarity but limiting adaptation. Conversely, external rewards boast greater flexibility in their format and structure. This flexibility allows for creativity in addressing challenges but can also introduce uncertainty as the reward may not be explicitly guaranteed.²⁹³ Just as the type of reward matters, so too does its timing. An IEA might require strong assurances on something like access to markets (predictable internal reward), but also desire flexibility for innovative clean energy solutions (flexible external reward). This malleability of rewarding mechanisms allows them to cater to diverse needs within the same agreement.

Rewarding mechanisms have been used in international treaties of the past, but formal penalties are much more commonly used in treaty design. In her empirical study of 234 treaties, Barbara Koremenos found that only 11% of treaties had rewards, and only in the

²⁹³ *Ibid* at 204.

sub-issue of disarmament.²⁹⁴ Significantly, of the IEAs I discussed in section 3.2, only five had rewarding mechanisms, and of those five only two had more than one. While this is not a broad survey of all IEAs, it does demonstrate the dearth of rewarding mechanisms in some of the largest IELs to date.

While the benefits of rewarding mechanisms are generally understood from an RCT perspective, this framework is too narrow to capture how penalties and rewards affect states. The Coase theorem is a foundational concept in law and economics. It argues that under certain conditions, private actors can efficiently resolve externalities (like pollution) through bargaining, regardless of the initial assignment of property rights.²⁹⁵ The theorem suggests a type of equivalence between rewards and penalties,²⁹⁶ but this is not necessarily true. Psychological research shows distinct differences between the perception and responses to rewards and penalties. Perceived losses and gains can provoke very different behaviour from states, and therefore, they must be utilized strategically.²⁹⁷ Framing affects deliberation and decisions, and therefore, it is significant how states look at international cooperation – as a positive because of the rewards it provides or a negative because of the penalties it threatens.

Penalties are not absent from IEAs; however, they are uncommon due to the fundamental principles underlying IEL. Challenges arising from state sovereignty, the lack of a central enforcement body, power imbalances, and concerns about retaliation create a preference for fostering cooperation in IEL over punishment. IEAs are more suited to utilizing rewarding mechanisms like capacity building, financial rewards, and reputational gain, which can encourage continued cooperation amongst states. The following chapter will discuss how rewards can be used to successfully bolster effectiveness in IEL by looking at one of the most effective agreements in history– the Montreal Protocol.

²⁹⁴ Barbara, Koremenos, “Punishment provisions” in *The Continent of International Law: Explaining Agreement Design*, (Cambridge: Cambridge University Press, 2016) 226.

²⁹⁵ See Ronald H. Coase, “The Problem of Social Cost” (1980) 3:1 *JL Econ* 1 for the original article outlining the theorem.

²⁹⁶ Aiken, *supra* note 280 at 197.

²⁹⁷ Aiken and Simsek at 197

Chapter 5

5 The Montreal Protocol

As early as the 1960s, scientists began to realize that some manufactured chemicals had the potential to deplete the ozone layer. However, it wasn't until 1974 that certain chemicals called ozone-depleting substances (ODS) were identified as the source of the problem.²⁹⁸ The depletion of the ozone layer posed serious threats to human health, leading to an increase in skin cancers, cataracts, and other health issues. It also had adverse effects on wildlife and ecosystems, damaging marine life, crops, and forests. The Montreal Protocol is an international environmental treaty aimed at protecting the ozone layer and phasing out substances responsible for ozone depletion. Under conditions of great scientific uncertainty and political and economic opposition, the negotiators of the Montreal Protocol were able to avert a significant threat to the global environment.²⁹⁹ It was adopted on September 16, 1987, in Montreal, Canada, and entered into force on January 1, 1989. As of May 2024, 198 states are parties to the Protocol.³⁰⁰

The Montreal Protocol's primary objective is to phase out the production and consumption of ODS to protect the ozone layer. The agreement sets legally binding targets and timetables for the phase-out of specific ODS. As of 2021, the protocol has been amended several times to strengthen its provisions and accelerate the phase-out process. The protocol is considered one of the most successful environmental agreements in history, in no small part because of its rewarding mechanisms.³⁰¹

²⁹⁸ *Ibid* at 5.

²⁹⁹ Donald Kaniaru, ed, *The Montreal Protocol: Celebrating 20 years of Environmental Progress, Ozone Layer and Climate Protection*, (UK: Cameron May Ltd: London, 2007) at 44.

³⁰⁰ United Nations, "Status of Treaties: Montreal Protocol on Substances that Deplete the Ozone Layer" (31 May, 2024) online: United Nations Treaty Collection:

<https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-2-a&chapter=27>.

³⁰¹ *Ibid*, at 3.

5.1 Rewarding Mechanisms in the Montreal Protocol

The Montreal Protocol is an example of an IEA providing a public good using a mix of internal and external rewards. While its success can be attributed to various factors (focus on specific chemicals, clear timelines, scientific consensus) the effective use of rewarding mechanisms contributed significantly to its achievements. The following section will detail the most significant rewarding mechanisms in the Montreal Protocol and how each contributed to its overall effectiveness.

5.1.1 Trade Provisions and Club Goods

As outlined in section 3.3.2 one of the challenges to effective environmental governance is the threat of free-riding. In the context of IEL, countries have an incentive to rely upon the actions of others, especially when dealing with transborder climate issues. One mechanism to overcome the threat of free riding is the establishment of a “club”. A club is a “voluntary group deriving mutual benefits from sharing the costs of producing an activity that has public-good characteristics”.³⁰² These gains must be large enough that members will pay dues and adhere to club rules in order to access membership benefits. According to William Nordhaus, the major conditions for a successful club include the following:

- 1) That there is a public-good-type resource that can be shared,
- 2) That the cooperative agreement, including the dues, is beneficial for each of the members,
- 3) That the non-member states can be excluded or penalized at a relatively low cost to members,
- 4) Membership is stable in the sense that no one wants to leave the club.³⁰³

³⁰² Nordhaus, *supra* note 202 at 1340.

³⁰³ *Ibid* at 1399.

Nordhaus goes on to describe what he calls “The Climate Club”.³⁰⁴ He proposes an agreement by participating countries to undertake harmonized emissions reduction by utilizing an “international target carbon price” as the focal provision. Countries could meet the target price in whichever way they choose, whether it be a carbon tax, cap-and-trade, or a hybrid of the two. He emphasizes that a key component of the club mechanism is that the nonparticipants are penalized in some way. In his proposal, the penalty is a uniform percentage tariff on the imports of non-participants into the club region. Crucially, the club must create a strategic situation in which the states acting in their self-interest will choose to enter the club and undertake high levels of emission reduction activity because of the structure of the incentives.³⁰⁵

The Montreal Protocol was not immune to the problem of free-riding and implemented a club system similar to that proposed by Nordhaus to combat it.³⁰⁶ The trade provisions in the Protocol limited member states to trade CFCs only with other member states, thus creating a club good.³⁰⁷ Once the main producing countries signed the Protocol, it was only a matter of time before others did as well. As the supply of CFCs and other ODS began to dwindle, more states signed and ratified the Protocol to benefit from the club good. In return for agreeing to observe the limits of production, states received access to trading privileges denied to non-parties and were thus rewarded.³⁰⁸ In this instance, the reward is part of the agreement bargain and, therefore, is an example of an internal award.³⁰⁹ As Nordhaus points out, crucial to the success of a club good is its ability to create a strategic situation in which participation is attractive enough that a state will comply with the requirements for club membership. The Montreal Protocol was able to

³⁰⁴ *Ibid* at 1341.

³⁰⁵ *Ibid*.

³⁰⁶ Although interestingly Nordhaus makes no mention of the Montreal Protocol in his paper. He laments the failure of the Kyoto Protocol and the difficulty of overcoming free-riding, but at no point in time does he refer to the trade provisions in the Montreal Protocol. Whether this is simple oversight, or an intentional omission is unclear.

³⁰⁷ Aaken, *supra* note 280 at 208.

³⁰⁸ Interestingly, Nordhaus terms this structure as a penalty for nonparticipant states, rather than a reward for participants. Although he uses different language to describe the effects of a club good, he explains the same effect that Aaken and Simsek. Part of Aaken and Simsek’s argument is that perceived losses and gains provoke different behaviours. This will be discussed later in this chapter, but it is worth mentioning here.

³⁰⁹ Oona Hathaway & Scott J. Shapiro, “Outcasting: Enforcement in Domestic and International Law” (2011) 121:1 Yale LJ 252.

create the possibility of withholding certain rights and benefits that a party would receive from the treaty, making membership extremely desirable (if not necessary). The creation of this club good is considered one of the most important aspects of the Protocol's success.³¹⁰

5.1.2 Multilateral Fund and Incapacity

Section 4.1.2 detailed the capacity issues that some states face regarding compliance. While they may desire to participate in and comply with IEAs, a lack of technological, financial, or structural frameworks may prevent them from doing so.³¹¹ The Montreal Protocol was one of the first IEAs to specifically recognize capacity as a barrier to compliance and create mechanisms to overcome this.

Four years after the Montreal Protocol was signed, only around half of the member states had fully complied with the treaty requirement that they report annual CFC consumption.³¹² The Conference of the Parties established an Ad Hoc Group of Experts on Reporting, which recognized that the great majority of the non-reporting states were developing countries that, for the most part, were simply unable to comply without technical assistance.³¹³ To address this disparity, the Montreal Protocol established the Multilateral Fund (MLF) to provide incremental funding for developing countries to help them meet their compliance targets.³¹⁴ This recognition (that nonreporting countries were largely developing countries unable to comply without technical assistance) was vital to the success of the Montreal Protocol. It became the first treaty under which parties

³¹⁰ *Ibid.*

³¹¹ Chayes, *supra* note 1 at 194.

³¹² See Report of the Secretariat on the Reporting of Data by the Parties in Accordance with Article 7 of the Montreal Protocol, UNEP/OzL.Pro.3/5, 23 May 1991, 6-12 and 22-24.

³¹³ For the establishment of the Ad Hoc Group of Experts, see Report of the Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, UNEP/ OzL.Pro.2/3, Decision 2/9, 29 June 1990, at 15. At its first meeting in December 1990, the Ad Hoc Group of Experts concluded that countries "lack knowledge and technical expertise necessary to provide or collect" the relevant data and made a detailed series of recommendations for addressing the problem. See Report of the First Meeting of the Ad Hoc Group of Experts on the Reporting of Data, UNEP/OzL.Pro/WG.2/1/4, 7 December 1990.

³¹⁴ Montreal Protocol, *supra* note 17 Article 10.

undertook to provide significant financial assistance to address the incremental costs of compliance for developing countries.³¹⁵

The Fund was crucial to the success of the Montreal Protocol, acting as an internal reward in the form of technical and financial assistance that helped overcome the constraints of compliance. Its specific objectives are to meet the agreed-upon costs, finance clearinghouse functions, and finance the secretarial services of the Fund and related support costs.³¹⁶ Some of the activities of the MLF include helping developing countries identify their needs for cooperation through country-specific studies, facilitating technical cooperation to meet these identified needs, distributing information and relevant materials, holding workshops and training sessions, and facilitating and monitoring other multilateral, regional, and bilateral cooperation.³¹⁷

The MLF also provided institutional support to countries, helping them build national capacity.³¹⁸ The necessity for monetary and systematic support to address incapacity has long been recognized by scholars³¹⁹ and continues to be a priority in international environmental negotiation. The Montreal Protocol's success offers a blueprint for addressing capacity limitations within IEAs. By recognizing that compliance often hinges on technical resources and expertise, the MLF empowered developing nations to become active participants in the agreement. It fostered not only short-term compliance but also a broader commitment to environmental protection by building sustainable practices within those countries. This type of focus on capacity building is widely recognized as essential for achieving equitable and effective global environmental governance.³²⁰

³¹⁵ Chayes, *supra* note 1 at 194.

³¹⁶ Lauren Kelly, "The Multilateral Fund for the Implementation of the Montreal Protocol" (Washington DC: The World Bank Evaluation Department, 2004) ix-x.

³¹⁷ *Ibid* at x.

³¹⁸ Aaken, *supra* note 1 at 209.

³¹⁹ Nordhaus, *supra* note 206 at 1347.

³²⁰ UNFCCC often emphasizes capacity building for developing countries in its provisions, particularly in areas like technology transfer and adaptation.

5.1.3 Rewarding Re-entering After Non-compliance

The Montreal Protocol's non-compliance procedure was designed as a nonpunitive and advisory procedure. Rather than focusing on punishment for noncompliance, this procedure prioritizes helping countries back into compliance. This might include assistance with data collection and reporting, technical assistance, technology transfer, financial assistance, information transfer, and training.³²¹ Industrialized signatories of the Montreal Protocol are under four major types of obligations:

1. To undertake the control measures in relation to the production and consumption of specified ozone-depleting substances (Articles 2, 2A-2H);
2. To restrict trade in certain controlled substances and in certain products containing controlled substances with non-Parties to the Protocol (Article 4);
3. To report statistical data on its annual production and trade in controlled substances (Article 7); and
4. To contribute to the Protocol's Multilateral Fund (Article 10).

If they fail to comply with any of these obligations, they will be subject to review by the Implementation Committee Under the Non-Compliance Procedure of the Protocol. In 1992 at the Fourth Meeting of the Parties, an “Indicative List of Measures that Might be Taken Away by a Meeting of the Parties in Respect of Non-compliance with the Protocol” was adopted by the parties to clarify the outcomes that parties may expect from the non-compliance procedure.³²² These measures are:

- a. Appropriate assistance, including assistance for the collection and reporting of data, technical assistance, technology transfer and financial assistance, information transfer and training
- b. Issuing cautions

³²¹ Aaken, *supra* note 1 at 210.

³²² Report of the Fourth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, UN Doc. UNEP/OzL.Pro.4/15 (Nov. 25, 1992); Decision IV/5 and Annex V of the Report of MOP-4.

- c. Suspension, in accordance with the applicable rules of international law concerning the suspension of the operation of a treaty, of specific rights and privileges under the Protocol, whether or not subject to time limits, including those concerned with industrial rationalization, production, consumption, trade, transfer of technology, financial mechanisms and institutional arrangements.³²³

Russia's Non-Compliance

The non-compliance procedure was tested in December 1995, when, at their seventh Meeting, the Parties to the Protocol were faced with the anticipated non-compliance of the Russian Federation.³²⁴ The Russian Federation was a major supplier of CFCs and other ODS for both Parties and non-Parties and for developed and developing countries.³²⁵ Russia was considered the:

[K]ey to the problems of Ozone Layer Protection because it accounts for over 60% of the consumption of controlled substances in the region, and because it is the only producer of controlled substances and the main supplier of ozone depleting substances of at least 20 of the countries with economies in transition.³²⁶

Thus, Russia's compliance with the Protocol's trade provisions and control measures affected not only the behaviour of other states in the region but also the stability of the treaty as a whole. In 1995, at the time of review, it can be argued that Russia was in non-compliance with each of its obligations.³²⁷

³²³ *Ibid.*

³²⁴ Jacob Werksman, "Compliance and Transition: Russia's Non-compliance Tests the Ozone Regime" (1996) 56 *Heidelb J Intl L* 750 at 750.

³²⁵ *Ibid.*

³²⁶ Assessment of Basic Problems Confronting Countries with Economies in Transition in Complying with the Montreal Protocol: Report of the TEAP Ad-Hoc Working Group on CEIT Aspects, November 1995, 25. [TEAP/CEIT Report].

³²⁷ The Montreal Protocol Implementation Committee found at its 10th Meeting that Russia was not in compliance with its reporting obligations under Article 7 ((Report of the Implementation Committee under the NonCompliance Procedure of the Montreal Protocol on the Work of its Tenth Meeting, 30 August 1995, UNEP/OzL.Pro.ImpCom/10/4). In 1996, Russia was over US \$54 million in arrears in its contributions to the Multilateral Fund (Report of the Treasurer, Executive Committee of the Multilateral Fund for the Montreal Protocol, 12 April 1996, UNEP/OzL.Pro/ExCom/19/3.).

The Protocol has very dynamic rule-making procedures that allow it to extend its coverage to additional substances by way of amendments.³²⁸ This means that the obligations of the industrialized Parties have evolved rapidly since the Protocol was first adopted. The 1987 text required that industrialized Parties freeze and then sharply reduce their consumption and production of “Annex A” substances (CFCs and halons). By 1995, the Protocol had not only extended its coverage to additional substances but had introduced stricter timetables for reductions and phase-outs.³²⁹ The steady tightening of the Protocol’s obligations had run in parallel with the collapse of the Soviet Union, and by 1995, Russia was in a very different economic position than it was when it became a signatory.³³⁰ In 1988 when the USSR first became a party to the Montreal Protocol, it was a major producer and consumer of ozone-depleting substances, and its economic profile and annual calculated level of consumption of controlled substances meant it would be required to shoulder the same responsibilities as its industrialized, free-market counterparts.³³¹ After the dissolution of the USSR, Russia argued that the collapse constituted an event “force majeure” that justified flexibility in the application of the Protocol to Russia.³³² This put Russia much in line with the responsibilities of Article 5 states, whose obligations differed from their Industrialized counterparts.

In 1990 the Parties to the Protocol met in London to adjust and amend the Ozone regime to expand its coverage to additional substances and increase financial obligations.³³³ Despite the formal dissolution of the Soviet Union less than one month previously, the newly formed Russian Federation ratified these amendments, undertaking both financial

³²⁸ Montreal Protocol, Article 2.9 (c) and (d); Article 11.4 (b) and (c). See T. Gehring, “International Environmental Regimes: Dynamic Sectoral. Legal Systems”, in G. Handl (ed.), *Yearbook of International Environmental Law* (London: Oxford University Press, 1990) at 35.

³²⁹ Werksman, *supra* note 324 at 752.

³³⁰ *Ibid.*

³³¹ *Ibid* at 753.

³³² Statement by the Minister of the Russian Federation at the Seventh Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (Vienna, 4 - 7 December 1995) [hereinafter the Russian Statement at MOP-7].

³³³ The London Amendment (1990): The amendment to the Montreal Protocol agreed by the Second Meeting of the Parties (London, 27-29 June 1990).

and control measure obligations.³³⁴ From 1992-1995, the Protocol was continuously strengthened, expanding its scope and making amendments to accelerate the phasing out of substances already controlled by the Protocol.³³⁵ Eventually, Russia was forced to notify the Parties that it would be unable to comply with its obligations under the new amendments because of its economic collapse, although made it clear that it was still committed to the principles of the Protocol.³³⁶

The collapse of its economic strength was not the only barrier to compliance, as the change in borders resulting from the dissolution of the USSR created very concrete empirical difficulties for Russia, especially regarding collecting export and import data. Furthermore, the dismemberment of the Soviet Union raised questions as to the legal capacity of the surviving states to carry out pre-existing obligations.³³⁷ These states, often termed “countries with economies in transition,” had been given special status under international law in several international environmental treaties.³³⁸ Although Russia suggested that the Protocol amend the Ozone regime to incorporate similar language, this went largely unheeded.³³⁹

³³⁴ Although it is not entirely clear why Russia presented itself as politically stable enough to take on these additional obligations, one theory might be the potential loss of face in the international community. Having recently been one of the most economically powerful states to participate in the treaty, the realization that not only could it not take on additional obligations, but it couldn't even meet its previous ones must have been difficult for a recently fallen empire.

³³⁵ Werksman, *supra* note 324 at 753.

³³⁶ Statement by countries with economies in transition that are Parties to the Montreal Protocol - Belarus, Bulgaria, Poland, Russian Federation, the Ukraine, circulated at the Eleventh Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol, May 1995: Arms Control, Environment and Peacekeeping; Statement by the Minister of the Russian Federation at the Seventh Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (Vienna, 4 - 7 December 1995).

³³⁷ Report of the Implementation Committee under the NonCompliance Procedure of the Montreal Protocol on the Work of its Tenth Meeting, 30 August 1995, UNEP/OzL.Pro.ImpCom/10/4, para 37. Although Russia claimed that it could not be held responsible for the legal obligations made by the USSR, there is evidence to suggest that as early as 1990, individual SSRs (including Russia) were prepared to take on the formal legal competence of bearing state responsibility for the transboundary impact of the use of natural resources and environmental protection within their territory.

³³⁸ Both the 1992 Convention on Biological Diversity and the 1992 Framework Convention on Climate Change (UNFCCC) adopt the principle of "common but differentiated responsibility" that, for example, calls upon the Conference of the Parties to allow "a certain degree of flexibility" to developed countries "undergoing the process of transition to a market economy, UNFCCC, *supra* note 144.

³³⁹ Among the options that Russia raised and the Technical and Economic Assessment Panel considered, was either the reclassification of Russia as operating under Article 5.1, or amendments to the Protocol that would allow certain countries with economies in transition to be eligible for funding under the Multilateral Fund of the Montreal Protocol. Problems Confronting Countries with Economies in Transition in Complying with the Montreal Protocol: Report of the TEAP Ad-Hoc Working Group on CEIT Aspects, November 1995 at 46.

Eventually, the Montreal Implementation Committee provided recommendations to the seventh Meeting of the Parties, despite the continued protests from Russia. The report offered a combination of rewards and punishments, recommending that the parties:

- Impose restrictions on Russia's trade in controlled substances and
- Encourage funding agencies to provide financial assistance to enable Russia's compliance with the Protocol.³⁴⁰

The Chair of the Technical and Economic Panel's Working Group indicated that without the financial assistance of a funding agency, Russia's compliance would likely be delayed for up to 4 years.³⁴¹ While these findings may seem inconsistent with the final recommendations of the Committee, the Panel sought to balance economic, environmental, and political concerns. The Panel recognized that doing nothing to assist Russia would likely speed up the phasing out of CFCs (by driving Russian companies out of business in a rapidly shrinking market). They also expressed concern over the potential loss of jobs throughout the former Soviet Union and Central and Eastern Europe. Furthermore, the Panel expressed concern that doing nothing would be contrary to the supportive attitude that the Parties had taken towards other Parties having trouble complying.³⁴² Although there is little elaboration on this point in their report, it indicates that the Panel was concerned with the potential reputational loss that doing nothing may invite, potentially demonstrating the importance placed on maintaining a positive reputation internationally. Although there is no evidence from the Panel to specifically confirm this, it is a feasible explanation for the inclusion of such reasoning.

Despite Russia's obvious need for financial assistance following the collapse of its economy, only Article 5 countries are eligible for the MLF. Thus, Russia had to turn to the Global Environmental Facility (GEF) for financial support.³⁴³ The GEF is a

³⁴⁰ Report of the Implementation Committee Under the Non-Compliance Procedure of the Montreal Protocol on the Work of its Thirteenth Meeting, UNEP/OzL.Pro/ImpCom/13/3.

³⁴¹ *Ibid* at para 33.

³⁴² TEAP/CEIT Report, *supra* note 326.

³⁴³ Werksman, *supra* note 324 at 757.

multilateral financial mechanism established by participating states, UNEP, UNDP and the World Bank to finance the incremental costs of projects designed to protect the global environment in the areas of climate change, biological diversity, international waters, and ozone depletion.³⁴⁴ Although not an instrument of the Montreal Protocol, the increasing need for collaboration between the two entities led both the Ozone Secretariat and the Secretariat of the Multilateral Fund of the Montreal Protocol to exchange letters of cooperation with the GEF Secretariat.³⁴⁵ The GEF Council, in adopting the GEF Operational Strategy, recognized that developing countries should be able to rely upon the MLF of the Montreal Protocol, and thus, the GEF would fund projects consistent with the policies and procedures of the Protocol. Although this assistance would include Article 5 countries, the GEF specified that it would primarily assist otherwise eligible countries that were not Article 5 countries.³⁴⁶ The connection between the GEF and the Protocol has become so intertwined that Ozone funding from the GEF for Parties that have triggered the Non-Compliance Procedure must first have the endorsement of the Montreal Protocol Implementation Committee and the Ozone Secretariat.³⁴⁷

An additional benefit of utilizing funding as a rewarding mechanism for non-compliant states is the ability to influence and participate in designing, implementing, and monitoring a state's efforts. The GEF's funding requires the opportunity for public participation, and for a formal monitoring and evaluation process that provides a level of accountability that unilateral assurances likely wouldn't be able to guarantee.³⁴⁸ In this way, using financial assistance as a rewarding mechanism can have benefits not only to the receiving state but the agreement itself.

³⁴⁴ Global Environment Facility, Instrument for the Establishment of the Restructured Global Environment Facility, Report of the GEF Participants Meeting, Geneva, Switzerland, 14 -16 March, 1994.

³⁴⁵ *Global Environment Facility annual report 1995: Global Environment Facility GEF: annual report 1995 (English)*. Washington, D.C.: World Bank Group. <<http://documents.worldbank.org/curated/en/596581468739225969/Global-Environment-Facility-GEF-annual-report-1995>>.

³⁴⁶ *Ibid.*

³⁴⁷ *Ibid.*

³⁴⁸ Werksman, *supra* note 324 at 772.

5.1.4 Observations from Russia's non-compliance

An analysis of the non-compliance process provides an opportunity to examine why Russia was eager to come back into compliance and how the rewarding mechanisms facilitated this. Although Russia's exact motivations cannot be confirmed, we can examine the elements of the Protocol that made participation attractive within the context of the recently formed Russian Federation.

It is helpful to first recognize the benefits that Russia gained from complying with the Protocol. Perhaps most significantly, and especially following the collapse of the Soviet Union, were the trade provisions, or "club good" that the Protocol provided. Although Russia was a strategic lynchpin for ozone-related activities in a very large region, this influence diminished significantly following the collapse. When the USSR ratified the Protocol, it was a major producer and consumer of CFCs and ODS, accounting for over 60% of the consumption of controlled substances in the region and operating as the only producer and main supplier of controlled substances to at least 20 countries with economies in transition.³⁴⁹ Presumably, following the collapse of the USSR, such a significant economic market would have been a valuable asset for Russia to have access to. If a consequence of non-compliance is trade restrictions, logically Russia would have a strong interest in accessing that club good as soon as possible.

Interestingly, the loss of trade access is treated as a penalty, when initially it would have been perceived as a reward for ratification. This demonstrates Aaken and Simsek's point, that once they become part of the baseline, rewards can be perceived as penalties once taken away. This is the benefit of providing such valuable rewards to compliant states; they don't fear participating in agreements that punish with the restriction of an associated reward. From an RCT perspective, it is unlikely a state will participate in an agreement if doing so puts it at risk of loss (punishment) without providing an outweighing gain (reward). The use of reward restrictions as punishment assuages the potential losses in this calculation. States are more likely to participate and comply if they

³⁴⁹ TEAP/CEIT Report, *supra* note 326.

only stand to gain from their initial baseline. Furthermore, once the reward becomes a part of the baseline, if it is attractive enough states will work to regain it once it has been lost.

In addition to trade access, Russia risked reputational loss by admitting non-compliance. Russia was a recently dissolved great empire at risk of losing its reputation for economic regional dominance, an identity it had held for decades. When Russia was forced to admit its non-compliance and seek treatment equivalent to Article 5 countries, it was simultaneously lobbying for membership in the Organization for Economic Co-operation and Development (OECD). The OECD is an intergovernmental organization founded to stimulate economic progress and world trade. The majority of OECD Members are high-income economies ranked as “very high” in the Human Development Index and are generally regarded as developed countries.³⁵⁰ Russia’s conflicting representation of itself demonstrates a desire to maintain its reputation and save face following its economic collapse. Although these factors don’t explicitly point to reputational considerations, this context may indicate an increased concern with maintaining its national image. Further to this point, despite the dissolution of the USSR in 1990, it wasn’t until 1995 that Russia notified the parties that it was unable to comply with its obligations under the new Amendments of the Protocol.³⁵¹ Russia’s initial ratification of the London Amendments may have been an attempt to present a façade of economic and structural strength to the international community.

Russia’s actions highlight the power of rewarding mechanisms within IEAs. The potential loss of a valuable trade market and the risk of reputational damage provided strong incentives for the newly formed Russian Federation to regain compliance – despite the significant economic costs involved. Their behaviour exemplifies how, when rewards

³⁵⁰ Russia was unsuccessful in its lobbying until 2007 when the OECD decided to open accession negotiations with Russia. In March of 2014 membership talks with Russia were halted in response to Russia’s role in the Crimean annexation, and eventually terminated in 2022 after Russia invaded Ukraine. See OECD, “*OECD Council Resolution on Enlargement and Enhanced Engagement*”. OECD. 16 May 2007; Statement from the OECD Secretary-General on *initial measures taken in response to Russia’s large scale aggression against Ukraine* (25 March 2022) <<https://www.oecd.org/newsroom/statement-from-oecd-secretary-general-on-initial-measures-taken-in-response-to-russia-s-large-scale-aggression-against-ukraine.htm>>.

³⁵¹ Werksman, *supra* note 324 at 772.

are perceived as essential to state interests, participation and compliance become self-enforcing. The Montreal Protocol case study underscores the importance of designing agreements that not only offer tangible benefits from compliance but also strategically leverage the potential penalties associated with the loss of those benefits.

5.2 Beyond Success: Lessons from the Montreal Protocol

Despite the historic and continuous success of the Montreal Protocol, there is a curious lack of similar provisions in contemporary agreements. Where the Protocol provided rewarding mechanisms like access to financing, capacity building, and reputational legitimacy, recent IEAs like the Paris Agreement and COP28 have provided ambiguous declarations and weak targets. The following section will look at some of the insights gained from the Protocol and discuss how they might be used in future IEAs.

5.2.1 Why Did States Comply With the Protocol?

The Montreal Protocol demonstrates how rewarding mechanisms can be implemented to attract participation and compliance, but it is less clear why states are motivated to do so. This thesis proposes that a broader theoretical framework can provide crucial insights into state behaviour. In the context of the Montreal Protocol, these insights can be gleaned by analyzing both the psychological and RCT reasoning for participation and compliance.

Psychological Influences

⇒ **Social Norms and Reputation:** The Montreal Protocol fostered a new international norm around environmental protection related to phasing out ODS. As more countries signed on, a sense of social pressure emerged, making it less acceptable for others to remain outside the agreement. Using cognitive psychology, specifically norm internalization, this type of reaction to an environmental norm can be quite predictable. Especially in the context of completely phasing out a substance, failure to

participate in this regime is particularly egregious.³⁵² In this instance, the fear of reputational damage can play a significant role in encouraging participation and compliance.

- ⇒ **Framing the Issue:** Effective communication framed the issue in a way that resonated with different stakeholders. Highlighting the long-term health risks associated with ozone depletion for citizens and the potential economic benefits of developing alternative technologies likely influenced public and industry support for the Protocol.³⁵³ As discussed in Chapter 2, behavioural theory acknowledges that actors are influenced by their endogenous preferences, behavioural influences, and a variety of psychological constraints. The presentation of an issue can significantly impact the way it is perceived by states. Presenting the Montreal Protocol as a desirable framework to participate in can influence how much a state may or may not want to join.
- ⇒ **Loss Aversion and Sunk Cost Fallacy:** Once countries invested in transitioning away from ODS, they became less likely to abandon the effort due to “loss aversion” – the psychological tendency to dislike giving up something we already have. Additionally, the “sunk cost fallacy” likely played a role – the idea that past investments shouldn’t influence future decisions. Since resources were already invested in alternatives, countries were more likely to see the Protocol through rather than start over.³⁵⁴ The Protocol was able to enforce this transition away from ODS by monopolizing its supply and forcing states to participate in the regime lest they lose access to them entirely. The consequences of this were twofold: one, that these states were now under the regulation of the Protocol, and two, that the very same Protocol was dedicated to phasing out the use of ODS, forcing the participating states to innovate new alternatives.

Rational Reasonings

³⁵² Marco Giuliani, "Europeanization in Comparative Perspective: Institutional Fit and National Adaptation" in K. Featherstone and C. M. Radaelli, eds, *The Politics of Europeanization*, (Oxford: Oxford University Press, 2003)

³⁵³ Amos Tversky & Daniel Kahneman, "The framing of decisions and the psychology of choice" (1981) 211:4481 *Science* 453.

³⁵⁴ Kahneman, *supra* note 71.

- ⇒ **Cost-Benefit Analysis and Addressing Compliance Costs:** Financial assistance to developing countries directly addressed the hurdle of high compliance costs, making the benefits of the Protocol (reduced healthcare costs, improved agriculture) more readily achievable. This assistance served as a reward for joining the agreement and incentivized participation, especially for countries with limited resources.
- ⇒ **Financial and Technological Assistance and Facilitating Technology Transfer:** Financial and technological assistance provided the potential for future economic benefits and improved agricultural productivity, especially for developing states.
- ⇒ **Reputation and Trade:** The potential for improved trade relations and increased foreign investment served as a positive incentive for compliance, while conversely, the threat of trade restrictions (or exclusion from the Climate Club) acted as a penalizing mechanism for non-participation. The attraction of the club good was significant enough to outweigh exclusion from it.
- ⇒ **Long-Term Self-Interest and Protecting the Ozone Layer:** While not a tangible reward of the Protocol, protecting the ozone layer ultimately benefited all countries. However, it is important to note that RCT has been criticized for its inability to consider the long-term benefits of environmental actions in its analyses.

Demonstrated by the mechanisms above, the Montreal Protocol's success transcended purely economic calculations by catering to the interests of states on both psychological and RCT grounds. While RCT explains the elements of state behaviour based on tangible benefits and costs, it cannot fully account for factors like social norms, issue framing, and perceived reputation. Behavioural theory complements RCT by highlighting these powerful, less calculated drivers. The Montreal Protocol's rewarding mechanisms strategically targeted both the rational calculations of states – addressing compliance costs, facilitating technological advancement, and offering reputational benefits – and the psychological influences that shape decision-making. This multifaceted approach, recognizing both the logic of self-benefit and the power of internal preferences and social pressures, ultimately attracted near-universal ratification of the Montreal Protocol.

The incentive framework provided by the Protocol continues to operate successfully to this day and acts as an example of international environmental law operating at its best. On October 15, 2016, in Kigali, Rwanda, the Parties to the Montreal Protocol agreed to phase down hydrofluorocarbons (HFCs). HFCs were introduced as non-ozone-depleting alternatives to support the timely phase-out of CFCs and HCFCs and are now widely used in air conditioners, refrigerators, aerosols, and other products.³⁵⁵ Although HFCs do not deplete the stratospheric ozone layer, some have high global warming potential. Overall, HFC emissions were projected to rise to 7-19% of global CO₂ emissions by 2050. Countries agreed to add HFCs to the list of controlled substances and approved a timeline for their gradual reduction by 80-85 % by the late 2040s.³⁵⁶ Under the Kigali Amendment, actions to limit the use of HFCs are expected to prevent the emissions of up to 105 billion tonnes of carbon dioxide equivalent of greenhouse gases, which will help avoid up to an increase of 0.5 degree Celsius global temperature rise by 2100.³⁵⁷ This is the single largest contribution the world has made towards keeping the global temperature rise “well below” 2 degrees Celsius.

Given the continuous demonstration of the Protocol’s effectiveness, it can provide valuable lessons for future IEA formation. There are analogous situations in contemporary IEL that could benefit from a framework that mirrors some of the strategic decisions made in the Protocol. For example, utilizing social and environmental norms could be particularly significant for the use of fossil fuels in the next few decades. Following an agreement made at the end of COP28 that signals the “beginning of the end” of the fossil fuel era,³⁵⁸ it is likely that not unlike ODS, fossil fuels will eventually be phased out of market use. Given the parallels between these two substances, it would seem logical to use the trade provisions in the Protocol as an example of an effective

³⁵⁵UN Environment Programme, “About Montreal Protocol” online: *UN Environment Program*, <<https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol#:~:text=Under%20the%20Kigali%20Amendment%2C%20actions,a%20truly%20unparalleled%20contribution%20to>>.

³⁵⁶ *Ibid.*

³⁵⁷ *Ibid.*

³⁵⁸ United Nations Climate Change, “COP28 Agreement Signals “Beginning of the End” of the Fossil Fuel Era” (13 December 2023) online: *UNFCCC* <<https://unfccc.int/news/cop28-agreement-signals-beginning-of-the-end-of-the-fossil-fuel-era>>.

incentive for participation and compliance with a regulatory regime. Although the phasing out of ODS and fossil fuels are not identical situations, they certainly share enough characteristics to warrant consideration. This suggestion is not made to offer definitive solutions, merely to demonstrate how easily the successes of the Montreal Protocol can be used to inform strategic agreement design. It's unlikely that the Protocol was designed with this kind of theoretical framework in mind, but that does not preclude its use for IEA design in the future.

The Montreal Protocol serves as a powerful testament to the potential of well-designed IEAs. However, the environmental challenges we face today – climate change, biodiversity loss, and pollution – dwarf the scale of the ozone depletion problem. The success of the Montreal Protocol is a testament to the power of international cooperation and collective action in addressing global environmental challenges. As the world continues to grapple with complex environmental issues, the Montreal Protocol serves as a model for future environmental agreements and demonstrates that concerted efforts by the international community can lead to positive and tangible outcomes for the planet's well-being.

Chapter 6

6 The Road Ahead: Embracing Change and Nuanced Frameworks

IEL has emerged as an essential pillar of global governance, evolving in response to the transboundary environmental issues that permeate the global environment. As threats to our environment intensify, the limitations of traditional IEL and its reliance on RCT become increasingly apparent. This thesis has argued that the climate crisis necessitates a paradigm shift away from rigid empirical models like RCT and economics. By incorporating insights from psychology and behavioural theory, we can craft agreements that are not just practically feasible but also psychologically compelling. Understanding these motivations is key to developing agreements that appeal to both self-interest and broader normative considerations of nations. For future IEAs to be effective, a nuanced theoretical framework encompassing both RCT and behavioural theory is crucial.

The Montreal Protocol demonstrates the power of a nuanced approach to IEL design. Its strategic blend of rewarding mechanisms, including trade provisions, financial assistance, and technology transfer, effectively addressed concerns of free-riding, capacity limitations, and reputational incentives. By offering a mix of internal and external rewards, the Protocol created a compelling incentive structure for both developed and developing nations to participate and comply with its obligations. It demonstrates the potential of rewarding mechanisms in fostering participation and compliance within IEL. While the Montreal Protocol offers inspiration, replicating its success in effectively addressing the complex challenges of climate change requires a nuanced approach.

6.1 Limitations and Future Research

While this thesis provides a novel perspective on the potential of rewarding mechanisms in IEL, there are several limitations to this study that must be emphasized.

⇒ **Westernized Perspective:** While this research may offer some valuable insights, it is important to acknowledge that it is reliant on a Westernized perspective of

environmental governance. Western models often emphasize a separation between humans and nature, focusing on command-and-control regulations and top-down management.³⁵⁹ There are few alternatives to these models in Western scholarship, but many valuable and insightful alternatives have been presented by non-Western authors. The specifics of ecological knowledge and ways of knowing are too vast to be generalized, but I encourage those interested to read the works of authors like McGregor,³⁶⁰ Renglet,³⁶¹ and Clogg et al.³⁶² Future studies could benefit from incorporating diverse cultural and historical perspectives, recognizing that different worldviews and value systems may influence state motivations and their perceptions of rewards and compliance with environmental agreements.

- ⇒ **Scope of Cognitive Psychology:** This thesis has touched upon a few key concepts within cognitive psychology. However, this field is vast and offers a wide range of additional insights into human decision-making and behaviour. Future studies might expand on this by exploring concepts such as prospect theory,³⁶³ mental accounting,³⁶⁴ and the role of emotions and biases in IEA designs.
- ⇒ **Scope of IEA Analysis:** This work has focused on a limited set of IEAs, with a primary emphasis on the Montreal Protocol. Future research could broaden the analysis to include a wider array of environmental agreements, including national laws, regional agreements, and local ordinances.³⁶⁵ These diverse legal tools can provide a more comprehensive picture of how environmental protection can be influenced by positive incentives more broadly.
- ⇒ **Focus on State Actors:** This thesis primarily examines the behaviour of states as central actors within IEL. However, contemporary global governance is increasingly

³⁵⁹ Amitav Acharya & Barry Buzan, “Why is there no non-Western international relations theory? An introduction” (2007) 7:3 *Intl relations of the Asia-Pacific* 287.

³⁶⁰ Deborah McGregor, “Indigenous Environmental Justice, Knowledge, and Law” (2018) 5:2 *Kalfou J Comp & Relational Ethnic Studies* 279.

³⁶¹ Charlotte Renglet, “The Recognition of the Special Relationship of Indigenous Peoples with their Environment under International Law: A Potential Advantage in Climate Litigation?” (2022) 29:4 *International journal on minority and group rights* 720.

³⁶² Jessica Clogg et al, “Indigenous Legal Traditions and the Future of Environmental Governance in Canada” (2016) 29 *Journal of environmental law and practice* 22.

³⁶³ See Daniel Osberghaus, “Prospect theory, mitigation and adaptation to climate change” (2016) 20:7 *J Risk Research* 909.

³⁶⁴ Richard H Thaler, “Mental accounting matters” (1999) 12:3 *J Behavioral Decision Making* 183.

³⁶⁵ Bodansky, *supra* note 2017 at 3.

characterized by the involvement of a wide range of non-state actors, including NGOs, corporations, and sub-national governments. Future research could investigate how these non-state actors influence state behaviour within IEAs. This broader analysis would be especially valuable when exploring how NGOs can shape public opinion and mobilize support for environmental agreements, ultimately putting pressure on states to participate and comply. It would also be beneficial to explore the potential role of rewarding mechanisms in directly incentivizing positive environmental actions by non-state actors.

⇒ **Environmental Justice Issues:** IEL encompasses a broad spectrum of environmental justice issues, including human rights, social equity, economic development and gender equity. This paper largely abstains from interacting with environmental justice issues, but they offer a very promising topic for further research. Future topics could explore the intersection of IEL with other critical areas like human rights and sustainable development goals (SDGs), building upon the insights gained from this analysis of incentive-based structures within IEL. It might also be beneficial to see if rewarding mechanisms can incentivize compliance by addressing significant environmental justice issues specifically.

6.2 Closing Thoughts

As the international community continues to grapple with the realities of environmental degradation, IEL must evolve to meet these unprecedented challenges. We can only maintain the status quo for so long until it is too late for us to make the necessary changes to keep our planet habitable. Rewarding mechanisms offer a promising avenue for incentivizing cooperation, addressing free-rider concerns, and ensuring equitable compliance. Drawing upon insights from cognitive psychology and RCT, we can design more effective IEAs that respond to both the rational and psychological motivations of states. By embracing innovative approaches and expanding our theoretical understanding, we can build a more sustainable future for all.

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