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Global Innovation Law

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This Article is about opening up a debate on global innovation law. The Article argues that a new hybrid area of transglobal law has emerged in the past decade due to the rise of various disruptive and technological challenges to law beyond the state. As such, the Article argues that global innovation law is a new field that encapsulates the dynamics of law making and regulatory governance in how law operates in a transglobal environment. With the rapid changes in law and regulation to meet the demands of the global economy—the interaction of law and these changes at the domestic and international level can no longer be subjected to the interaction of domestic and international law. Although, there have been efforts to engage in a steady stream of scholarship to address similar developments, whether as "global administrative law," "legal pluralism," "transnational law," amongst others—they do not capture the dynamics of how law meets innovation as a result of disruptive technology. Hence, global innovation law is meant to address some of these challenges by looking at the confluence of globalization, innovation, and disruptive technologies such as artificial intelligence, data governance, and the financial technology sector. The premise of this Article is therefore to map the foundations of global innovation law.

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I. INTRODUCTION

In the beginning of the *internet disruptive technological innovation*—there was Napster—the all-encompassing music sharing portal that used MP3 file sharing technology to share music globally as it *trespassed* on every conceivable copyright rule and norm. Ultimately, Napster could not defend itself from the music industry under the copyright laws of the US and it eventually collapsed.[1] Napster was one of the first efforts at promoting a disruptive technological method through the internet. However, Napster was also a prime target of regulators and the music industry giants who used the strong arm of the law to rein in such *disruptions*. However, despite the tragedy of Napster and the promises of internet revolution, more and more disruptive technological innovation over the internet emerges with severe implications for international legal relations.[2] At present, this disruptive technological revolution is especially evident in how areas such as artificial intelligence, algorithmic governance, platform governance, blockchain technology, financial technology (Fintech), and big data via the use of technical devices, shapes the global economy.[3]

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1. *See* A & M Records, Inc., v. Napster, Inc., 114 F. Supp. 2d 896 (N.D. Cal. 2000); Michael Carroll, *Disruptive Technology and Common Law Lawmaking: A Brief Analysis of A & M Records, Inc. v. Napster, Inc.*, 9 VILL. SPORTS & ENT. L.J. 5, 12 (2002) (depicting how Napster was on the one hand seen as an "evil incarnate", and, on the other, some copyright holders were positively optimistic "to the rampant file sharing that had taken the Internet by storm").

2. *See* Henry Gladney, *Digital Intellectual Property: Controversial and International Aspects*, 24 COLUM. J.L. & ARTS 47, 76–79 (2000) (setting out some of the complexities of international legal reactions relating to "IP leakage" on the internet); Jeffrey Dodes, *Beyond Napster, Beyond the United States: The Technological and International Legal Barriers to On-Line Copyright Enforcement*, 46 N.Y.U. L. REV. 279, 295–301 (2002) (looking at some of the extraterritorial aspects of the Napster case); Antonio Segura-Serrano*, Internet Regulation and the Role of International Law*, 10 MAX PLANCK Y.B. UNITED NATIONS L. 191, 205 (2006) (nothing how states embraced sovereignty over "technological innovation."); P. Sean Morris, *Pirates of the Internet, At Intellectual Property's End with Torrents and Challenges for Choice of Law*, 17 INT'L J.L. & INFO. TECH. 282, 298–99 (2009) (highlighting some jurisdictional problems for copyright infringement over the internet); Stephen Bright, *The Current State of BitTorrent in International Law: Why Copyright Law is Ineffective and What Needs to Change*, 17 NEW ENG. J. INT'L & COMP. L. 265, 287 (2011) (suggesting the need to reform international law to better reflect developments in intellectual property and internet infringement); Stephen Small, *Bitcoin: The Napster of Currency*, 37 HOUS. J. INT'L L. 581 (2015) (generally arguing how the rise of Bitcoin presents the same challenges as Napster).

3. In some ways the very essence of technological revolution since the commercial days of the internet relies on big data and technical devices (such as computers). Moreover, the concept of artificial intelligence—is in some ways, rather *artificial*, when other components such as algorithm or machine deep learning are considered. Thus, in this article, I employ a one-size fits all approach to the concept of artificial intelligence—but not a substitute for the main concept of global innovation (law) that I am advancing in the article. I will however, discuss a narrow framework of artificial intelligence as part of the global innovation (law)

These areas have been some of the fastest growing regulatory challenges and the necessity of law because as a form of *disruptive technological innovation* they create several legal disorders. But, more formally, the question is, how should these challenges be seen in light of innovation and approaches to law in the established global legal order.[4] We have witnessed these developments in a number of areas such as artificial intelligence, algorithms, data governance, financial technology (Fintech), the platform economy, digital copyright, and a host of other disruptive technologies[5] tend to create jurisdictional issues in contemporary international law. Not only have these *innovations* been a common issue in the domestic paradigm of states but they have also been elevated to the global arena where they intersect with the traditional domain of international law. The convergence of *disruptive laws* and international law has actually brought on a new system of law that has gained little traction in the academic debate—global innovation law.

Global innovation law is a complex phenomenon brought about by technological changes often promulgated by private actors in the economy but requires the public nature of law to enforce or safeguard proprietary interests. Global innovation law therefore, on the one hand, intersects with technological and proprietary functions of law, and on the other, forms a governance structure beyond the territorial boundaries of states.

This, therefore, gives rise to questions of how traditional international law should respond to global innovation law, whether global innovation law is a normative structure creating new obligations for states, and questions about the private initiatives behind the technological and proprietary functions of global innovation law. To be clear, global innovation law is not about

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ecosystem later in this article. For some discussions on artificial intelligence from policy and regulatory perspectives *see*, *e.g.*, Olivia Erdelyi & Judy Goldsmith, *Regulating Artificial Intelligence: Proposal for a Global Solution*, 2018 AAAI/ACM CONF. ON AI ETHICS & SOC'Y 1 (proposing the creation of an International Artificial Intelligence Organization – IAIO), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3263992 [https://perma.cc/VN46-VANE]; ADAM THIERER ET AL., ARTIFICIAL INTELLIGENCE AND PUBLIC POLICY (2017); Ryan Calo, *Artificial Intelligence Policy: A Primer and Roadmap*, 51 U.C. DAVIS L. REV. 399 (2017); Riika Koulu, *Human Control over Automation: EU Policy and AI Ethics*, EUR J. L. STUD. 9, 35 (2020) (arguing for instance that despite the AI policy strategies of the EU, "AI problems, it seems, are problems created by the technology, not by humans, and these problems should primarily be addressed by product liability and data protection regimes, i.e. only certain areas of law").

4. For discussions on disruption theory *see e.g.*, Joseph Bower & Clayton Christensen, *Disruptive Technologies: Catching the Wave*, HARV. BUS. REV., Jan.–Feb. 1995, at 43; Tim Wu, *Agency Threats*, 60 DUKE L.J. 1841 (2011); Ronald Gilson, *Locating Innovation: The Endogeneity of Technology, Organizational Structure, and Financial Contracting*, 110 COLUM. L. REV. 885 (2010); Nathan Cortez, *Regulating Disruptive Innovation*, 29 BERKELEY TECH. L.J. 175 (2014).

5. Kal Raustiala & Christopher Sprigman, *The Second Digital Disruption: Streaming Data and the Dawn of Data-Driven Creativity*, 94 N.Y.U. L. REV. 1555 (2019).

regulating how "technological law"[6] forms part of an overarching administrative system. Rather, global innovation law relates to the new dynamics of how the different disruptive regimes such as technological law, data governance, Fintech, artificial intelligence, platform governance, amongst others forms the basis of a new *system* of law at the international level.

My emphasis on the international level is because of the fact that in these modern times—the second decade of the twenty-first century—law is increasingly global. In other words, law is no longer solely confined to the internal territorial boundaries of a state—rather, law has become extraterritorial[7] and with extraterritoriality becomes a concern of the *modern global law*. It is at this complex juncture of modern global law that, I would argue, incorporates the different *provinces* of global law such as transnational law, global constitutionalism,[8] global administrative law, global legal pluralism or global governance.[9] The province of global administrative law, for instance, has gained a serious amount of exposure in the academic literature as it purports to address how to ground different administrative governance organizations or their regulatory competence at the global level[10] and their fit

6. *See* Shin-Yi Peng, *The Rule of Law in Times of Technological Uncertainty: Is International Economic Law Ready For Emerging Supervisory Trends?*, 22 J. INT'L ECON. L. 1, 12 (2019) (discussing especially the rule of law in times of technological uncertainty); Tibor Tajti, *The Impact of Technology on Access to Law and the Concomitant Repercussions: Pass, Present, and the Future (From the 1980s to Present Time)*, 24 UNIF. L. REV. 396 (2019); Mark Fenwick et al., *Regulation Tomorrow: What Happens When Technology is Faster than the Law?*, 6 AM. UNIV. BUS. L. REV. 561 (2017); Iain Sheridan, *Financial Technology and Global Capital Markets: The Impact of Pro-Enterprise Regulation and English Law*, 13 CAP. MKTS. L.J. 587 (2018); Riika Koulu, *Blockchains and Online Dispute Resolution: Smart Contracts as an Alternative to Enforcement*, 13 SCRIPTED 40 (2016); Anna Butenko & Pieere Larouche, *Regulation for Innovativeness or Regulation of Innovation?*, 7 L. INNOVATION & TECH. 52 (2015); Joel Trachtman, *International Legal Control of Domestic Administrative Action*, 17 J. INT'L ECON. L. 753 (2014); ROGER BROWNSWORD & MORAG GOODWIN, LAW AND TECHNOLOGIES OF THE TWENTY-FIRST CENTURY (2012); Lyria B. Moses, *Agents of Change: How the Law 'Copes' with Technological Change*, 20 GRIFFITH L. REV. 763 (2011); SUSAN BRENNER, LAW IN AN ERA OF "SMART" TECHNOLOGY (2007).

7. *See, e.g.*, KBR Inc, R (On the Application of) v The Director of the Serious Fraud Office [2018] EWHC (Admin) 2368 (relating to the extraterritorial effect of certain provisions of the Criminal Justice Act (1987)) (UK).

8. *See, e.g.*, David Law and Mila Versteeg, *The Evolution and Ideology of Global Constitutionalism*, 99 CAL. L. REV. 1163 (2011); Cormac Mac Amhlaigh, *Harmonising Global Constitutionalism*, 5 GLOB. CONSTITUTIONALISM 173 (2016).

9. *See* RULING THE WORLD? CONSTITUTIONALISM, INTERNATIONAL LAW AND GLOBAL GOVERNANCE (Jeffrey L. Dunoff & Joel P. Trachtmann eds., 2009) [hereinafter "Ruling the World"].

10. Benedict Kingsbury, Nico Krisch & Richard Stewart, *The Emergence of Global Administrative Law*, 68 L. & CONTEMP. PROBS. 15 (2005). *See also* Nico Krisch & Benedict Kingsbury, *Introduction: Global Governance and Global Administrative Law in the International Legal Order*, 17 EUR. J. INT'L L. 1, 2 (2006) ("The concept of global administrative law begins from the twin ideas that much global governance can be understood as administration,

into the globalization narrative.[11] The narrative of global administrative law, however, has fizzled out, and the rise of technological challenges beyond the state requires a new narrative.

Let me narrow the meaning of globalization in this introductory argument to that of "global governance"[12]—where one can argue that in essence global governance relates to how states assemble in international cooperation to harmonize the common good of the world order. Alternatively, one can endorse any of the multiple constructions of global governance such as a sharp rise in "economic globalization, and everything associated with it, was allowed to thrive and develop because it took place in a relatively open, relatively peaceful, relatively liberal institutionalized world order."[13] Whichever position we ultimately agree is global governance—whether it is world politics[14] or the transposition of domestic regulatory structures to international law[15]—the idea of global governance is well grounded in academic discourse, private actors in the global economy, and state[16] practice. It is not the position of this Article to challenge the idea of global governance, rather, it is necessary to refer to global governance as part of the project of globalization and as such influences how other systems of law and regulation in the global economy manifest into, or, can be christen as "global ___ law". It is in this vein that the idea of global governance must be understood as it helps to reflect how changes on the global legal landscape occur as a result of many factors including for the purposes of this Article—disruptive technology. Thus, it is a matter of how we account for such changes in the global economy and the relation of those changes to international law—which continues on a path of *fragmentation*.

The many facets of the new international law (fragmentation) that global governance represents include trade law, transnational law, global administrative law, and as this Article is proposing global innovation law. The

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and that such administration is often organized and shaped by principles of an administrative law character.").

11. *See*, *e.g.*, Carol Harlow, *Global Administrative Law: The Quest for Principles and Values*, 17 EUR. J. INT'L L. 187 (2006); DAVID BEDERMAN, GLOBALIZATION AND INTERNATIONAL LAW (2008); Gralf-Peter Calliess & Moritz Renner, *Between Law and Social Norms: The Evolution of Global Governance*, 22 RATIO JURIS 260 (2009).

12. David Kennedy, *The Mystery of Global Governance*, 34 OHIO N.U. L. REV. 827 (2008).

13. David Held, *Elements of a Theory of Global Governance*, 42 PHIL. & SOC. CRITICISM 837, 839 (2016).

14. Lawrence Finkelstein, *What is Global Governance?*, 1 GLOB. GOVERNANCE 367 (1995).

15. Martti Koskenniemi, *Global Governance and Public International Law*, 37 KRITISCHE JUSTIZ 241 (2004).

16. Shahar Hameiri & Lee Jones, *Global Governance as State Transformation*, 64 POL. STUD. 793 (2016).

changes that are taking place within the new international law under the umbrella of "global law" is the fact that such transformation represents the previous incarnation of "old international law" such as the law of nations in the long nineteenth century,[17]world law in parts of the twentieth century, and nowadays global law in the twenty-first century. As a twenty-first century novelty that is partially based on globalization—then we must embrace the "global" in the new facets of international law—and in this regard, not only should the "global" represent "globalism"—the expanding network of cooperation—but also the ability to be disruptive, that is challenge existing norms. From an international law perspective, the idea of global administrative law had been disruptive in that it challenged the classical models of international law.[18] However, global administrative law, in my view failed to grasp the fast-moving changes in the international legal environment as a result of technology, and therefore gives way to a new narrative as I am positing.

Global innovation law is however a completely different province when compared to say global administrative law—or at least, that is how I am conceptualizing global innovation law. Thus, if global administrative law is a *normative* domain—then global innovation law is a *system*. As a system, I will later argue, global innovation law harnesses the practices and existing rules of the modern international legal order as opposed to setting up a normative base that can essentially raise more questions than answers. In other words, the rules of the games for global innovation law are already in existence—whether through international organizations such as the World Trade Organization (WTO); the United Nations; the World Intellectual Property Organization (WIPO), or international tribunals. Thus, if global innovation law is seen as part of the paradigm of modern global law, then, the purpose of global innovation law is to harness the disruptive laws and their global impact. Global innovation law has many facets and demonstrates the many dimensions of innovators and innovations that must adhere to a rule of law system. As a system—global innovation law must contend with the realities of disruptions and technological innovations where the rule of law can sometimes be murky or absent.

But it is this murky world of facts and realities of the technological innovation sphere and the necessities of the rule of law that can be conceived

17. I am primarily referring to how international law as such practiced in the nineteenth century to include some of the ideals of previous international legal orders such as during the medieval and early scholastic era where such polities matched the transformation of international law in the nineteenth century. For further readings *see generally*, Lauren Benton & Adam Cluclow, *Legal Encounters and the Origins of Global Law, in* CAMBRIDGE HISTORY OF THE WORLD (2015); HENRY WHEATON, HISTORY OF THE LAW OF NATIONS IN EUROPE AND AMERICA: FROM THE EARLIEST TIMES TO THE TREATY OF WASHINGTON, 1842 (1845); PAOLO AMOROSA, REWRITING THE HISTORY OF THE LAW OF NATIONS: HOW JAMES BROWN SCOTT MADE FRANCISCO DE VITORIA THE FOUNDER OF INTERNATIONAL LAW (2019).

18. Benedict Kingsbury, *The Concept of 'Law' in Global Administrative Law*, 20 EUR. J. INT'L L. 23 (2009).

not only as special, but also as the need for a new framework to capture how law responds to technological innovation in the global economic system. Given that some of the realities include the domestic private law system that deals with intellectual property and technological innovation or their counterpart at the international legal level such as the WTO system of GATS, TRIPS or even amendments to the Vienna Convention on Road Traffic[19] that take into account self-driving cars—the pattern of global innovation law begins to emerge.

Although different facets of global innovation law such as financial technology or artificial intelligence have been addressed in different scholarships—no single source has yet to address this phenomenon.[20] It is that weakness in the legal literature that this Article aims to capture and at the same time provides a foundation of global innovation law. The existence of global innovation law, then, can be interpreted and formalized as part of the changing (*disruptive*) nature of international law.

II. TOWARD THE SYSTEM OF GLOBAL INNOVATION LAW

To pin down a solid definition of "global innovation law" is perhaps the ideal thing to do in an Article of this nature.[21] However, that task is not as easy as it may appear.[22] This is because, a rock-solid definition of global innovation law is still not possible—because it is an evolving system, and moreover, there is the need to be flexible when discussing any new system. In this regard, what I am proposing is not so much a definition of global innovation law (either in the above introduction or in this part of the article)—rather, I am proposing some guiding structures that can capture the essence of global innovation law in light of "law and technological change."[23] Thus, one could agree that global innovation law is a system of rules that

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19. U.N. Secretary-General, *Convention on Road Traffic*, UN.Doc, C.N.162.2015 (Nov. 8, 1968); Nynke Vellinga, *Automated Driving and Its Challenges to International Traffic Law: Which Way to Go?*, 11 L. INNOVATION & TECH. 257 (2019).

20. *But see* JULIE COHEN, BETWEEN TRUTH AND POWER: THE LEGAL CONSTRUCTIONS OF INFORMATIONAL CAPITALISM (2019) (framing disruptive technologies from a commerce angle).

21. When Jessup coined the term "transnational law" or at least popularized it, he associated its meaning to: "include all law which regulates actions or events that transcend national frontiers. Both public and private international law are included, as are other rules which do not wholly fit into such standard categories." *See* PHILIP JESSUP, TRANSNATIONAL LAW 2 (1956).

22. *But see* my introductory remarks where I made attempts at setting out definitions of global innovation law. *See also* Aurelien Portuese & Julien Pillot, *The Case for an Innovation Principle: A Comparative Law and Economics Analysis*, 15 MANCHESTER J. INT'L ECON. L. 214 (2018).

23. Lyria Moses, *Why Have a Theory of Law and Technological Change?*, 8 MINN. J.L., SCI. & TECH. 589 (2007).

demarcates the legal operations of technology and innovation in the global economic system.

As a system, global innovation law is exemplified by disruptive technologies in many areas such as autonomous robotic system, block-chain, Fintech, artificial intelligence, platform governance, deep learning, machine learning, algorithm, biomedical innovation, patents and nanotechnology, big data (governance), amongst others. Through these disruptions, global innovation law engages with international law as a conduit of protecting and harnessing private proprietary rights and innovation through how states cooperate in the global economic system. In a sense, global innovation law through the dynamics of disruptive technological innovation brings about *changes* in the global economic system, but at the same time, by embracing the traditional structure of international law—global innovation law also represents *continuity*.

Unlike other systems of law that manifested in the international legal literature in recent decades where they detach themselves from the corpus of international law or came to be seen as "hybrids"—global innovation law fully embraces the traditional structures of international law. By embracing the core of international law such as its principles and customary nature—global innovation law acts as a catalyst for the interpretation of disruptive technologies in international law. To give an example of what I am referring to here—take the dispute settlement system (DSU) of the WTO which provides for in Article 3.2 that the "dispute settlement system of the WTO is a central element in providing security and predictability to the multilateral trading system."[24] In the same vein, global innovation law should be seen as the main road that leads all disruptive technologies operating in the global legal sphere to the central tenets of international law. This is necessary so that when those disruptive technologies raise questions of "rights" or "obligations" beyond the state—international law can properly address them albeit under the framework of global innovation law. This is part of the continuity argument of international law—and it is necessary to avoid some of the pitfalls regarding the ideas of new systems of law at the global level that contributes to those new systems of *lex specialis* or not part of the corpus of traditional international law. The continuity thesis, I posit, requires international law to be aligned with its traditional principles but have the flexibility to incorporate modern legal challenges to those principles.

It is equally important to understand that global innovation law as I am developing in this Article has linkages to the domestic private law systems of nation states. By this, I am referring to the fact that it is constituent domes-

24. Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154 app. 10.

tic regulation such as in the area of "virtual financial transactions," intellectual property, contracts,[25] torts[26] or on "data" that governs the system of innovation law and how that system gives rise to international legal norms. Moreover, it is domestic legal principles that are often taken into account when breaches or acts of illegality by private parties occur in another state.[27] For instance, on a number of occasions, private entities and individuals have used the domestic law of states to initiate legal proceedings for breaches or illegality that took place in another state.[28] In recent times we have seen that the incentives to use domestic law for such breaches have taken place regarding the illegal use of trademarks[29] or historically with antitrust in the United States and more recently securities in financial matters.[30] Although the reliance on domestic law is often a one-sided affair—in that fingers can be pointed to a single state—the larger picture here is that such jurisdictional questions often arise that challenge the boundaries of innovation as seen, for example, in a recent case relating to the *legal standards on patentability*.[31] This is where domestic private law is used as an attempt to interfere in the sovereignty of another nation, which is actually a signal that the traditional state-centered nature of international law requires a framework for the modern challenges of disruptive technologies and international law.

For example, the current realm of international intellectual property law has most of the core tenets that can be linked to global innovation law. International intellectual property law, which, primarily is based on the TRIPS Agreement, WIPO administered treaties, and/or principles of international law, it can be argued, contain elements for regulating contemporary global innovation.[32] However, the relationship between TRIPS for example and global innovation is more complex given that TRIPS is "trade-based" in that

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25. Lauren Scholz, *Algorithmic Contracts*, 20 STAN. TECH. L. REV. 128 (2017).

26. James Henderson, *Tort vs. Technology: Accommodating Disruptive Innovation*, 47 ARIZ. ST. L.J. 1145 (2015).

27. In the area of copyright, US courts have attempted to extend its copyright laws in transnational disputes in cases such as in Update Art, Inc. v. Modiin Publ'g, Ltd., 843 F.2d 67 (2d Cir. 1988); Itar-Tass Russian News Agency v. Russian Kurier, Inc., 153 F.3d 82 (2d Cir. 1998). For some discussions *see* Gregory Swank, *Extending the Copyright Act Abroad: The Need for Courts to Reevaluate the Predicate-Act Doctrine*, 23 DEPAUL J. ART, TECH. & INTELL. PROP. L. 237 (2012).

28. Subafilms, Ltd., v. MGM-Pathe Commc'ns Co., 24 F.3d 1088 (9th Cir. 1994).

29. Trader Joe's Co. v. Hallatt, 835 F.3d 960 (9th Cir. 2016).

30. Morrison v. Nat'l Austl. Bank, 561 U.S. 247 (2010).

31. *See e.g.*, KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398 (2007) (where the court determined the obviousness criteria for patent under US law). This case is important as it has implications beyond the United States for other countries that must strive to "innovate," for similar discussions *see* Ron A. Bouchard, *KSR v. Teleflex Part 2: Impact of U.S. Supreme Court Patent Law on Canadian and Global Systems-Based Innovation Ecologies*, 15 HEALTH L.J. 247 (2007).

32. Katherine Strandburg, *Evolving Innovation Paradigms and the Global Intellectual Property Regime*, 41 CONN. L. REV. 861 (2009).

it orients towards markets[33] and newer challenges such as the disruptive technologies thesis of this Article does not sufficiently fit into the TRIPS paradigm. Moreover, the ability of the WTO *vis a vis* the TRIPS to make new rules regarding developments in intellectual property or innovation has been in a state of 'law making deficit'.[34] Yet, when we speak of "innovation"[35] the linkages with intellectual property cannot be ignored.[36] Intellectual property is on the one hand synonymous with innovation especially in the field of patents[37] (especially from a technological perspective)[38] and, on the other, the modern challenges to international law, whether by Fintech,[39] mobile money,[40] data,[41] high frequency trading (HFT), or the problematic notion of copyright fair use,[42] also have underlying elements relating to intellectual property. And, it goes without saying that copyright matters form one of the core tenets of intellectual property rights.

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33. See *id*.

34. On this argument *see* Rochelle Cooper Dreyfuss, *Fostering Dynamic Innovation, Development and Trade: Intellectual Property as a Case Study in Global Administrative Law*, 2009 ACTA JURIDICA 237 (2009).

35. Although my arguments in this article concern "technological innovation" – innovation also occurs in other areas where intellectual property is concerned, moreover, innovation as a concept is wide enough to factor in other developments, for a theoretical guidance *see e.g.*, Robert Edgell & Roland Vogl, *A Theory of Innovation: Benefit, Harm, and Legal Regimes*, 5 L. INNOVATION & TECH. 21 (2013).

36. *See e.g.*, Graham v. John Deere Co., 383 U.S. 1, 6 (1966) (noting that "[i]nnovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system."); Philip Weiser, *The Internet, Innovation, and Intellectual Property Policy* 103 COLUM. L. REV. 534 (2003); Geoffrey Scott, *A Protocol for Evaluating Changing Global Attitudes Toward Innovation and Intellectual Property Regimes* 32 U. PA. J. INT'L L. 1165 (2011); Daniel Gervais, *Challenges in Intellectual Property Governance: Providing the Right Incentives in the Quest for Global Innovation*, 4 TRADE L. & DEV. 385 (2012); Carl Mair, *Taking Technological Infrastructure Seriously: Standards, Intellectual Property and Open Access*, 32 UTRECHT J. INT'L & EUR. L. 59 (2016); Daniel Hemel & Lisa Larrimore Ouellette, *Innovation Policy Pluralism* 128 YALE L. J. 544 (2019).

37. Jonathan M. Barrett, *Patent Tigers: The New Geography of Global Innovation* 2 CRITERION: J. INNOVATION 429 (2017).

38. Deborah Strumsky et al, *Using Patent Technology Codes to Study Technological Change* 21 ECON. INNOVATION & NEW TECH. 267 (2012); Bernard Chao, *Horizontal Innovation and Interface Patents* 2016 WIS. L. REV. 287 (2016); Esteban Donoso, *Application of a Mechanism of Proportional Rewards Towards Global Innovation*, 4 N.Y.U. J. INTELL. PROP. & ENT. L. 105 (2014).

39. Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trilemma*, 107 GEO. L. J. 235 (2019).

40. David Myerson, *The Next Global Disruptive Innovation: Can Mobile Money Make the Journey Upmarket to Disrupt the Financial Services Industry?*, 39 NW. J. INT'L L. & BUS. 309 (2019).

41. Jerome Reichmann & Pamela Samuelsson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51 (1997).

42. Peter Yu, *Fair Use and Its Global Paradigm Evolution*, 2019 U. ILL. L. REV. 111 (2019).

The TRIPS Agreement for its part alludes to the relationship between innovation and intellectual property for instance noting that technology[43] is "enjoyable without discrimination[;]"[44] and that include the existence of "an inventive step"[45] as a rationale for "industrial application."[46] These TRIPS paradigms are an indication that not only do intellectual property and innovation have the same end goal but also represents part of the initial groundwork for global innovation law. Moreover, TRIPS flexibilities,[47] such as those relating to compulsory licensing or exclusions from patentability, fit into the narrative of the disruptive nature of global innovation law; however, the drawback with that argument is that TRIPS is based on trade norms whilst disruptive technologies are increasingly seen as a challenge to the status quo, including standard trade norms and market access.

By taking lessons from the patent system of innovation, the concept of innovation in this context should also be a part of the new technological innovations of disruptive paradigms. Furthermore, global innovation law shares a relationship with the global economy. This is, in that the different facets of the global economy that rely on innovation such as digital trade, Internet of Things (IoT), the platform economy,[48] intermediated securities,[49] high frequency trading, data, artificial intelligence,[50] amongst others, initially coordinated under domestic private law rules in order to perform economic functions or offer services on a global level. Thus, domestic legal principles are in effect coordinating the global economy as a result of innovation, yet, there is no actual system of global innovation law. Introducing the concept of global innovation law to coordinate legal activities (both domestic and international) allows for the adaptability of the different paradigms that similarly in Jessup's word transcends national frontiers and requires the inclusion of private and public international law[51] to fit into this new paradigm of global innovation law.

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43. Agreement on Trade-Related Aspects of Intellectual Property Rights, Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1869 U.N.T.S. 299.

44. *Id.*

45. *Id.*

46. *Id.*

47. ELIZABETH SIEW-KUAN NG & ALBERT GUANGZHOU HU, FLEXIBILITIES IN THE IMPLEMENTATION OF TRIPS: AN ANALYSIS OF THEIR IMPACT ON TECHNOLOGICAL INNOVATION AND PUBLIC HEALTH IN ASIA (Rochelle Dreyfuss & Elizabeth Siew-Kuan Ng eds., 2018).

48. Julie Cohen, *Law for the Platform Economy* 51 U.C. DAVIS L. REV. 133 (2017).

49. Ferdisha Snagg & Sarah Green, *Distributed Ledger Technology and Intermediated Securities, in* INTERMEDIATION AND BEYOND 337 (2019).

50. Teresa Ballell, *Legal Challenge of Artificial Intelligence: Modelling the Disruptive Features of Emerging Technologies and Assessing Their Possible Legal Impact* 24 UNIF. L. REV. 302 (2019); THOMAS WISCHMEYER & TIMO RADEMACHER, REGULATING ARTIFICIAL INTELLIGENCE (2020).

51. JESSUP, *supra* note 21.

These guiding frameworks for global innovation law do have some connotations with the Jessupian notion of transnational law in that global innovation law relates to all forms of disruptive technologies that interact with domestic legal rules, such as intellectual property and international legal norms, to address modern challenges to international law. The modern challenges to international law requires that there is a firm understanding of how disruptive technologies are intertwined with domestic legal rules. But, at the same time, the influence of the domestic legal system on international legal norms indicates that global innovation law is an interdependent system of domestic legal rules. As an independent system, these rules pertain mostly to technology, innovation, and other legal obligations regarding questions of jurisdiction and regulation beyond the territorial borders of the state. In that regard, those rules must help interpret private actions or illegal conduct in another state without trespassing in that state's sovereignty.

Given that this Article is not about reforming international law, but rather acknowledging the various challenges and new paradigms[52] as a result of disruptive innovations and their relations to law in an international context, then the simplistic function of global innovation law ought to be replicating the traditional role of international law. If global innovation law replicates traditional international law while at the same time highlighting the importance and relevance of modern challenges and disruptive technologies then international law would become adaptive, interactive, and less state centred but also include the relevance of disruptive communities and innovators to ease the transition from domestic regulation to global regulation. The proliferation of disruptive technologies and their impact on the law represent both a desire to engage with states and other actors in the international legal process on the new paradigm that global innovation law represents. At the same time, this new paradigm of global innovation law is part of the *ordolegal*[53] complex of contemporary *ius gentium* where the lawmaking process is no longer state-centred, but increasingly relies on the dynamics of the global economy with private actors.

III. SAMPLE REGIMES IN THE SYSTEM OF GLOBAL INNOVATION LAW: ARTIFICIAL INTELLIGENCE, ALGORITHMS, AND FINANCIAL TECHNOLOGY

Although the notion of artificial intelligence[54] and its relation to law has experienced a rejuvenation in the legal academic circles in recent years due

52. Yu, *supra* note 42 (discussing new paradigms in global copyright law).

53. P. Sean Morris, *Ordolegality* (Working Paper, 2019) (on file with author).

54. It is not my intention to go into a conceptual dissection of artificial intelligence in this part of the article unlike my previous foray into global innovation law as set out in the introduction and the previous section. Unlike global innovation law which is a new proposition – artificial intelligence, for good measure is a term that has been in existence for a while, as

to disruptive technologic innovation, in fact, it has a long history in relation to different areas of intellectual property, early advances in technology, and general legal reasoning.[55] Taking this into account and, for the purposes of the discussion in the section of the article, where artificial intelligence is one of the examples of global innovation law–-the narrative is on recent approaches to artificial intelligence and also its connection to international law.[56] In other words, my inquiry is about framing some of the arguments across sample regimes that also require or take into account artificial intelligence. In this regard, although the concept of artificial intelligence is broad enough to include, among other things, automation, algorithmic, big data, AI governance, and regulation, my aim is not to focus on those concepts as such. Rather, I want to start from two positions: regulation and governance relating to artificial intelligence as a legal concept and an underlying technology in relation to the other regimes of global innovation law. The arguments in this section are only for demonstrative purposes-–a sample–and therefore, I want

attested by different fields whether in the social or physical sciences. Most of the sources I came across attributed the origins of the concept to a paper that first appeared in 1955, *see* JOHN MCCARTHY ET AL, A PROPOSAL FOR THE DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE (1955) (they in part define the concept of artificial intelligence as "that of making a machine behave in ways that would be intelligent if a human were so behaving"). *See also* Alan Turing, *Computing Machinery and Intelligence*, 49 MIND 433 (1950); Calo, *supra* note 3, at 404 (describing artificial intelligence "as a set of techniques aimed at approximating some aspect of human or animal cognition using machines"). Due to the rise of technology in the post internet world, some courts in modern times have at least explicitly acknowledged that the concept of artificial intelligence is used to drive or support technological innovation, *see e.g.*., Yellobrix, Inc. v. Yellobrick Solutions, Inc., 181 F. Supp. 2d 575 (E.D.N.C. 2001) (noting that artificial intelligence technology is used to tailor the tastes of customers websites). Similar cases that acknowledged the role of artificial intelligence in technology include: Go2Net, Inc. v. CI Host, Inc., 60 P.3d 1245 (Wash. Ct. App. 2003); United States v. Skys*,* 637 F.3d 146 (2d Cir. 2011); Smart Systems Innovations v. Chicago Transit Auth., 873 F.3d 1364 (Fed. Cir. 2017).

55. On this latter argument *see e.g.*, Richard Susskind, *Expert Systems in Law: A Jurisprudential Approach to Artificial Intelligence and Legal Reasoning*, 49 MOD. L. REV. 168 (1986).

56. Matthijs Maas, *International Law Does Not Compete: Artificial Intelligence and the Development, Displace or Destruction of the Global Legal Order*, 20 MELB. J. INT'L L. 29 (2019); Thomas Burri, *International Law and Artificial Intelligence*, 60 GERMAN Y.B. INT'L L. 91 (2019). For some provocative reading *see generally* Mireille Hilderbrandt, *Algorithmic Regulation and the Rule of Law*, 376 PHIL. TRANSACTIONS ROYAL SOC'Y (2018); Pamela Andanda, *Towards a Paradigm Shift in Governing Data Access and Related Intellectual Property Rights in Data and Health-Related Research*, 50 INT'L REV. INTELL. PROP. & COMPETITION L. 1052 (2019); Jeffrey Ritter & Anna Mayer, *Regulating Data as Property: A New Construct for Moving Forward*, 16 DUKE L. & TECH. REV. 220 (2017); Andrew Tutt, *An FDA for Algorithms*, 69 ADMIN. L. REV. 83 (2017); Neil Walker, *Beyond Boundary Disputes and Basic Grids: Mapping the Global Disorder of Normative Orders*, 6 INT'L J. OF CONST. L.373 (2008); John Linarelli, *Artificial General Intelligence and Contract*, 24 UNIF. L. REV. 330 (2019).

to know how they contribute to global innovation law or the specific relationship they create in international law and what factors give rise to such relationship.

A. THE HISTORICAL DIMENSION OF ARTIFICIAL INTELLIGENCE AND LEGAL REASONING

Alan Turing famously asked: "Can machines think?"[57] In the same fashion, I am interested by this question regarding the emergence of modern artificial intelligence techniques: can disruptive innovative technologies think, and if so, what are the implications for international law?[58] The answer, I suspect, lies within the early treatment of artificial intelligence and general legal reasoning in the literature.[59] Moreover, some case law can also point in the direction of artificial intelligence and its evolution as a legal concept.[60] As a point of clarification, I am not so much interested in the jurisprudential character of legal reasoning,[61] rather, I am dealing with the legal reasoning of some scholars who examined artificial intelligence mostly in American legal literature from the 1970s – in order to situate the historical dimension of artificial intelligence.[62]

There is no doubt that the evolutionary nature of technology will always pose complex problems for both the law and the interpreters of the law – courts or the community of scholarly legal experts and concepts such as artificial intelligence present challenges for legal reasoning. The early technologies of the 1950s – 1970s that brought about computing required human interventions to create artificial intelligence. Such human interventions took the form of how machines were instructed to behave (intelligently) and

57. Alan Turing, *Computing Machinery and Intelligence*, 49 MIND 433, 433 (1950); *see also* Kevin Warwick & Huma Shah, *Can Machines Think? A Report on Turning Test Experiments at the Royal Society*, 28 J. EXPERIMENTAL & THEORETICAL A.I. 989 (2015).

58. *See also* Maas, *supra* note 56.

59. Susskind, *supra* note 55; Bruce Buchanan & Thomas Headrick, *Some Speculation about Artificial Intelligence and Legal Reasoning*, 23 STAN. L. REV. 40 (1970); PAMELA GRAY, ARTIFICIAL LEGAL INTELLIGENCE (1996). For a review of Gray's book, *see* Stephen McJohn, Book Note, 12 HARV. J. L. & TECH. 241 (1998) (reviewing PAMELA GRAY, ARTIFICIAL LEGAL INTELLIGENCE) (1996).

60. The thinking is that if artificial intelligence is considered as part of the property nexus in investments then such disputes for instance would require the invocation of international legal norms and the relationship of property as investments, *but see* Bridgestone Licensing Servs., Inc. & Bridgestone Ams., Inc. v. Republic of Panama, ICSID Case No. ARB/16/34, Decision on Expedited Objection (Dec. 13, 2017). *See also* Ritter & Mayer, *supra* note 56 (discussing property and data); Paul M. Schwartz, *Property, Privacy, and Personal Data*, 117 HARV. L. REV. 2056, 2069 (discussing the commodification of data).

61. EDWARD LEVI, AN INTRODUCTION TO LEGAL REASONING (1949); NEIL MACCORMICK, LEGAL REASONING AND LEGAL THEORY (1978); PHOEBE ELLSWORTH, THE CAMBRIDGE HANDBOOK OF THINKING AND REASONING (K.J. Holyoak & R.G. Morrison eds., 2005).

62. *See also* Gray, *supra* note 59.

thereby give rise to artificial intelligence. The drawback of course when compared to humans is that machines, then and now, still require humans to feed the algorithmic instructions so that the machines can behave independent of humans. Once armed with its algorithmic instructions and data, machines are able to follow sequences of logical patterns – yet, unfortunately, are unable to *think* – or at least think like the humans that feed the algorithmic instructions in the first place. The field of law – or to solve legal problems – is about data – lots of data and this data has to be managed in technological devices and/or printed form (which can also be transposed to fit technical devices). So, the key issue now becomes – if law is about solving problems using data – and artificial intelligence is about accepting how humans instruct technical devices with algorithmic methods and data, then, can those technical devices equipped with artificial intelligence reason, and is *their* reasoning legal?[63]

When some of the early literature addressed the novel intersection of legal reasoning and artificial intelligence there was both optimism[64] and caution that technical devices would be able to "simulate legal reasoning processes."[65] There were two drawbacks I found in most of the literature. Firstly, they analyzed artificial intelligence in the context of document retrieval and assembly,[66] and, secondly, artificial intelligence would often be treated similarly to other "expert systems."[67] But regardless of these anomalies on artificial intelligence, the scholarly output had one central question – could/can machines exhibit legal reasoning? According to one author, there was the need to a draw a line between machines and humans when it came to legal reasoning: such a line was a common sense one[68] – a quality which machines do not have.

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63. McJohn, *supra* note 59, at 245. Quoted Gray's concept of legal reasoning as a process of "moving from one of legal data to the next to make a selection." *But see* Cass Sunstein, *On Artificial Intelligence and Legal Reasoning*, 8 UNIV. CHI. L. SCH. ROUNDTABLE 29, 33-34 (2001) (casting doubt on artificial intelligence and legal reasoning). *See also* E.C. Lashbrooke, *Legal Reasoning and Artificial Intelligence*, 34 LOY. L. REV. 287 (1988); John Barnden & Donald Peterson, *Artificial Intelligence, Mindreading, and Reasoning in the Law*, 22 CARDOZO L. REV. 1381 (2001); L. Thorne McCarty, *Reflections on Taxman: An Experiment in Artificial Intelligence and Legal Reasoning*, 90 HARV. L. REV. 837 (1977); Edwin Rissland, *Artificial Intelligence and Law: Stepping Stones to a Model of Legal Reasoning*, 99 YALE L. J. 1957 (1990).

64. Rissland, *supra* note 63.

65. Buchanan & Headrick, *supra* note 59, at 41.

66. Susskind, *supra* note 55, at 168. Already acknowledging in 1986 that the first twenty-five years of computer technology to law largely involved "legal information retrieval system[s]."

67. Lashbrooke, *supra* note 63, at 295. Noting the general lack of agreement regarding the concept of artificial intelligence, which he defines as: "the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit the characteristics we associate with intelligence in human behaviour."

68. *Id.* at 296. "Legal rules are often ambiguous and seemingly contradictory. The ability to relate them in another context makes sense of the law." Furthermore, he notes that computer programs "always lagged behind the law[.]" *Id.* at 304.

Perhaps, when we consider the fact that machines and humans are equated on the same level when we take into consideration the common elements of the conception of artificial intelligence such as those posited by McCarthy,[69] Turing,[70] or Lashbrooke,[71] the only difference appears to be the ability to deploy common sense in times of complexities. In other words, if a technical device is fed with algorithmic instructions to analyze the violation of a peace treaty by the Republic of X and the technical device proceeds to launch a nuclear strike, a human can intervene to manipulate the technical device's data in order to cancel or prevent such a strike. Perhaps, it was in the same vein Gardner[72] managed to situate artificial intelligence and legal reasoning in a neutral way – that is how to make artificial intelligence and legal reasoning compatible. Yet, Gardner's work is more practical – that is, it has, as its objective, "to create a model of legal reasoning process that makes sense from both jurisprudential and AI perspectives."[73] The model approach in Gardner's work therefore reinforces my own position that the early treatment of artificial intelligence in the legal literature is based on the conception of artificial intelligence as "projects" representing certain technological developments and not a one-size fits all conception of artificial intelligence. If this is true, then artificial intelligence – in a technical sense – today, exhibit patterns of its recent history and represents "projects" such as data, algorithms, platform governance, financial technology, drone technology or "computational models of legal reasoning."[74]

In considering how much artificial intelligence is linked to legal reasoning, the observable complexities of law will always separate man from machine and the ability of both to deduct and analyze whether there *ought* to be a nuclear strike or *is* a nuclear strike preventable. The fact is, while artificial intelligence may aid and abet the legal reasoning process such as reducing the amount of time a human may spend on the available data (legal facts, case studies, treaties, etc.) – algorithmic technical devices will still fall short of the human common-sense approach. Both the human and the machine have different faculty tools that shape their reasoning. For the machine – its algorithmic data – derives from the reasonable deductions that a human put into its coordination for the purposes of a technical device. But given that laws still remain a man-made process similar to how artificial intelligence is man-made, the human ability of reason and deduction are more important. What

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69. McCarthy, *supra* note 54.

70. Turing, *supra* note 57.

71. Lashbrooke, *supra* note 63.

72. ANN GARDNER, AN ARTIFICIAL INTELLIGENCE APPROACH TO LEGAL REASONING (1987).

73. *Id.* at 1.

74. On this latter subject, *see* KEVIN ASHLEY, ARTIFICIAL INTELLIGENCE AND LEGAL ANALYTICS: NEW TOOLS FOR LAW PRACTICE IN THE DIGITAL AGE (2017).

the historical narratives reveal is that artificial intelligence began as "projects" relevant to different parts of the legal process, such as aiding the analysis of a problem or supplying data within a reasonable time. Artificial intelligence, in the historical sense, was not about legal reasoning even though the literature analogously points in that direction – rather, artificial intelligence was part of the technological innovation process that conflated the idea of legal reasoning. Legal reasoning has been and remains a complex enterprise where logic, deductions,[75] and other mental elements require the faculties of a *being* as opposed to a *thing*.

B. MODERN INTERNATIONAL LEGAL VISIONS AND GOVERNANCE OF ARTIFICIAL INTELLIGENCE

If we proceed on the premise that the law is always slow to new technology – then, two key questions can be address based on this statement. The first question is *should* artificial intelligence be regulated, and, secondly, how should the state go about regulating artificial intelligence? In terms of the first part of the question on whether artificial intelligence should be regulated, it is extremely rare to find those arguing the opposite, and as such, my core concern is the *form* of the regulation. The broader related questions on international law are primarily present elsewhere in the literature.[76] For the sake of simplicity, I am using the term artificial intelligence as a one-size fits all regarding governance and regulation, even though, at times in the discussion I will point to specific laws such as on data privacy or health, autonomous machines, high frequency trading, amongst others that invariably includes "public law" as such. Moreover, it should be borne in mind, based on my earlier analysis of artificial intelligence and along with standard practice – artificial intelligence is foremost about data/algorithms and how they are fed to a technical device.

A number of countries around the globe have developed polices on artificial intelligence or have taken steps towards the regulation of artificial intelligence.[77] This has arisen partly because the source of artificial intelligence, that is, data (and associated algorithms), has grown exponentially, and

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75. Antonio Martino, *Artificial Intelligence and Law*, 2 INT'L J.L. & INFO. TECH. 154 (1994).

76. *See, e.g.*, Maas, *supra* note 56. There has been call for a model convention. Andrey Nezamov & Victor Naumov, *Model Convention on Robotics and Artificial Intelligence: Toward International Regulation*, 2 J. ROBOTICS A.I. & L. 205 (2019); John Weaver, *Abhor a Vacuum: The Status of Artificial Intelligence and AI Drones Under International Law*, 54 N.H. BAR J. 14 (2013).

77. Council Directive 2016/679, O.J. (L 119) 1.; Aviv Gaon & Ian Stedman, *A Call to Action: Moving Forward with the Governance of Artificial Intelligence in Canada*, 56 ALTA. L. REV. 1137 (2019). The US House of Representatives in February 2019 introduced Resolution 153 with the intention of developing ethical guidelines for artificial intelligence.

is being the target of collection by a number of non-state actors. At the same time, due to a number of public law concerns such as breach of privacy and constitutional limits, states and supranational entities are often being called upon to set the legal limits as to how far non-state actors can collect or use data. Moreover, the various technical devices and cloud systems that store and or use data are often operating in a number of different jurisdictions and thereby raise questions on which state has the jurisdiction over cloud systems.[78]

Some of the more critical areas that concern states and artificial intelligence that have implications domestically and beyond their territories are in the areas of autonomous weapon systems (AWS),[79] drones, and robots. The increased militaristic reliance on artificial intelligence signals that urgent standards or regulations are required in order to limit the governance or who should control and use artificial intelligence in technical devices of military standards. In recent times, the idea of "innovation-proof global governance" has been mooted as resilient or adaptive for future military purposes and artificial intelligence.[80] While this is a valid argument, and the fact that militaries the world over are source of innovation and needs to keep pace with new technologies, one possible fault line with the innovation-proof argument is that it reaches into the sovereign status of militaries. In other words, unlike nuclear arms treaties, one must consider whether the Republic of X would want to sign up to governance codes developed by the Republic of Y in order to reign in military technology. Such codes, would in my view, pose "national security threats" to states given that even at the internal level of states discussions on matters of "cybersecurity" (to include artificial intelligence) are "mostly classified".[81]

What the various approaches by states to artificial intelligence – and to a larger extent – other developments in relation to innovation and the law suggests that there is a need for regulation – and therefore the emergence of

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Similarly, the Algorithmic Accountability Act, introduced in the US Senate seeks to fix flawed algorithms that may impact personal lives. *See* H.R. Res. 153, 116th Cong. (2019); S. 1108, 116th Cong. (2019). Non-Western countries such as India and Russia have also developed national strategies on artificial intelligence and or in the process of proposing legislations to regulate artificial intelligence. *See* ARNAB KUMAR ET AL., NITI AAYOG, NATIONAL STRATEGY FOR ARTIFICIAL INTELLIGENCE (2018), https://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf.

78. P. Sean Morris, *"War Crimes" Against Privacy: The Jurisdiction of Data and International Law*, 17 SUFFOLK U. J. HIGH TECH. L. 1 (2016).

79. Alan Schuller, *At the Crossroads of Control: The Intersection of Artificial Intelligence in Autonomous Weapon Systems with International Humanitarian Law*, 8 HARV. NAT'L SECURITY J. 379 (2017).

80. Matthijs Maas, *Innovation-Proof Global Governance for Military Artificial Intelligence?*, 10 J. INT'L HUMANITARIAN LEGAL STUD. 129 (2019).

81. Dan Efrony & Yuval Shany, *A Rule Book on the Shelf? Tallinn Manual 2.0 on Cyberoperations and Subsequent State Practice*, 112 AM. J. INTL L. 583, 631 (2018).

a new area of law. The content and purpose of any regulatory approach is not the concern here – rather, the very existence of regulatory activities that gives rise to a form of law is already an indication of *innovation law*. But the regulatory argument as it applies to general innovation is a complex one. Thus, it might be the case that those who are affected by innovation (such as artificial intelligence bias systems in healthcare, cyberattacks or financial activities) may prefer regulation. The justification from a consumer perspective must be weighed against how detrimental innovation is to the welfare of society. On the other hand, the producers of innovation, for example, those who develop and deploy artificial intelligence or algorithmic commercial activities, would be quite cautious about *regulating* innovation. The idea of regulation in the technology sector, or at least in the areas where innovation thrives, always sends a chill down the spine of innovators. This is because regulation tends to diminish the capabilities of the innovation in the first place. Moreover, given the fact that innovation often emerges from a competitive free market – for the state to *impede* that free market approach with regulation can also deter the pace of innovation. Another factor is that innovation often builds through how private market actors are able to guard their intellectual property rights, whether through statutory laws such as patent laws or through trade secrecy. From this perspective, then regulation may force innovators to breach the very existence of intellectual property rules – if certain information needs to be revealed during the development of regulatory rules by the state for innovation.[82]

The justifications for regulation from the prism of international law is also nuanced. We have seen how there are ways that artificial intelligence invariably interacts with international – but the crucial question is how to situate artificial intelligence in the international legal system. Let's first take the example of a model convention on robotics and artificial intelligence. Should such a proposal become law – that is a treaty in public international law – then it would follow the natural trajectory of how the law responds to innovation and or issues that give rise to concern beyond the domestic state. We can take lessons from the infringement of intellectual property since the late nineteenth century across borders that gave rise to the Paris and Bern Conventions and their modern incarnations in the TRIPS Agreement.[83] These treaty systems are interpreted and or to be interpreted as international law and not separate systems. The same can be said of a potential treaty on artificial intelligence or a narrow convention such as the proposed robotics convention. Beyond hypothetical we could take the amended *Vienna Traffic*

82. DAVID COLLINGRIDGE, THE SOCIAL CONTROL OF TECHNOLOGY (1980) (developing in general a thesis on the dilemmas of regulating technology); Gary Merchant & Wendell Wallach, *Coordinating Technology Governance*, 31 ISSUES SCI. & TECH. 430 (2015) (discussing the need for a Government Coordinating Committee).

83. *See generally* P. Sean Morris, *Private Intellectual Property Regulation in Public International Law*, 26 U.C. DAVIS J. INT'L L. & POL'Y 147 (2020).

Convention[84], for example, that responded to the needs of artificial intelligence in the self-driving car industry as how international legal instruments are in the modern times keeping up to innovations and developments that have international legal implications. Technological developments have always led to new rules or "methods of creating new rules"[85] in the international legal system and nowadays the same is true for artificial intelligence.

Yet, other challenges for artificial intelligence and international law are more complex. Let us return to the hypothetical nuclear strike mentioned earlier. What if such a strike was actually launched either by a human operating a technical device from a remote location, or, the technical device, acting on its own *intelligent* instructions? The key questions therefore become did the operation violate international law (the sovereignty of nations) if the technical device carrying the nuclear warhead has to travel over the airspace of several states? Another question is, could an international treaty such as the proposed robotics convention or nuclear arms control treaty prevent the nuclear strike? The likely answer in both scenarios is "no" given that (a) artificial intelligence has not yet shown that it can prevent conflicts and (b) the existence of international treaties to prevent conflicts (or arms control) are deficient when it comes to innovation as they are mostly from a *pre-artificial intelligence* era. In other words, if non-proliferation treaties have not or failed to control the spread of nuclear technology or how such technology can be deployed – then artificial intelligence – may also have difficulties doing the same. In fact, artificial intelligence, it appears, seems to aid and abet military applications that may include nuclear technology[86] that can give rise to state aggression.[87]

Naturally, there is no one way of enumerating the potential benefits or challenges of artificial intelligence in international law. And, this is despite whether such artificial intelligence is being used for military purposes or for economic benefits by technology companies. Thus, for both purposes, that is military use of artificial intelligence in the present, or for economic benefits of artificial intelligence through technological disruptions, then artificial intelligence has to be embraced in terms of how it interacts with the rule system of international law. This is what Lord Bingham would refer to as "the rule of law."[88] For Bingham, the rule of law is applicable to both public and pri-

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84. *Convention on Road Traffic*, *supra* note 19.

85. Louis Sohn, *The Impact of Technological Changes on International Law*, 30 WASH. & LEE L. REV. 1, 10 (1973).

86. *See, e.g.*, Matthijs Maas, *How Viable is International Arms Control for Military Artificial Intelligence? Three Lessons from Nuclear Weapons*, 30 CONTEMP. SECURITY POL'Y 285 (2019).

87. *See* Sean Kanuk, *Sovereign Discourse on Cyber Conflict Under International Law*, 88 TEX. L. REV. 1571 (2010) (for a similar take using cyber conflicts).

88. TOM BINGHAM, THE RULE OF LAW (2010).

vate legal relations. And, applying this same argument to artificial intelligence in the context of how artificial intelligence *exists* in international law – whether for military purposes or economic purposes – then artificial intelligence in these circumstances becomes a rule of law issue or, as I imagined it, public law and private law matters in artificial intelligence. The relevance of tying this argument of artificial intelligence to the rule of law in the international legal system is that it does not matter how artificial intelligence actually evolves given that the same basic legal questions are always asked in relation to the different evolutions of artificial intelligence – *is it legal*?

So, as my earlier discussion demonstrates that there were early legal commentaries on artificial intelligence in the 1970s – 1980s that focused on robotics and legal reasoning as "projects", and, for present purposes, it is the *same* discussion that is taking place in relation to artificial intelligence and disruptive technologies – is it legal? Thus, if the discussion on artificial intelligence is repetitive or follows a pattern depending on the evolution of artificial intelligence, such as digitization, platform governance and fintech as "projects" for the purposes of the present time as opposed to robotics and legal reasoning a few decades earlier – in the international legal context there is no change to the rule of law in the international legal system per se. The most notable change, however, relates to the international intellectual property system in relation to the protection of *private* property rights through the TRIPS Agreement, since it was not in existence in the period that focused on robotics.[89] Thus, the rule of law as a *system* or *norm* in the international legal context rests on the foundation that there is a safety valve that guarantees the protection of sovereign and private property rights in any civilized society.

Furthermore, international tribunals such as the Permanent Court of International Justice (PCIJ) have confirmed that the rule of law is a cornerstone tenet of the international legal system. In *Free City of Danzig*[90] the PCIJ noted that states are "governed by the rule of law"[91] and, certainly, there is a modern need for the same logic in relation to artificial intelligence. Therefore, the rule of law for both international law and artificial intelligence requires both the private and public legal system of states and how those states interact with other states (and individuals[92]) in international legal relations.

But as international law builds upon the rule of law as a system to embrace artificial intelligence for military planners and states' inter-military activities, the rule of law questions become opaque. In other words, *is it legal* for states to use artificial intelligence to improve military capabilities, espe-

89. *But see* Morton Goldberg & David Carson, *Copyright Protection for Artificial Intelligence Systems*, 39 J. COPYRIGHT SOC'Y U.S. 57 (1991).

90. Consistency of Certain Danzig Legislative Decrees with the Constitution of the Free City, Advisory Opinion, 1935 P.C.I.J. (ser. A/B) No. 65 (Dec. 4).

91. *Id.* ¶ 54.

92. Corporations or private technology companies that deploy AI – are individuals.

cially if such capabilities violate international treaties? Could artificial intelligence biohack national laboratories and release infectious diseases and thereby breach international treaties such as the Chemical Weapons Convention.[93] Can artificial intelligence create or cause armed conflicts? And, more importantly, although raised in other fora, "how can international law regulate autonomous weapons" that uses artificial intelligence?[94] How should international law respond under those circumstances?

My purpose is not to provide answers to these challenging questions for the purposes of this article, rather I wanted to highlight them to show how artificial intelligence as emerging technology fits into the broader dialogue of global innovation law that this article develops. Hence, artificial intelligence should be seen as part of a technological revolution that constantly changes the requirements for adhering to new developments for the application of international law. If those new developments involve managing autonomous weapon systems or improving the strike capabilities of nuclear weapons, then in this perspective they relate to innovation in the global legal system. It is this innovation that comports with my conception of global innovation law. Necessary precautions would be useful so that artificial intelligence, broadly construed, and or artificial intelligence systems do not breach international legal obligations, but those precautions can be managed within how the innovation evolves pertaining to, for example, a weapon systems or how artificial intelligence control biological laboratories under the defence departments or private firms apparatus of states.

Bringing insights from "international law" on artificial intelligence to shape the new system of global innovation law at least presents an opportunity to shape global innovation law in a way to respond to some of the challenges that artificial intelligence presents for international law in general and would under some circumstance be unable to respond. Global innovation law should be able to respond to artificial intelligence and its challenges so that any gap within the rule of law system can be addressed. This depiction will help to strengthen the existing system of international law and global innovation law would then be a system that represents the legal relationship of disruptive technologies at the international level and also act as a homogeneous legal system in international law the same way WTO law forms part of international law.

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93. Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Jan. 13, 1993, 32 I.L.M. 800 (1993).

94. On this latter question *see, e.g.*, Ted Piccone, *How Can International Law Regulation Autonomous Weapons*, BROOKINGS: BLOG (Apr. 10, 2018), https://www.brookings.edu/blog/order-from-chaos/2018/04/10/how-can-international-law-regulate-autonomous-weapons/ [https://perma.cc/PWJ3-JLQB]; Helin Laufer, *War, Weapons and Watchdogs: An Assessment of the Legality of New Weapons Under International Human Rights Law*, 6 CAMBRIDGE J. INT'L & COMP. L. 62 (2017).

C. THE GLOBAL FINANCIAL TECHNOLOGY SECTOR, DATA AND ALGORITHMIC GOVERNANCE

In this section of the article, I turn to one area that has presented some interesting legal questions pertaining to its rapid rise in the global economic system – the financial technology industry (Fintech).[95] Specifically, I want to address two areas in Fintech – that also have implications beyond financial services – regulating and governing data and its algorithmic operations.[96] It should be pointed out that the regulation and governance of data in the Fintech sector along with its algorithmic operations relates to many fields of law including financial law, intellectual property law, and of course jurisdictional questions in international law. However, I want to keep the narrative in the context of this article as global innovation law and therefore focus only on the regulatory and governance challenges that data and algorithmic operations in the fintech industry presents and how it actually fits into global innovation law. This limitation allows me to present a concrete core of global innovation law in more detail, and, it also contributes to perhaps what is a burgeoning field – *regtech legal scholarship*.[97] There are two issues in particular that I want to address – (a) data as a product in the financial sector and (b) the underlying algorithmic operations of governance in global finance.[98] There is no doubt the operations and nature of global financial governance, banking, and capital has changed, and a big role in that change has to do with

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95. Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trilemma*, 107 GEO. L. J. 235 (2019).

96. *See generally* Barbara Cohn, *Data Governance: A Quality Imperative in the Era of Big Data, Open Data and Beyond*, 10 I/S: A J. L. & POL'Y FOR INFO. SOC'Y 811 (2015); Tom Lin, *Compliance, Technology, and Modern Finance*, 11 BROOK. J. CORP., FIN. & COM. L. 159 (2016); Bart Sloot & Sascha Schendel, *Ten Questions for Future Regulation of Big Data: A Comparative and Empirical Legal Study*, 7 J. INTELL. PROPERTY INFO. TECH. & ELECTRONIC COM. L. 110 (2016); Kristin Johnson, *Regulating Innovation: High Frequency Trading in Dark Pools*, 42 J. CORP. L. 833 (2017); Timothy Robinson, *A Normative Evaluation of Algorithmic Law*, 23 AUCKLAND U. L. REV. 293 (2017); Yesha Yadav, *How Algorithmic Trading Undermines Efficiency in Capital Markets*, 68 VAND. L. REV. 1607 (2015); Dany Busch, *MiFID II: Regulating High Frequency Trading, Other Forms of Algorithmic Trade and Direct Electronic Market Access*, 10 L. & FIN. MKTS. REV. 72 (2016); Lynn LoPucki, *Algorithmic Entities*, 95 WASH. U. L. REV. 887 (2018); Philip Paech, *The Governance of Blockchain Financial Networks*, 80 MOD. L. REV. 1073 (2017); Eyal Benvenisti, *Upholding Democracy Amid the Challenges of New Technology: What Role for the Law of Global Governance*, 29 EUR. J. INT'L L. 9 (2018).

97. Vicki Waye, *Regtech: A New Frontier in Legal Scholarship*, 40 ADELAIDE L. REV. 363 (2019). In perhaps, what is closer to my notion of global innovation law and the "regtech" sector, *see* Benedict Kingsbury, *Infrastructure and InfraReg: On Rousing the International Law "Wizard of Is*", 8 CAMBRIDGE INT'L L.J. 171 (2019).

98. For some of the nomenclatures associated with Fintech, data and algorithms *see*, Danny Busch, *MIFID II: Regulating High Frequency Trading, Other Forms of Algorithmic Trading and Direct Electronic Market Access*, 10 L. & FIN. MKTS REV. 72, 74–75 (2016). For instance, defining algorithmic trading as "trading in financial instruments where a computer algorithm automatically determines individual parameters of orders . . ." *Id.*

data. Furthermore, algorithmic methods in financial trading have shifted the art of financial trading from man to machines in order to increase "informational efficiency."[99] Even if the human factor has been removed, albeit allegedly, from machine trading of financial products, this does not mean that the role of humans is entirely redundant. On the contrary, at least from my perspective and the application of the law and other regulatory tools – the actual intervention of humans in the governance and regulatory system can help to diffuse the necessity and interpretation of law.

In his instructive article, Paech[100] observes that "the lion's share of the services provided by the financial service industry relates to data storage and data processing."[101] This is perhaps an understatement, but it captures the essence of data in the global financial sector.[102] The natural question now becomes how to regulate that data and what are the governance mechanisms to address such data? In recent years, there have been a number of academic pages devoted to data governance in the financial sector, not only from a legal point of view, but questions have been raised from a variety of disciplines.[103] What seems to connect most of this scholarship relates to the actual governance of the data that are amassed in the financial sector.[104] The same question also arises in the legal literature and therefore suggests how important questions relating to data and its regulation and governance has become.[105]

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99. Ross Buckley, *Reconceptualizing the Regulation of Global Finance*, 36 OXFORD J. LEGAL STUD. 242, 248 (2016). *See also* Dirk Zetsche et al., *From Fintech to Techfin: The Regulatory Challenges of Data-Driven Finance*, 14 N.Y.U. J. L. & BUS. 393 (2018).

100. Paech, *supra* note 96.

101. Paech, *supra* note 96, at 1079.

102. FRANK PASQUALE, THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT THAT CONTROL MONEY AND INFORMATION (2015).

103. *E.g.*, Malcolm Campbell-Verduyn, Marcel Goguen & Tony Porter, *Big Data and Algorithmic Governance: The Case of Financial Practices*, 22 NEW POL. ECON. 219 (2017); FRANCESCO RAMELLA, SOCIOLOGY OF ECONOMIC INNOVATION (2016); Yan Carriere-Swallow & Vikram Haksar, *The Economics and Implications of Data: An Integrated Perspective*, IMF Departmental Paper No. 19/16 (2019). Some of the legal discussions include: Solon Barocas & Andrew Selbst, *Big Data's Disparate Impact*, 104 CAL. L. REV. 671 (2016); Karni Chagal-Feferkorn, *The Reasonable Algorithm*, 1 U. ILL. J.L., TECH. & POL'Y 111 (2018).

104. WALTER MATTLI, GLOBAL ALGORITHMIC CAPITAL MARKETS: HIGH FREQUENCY TRADING, DARK POOLS, AND REGULATORY CHALLENGES (2019).

105. Ugo Pagallo, Pompeu Casanovas & Robert Madelin, *The Middle-Out Approach: Assessing Models of Legal Governance in Data Protection, Artificial Intelligence, and the Web of Data*, 7 THEORY & PRAC. LEGIS. 1 (2019); Federico Ferretti, *Not-So-Big- and Big Credit Data Between Traditional Consumer Finance, FinTechs, and the Banking Union: Old and New Challenges in an Enduring EU Policy and Legal Conundrum*, 18 GLOB. JURIST 1 (2018).

When Facebook proposed its own currency,[106] (and now in hiatus) the regulators were wary of such virtual currency[107] given the amount of data Facebook already controls via its online platforms.[108] If, in a hypothetical sense, Amazon.com were to launch its own virtual currency then, one would reasonably assume that Amazon's control of the internet[109] would put it in an advantageous position. But there is evidence that Chinese operators such as Alibaba, Tencent, and Baidu have a systematic control of data and virtual currency and other financial services information.[110] These evolutions of financial services and virtual currencies suggest that from a regulatory standpoint, there is room for the traditional issuer of currencies – central banks – to play a more prominent role. Such a role could take the form of (a) participant, where central banks also issue their own virtual currencies, and (b) develop and implement the regulatory infrastructure for virtual currency similar to that of traditional currencies.

The formalization, management, and deployment of data by using various computational devices or the creation of an *algo-language* for such data through technical capabilities and coding to execute certain processes or instructions already raise the question of who should regulate or should this entire algorithmic development be regulated.[111] For the most part the very development and evolution of an algorithmic system is a product of private enterprises whether initiated and encouraged by data collecting systems such as Google, Facebook, the Swap Data Repositories (SDRs), or the SWIFT – the latter representing data in global financial transactions. Another question that is often invoked is the level of transparency needed once regulation comes into play (or even prior), however, the transparency narrative is not

106. *See, e.g.*, Sam Gibb, *Is Facebook's Libra a Positive Development for Cryptocurrencies in General*, 2019 INT'L FIN. L. REV. 20; Michelle Neitz, *The Influencers: Facebook's Libra, Public Blockchains, and the Ethical Considerations of Centralization*, 21 N.C.J. L. & TECH. 41 (2019).

107. The European Parliament, for example, provided some response to regulatory questions. *Parliamentary Questions*, EUROPEAN PARLIAMENT (Aug. 28, 2019), https://www.europarl.europa.eu/doceo/document/E-9-2019-002268-ASW_EN.html [https://perma.cc/K6AP-QWHD].

108. Facebook Inc., controls the Facebook platform, along with Instagram, WhatsApp, Oculus VR, CrodTrainagle, and others. *The Facebook Companies*, FACEBOOK (2021), https://www.facebook.com/help/111814505650678 [https://perma.cc/YX7K-YPSY]; *see also* Matt Sneed, *The Key to Regulating Facebook and Data Collection Companies is Transparency*, 30 ALB. L.J. SCI. & TECH. 109 (2020).

109. *But see* Miranda Mowbray, *The Fog over the Grimpen Mire: Cloud Computing and the Law*, 6 SCRIPTED 132 (2009) (discussing some of the early aspects of Amazon Web Services).

110. *See, e.g.*, Julian Gruin, *Financializing Authoritarian Capitalism: Chinese Fintech and the Institutional Foundations of Algorithmic Governance*, 5 FIN. & SOC'Y 1 (2019) (offering a critique of the role of Fintech firms in China).

111. BANK OF ENGLAND, MACHINE LEARNING IN UK FINANCIAL SERVICES (2019), https://www.bankofengland.co.uk/-/media/boe/files/report/2019/machine-learning-in-uk-financial-services.pdf [https://perma.cc/NAV3-VUR3].

the concern of this Article.[112] The focus, however, is on the notion of "algorithmic governance" given that in my view an algorithmic process is part of the natural evolution of the generation and computational process of data. Hence, the concept of algorithmic governance in this Article is a designation to demonstrate integration of data in the financial technology sphere as part of a phenomenon that deals with regulation and governance. Thus, if data generated in high frequency trading (HFT)[113] relies only on the internal codes and procedures of the firms that engage in this form of daily financial trading, then such internal codes and procedures are arguably regulation per se under the umbrella of non-state actors. However, if states through their financial supervisory bodies generate certain best practices and rules for how HFT should be conducted then states become part of the system that governs algorithmic transactions. In this scenario, the governance of HFT through non-state actors will also enable state actors to become actively engaged in algorithmic governance since both state and non-state actors have interests in how algorithmic transactions are conducted. The relevance of this example is that it shows that algorithmic governance relates to how complex data transactions are first, a matter to internal regulation so that its complexities can be understood for a wider non-specialist audience and second, the state as regulator can build upon the internal regulation of complex data transactions and therefore adopt rules that do not eviscerate the economic potentials of complex data transactions such as HFT.

Naturally, in this example of HFT – very specialized technical devices are responsible for executing the trades and in that regard such devices operate in theory based on how specialized instructions are given to them via algorithmic software (artificial intelligence). It is the actual existence of artificial intelligence in algorithmic governance that gives rise to some of the more complex legal questions that often touch upon rights,[114] social and race structures, privacy (personal data),[115] or for the purposes of this discussion – who, in terms of individuals, gets a loan/credit card or how firms execute HFT. In a recent paper where the authors looked at HFT as an example of data governance in the financial sector, they argued that there is a high risk of human intervention into HFT in order to "manipulate HFT algorithms"[116] and as such paves the way for "social location"[117] in search of profits. In some

112. EUROPEAN PARLIAMENT, A GOVERNANCE FRAMEWORK FOR ALGORITHMIC ACCOUNTABILITY AND TRANSPARENCY (2019).

113. *See, e.g.*, Nathan D. Brown, *The Rise of High Frequency Trading: The Role Algorithms, and the Lack of Regulations, Play in Today's Stock Market*, 11 APPALACHIAN J.L. 209 (2012).

114. Karen Yeung, *Algorithmic Regulation: A Critical Interrogation*, 12 REG. & GOVERNANCE 505, 515 (2018) (discussing "social ordering").

115. Lisa M. Austin, *Towards a Public Law of Privacy: Meeting the Big Data Challenge*, 71 SUP. CT. L. REV. 527 (2015).

116. Campbell-Verduyn et al., *supra* note 103, at 228.

117. *Id.* at 229.

ways, such an observation on social location is not entirely new (when one analogously looks at forum shopping), whether it applies to financial data or elsewhere in the data ecosystem. What is however troubling is that the actual financial markets and their "efficiencies"[118] are undermined and in that way require regulatory input from state regulators.

Part of the contribution of innovation in the financial system is that it contributes to the emergence of global norms that can shape how law is formed at the international level. This is despite the fact that there is no legislator in the international legal system. Hence, the emergence of global innovation law will be a joint effort that takes into account all the major actors: the fintech innovators, platform governance operators, international institutions, and states. The normative structure that continues to shape the evolving nature of global innovation law lies in the practice and theory of governance – and for the purposes here – as it relates to global financial transactions and innovation. The practice and theory of governance supports global innovation law especially for financial transactions and innovation given governance theory and practice is part of a broader system of the new *global law*. The new global law is a phenomenon that embraces new and dynamic approaches to law, regulation, governance, and adjudication in the international system. The new global law is both risk-taking and innovative. Hence, global innovation law boldly embraces the disruptive nature of fintech, platform goverance and other technological innovations that challenge law and technology in and beyond the nation state. Thus, the same way that a disruptive innovator strives to serve a new market or extend the services in a current market – the same way global innovation law responds to the extension or strive to serve the new legal challenges that disruptive innovation brings about. But because disruptive innovation is also linked to the governance argument, thereby involving the state, international actors, and the private innovators, there is always the need to ground how disruptive innovations, especially those concerning financial transactions, are seen as part of the global governance system.

As pointed out elsewhere in this Article and also what has long been a *project* of the international legal community, global governance exuberates some form of *public authority*[119] and therefore it is with the same authoritative force that attracts global innovation law. And, although different variables in the global governance context such as the interaction of public and private actors drives the governance questions, the norms that give rise to global innovation law are rather robust and deal with the practicality of legal questions in defined areas (fintech, artificial intelligence, platform govern-

118. *See* Yadav, *supra* note 39.

119. Nico Krisch, *Global Governance as Public Authority: An Introduction*, 4 INT'L J. CONST. L. 976 (2012).

ance, and other innovations). Hence, how the *law* can deal with these practical problems certainly lends credence to the argument that global law (or even international law) has always been at the forefront of the public/private divide, and as such, enables the norms of global governance to insert themselves into legal questions. The benefit of this is that global governance norms may contribute further to how the norms of global law are coordinated and settle the battle lines between competing legal systems, such as private law norms or public law norms, in relation to global innovation law.

IV. CONCLUSION

The examples of global innovation law that are proposed in this Article are instructive in that they focus on some of the technological and legal challenges that permeate the global operations of contemporary law. Naturally, the sample proposals of global innovation law can only benefit certain modes and norms as it can be argued that different modes of law and technology can also fit into the regime of global innovation law. It is also perfectly legitimate for a counter argument to dismiss the idea of global innovation law, but any such dismissal would need to give a thorough account of the process and emergence of law, technology, and their interactions at the international level that involve states, platform governance, private actors, courts, and international tribunals. The most useful way, however, of viewing and conceptualizing global innovation law is to view it as a system or technique in the international legal system.[120] Such a system or technique can also be compared to the "innovation," "automation," and existence of the tools that drive law and technology across borders – artificial intelligence. The fact that these techniques at the level of interaction of law and technology preoccupy the scholarly community suggests that there are challenges and or some legal nuances to be addressed,[121] specifically, if such challenges concern the framework of law at the global level.

Is there a prognosis for global innovation law? Not exactly, given that there are still a number of unanswered questions, and key among them, is whether global innovation law should be seen as a global regime or is it more suited for a hybrid structure that is "trans-global"? This major question af-

120. Susskind, *supra* note 55 (discussing the concept of expert systems); Philip A. Schrodt, *Artificial Intelligence and Formal Models of International Behavior*, 19 AM. SOCIOLOGIST 71 (1988); Schuller, *supra* note 79.

121. One area that some of these challenges occurs in relation to present rules on the intellectual property system concerns patents, *see generally* Mizuki Hashiguchi, *The Global Artificial Intelligence Revolution Challenges Patent Eligibility Laws*, 13 J. BUS. & TECH. L. 1 (2017); *see also* Nachshon Sean Goltz, Addison Cameron-Huff & Giulia Dondoli, *Rethinking Global-Regulation: World's Law Meets Artificial Intelligence*, 28 INFO. & COMMC'N TECH. L. 36 (2019).

fects how other questions can be addressed, such as the future of global innovation law, or whether it is private or public law regime. Let me first address the terminological nomenclature. Although I imagined the concept of trans-global in this Article as a cross between transnational law and global law, to develop and defend that concept would perhaps be suicidal given that global innovation law as a concept in itself is still untested and underdeveloped. Hence, in order to avoid inconsistences, trans-global has been invoked merely as a narrative tool for the purposes of this Article. Despite this, the notion of trans-global also invokes the normative divide between public and private law, and as such, it is this example that will also require further elaboration.

In summary, this Article introduced and examined the system of global innovation law as a phenomenon that rose from the regulatory challenges and interface technological disruptions present to the law in a global setting. In the Article, I argued that global innovation law is a system that relies on the continuity of international law in the traditional sense but takes into account the specificities of innovations and the law. Specific reference is made to the fintech sector, artificial intelligence, platform governance, data governance, and other areas to demonstrate how global innovation law emerges. The arguments in the Article are only a view through the window of how and or what global innovation is and how it fits contemporary narratives on different systems of trans-global law. Thus, further research is required to develop the notion of global innovation law, its wider relationship with international law, the role of private epistemic communities in the formation of global innovation law, and naturally, what are some of the dynamics of global innovation law that separate it from other forms of trans-global law such as global administrative law or transnational law. But as the legal scholarship expands, it is hoped that global innovation law is more than a catchphrase or technological development relating to the formation or evolution of disruptions in the global economic system. Rather, global innovation law should be seen in terms of the challenges posed to the law by the requirements of modern commerce and technological evolutions in the global economic environment.