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CAN THE LIBERAL ORDER BE SUSTAINED? NATIONS, NETWORK EFFECTS, AND THE EROSION OF GLOBAL INSTITUTIONS

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I. INTRODUCTION

Economists recognize two kinds of value: value derived directly from a product (e.g., the value of a hammer or a pencil) and network value, value that flows from other people's use of that thing (e.g., a language or money). A hammer has value regardless of how many other people use hammers. Languages, currencies, times zones, and the Internet, on the other hand, possess network value. Their value flows from the fact that they are networks. Consider for a moment the value of a language that only one person speaks, or a currency that only one person uses, or a private social media platform, a private time zone, or a one-person Internet. While a currency that only one person uses or a language that only one person speaks is useless, the inverse is also true: As more people employ a currency or speak a language, the more useful the currency or language become. Because of this, networks have a way of trapping in their users. Unlike a pencil or hammer, which you can just throw away for another, there is a silent pressure that prevents users from easily leaving networks because they will lose access to the network. For example, users of Facebook or the English language are effectively locked into these networks. In the case of Facebook, users would lose access to an online network of other Facebook users. In the case of English, speakers would lose the ability to communicate with a vast network of other English speakers and operate in the English-speaking world. In both examples, the prospect of losing access to the network locks each of its users into the network and helps keep them there. Although they are technically free to leave, network effect pressure prevents them from doing so. Whether we realize it or not, we are in fact imprisoned within networks of time, words, social media, and currencies. While we may scarcely notice their force operating upon us, a pressure is locking us into these constructs. It is only when we try to leave a network—say speak a language where it is not spoken or use a foreign currency where it is not accepted—that this power suddenly reveals itself.

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While it may not be immediately obvious, the ability of networks to lock in their users directly relates to the question this article seeks to answer. The question is this: Given the growing disruption to the international system, how can we strengthen the institutions that sustain international order? How we answer this question is of cardinal importance. The liberal international order forged by the United States in the aftermath of World War II is now under its deepest and most sustained pressure since its inception. A global rise in populism and hyper-nationalism is triggering a retreat from multilateralism that is destabilizing this governance structure.[1] We are facing a breakdown, perhaps even a potential collapse, in global governance. While imperfect, this patchwork of institutions, international organizations, and the multilateral treaties that establish them has promoted global cooperation and spearheaded the advance of international law for the past seventy years.[2] Yet, the constancy of this order can no longer be taken for granted.[3] From climate change, to international security, technological disruption, and global pandemics, we face challenges that can only be solved through inter-

1. The relation between populism and the crisis of multilateralism (mostly reflected in several recent withdrawals from multilateral treaties) has been and continues to be widely discussed. To cite just one recent compelling article on the subject, see John Ikenberry, *The End of the Liberal International Order?*, 94 INT'L AFFS. 7, 16 (2018) (discussing the extent to which the liberal international order is being undermined by far right populism and extreme nationalism, and the resilience of liberal internationalism in the face of these challenges).

2. A brief note on the article's terminology: I use the terms 'international organization' and 'international institution' (or simply organization or institution) interchangeably to refer to any *organizational arrangement that involves three or more states*. What is primarily meant here is intergovernmental organizations ("IGOs") such as the United Nations and its agencies. However, the term is also employed more broadly to include multilateral treaties not traditionally seen as international organizations, such as basic trade agreements (e.g., "NAFTA"), security agreements, as well as any kind of international treaty-based regime involving three or more states that produces an organizational structure. The reader should note that this is a departure from how many contemporary theorists now use these terms. International organizations are commonly understood as entities, and international institutions are understood as norms or rules. Employing the terms interchangeably is a somewhat older usage, but I do so because the term international organization alone does not entirely capture what I am expressing. The line between institution and organization is not as clear as some theorists contend—many agreements have organizational structures that, while not technically international organizations, capture many of the aspects of formally recognized international organizations. *See*, *e.g.*, Beth Simmons & Lisa Martin, *International Organizations and Institutions, in* THE HANDBOOK OF INTERNATIONAL RELATIONS 326, 326 (Walter Carlsnaes, Thomas Risse, & Beth A Simmons, eds., 2013) (differentiating between the terms 'international organizations' and 'institutions').

3. In the first two decades of this century, the number of new multilateral organizations has declined dramatically. The postwar period, which saw the creation of the United Nations ("UN") system and its specialized agencies and programs, a proliferation of IGOs, massive expansion of European institutions, and a surge in the number of multilateral treaties, is losing momentum. The growth in "the number of IGOs has . . . decreased by about 20 percent. Adoption of new environmental treaties has slowed even more sharply." Kenneth W. Abbott, Jessica F. Green & Robert O. Keohane, *Organizational Ecology and Institutional Change in Global Governance*, 70 INT. ORG. 247, 247 (2016).

national coordination, yet multilateralism is faltering precisely when we need it most. If we assume the rules-based international order is worth saving (which this article does),[4] the question is: How? Applying network theory to this crisis in governance, this article argues that policymakers can strengthen multilateral institutions by leveraging the *network effect* pressures they naturally generate to lock states more firmly into international organizations central to the liberal order, such as the United Nations ("UN"), the World Trade Organization ("WTO"), the International Monetary Fund ("IMF"), and so on. The basic idea is to exploit the latent structural power of network effect pressures to shore up these institutions so that they can weather this period of global instability until the international system rebalances itself and settles once again into a new but stable equilibrium.

Network effect pressure is the structural force I was describing in the first paragraph. It is present whenever the value that one user derives from a given network is tied to how many other users also use the network.[5] For our purposes, the key dynamic produced by network effect pressure is its *lock-in* effect. As I described, lock-in occurs when users become unable to unplug from a network without incurring a loss and so become 'locked' into the network. Just like Facebook or the English language, international organizations are networks of actors that generate network effects like lock-in. While states participate in institutions for a variety of reasons, network effect pressures are always present, gently influencing their choices and decisions. States can become locked into organizations when the cost of nonparticipation (in terms of loss of benefit and cost of switching) grows too

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4. Some readers may disagree for a variety of reasons. I take up this issue in the article's conclusion, offering a brief discussion of the disadvantages to maintaining the current system. This article, however, is predicated on the notion that the Western liberal order is indeed worth saving, and that more benefit may be gleaned from preserving it than by allowing it to unravel.

5. For the foundational literature on network effects and the related concept of path dependence, see P. A. David, *Clio and the Economics of QWERTY*, 75 AM. ECON. REV. 332, 335 (1985) (defining path dependence as a process that is influenced by temporally remote events, which may include mere random events); M. L. Katz & C. Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424, 424 (1985) (providing a static model of markets in which consumption externalities dominate); W. Brian Arthur, *Competing Technologies, Increasing Returns, and Lock-in by Historical Events,* 99 ECON. J. 116, 116 (1989) (an early study of the dynamics of allocation in situation of increasing returns in which agents choose between technologies competing for adoption); W. Brian Arthur, *Positive Feedbacks in the Economy*, 262 SCI. AM. 92, 92 (1990) [hereinafter *Positive Feedbacks*] (discussing the theory of positive feedback); W. BRIAN ARTHUR, INCREASING RETURNS AND PATH DEPENDENCE IN THE ECONOMY 13 (1994) [hereinafter PATH DEPENDENCE IN THE ECONOMY] (providing a view of economics that incorporates path dependence and increasing returns); *see also* Paul A. David, *Why Are Institutions the 'Carriers of History'?: Path Dependence and the Evolution of Conventions, Organizations and Institutions*, 5 STRUCTURAL CHANGE AND ECON. DYNAMICS 205, 205 (1994) (applying the concept of path dependence to the evolution of human organizations and institutions, drawing an analogy between technological systems and human organizations).

high, the organization is simply the only viable game in town, or both. Just as Facebook is a network for social media users and English is a network for people wishing to communicate, a multilateral institution is a network that enables coordination between states to achieve some benefit.[6] The ultimate value of multilateral treaties and the international organizations they establish is not value derived directly from a product—it is network value. A treaty to which only one state is a signatory has as much value as a language that only one person speaks. And so, just like for Facebook and English, network effect pressure can be quite powerful in the case of multilateral institutions.[7] Yet for those unfamiliar with the literature on network effects, it may be difficult to really appreciate their force.

Consider the UN. The UN system is riddled with shortcomings, yet it has held up remarkably well.[8] A key explanation for its staying power, I submit, is the network effect pressure the UN system is generating in terms of both size and scope, together with the fact that it is really the only game in town. This makes it challenging for even the most disaffected state to unplug from it, something no nation has ever done in the UN's seventy-five-year history. Likewise, the WTO generates massive network effect pressure that make it functionally impossible for any advanced economy to withdraw from it at this point. Despite growing worries about trade liberalization, every major economy now conducts their commercial intercourse according to the WTO's conventions.[9] The network effect pressure and lock-in effect of the European Union ("EU") is so powerful that it required a four-year her-

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6. The word 'benefit' is used throughout the discussion as an umbrella term that means any form of benefit member states derive from an international organization.

7. Indeed, the lock-in effect generated by network effect pressures is often so strong that the majority of international organizations do not dissolve even after they stop serving much functional purpose. Rather, they simply lapse into inactivity while their institutional husk lingers on (with their membership largely intact). On the idea that international organizations tend to organizationally persist, see S. Strange, *Why Do International Organizations Never Die?, in* AUTONOMOUS POLICY MAKING BY INTERNATIONAL ORGANIZATIONS 216, 217 (B. Reinalda et al. eds., 2018); *see also* R. O. KEOHANE, AFTER HEGEMONY: COOPERATION AND DISCORD IN THE WORLD POLITICAL ECONOMY 101–07 (1984); Cheryl Shanks, Harold K. Jacobson & Jeffrey H. Kaplan, *Inertia and Change in the Constellation of IGOs, 1981-1992*, 50 INT. ORG. 593, 593–627 (1996); ARTHUR A. STEIN, WHY NATIONS COOPERATE: CIRCUMSTANCE AND CHOICE IN INTERNATIONAL RELATIONS 51 (1990); M. N. Barnett & M. Finnemore, *The Politics, Power, and Pathologies of International Organizations*, 53 INT. ORG. 699, 699 (1999); P. Bernholz, *Are International Organizations Like the Bank for International Settlements Unable to Die?* 4 REV. INT. ORG. 361, 362–64 (2009).

8. Perceived shortcomings of the UN range from the organization's inequality of representation, an inability to enforce its rulings, bureaucratic bloat, the inability to prevent armed conflict (as outlined in Article 1 of the UN Charter), to charges of corruption, moral relativism, and anti-Semitism. For a good discussion of the main criticisms of the UN, see JOHN E. TRENT, MODERNIZING THE UNITED NATIONS SYSTEM: CIVIL SOCIETY'S ROLE IN MOVING FROM INTERNATIONAL RELATIONS TO GLOBAL GOVERNANCE 109–157 (2007).

9. DAVID GREWAL, NETWORK POWER: THE SOCIAL DYNAMICS OF GLOBALIZATION 234 (2008).

culean effort for the UK to wrench itself from the union, the implications of which are still unclear. These are just a few high-profile examples.

While it varies in intensity, all international organizations generate network lock-in to some degree. The more intense the network effect pressure, the greater its lock-in effect. In some cases, this may be weak. In others, this may be strong. But in all cases, the effect is open to strategic manipulation. To that end, this article offers a suite of strategies policymakers can use to exploit this untapped repository of power and boost an organization's lock-in effect—an approach I call *treaty hacking*. Treaty hacking offers a toolkit from which policymakers can draw to help sustain multilateral governance through this period of global instability. The article's contribution to the literature lies here. While lock-in has been explored in the economics and political science literature in relation to path dependence,[10] to my knowledge, no one has outlined specific strategies to strengthen the cohesion of international organizations and the multilateral treaties that establish them by manipulating their network effect pressures in order to intensify their lock-in effect. The literature traditionally sees lock-in as a problem: Actors become 'locked' into an institutional arrangement, which allows sub-optimal arrangements to persist in a path-dependent manner where they would otherwise be improved upon or replaced. This article, however, sees lock-in as something that can be used.

One of the main obstacles to sustaining multilateralism is the inherent rigidity of treaties.[11] Once in place, it is very difficult to amend a multilateral treaty. Formal amendment usually requires states to go through a long and protracted ratification process. This presents a challenge in situations where compliance is weakening. It is difficult to strengthen a failing organization by tweaking its constituent treaty because many states will just exit the agreement. Most of our major international organizations were established decades ago, making these treaties very tricky to revisit, especially if commitment is already flagging. But while it is difficult to alter them directly, we can indirectly strengthen these treaties by manipulating the network effect pressures of the organizations they establish to increase their lock-in effect. Intensifying an organization's lock-in effect is a sort of backdoor into its treaty—a way to 'hack' into a treaty. Hence the term: 'treaty hacking.'

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10. Path dependence is the idea that institutions or technologies tend, over time, to develop along specific constraining growth trajectories (i.e. paths) as a consequence of their structural properties or commonly held beliefs and values. In its simplest form, path dependence is the contention that 'history matters.' For further elaboration, see *infra* note 22. For its application in the political science literature (as well as in other disciplines like historical institutionalism), see *infra* notes 22–27 and accompanying text.

11. International organizations are established by treaties. However, in some cases, another agreement acts as a charter and gives them standing under international law. International organizations can also spawn other sub-organizations, the UN's specialized agencies being a prime example. Moreover, international organizations may themselves be a party to and may administer multiple treaties (the World Trade Organization ("WTO"), for example, administers numerous international treaties).

This treaty-hacking approach requires us to view the international system in an entirely different light, to see it as a 'market' in which international organizations, in function if not in intention, lock in countries like firms competing in markets with strong network effects lock in their customers. I invite the reader to view the evolution of the liberal international order precisely in these terms. The basic argument is that because global institutions produce positive feedback and lock-in effects just like any other networked market, policymakers can adopt many of the same strategies that firms deploy when competing in such markets to help shore up these institutions. While the extent to which treaty hacking can prevent institutional collapse is an open question, even minor effects can be consequential in the right circumstances. The claim here is not that network lock-in is some impervious bulwark against member withdrawal. Rather, the argument is that intensifying network lock-in can strengthen an organization and render such withdrawal less likely. In some circumstances, intensifying an organization's lock-in effect may prove to be the key element in preventing a faltering multilateral institution from completely unraveling.

Assuming that the international system is a networked market, it may be only deceptively stable. Institutions within such markets may appear robust when they are not. While network effects produce positive feedback and exponential growth, they can likewise trigger exponential decay and sudden collapse.[12] It may be the case that the liberal international order and its institutions are in fact far weaker than they appear. They may be teetering on an invisible brink, a tipping point, where a small shock may cause them to collapse with astonishing speed. Without a proper understanding of network effect pressures and network lock-in, it is simply impossible to accurately assess the genuine robustness of these institutions. Appraising the deeper structural forces at play may also prove useful when crafting new treaties: Policymakers can design treaties to maximize their lock-in effect thus making them more resistant to collapse. This structural approach can also help explain why some international organizations succeed while others sputter and fail. Although not developed here, this is an interesting and potentially fruitful research program that may advance our understanding of how global governance evolves more generally.[13]

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12. A system generates positive feedback when "a change in one variable leads to a further change in that same variable, and in the same direction." GREWAL, *supra* note 9, at 25.

13. The model may be particularly useful to theorists working in the area of organizational studies—specifically, in its subfield of organization ecology. Drawing from disciplines like biology, economics, and sociology, organizational ecology seeks to identify the factors that cause organizations to emerge, grow, and die using statistical analysis. For the foundational literature in organization ecology, *see* Michael T. Hannan & John Freeman, *The Population Ecology of Organizations*, 82 AM. J. SOC. 929, 929 (1977) (formulating a theory of population ecology); MICHAEL T. HANNAN & JOHN FREEMAN, ORGANIZATIONAL ECOLOGY 3 (1989) (articulating a clear model of organizational ecology). For a good summary work on organizational ecology, see MICHAEL T. HANNAN, LÁSZLÓ PÓLOS, & GLENN R. CARROLL,

My argument proceeds in three parts. Part I discusses the model's two key concepts: network effects and network lock-in. Part II then examines ways in which we can roughly gauge the strength of an organization's network effect pressure. This is possible because, whatever other variables are at play, on a basic structural level, network effect pressures are always present. Part III—the most important part of the article—then offers specific strategies that may be deployed to boost an organization's network effect pressure and amplify its lock-in effect. The final section concludes, discussing limitations to the model.

II. THE MODEL'S TWO KEY CONCEPTS: NETWORK EFFECTS AND NETWORK LOCK-IN

A. *Network Effects*

The standard definition of a network effect is a situation in which the value of a product or service increases as the number of other agents using the product or service grows.[14] Commonly cited examples of network effects in the economics literature include such things as telephone networks, railway gauges, credit cards, videotape standards, currencies, electrical outlets, even screw thread sizes.[15] Users of these standards form a network, and in each case, positive feedback causes users to coalesce around the standard and then lock into use of that standard unable to exit the network without incurring significant costs. Language illustrates the dynamic well. As a result of language's naturally powerful network effect pressures, people are locked into particular linguistic networks. Not only are there the obvious costs associated with learning a new language (what are known as switching costs), if a person ceases speaking a language, they will lose access to that linguistic network (its network benefit).[16] If you are, for example, the inhab-

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LOGICS OF ORGANIZATION THEORY: AUDIENCES, CODES, AND ECOLOGIES (2007) (providing a comprehensive overview of the various theories and methods active in the research area).

14. *See* S.J. Liebowitz & Stephen E. Margolis, *Network Externalities, in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 671, 671 (Peter Newman ed., 1998). Some of this section draws from other work by Liebowitz. *See* Andrea K. Bjorklund & Bryan Druzin, *Institutional Lock-in Within the Field of International Investment Arbitration*, 39 U. PA. J. INT'L L. 707, 716 (2018).

15. For a very good overview of other network effect examples in a wide range of contexts, see JOSEPH FERRELL & PAUL KLEMPERER, COORDINATION AND LOCK-IN: COMPETITION WITH SWITCHING COSTS AND NETWORK EFFECTS 46–54 (2006). For other varied applications of the concept, see, e.g., D. Foray, *The Dynamic Implications of Increasing Returns: Technological Change and Path Dependent Inefficiency*, 15 INT. J. INDUS. ORG. 733 (1997); James Simmie, *Path Dependence and New Technological Path Creation in the Danish Wind Power Industry*, EUR. PLAN. STUD. 753 (2012).

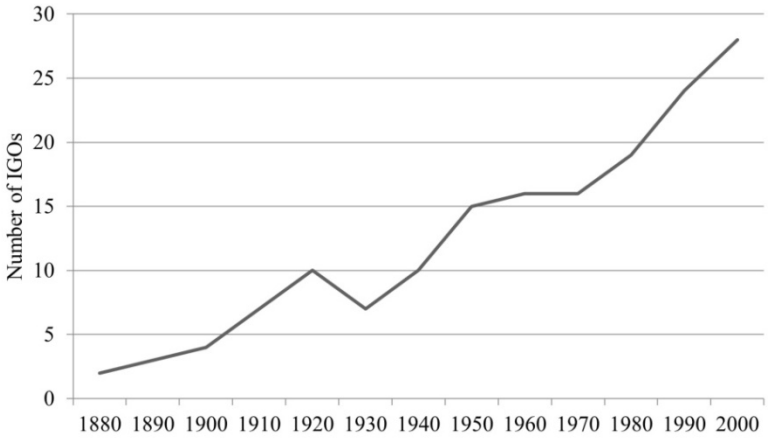
16. I am ignoring for the moment the concept of 'multi-homing' (the ability to switch between networks), which in the context of language would take the form of bilingualism. I return to the concept of multi-homing later in the discussion.

itant of an isolated Chinese village that speaks only Mandarin, while you are technically free to speak any language you please, in practice you are not: You are locked into speaking Mandarin. It is a choice already made for you.[17]

This dynamic may also be applied to international multilateral organizations. In its most straightforward application, the benefits of institutional membership—be they economic integration, facilitating trade, the setting of common standards, or the provision of security—increase with each additional member. As this occurs, the benefits of participation (and thus the cost of non-participation) begin to lock actors into the organization. Indeed, a strong argument could be made that network effect pressures were a significant contributor to the robust and steady increase in inter-governmental organizations ("IGO") membership throughout the 20th century (see Figure 1 below).

Figure 1. This figure shows the average number of IGOs shared by a pair of countries, 1885-2000. Apart from a pronounced dip in the period preceding the Second World War, the last century saw a persistent growth in state participation in IGOs.[18]

FIGURE 1



17. We may, however, "interpret the idea of network effects much more broadly than the economics literature in which this concept originated has done." Indeed, we can "understand network effects as the positive externalities that are generated in the interdependence of action, the positive feedback that results from the use of [any] standard." This includes not only standards of technical coordination, but also any kind of standard that facilitates coordination between networks of actors. The concept's true scope of potential application is thus massive. *See* GREWAL, *supra* note 9, at 66.

18. Source data from B. RUSSET & J. O'NEAL, TRIANGULATING PEACE: DEMOCRACY, INTERDEPENDENCE, AND INTERNATIONAL ORGANIZATIONS (2001).

While in the case of some organizations there may be disadvantages to over-expansion, this 'bigger-is-better principle' generally holds true.[19] Like language, in the case of international organizations, increasing returns generate network effects, which then usually produce lock-in.

B. *Network Lock-in*

The concept of lock-in is central to the literature on path dependence.[20] The idea of path dependence was first developed in the social sciences in the context of technological standards, but has since been applied to a wide range of subjects, including economic geography, evolutionary economics, political science, historical sociology, and law.[21] Douglass C. North's work

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19. For a discussion of the perils of overexpansion with respect to the EU, see *infra* Figure 8 and surrounding text. Even in cases where over-enlargement of the network may begin producing diminishing returns past a particular threshold, network effects will drive an organization's expansion up to that point. The potential limits of network enlargement are discussed in greater detail in Part III.

20. For a rigorous unpacking of the concept of path dependence, see Scott E. Page, *Path Dependence*, 1 Q.J. POL. SCI. 87 (2006). While the terms 'increasing returns' and 'positive feedback' are used interchangeably here, Scott notes a technical distinction between them. *Id.* at 88.

21. The literature on path dependence and its attendant concept of lock-in is vast. However, for a glimpse of its application across various disciplines (with specific emphasis on its application in the legal literature), the following resources are valuable. In economics, see, e.g., Paul Krugman, *History and Industry Location: The Case of the Manufacturing Belt*, 81 AM. ECON. REV. 80, 80 (1991) (discussing path dependence in economic geography, citing specific historical examples); PAUL KRUGMAN, GEOGRAPHY AND TRADE 10 (1991) (citing the importance of economic geography in the context of geographical economics); DOUGLASS C. NORTH, INSTITUTIONS, INSTITUTIONAL CHANGE AND ECONOMIC PERFORMANCE 73–104 (1990) (setting forth the concept of institutional lock-in as an impediment to economic development); David, *supra* note 5, at 334. In political science, see P. Pierson, *Increasing Returns, Path Dependence, and the Study of Politics*, 94 AM. POL. SCI. REV. 251, 251 (2000) [hereinafter *Increasing Returns*] (applying the increasing returns literature to politics institutions, arguing that political development is thus punctuated by critical events that invariably shape its future development); P. Pierson, *Not Just What, but When: Timing and Sequence in Political Processes*, 14 STUD. AM. POL. DEV. 72, 72 (2000) [hereinafter *Timing and Sequence*]; GREWAL, *supra* note 9, at 228 (Employing network effects and lock-in as an analytical framework for globalization). In sociology, see James Mahoney, *Path Dependence in Historical Sociology*, 29 THEORY AND SOC'Y 507, 507 (2000). In law, see Oona A. Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA L. REV. 601, 606 (2001) (discussing path dependence and lock-in generating inefficiencies when legal rules become stuck, unable to evolve to changing conditions—which has weighty implications for the doctrine of stare decisis); Paul A. David, *Intellectual Property Institutions and the Panda's Thumb: Patents, Copyrights, and Trade Secrets in Economic Theory and History*, in GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHTS IN SCIENCE AND TECHNOLOGY 19, 19 (Mitchel B. Wallerstein, Mary Ellen Mogee & Roberta A. Schoen eds., 1993) (discussing path dependency with respect to intellectual property law); Richard A. Posner, *Path-Dependency, Pragmatism, and a Critique of History in Adjudication and Legal Scholarship*, 67 U. CHI. L. REV. 573, 583 (2000) (examining the use of history to analyze adjudication and legal scholarship); S.J. Liebowitz & S. E. Margolis, *The Fable of the Keys,* 30 J.L. & ECON. 1, 2 (1990) (challenging the veracity of the lock-in effect by critically

in the area, however, is perhaps the most well-known. North argues that increasing returns produce lock-in *vis-à-vis* institutions, a dynamic he terms 'institutional lock-in' (for which he won a Nobel Prize in 1993).[22] North argues that institutions become more entrenched over time and, as a consequence, difficult to dislodge.[23] Path dependence envisions institutional evolution something like raindrops running down a pane of glass—as they collcollect together they form larger pools of water that forge a downward path that is progressively more difficult to redirect as it runs farther down the glass.

North identifies several sources of increasing returns with respect to the growth of institutions, which he adapts from the earlier work of Brian Arthur on technological lock-in[24] These include high start-up costs involved in

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scrutinizing the oft-cited example of lock-in—the persistence of the QWERTY keyboard design over the more efficient Dvorak design); S.J. Liebowitz & Stephen E. Margolis, *Path Dependence, Lock-In, and History*, 11 J.L. ECON. & ORG. 205, 205 (1995) (discussing three different forms of path dependence and their potential to generate market errors and lock-in); Lucian Arye Bebchuk & Mark J. Roe, *A Theory of Path Dependence in Corporate Ownership and Governance*, 52 STAN. L. REV. 127, 129 (1999) (articulating a theory of the path dependence of corporate structure); Marcel Kahan & Michael Klausner, *Path Dependence in Corporate Contracting*, 74 WASH. U. L. REV. 347, 349 (1996) (discussing how agency costs and behavioral biases can lead to standardization in corporate contracting); Michael Klausner, *Corporations, Corporate Law, and Networks of Contracts*, 81 VA. L. REV. 757, 763 (1995) (examining the impact of network externalities in corporate contracts); Mark J. Roe, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641, 641 (1996); Mark A. Lemley, *Antitrust and the Internet Standardization Problem*, 28 CONN. L. REV. 1041, 1050 (1996); Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 482 (1998); C. Gillette, *Lock-In Effects in Law and Norms*, 78 B.U. L REV. 813, 820 (1998); C. Gillette, *Harmony and Stasis in Trade Usage for International Sales*, 39 VA. J. INT'L L. 707, 711–12 (1999); D.L. Burk, *Law as a Network Standard*, 8 YALE J.L. & TECH. 63, 72 (2006); Bryan Druzin, *Buying Commercial Law: Choice of Law, Choice of Forum, and Network Externalities* 18 TULANE J. INT'L & COMP. L. 131, 131 (2009) [hereinafter *Buying Commercial Law*] (arguing that network effects induce standardization in choice of law and choice of forum clauses in transnational commercial contracts); Bryan Druzin, *Why Does Soft Law Have any Power Anyway?* 7 ASIAN J. INT'L L. 361, 362 (2016) (arguing that many areas of soft law exhibit strong network effects which render it uniquely calibrated to induce voluntary adoption).

22. *See* NORTH, *supra* note 21, at 103 (positing that institutional development may produce a path-dependent pattern of development over time); *see also Increasing Returns*, *supra* note 21, at 251 (arguing political institutions are particularly vulnerable to this process); *Timing and Sequence*, *supra* note 21, at 72 (arguing that systematically situating particular political moments in a temporal sequence of events and processes will aid us in our understanding of complex social dynamics); Kathleen Thelen, *How Institutions Evolve: Insight from Comparative Historical Analysis, in* COMPARATIVE HISTORICAL ANALYSIS IN THE SOCIAL SCIENCES 208, 208–40 (James Mahoney & Dietrich Rueschemeyer eds., 2003) (discussing the "feedback mechanisms" that steer institutional and policy trajectories over time).

23. NORTH, *supra* note 21, at 95.

24. Douglass C. North, *Institutions*, 5 J. ECON. PERSP. 97, 97–100 (1991). For North, 'institutions' are "informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)." North distinguishes institu-

setting up alternative institutions from scratch, significant learning effects for an organization, coordination effects driven by direct interconnection with other organizations and indirectly through complementary activities, and reduction in uncertainty regarding the permanency of specific rules arising from their increasing prevalence and use (what is known in the literature as 'adaptive expectations').[25] Collectively, these features, North argues, generate "an institutional matrix [that] produces massive increasing returns,"[26] bringing about institutional lock-in. North's focus is on the evolutionary inefficiencies that path dependence may produce as a consequence of organizations being unable to abandon institutions, which may lead to societal stagnation and decline.

Although similar, my argument should not be confused with North's. I am not concerned here with how organizations become locked into rules ('institutions', as North calls them); rather, I am interested in how *states become locked into organizations*.[27] As such, the present thesis draws more from the literature on strategic competition in winner-take-all markets—what is colloquially known as 'standards wars'—than it does from the path dependence literature.[28] What is proposed here is the strategic exploitation of network effect pressures to lock states into multilateral organizations and the treaties that underpin them. That is, however, not to suggest that the success and failure of an organization can be chalked up solely to network effect pressures—network effect pressure alone is seldom enough to sustain an institution. Indeed, currencies are abandoned and languages die, and they do so due to a host of factors unrelated to network lock-in. However, network effect pressure is a ubiquitous force that undergirds networked institu-

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tions from organizations: institutions are the rules of the game and organizations are akin to sports teams playing the game constrained by these rules.

25. *See* NORTH, *supra* note 21, at 95; *Positive Feedbacks*, *supra* note 5, at 95; *Path Dependence in the Economy*, *supra* note 5, at 112.

26. NORTH, *supra* note 21, at 95.

27. A minor but important semantic point should be restated here in the context of North's work: The term 'institution' is understood in the present article in its more generic sense, as an organizational framework that regulates the interaction of its members. In this case the term refers to the international institutions of global governance. This is distinct from how the term is used in political economy, specifically new institutionalism (where it connotes a rule or convention rather than an organization). Used in this sense, institutions are better understood as "a special type of social structure that involves potentially codifiable and . . . normative rules of interpretation and behavior." Geoffrey M. Hodgson, *What Are Institutions?*, 11 J. ECON. ISSUES 1, 4 (2006). This understanding of institutions can be traced back to Thorstein Veblen in the early literature on institutionalism—Veblen defined institutions as the "settled habits of thought common to the generality of men." Thorstein Veblen, *The Limitations of Marginal Utility*, 17 J. POL. ECON. 620, 626 (1909).

28. For the foundational literature on standards wars and firm competition in networked markets, *see, e.g.,* Carl Shapiro & Hal Varian, *The Art of Standard Wars*, 41 CAL. MGMT. REV. 8 (1999); *see also* Michael Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSPS. 93, 96 (1994); Stanley Besen & Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization*, 8 J. ECON. PERSPS. 117, 124–26 (1994).

tions and is therefore an ever-present mechanism that can be exploited. It usually takes a powerful exogenous shock for people to abandon a currency, as it does for a language to quickly die. It took a four-year civil war to render the Confederate States dollar worthless, and history has shown that it often takes a genocide to fully extinguish a language. While there are many variables that determine state compliance with a treaty, network effect pressures and lock-in play a non-trivial role, and, in the right circumstances, may be critical in preventing an institution from unraveling.

III. ASSESSING INSTITUTIONAL NETWORK EFFECT PRESSURE AND NETWORK LOCK-IN

Network effect pressures vary between international organizations, ranging from a minor pulse to a powerful binding force. Yet, by virtue of their networked character, all international organizations possess some degree of network effect pressure. There are indicators we can use to gauge the intensity of this pressure that, taken together, allow us—albeit on a very general level—to make a broad-stroke assessment of an organization's lock-in effect. While it is difficult to assess the precise degree of lock-in that an organization is generating, it is possible to get an approximate fix on it, particularly where the gap between institutions is extreme. Below I discuss four general indicators of network effect pressure. These concepts will prove useful in the section that follows when I outline the specific treaty-hacking strategies.

A. *Network Benefit and 'Thickness'*

Foremost among these is the most obvious: How crucial is the benefit that states gain from participating in the international organization? This will vary depending on the nature of the organization and the purpose it serves. For example, there is a substantial difference between the benefit gleaned from membership in an organization that provides international security, such as the North Atlantic Treaty Organization ("NATO") and an institution that merely establishes common postal standards, the mandate of the Universal Postal Union ("UPU"). Obviously, the network benefit is far more critical to national governments in the case of the former than the latter.[29] The more crucial this network benefit, the greater the cost of abandoning the organization.

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29. In the case of the North Atlantic Treaty Organization ("NATO"), the benefit will, of course, vary depending on how serious the threat of being attacked is for a given state. However, even if the probability is low, because the consequences of conflict are potentially high, national security usually is of greater concern even if a state may use the international mail system on a far more frequent basis. This is not, however, to suggest that the Universal Postal Union ("UPU") does not possess significant network effect pressures. It, in fact, boasts a fair degree of network lock-in due to its high level of 'market consolidation' and the need

It is, however, not only a matter of the importance of the benefit; the sheer number of benefits provided by an organization is also significant. I refer to this as an organization's *thickness*. International organizations provide what we may call their primary benefit (e.g. security in the case of NATO). However, international organizations usually provide multiple benefits to its members. While these benefits may differ considerably in term of their importance, one would be hard-pressed to find an international organization that offered only a single benefit to its members. The thickness of international organizations ranges greatly. For instance, the UN, the WTO, and the EU provide a deep well of benefits to their member states that touch on a wide array of issue areas, many of which are of critical importance.[30] This may be contrasted with an organization such as the Nuclear Energy Agency ("NEA"), which assists member states in the peaceful development of nuclear energy. While the NEA provides numerous benefits to its members, [31] comparatively, the NEA is not nearly as 'thick' as the UN, the WTO, or the EU.

Typically, the richer the tapestry of interconnections created and the broader the range of issue areas addressed by an organization, the greater the number of network benefits it will provide to its members. The more benefits an organization creates, the greater an organization's thickness—the greater its thickness, the greater its network effect pressure. This is because the lock-in effect will be stronger if the benefits, in terms of both their importance and their number, are greater.[32]

B. *Network Size and 'Market Share'*

Another important factor for assessing the intensity of network effects is the size of the network. When it comes to network effects, size matters. In general, the bigger the network in terms of the number of users, the stronger its lock-in effect will be. This is because, as already discussed, as a network

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for 'synchronization' in postal delivery, which produces coordination benefits. I discuss both these concepts later in the discussion.

30. For an excellent in-depth analysis of the WTO with reference to network effect pressures, *see* GREWAL, *supra* note 9, at 225–46 (applying a concept he coins 'network power' to the formation of the WTO).

31. The Nuclear Energy Agency ("NEA") provides a range of benefits as outlined in its Mission Statement: "The mission of the NEA is to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes. It strives to provide authoritative assessments and to forge common understandings on key issues as input to government decisions on nuclear energy policy and to broader OECD analyses in areas such as energy and the sustainable development of low-carbon economies." NUCLEAR ENERGY AGENCY, STRATEGIC PLAN OF THE NUCLEAR ENERGY AGENCY 2017-2022, 15 (2016).

32. This, however, is not the case where the primary benefit is a public good. This concept is explored in greater detail later in the discussion with respect to multilateral environmental agreements.

grows, it is frequently the case that the benefit to each of its users increases commensurate with this growth. As it grows in membership, a security organization typically grows in power; an economic union increases in value, and so on. This will affect actors' ability to exit a network. The greater benefit of a larger network tends to lock actors into it. Again, language offers a convenient illustration. It is estimated that presently around a fifth of humankind is conversant in English.[33] As the number of English speakers increases, the value of plugging into this vast linguistic network grows and, conversely, the cost of unplugging (permanently) from it also increases. Compare this with Somali. Somali is a much smaller linguistic network and so provides comparatively little value to speakers in the larger international community.[34] Somali's lock-in effect is thus less than that of English. Indeed, the standardization of English as the world's de facto common tongue may largely be attributed to the network effect pressures and lock-in naturally generated by linguistic networks.[35]

Because network size is a relative concept, a crucial point here is how many states in the international system are consolidated into the organization. We can understand this as 'institutional market share.' Institutional market share is the extent to which the number of states that could in theory participate in the organization are in fact members of the institutional arrangement—that is, all the potential 'consumers' in the 'institutional market.'[36] As nearly all the states in the international system are UN members, the UN may be said to have captured total institutional market share. This may be contrasted with, for example, the EU. The EU presently comprises 27 member states. Putting aside for the moment the EU's obvious connection to the continent of Europe and considering it merely as a political and economic union, there are a remaining 168 states that, in principle, could

33. The actual number may be as high as 1.4 billion people, of which more than 400 million are native speakers. English is also the official language of 53 states. C.M. MILLWARD & MARY HAYES, A BIOGRAPHY OF THE ENGLISH LANGUAGE 342 (Cengage Learning, 3rd ed. 2011). Estimates of second-language speakers vary considerably. David Crystal, *Two Thousand Million?*, 24 ENGLISH TODAY 3, 3–6 (2008). While Mandarin and Spanish claim more native speakers, English is the world's most common second language with estimates putting the number of second-language speakers anywhere between 100 million to 1 billion, depending on the level of proficiency specified. Some estimates put the number as high as one in every three humans. GREWAL, *supra* note 9, at 73. For a fascinating discussion of the growth of the English language in relation to network effects, see GREWAL, *supra* note 9, at 73–79.

34. There are an estimated 10-15 million speakers of Somali. PETER AUSTIN, ONE THOUSAND LANGUAGES: LIVING, ENDANGERED, AND LOST 70 (2008).

35. While other factors, such as British colonialism and American soft power, have no doubt contributed to the linguistic dominance of English on a global scale, powerful network effects, I would argue, have driven its expansion.

36. Thus, for example, the institutional market with reference to the NEA would comprise only states that are developing nuclear energy.

join the EU.[37] The EU therefore possesses less institutional market share than the UN. Yet the EU's institutional market share is much higher than in the case of, for example, the Association of Southeast Asian Nations ("ASEAN"), which boasts only 10 member states. Because 185 states remain outside of this network, ASEAN possesses an even smaller institutional market share than the EU.[38]

Institutional market share matters because it affects an organization's lock-in effect. The greater an organization's institutional market share, generally the greater its lock-in effect. Even in cases in which the benefit provided by an organization is substantial, if there are alternative organizations that provide a comparable degree of benefit, then the lock-in effect will not be powerful. And the reverse is true: Even if the benefit provided by an organization is minimal, if it is the only game in town, then the lock-in effect may be extremely robust. Thus, an organization's lock-in effect will vary depending on whether there are institutional alternatives available.[39]

The more the market is consolidated into one organization the more difficult this 'start-up problem' becomes. For instance, it has become increasingly difficult for a small start-up social media company to unseat Facebook as the dominant player in their field.[40] International organizations are no different. As it achieves great power status, China may desire to challenge the Western institutional model created by the U.S. and its allies. However, if a powerful state such as China or another rising power wishes at some point to replace an existing international organization with one that better serves its national interests but the incumbent organization has consolidated the market, the break-away state will find this difficult to pull off despite its newly-acquired power and influence. Consider, for instance, the International Centre for Settlement of Investment Disputes ("ICSID"). With 163 signatory States and 155 States party to the ICSID Convention, ICSID pos-

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37. This is, of course, little more than a thought experiment, as Article O of the Maastricht Treaty explicitly restricts EU membership to European states. *See* Maastricht Treaty art. O, Nov. 1, 1993, 31 I.L.M. 247.

38. Note that while the model put forward here is decidedly state-centric, a more nuanced model might also consider the market as one also composed of other actors that are indirectly involved in the network, such as other international organizations and non-state entities (e.g. civil society).

39. *See* GREWAL, *supra* note 9, at 27 (This "is always a comparative notion, based on the different sizes of rival networks—that is, networks based on different standards, each of which facilitate the same activity.").

40. Although not impossible. For early work challenging the assumption that network effects induce a permanent monopoly as applied to products and services, see S. J. LIEBOWITZ & STEPHEN MARGOLIS, WINNERS, LOSERS & MICROSOFT: COMPETITION AND ANTITRUST IN HIGH TECHNOLOGY 135–36 (rev. ed. 2001) (arguing that, although there are indeed periods of persistent lock-in where a single product dominates the market—they look specifically at the computer software market—the market will frequently tip towards a new monopoly). The authors call this process "serial monopoly." *Id.* at 10.

sesses substantial institutional market share.[41] While not impossible, a rival organization would likely find it a struggle to challenge ICSID's market dominance because the degree to which ICSID has already consolidated the institutional market is high, making it difficult to unseat.[42]

While in principle a state is free to exit an institutional arrangement and establish an alternative one, when an institution grows sufficiently large, in practice, a government will be as powerless to do this as an individual is to create their own currency or language. While possible, it requires large-scale coordination between many (if not a majority of) the incumbent organization's members. This is because in network effect markets a product "is only interesting for potential customers if a critical mass of consumers is reached such that the sum of original and derivative utility outweighs the respective costs"[43] of switching to the new product or service. If the existing base of users is too small, additional users will not adopt it; yet, so long as users will not adopt it, its base of users will remain small (a chicken-and-egg dilemma). If an international organization has achieved total market consolidation, this start-up problem will be formidable. For example, because of its total market consolidation, it would be difficult for a state or even a small coalition of states to unilaterally abandon the UN system and replace it with an alternative institutional arrangement. This would require a massive exogenous shock, such as the outbreak of WWII, which saw the complete collapse of the League of Nations ("LN") before the creation of the UN as its institutional replacement in the ashes of the war.[44]

C. *Member Status*

A third factor that may affect an organization's lock-in effect is the *status* of its member states. Status is understood here in a broad sense. It includes obvious factors such as a state's geopolitical and economic weight. However, factors such as political stability and a state's reputation as a reliable actor on the world stage may also come into play. Thus, for example,

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41. Database of ICSID Member States, INT'L CTR. FOR SETTLEMENT OF INV. DISPS., https://icsid.worldbank.org/en/Pages/about/Database-of-Member-States.aspx (last visited Oct. 1, 2020). On the role of ICSID in general, see Julien Chaisse & Christian Bellak, *Navigating the Expanding Universe of Investment Treaties—Creation and Use of Critical Index*, 18 J. INT'L ECON. 79 (2015). For the most recent economic trends in this space, see U.N. Conf. on Trade and Dev., *Global Investment Trends Monitor No. 33*, U.N. Doc. UNCTAD/WEB/DIAE/IA/INF/2020/1 (Jan. 20, 2020).

42. *See* Bjorklund & Druzin, *supra* note 14, at 707 (arguing that institutional competition of ICSID from other regions of the world is constrained by network effects and lock-in).

43. ANDREAS KEMPER, VALUATION OF NETWORK EFFECTS IN SOFTWARE MARKETS: A COMPLEX NETWORKS APPROACH 73–74 (2010).

44. The League of Nations ("LN") never achieved a sufficiently robust level of network lock-in for many reasons. For one, the LN never carved out a high enough level of market consolidation given its institutional ambition—at its height, the LN boasted only 58 member states. Member status also played a role in the LN's failure (I revisit this in Part III).

the United States may be said to possess higher status than, say, Liberia. But status may vary depending upon the nature of the organization in question. A state normally seen as wielding little international gravitas may possess a unique status in certain situations. For instance, Sri Lanka's participation in the Indian Ocean Tuna Commission ("IOTC") is more critical than that of the United States. simply because of Sri Lanka's geographical location. Thus, with respect to the IOTC, Sri Lanka may be understood as possessing higher status than the U.S. Similarly, with respect to a multilateral environmental agreement ("MEA") addressing carbon dioxide emissions, Iran may be considered a higher-status state than the UK, France, Canada, or Australia, simply because Iran is a larger producer of CO2 emissions than any of the latter four countries, so its decision to participate or not to participate is of greater consequence given the aims of the treaty.

An international organization with high-status members is more likely to enjoy robust network lock-in for two reasons. The first is that a high-status state will increase the value of an organization for all its members in a substantive sense—i.e., because of its economic clout, military power, etc. The second reason, however, is less obvious but arguably more crucial. There is an important signaling component to the participation of a high-status state. Their participation can help shape 'market' expectations, signaling to the international system that the organization boasts robust support. This helps shape perceptions regarding an organization's stability, which in turn can "drive market outcomes such that they become self-fulfilling."[45] This is similar to the concept of adaptive expectations described by Arthur and later taken up by North in which the increased prevalence of a technology (or rule in the case of North) reduces uncertainty regarding its continued adoption and, thus, enhances belief of further prevalence.[46] In some cases, member status may prove decisive. For instance the United States' failure to join the LN undermined the League's network effect pressure in terms of its substantive collective military power, but more crucially, it weakened its credibility. Because a collective security architecture like the LN turned so much on collective expectations, this signaling function may have been the stronger determinant in the LN's eventual collapse. This signaling component is fleshed out in greater detail in Part III.

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45. Irina Suleymanova & Christian Wey, *On the Role of Consumer Expectations in Markets with Network Effects* (Düsseldorf Inst. for Competition Econ., Working Paper No. 13, 2010). On self-fulfilling prophecies, see THOMAS C. SCHELLING, MICROMOTIVES AND MACROBEHAVIOR 115–18 (1978) (citing examples of expectations that "induce the kind of behavior that will cause the expectations to be fulfilled.").

46. *See* W.B. Arthur, *Self-Reinforcing Mechanisms in Economics, in* THE ECONOMY AS AN EVOLVING COMPLEX SYSTEM 10, 10 (Philip Anderson eds., 1988); NORTH, *supra* note 21, at 95; *Positive Feedbacks*, *supra* note 5, at 92; PATH DEPENDENCE IN THE ECONOMY, *supra* note 5, at 112.

D. *Coordination Benefits*

A fourth variable that may indicate the degree of network lock-in that an organization is generating is what is known in the literature on standards as *synchronization value*.[47] Synchronization value arises where agents require common standards in order to coordinate their interactions. Again, language is a good example: In order to communicate (synchronize), speakers require common words with established meanings (common standards). Synchronization value may be distinguished from other kinds of network benefits that are not entirely tied to synchronization. For instance, NATO's primary network benefit is that it provides collective security to its members. While this certainly requires high degrees of synchronization, synchronization is not the principal benefit of NATO membership. This may be contrasted with the UPU. The UPU's primary benefit is its synchronization value (establishing universal postal standards in order to coordinate postal delivery between its member states). Its institutional function is essentially to solve a coordination game between states, i.e., facilitating postal delivery.[48] Here multilateral intuitions are not only standards for coordination themselves, but they actually produce additional coordination standards.

While all organizations provide network benefits, synchronization does not always feature prominently. Synchronization differs among organizations. Organizations whose primary or sole benefit is the provision of synchronization tend to be quite robust primarily because member states have little incentive to withdraw from them. Such institutions often resemble pure coordination games—i.e., driving on the left side of the road is just as good as driving on the right so long as everyone is in agreement. International organizations whose main benefit is establishing coordination standards typically produce powerful lock-in effects—the more crucial the need to coordinate, the more intense the lock-in effect.

In sum, while precision is elusive, we can get a rough fix on an organization's lock-in effect by considering these metrics. These indicators, however, have to be weighed against one another. Strength in one may compensate for weakness in another. For instance, while the North American Free Trade Agreement ("NAFTA") only comprises three states (a small network size), it is a very thick organization that involves a high-status state (the United States), and which offers significant economic benefits to its members. Although it falls short in terms of network size, NAFTA's lock-in effect is robust because it compensates for this in other areas.[49]

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47. For the concept of synchronization value, see S.J. LIEBOWITZ & STEPHEN E. MARGOLIS, *Should Technology Choice Be a Concern of Antitrust Policy?* 9 HARV. J.L. & TECH. 283, 295 (1996).

48. *See* The Universal Postal Union, General Regulations of the Universal Postal Union (2012).

49. Since first writing this, the Trump administration has renegotiated the North American Free Trade Agreement ("NAFTA") (as the United States–Mexico–Canada Agreement

In other cases, however, strength in one metric may be insufficient to compensate for weaknesses in another. For example, because of its high status, the United States' withdrawal from the Paris Climate Agreement has sapped the agreement of substantial network effect pressure, weakening it as a framework for future environmental cooperation notwithstanding the importance of the agreement's network benefit, its large network size, and its considerable market consolidation.[50] Assessing the degree of lock-in that an organization is generating can be compared to assessing the strength of a tennis player. A player's bad backhand and weak volley game may be offset by their strong serve, or it may not. However, where their backhand, volley game, serve, etc. are all strong, you can assume they are a strong player.

While an organization's lock-in effect is difficult to assess when two organizations differ only slightly, it is not difficult to distinguish when this difference is extreme. Although it may be hard to quantify precisely, we can, for instance, confidently make the claim that the UN possesses a far greater degree of network lock-in than, for example, the International Commission on Missing Persons ("ICMP"). The ICMP is simply not comparable to the UN in any of the metrics discussed above. This kind of exercise, however, must be taken for what it is—a rough approximation at best—and it is most meaningful when dealing with substantial differences between organizations.

IV. THE ART OF TREATY HACKING: STRATEGIES TO BOOST NETWORK LOCK-IN

The critical question is how we can use all of this to intensify the lock-in effect of international organizations. This is the core of our discussion, for if we can do this, we can make these institutions more resistant to collapse. With this goal in mind, this section offers a toolbox of sorts—six strategies policymakers may adopt to achieve this goal. These six strategies are as follows: (1) thickening, (2) status management, (3) network enlarge-

("USMCA")), initiated a formal withdrawal from the World Health Organization ("WHO"), and signaled that the United States will exit the UPU. This is a testament to the fact that network effect pressure is no guarantee that states will not abandon an institution. It merely makes it less likely they will. It is typically the case that powerful countries, such as the United States, are less constrained by institutional lock-in.

50. Note that the United States is a high status state with respect to the Paris Agreement primarily because it is the second largest emitter of greenhouse gases. *See Each Country's Share of CO2 Emissions,* UCSUSA (Aug. 12, 2020), https://www.ucsusa.org/resources/each-countrys-share-co2-emissions. That the Paris Agreement has not unraveled in the wake of the United States' signaled withdrawal speaks to the agreement's robust network effect pressure generated by its importance, massive network size, and near perfect market consolidation. *But see* Bryan Druzin, *The Coming Collapse of the Paris Agreement*, HARV. J. ON LEGIS. ONLINE (Aug. 16, 2017), https://harvardjol.com/2017/08/16/the-coming-collapse-of-the-paris-climate-agreement/ (arguing that multilateral environmental agreements are uniquely fragile because their value depends directly upon the number of states that are party to it and thus possess a certain 'all or nothing' quality to them).

ment, (4) member stuffing, (5) forced incompatibility, and (6) increasing coordinating standards. While efficacy of each strategy will vary depending on the character of the organization in question, all these strategies may be applied to most international organizations to some degree. This is because all international organizations are composed of individual member states linked together, and so, on a basic structural level, are networks.

Networked markets demonstrate some peculiar structural characteristics. They can, for instance, be extremely non-linear. Change might begin slowly and then suddenly accelerate with astonishing speed. Thresholds, critical mass, tipping points, bandwagoning, and collective expectations often feature prominently.[51] They are highly sensitive to minor perturbations that are then powerfully amplified in either direction, i.e., towards rapid expansion or rapid dissolution. Networked markets are also 'hyper-selective.' That is, because multiple equilibria are unable to co-exist for long periods, a single standard will, over time, tend to dominate, causing actors to coalesce around this single standard or institution.[52] Another feature of networked markets is that they tend to create zero-sum dynamics in which gain by one network can only come at a rival's expense. Their most crucial feature, however, is that they generate positive externalities—as the network grows larger, it increases in value for each of its users. All of the treaty-hacking strategies outlined below are designed to exploit these unique structural dynamics and should be understood in this context. The strength of these strategies is that none of them require any formal amendment to the constituent treaty of an organization. They operate entirely on the basic structural level of the organization rather than with respect to its legal framework.[53]

A. *Thickening*

The first of these strategies, *thickening*, entails increasing the number of benefits member states derive from an organization by expanding the number of issue areas covered by the institution. The more numerous the benefits, the greater the relative cost of exiting the network and thus the stronger the lock-in effect. On one level this strategy may seem obvious: If you want

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51. For the important concepts of critical mass and tipping, see SCHELLING, *supra* note 45, at 98–99, 101–10. The idea of 'tipping points' was first developed by Morton Grodzins. Morton Grodzins, *Metropolitan Segregation*, 197 SCI. AM., Oct. 1957, at 33–47. This is related to the concept of 'phase transition' in physics and the study of complex systems.

52. TIM WEITZEL, ECONOMICS OF STANDARDS IN INFORMATION NETWORKS 24 (2004); *see also* RUDI BEKKERS, MOBILE TELECOMMUNICATIONS STANDARDS: GSM, UMTS, TETRA, AND ERMES 196 (2001) (Discussing self-standardization with respect to telecommunications). For the application of self-standardization induced by network effect pressures to the formation of legal order, see Bryan Druzin, *Towards a Theory of Spontaneous Legal Standardization*, 8 J. INT'L DIS. SETTLEMENT 403 (2016) (arguing that transnational legal norms evolve as a consequence of network effect pressures and increased interconnectivity).

53. The one exception here, depending on the organization in question, may be the strategy of forced incompatibility.

to keep states in an organization, increase the benefits they get from it. However, where network effects are at play, this takes on a different character: Thickening will exert a uniquely powerful impact because even the slightest increase in benefit is immediately and evenly distributed to every actor within the network. For instance, if a cell phone carrier improves its coverage, every customer of the cell phone carrier immediately receives that benefit. If a new person learns a language, every single speaker of that language instantly benefits (because they have an additional speaker with whom they can potentially communicate). If a small city repaves its network of roads, all of the city's drivers will benefit (assuming they all equally use the road system). If one person in a small community is vaccinated for a highly contagious virus, all of the people in that network instantly benefit because their odds of contracting that virus decrease.

This 'equality of benefit' is not guaranteed in the case of organizational structures that do not generate strong network effects. Take, for example, a company that has a windfall of additional revenue, which it decides to distribute in the form of salary increases. This is an excludable, rivalrous good (i.e., it can be distributed unequally and consumption by one consumer prevents simultaneous consumption by other consumers). If the company decides to give the entire additional revenue to its CEO as a giant bonus, this will not increase the organization's lock-in effect.[54] Where network effects are present, however, this is not possible: Every user of the network immediately shares in the benefit.[55] The benefit is largely non-excludable and non-rivalrous. This is a core difference: This renders organizations that produce network effects more responsive to thickening because they more effectively lock in all of their member states equally.[56]

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54. Indeed, in the case of many organizations, intra-organizational politics, rent-seeking, or just the basic structure of an organization (e.g. top-down vs. decentralized), often cause benefits to be allocated unequally to its members.

55. This is not to say that, in the case of organizations that generate network effects, every benefit must be distributed equally merely that, unlike the example of the CEO bonus, there will always be at least some degree of additional distribution because of the inherently non-excludable and non-rivalrous nature of network-effect generated benefits. For instance, some of the examples cited above (namely the road paving and vaccination examples) may also involve a certain unequal distribution of benefit in addition to the benefit gleaned by each network member: Some drivers may own Ferraris that benefit more from smoothly repaved roads, and particularly vulnerable demographics, such as the elderly and immunocompromised, may benefit more from suppressing a virus's transmissibility within a community. The point here is simply that, unlike with the example of the CEO bonus, network effects guarantee that there will always be some degree of 'benefit spillover.'

56. The idea of thickening should not be confused with, for example, the idea of spillover in the neofunctionalist theory of regional integration (or the concept of complex interdependence in international relations theory), which is superficially similar. This is because thickening has a unique impact where network effects are at play. On the idea of spill-over, see ERNST B. HAAS, THE UNITING OF EUROPE: POLITICAL, SOCIAL, AND ECONOMIC FORCES, 1950-1957 (1958). For the foundational work on complex interdependence, see ROBERT

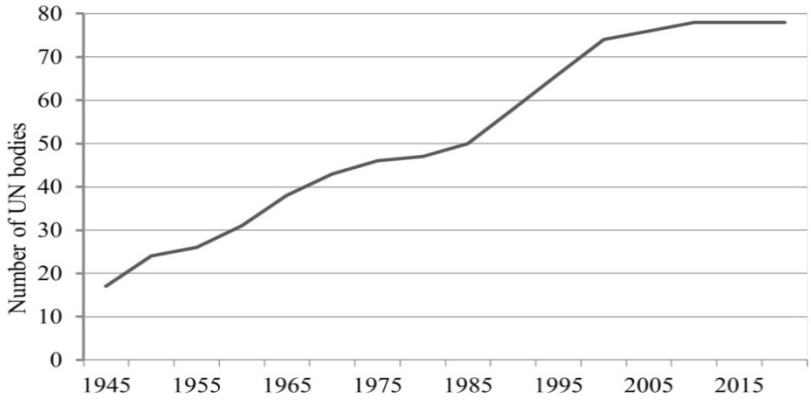
A great example of thickening (as a deliberate strategy or not) is the UN's incremental expansion through the creation of new agencies or the incorporation of existing organizations as specialized agencies into the UN System. In the case of the UN, thickening has occurred gradually over three-quarters of a century. Specialized agencies, such as the World Bank Group ("WBG") established in 1944, the World Health Organization ("WHO") established in 1948, the International Atomic Energy Agency ("IAEA") formed in 1957, the World Intellectual Property Organization ("WIPO") established in 1967, and the United Nations Industrial Development Organization ("UNIDO") founded (as a specialized agency) in 1985, intensified the UN's lock-in effect by multiplying the benefits of UN membership while raising the costs of remaining outside of the UN system. Although not every UN member directly participates in its many sub-agencies, the UN system as a whole is indirectly strengthened as its web of intra-institutional arrangements grows—that is, as the UN system thickens.[57] This expansion progressively increased the UN's lock-in effect. Today the UN system generates massive network effect pressures and, as a result, exerts an intense lock-in effect. Any nation wishing to withdraw from its institutional arrangement would face a heavy cost in doing so. The UN system is fairly robust as a consequence.

Figure 2. The figure below shows the gradual 'thickening' of the UN since its inception. It shows the total annual number of the UN's secretariat offices and departments and its major programs and specialized agencies (as well as related sub-organizations) added to the UN's six principal organs in each year. The UN system grew more than fourfold between 1945 and 2020.[58]

KEOHANE & JOSEPH NYE, POWER AND INTERDEPENDENCE: WORLD POLITICS IN TRANSITION (1977).

57. A situation in which an actor gains benefit indirectly from network growth is known in the literature as an indirect network effect. For example, every new Tesla owner in Oslo creates the impetus to build more charging stations in the city, which then indirectly benefits every other Tesla owner in the Oslo area. For a more expansive explanation of the distinction between direct and indirect network effects, see *Buying Commercial Law*, *supra* note 21, at 149–53; Katz & Shapiro, *supra* note 5, at 424; *see also* Lemley & McGowan, *supra* note 21, at 488–94 (distinguishing between what they term 'actual networks' and 'virtual networks').

58. Note that this is not an exhaustive list. *Funds, Programmes, Specialized Agencies, and Others*, UNITED NATIONS, https://www.un.org/en/sections/about-un/funds-programmes-specialized-agencies-and-others/index.html (last visited Oct. 13, 2020).



As an organization thickens, member states become progressively more committed to the institution because the relative price of leaving it grows higher with each new benefit created. John Ikenberry notes this lock-in effect (although he is referring to institutions *à la* North),: as "more of their activities are hooked into the institution and its operations. . .[agents] have a stake—or a vested interest—in the continuation of the institution."[59] The result is that the "costs of disruption or change in the institutions grow over time."[60] Thus, as benefits proliferate, it becomes more difficult for states to reduce or abandon their commitments to the organization.

The evolution of the EU from a rudimentary customs union, focused simply on issues of industrial production, to an organizational arrangement of ever-increasing economic, legal, and political complexity is another excellent example of thickening.

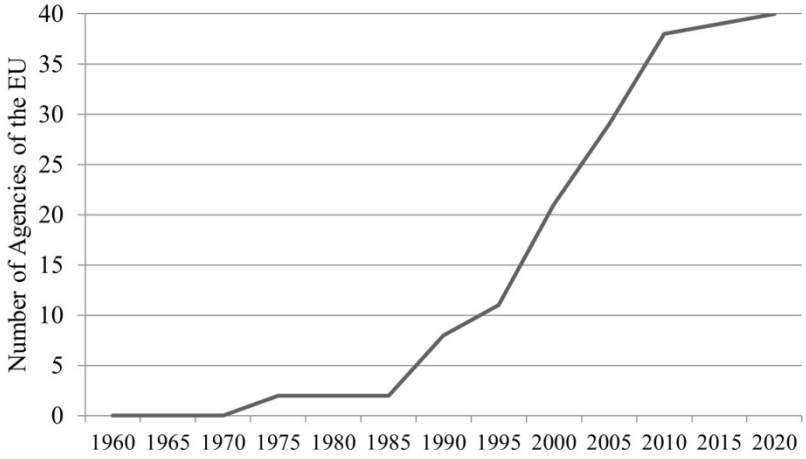
Figure 3. The figure below shows the rapid growth of the agencies of the eu (decentralized bodies that targeta broad range of specific issue areas from intellectual property to aviation safety). Note that the chart includes two proposed agencies for 2020 and 2021 respectively: the European Public Prosecutor's Office ("EPPO") and the European Union Agency for the Space Programme ("EUSPA").[61]

59. JOHN IKENBERRY, AFTER VICTORY: INSTITUTIONS, STRATEGIC RESTRAINT, AND THE REBUILDING OF ORDER AFTER MAJOR WARS 70 (Princeton Univ. Press new ed. 2019).

60. *Id*.

61. *Agencies and Other EU Bodies*, EUR. UNION, https://europa.eu/23uropean-union/about-eu/agencies_en (last visited Feb. 20, 2020).

FIGURE 3



Although the overall institutional strength of the European project remains the subject of perennial speculation, what is certain is that the broadening of the union and the deepening of its political, cultural, and economic ties has made the EU more cohesive than it would have otherwise been. This is not, however, to suggest that thickening renders exit from a network impossible. Clearly, the case of Brexit demonstrates otherwise. However, the fact that the U.K.'s withdrawal from the EU is the cause of such enormous economic and socio-political upheaval illustrates the binding effect of thickening. Had the U.K. joined the European Economic Community ("EEC") in 1958 and left it a few years later, it would have hardly registered as an event of such historic import as the U.K. leaving the EU in 2020. Likewise, if the EU project continues for another sixty years, the ability of the U.K. to successfully decouple itself from the union would have, undoubtedly, only further diminished.[62]

It is not always realistic—indeed it is sometimes impossible—to augment the benefit actors glean from an organization. However, it is usually possible to increase the *number* of benefits on offer by broadening the range of issue areas the organization addresses. While the approach conforms bet-

62. The fact that Brexit was decided through a popular referendum directly by British voters (the vast majority of whom were likely unfamiliar with the multifaceted and fine-grained nuances of the network benefits provided by EU membership) also cannot be overlooked. Had the question been left to policymakers and technocrats, it would have been, I submit, exceedingly unlikely that the decision would have favored leaving the EU. A plebiscite uniquely allows for influences unrelated to a rational and unified assessment of network benefit, such as economic anxieties, nationalist fervor, and populist sentiment, to enter the conversation and hold sway. The treaty-hacking strategies put forward here assume a model in which an institution's network benefit is clearly assessed so that nations can act on their strategic interests. The influence of popular opinion over national policies may at times subvert this process.

ter to some international organizations than others, it can be applied to most organizations to some degree.

B. *Status Management*

A second strategy policymakers may employ to strengthen network lock-in involves curating an organization's member states *vis-à-vis* their status. This strategy is uniquely effective in the case of network effect markets because such markets are particularly prone to tipping and sudden bandwagons.[63] International organizations are highly vulnerable to bandwagoning behavior because the value of an organization for each of its member states depends on the participation of other member states. The exit of a member state from an organization instantly reduces the organization's value for all of its remaining members, which may in turn cause others to follow suit in a self-reinforcing manner, creating a 'jumping ship' effect and sparking a death spiral towards collapse.[64] The choices of high-status states are thus especially consequential because their impact in this regard is far greater than low-status states.

This operates in two dimensions. The first is in terms of the substantive benefits that high-status states bring to an organization. The second is the effect they have on collective perceptions. The latter is, in fact, often the more important of the two because, while the substantive impact of high-status states is not always clear or possible to quantify correctly, perceptions are constantly at work whether they are accurate or not. Thus, in network effect markets, perceptions matter.[65] The loss of a high-status member can shatter collective confidence in an organization, triggering a dynamic of self-confirming expectations. To use Thomas Schelling's bank-run example: If people believe that a bank is on the verge of insolvency, they will hurry to withdraw their money, creating the very insolvency they fear.[66] Indeed, it might be the case that the greater threat to the EU posed by Brexit is not the material loss the U.K.'s exit represents to the EU, but rather its effect on collective perceptions regarding the EU's stability going forward.[67]

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63. 'Tipping' occurs when a system lurches to a new equilibrium in a sudden and punctuated fashion. For the concept of tipping, see SCHELLING, *supra* note 45, at 92–94, 98–99.

64. I have written elsewhere on the impact of collective expectations on treaty stability, specifically in the case of Multilateral Environmental Agreements ("MEAs"). *See* Bryan Druzin, *The Parched Earth of Cooperation: How to Solve the Tragedy of the Commons in International Environmental Governance*, 27 DUKE J. COMPAR. & INT'L L. 73, 96 (2016). I draw from that article here.

65. *See generally* Joseph Farrell & Paul Klemperer, *Coordination and Lock-in: Competition with Switching Costs and Network Effects, in* 3 HANDBOOK OF INDUSTRIAL ORGANIZATION 1967, 2021–27 (M. Armstrong & R. Porter eds., 2007).

66. I am paraphrasing Schelling here. *See* SCHELLING, *supra* note 45, at 117.

67. Brexit, however, has arguably demonstrated the overall robustness of the EU's network effect pressure. When the U.K. voted to leave the EU many feared it marked the beginning of its demise. Analysts predicted that the U.K.'s exit was "the first in a series of dom-

Organizations that require collective action or are threatened by free-riding, such as MEAs, are particularly sensitive to the participation of high-status states. For instance, the United States' failure to ratify the Kyoto Protocol impaired the treaty's cohesion: It arguably caused Canada to later withdraw, which effectively crippled the treaty. Notably, the United States' withdrawal was itself a response to perceived free-riding by high-status polluters such as China and India. Although it did not formally collapse, the Kyoto Protocol was so weakened that the international community was forced to negotiate the Paris Agreement in 2015.[68] However, the United States' signaled withdrawal from the Paris Agreement in 2017 profoundly weakened the agreement and may prove to be fatal. In the wake of the loss of such a high-status state, the perception that other states' commitment to the agreement might now also be flagging may enervate compliance, becoming a self-fulfilling prophecy, as states adapt their "actions in light of our expectations about the actions of others."[69] This is often the case with international organizations that produce a public good and so possess an all-or-none flavor. If, however, instead of the United States, Kenya withdrew from the Paris Agreement, it would hardly raise a stir. After all, it is but one country of 195. The United States, however, is an extremely high-status player (chiefly because it is the world's second greatest producer of carbon emissions), thus its impending exit has undercut the agreement and thrown its viability into question.

Collective security organizations are also excellent examples of public goods problems. They are highly sensitive to free-riding and can thus collapse as a result of changes in collective expectations. The failure of the LN is perhaps the paradigmatic example. While the organization achieved a healthy degree of market consolidation (at its greatest extent, between 1934 and 1935, it comprised fifty-eight countries of a seventy-seven-country system), the LN was profoundly fragile.[70] Key high-status powers never joined the LN (namely the United States) or did not sufficiently overlap in their periods of membership, which undermined the LN's credibility. It did not take much to shatter the organization's cohesion. The withdrawal of two high-status states in 1933—Japan and Germany—sent the LN into a tailspin and

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inoes to fall and spoke of a possible "Frexit," "Nexit" and "Swexit." Frank Langfitt, *Here's Why Brexit Wasn't Followed by Frexit, Swexit, or Nexit*, NAT'L PUB. RADIO, Apr 26, 2019, https://www.npr.org/2019/04/26/715926169/heres-why-brexit-wasnt-followed-by-frexit-swexit-or-nexit. This, however, never materialized. Battered by Brexit, a global pandemic, and strong economic headwinds, the EU remains very much intact. See also infra note 105 and accompanying text.

68. *See* Robert C. Stowe, *Differentiation, Financial Support, and the Paris Climate Talks*, HARVARD KENNEDY SCH. BELFER CTR. FOR SCI. & INT'L AFFS.: ANALYSIS & OPS. (Nov. 12, 2015), https://www.belfercenter.org/publication/differentiation-financial-support-and-paris-climate-talks.

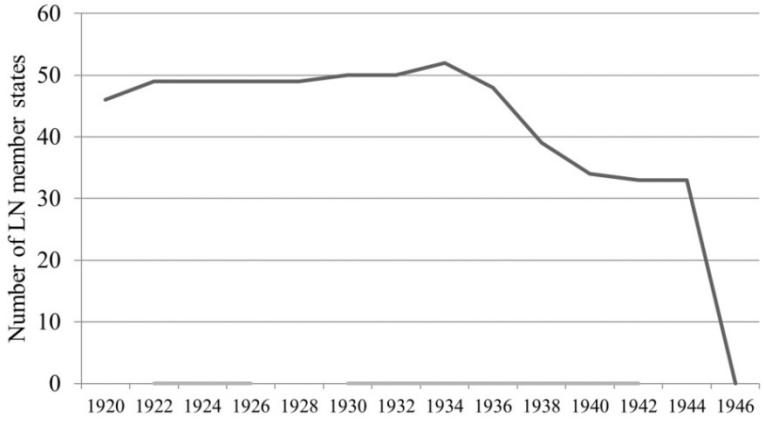
69. *Increasing Returns*, *supra* note 21, at 254.

70. *See* ANIQUE H.M. VAN GINNEKEN, HISTORICAL DICTIONARY OF THE LEAGUE OF NATIONS 217–18 (2006).

hurled it towards collapse.[71] Japan and Germany were especially high-status members because they were belligerent states. Their exit weakened the LN's collective strength. However, more crucially, as aggressive states standing outside of the League and thus representing potential military challenges to the organization, their withdrawal eroded member states' confidence in the LN's ability to maintain its cohesion in the face of potential aggression. As a result, their exit sparked a cascade of withdrawals that cripcrippled the LN's ability to function. Most of these fleeing countries were not militarily significant.[72] However, their exit undermined collective confidence in the organization—the damage was done on the level of collective perceptions and expectations.

Figure 4. The figure below shows the gradual collapse of the ln beginning soon after japan and germany's withdrawal. the ln was finally dissolved in 1946 (represented by the sudden plunge to zero depicted at its tail).[73]

FIGURE 4



After failing to adequately confront aggression in 1935 and 1936, by 1937, the LN could not muster any meaningful international support to oppose the full-scale Japanese invasion of China. The LN simply lacked credibility. Agreements without third-party coercion only have as much power as the parties to the agreement believe they do—no more and no less. By 1937, no one believed the LN still had collective support; it therefore did not have collective support. The LN then limped along, weakened and ineffectual,

71. *Id.*

72. Member states withdrew in the following order by year (note that countries annexed by the Axis powers are omitted from this list): Paraguay (1935); Guatemala (1936); Honduras (1936); Nicaragua (1936); El Salvador (1937); Italy (1937); Chile (1938); Venezuela (1938); Peru (1939); Thailand (1939); Spain (1939); Hungary (1939); Haiti (1942). *See Id.*

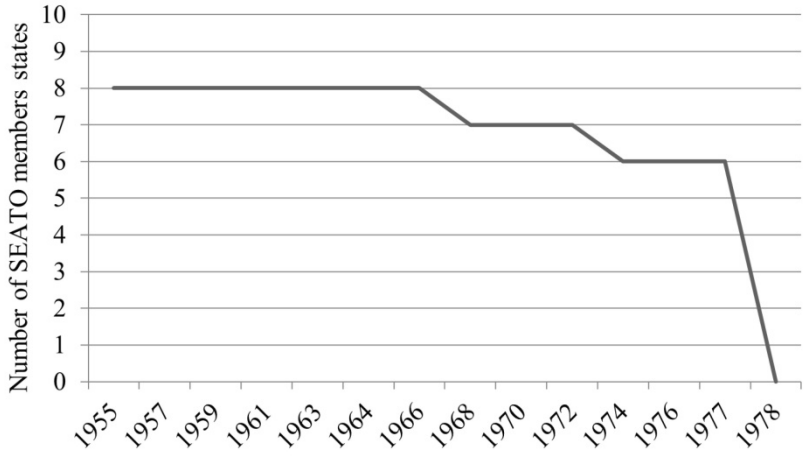
73. *Id.*

until its official dissolution in 1946. The LN's collapse illustrates in dramatic fashion the significance of high-status states in maintaining an international organization's cohesion.

The collapse of the Southeast Asia Treaty Organization ("SEATO"), also a collective security organization, is another (albeit less consequential) example. Formed in 1954 to counter the expansion of communism in South East Asia, it comprised eight states: the United States, France, the U.K., New Zealand, Australia, the Philippines, Thailand and Pakistan. Pakistan exited SEATO in 1968 (formally in 1973) and France suspended all support in 1975 (although it did not formally leave).[74] With the alliance's cohesion seriously weakened, the ceasing of hostilities in Vietnam was sufficient to cause an already fragile SEATO to completely unravel by 1977.[75] SEATO illustrates how states can have high-status simply because a network is small. In this case, Pakistan's participation proved significant because it was one of only eight member states.

Figure 5. The figure below shows the collapse of the Southeast Asia treaty organization ("SEATO").[76]

FIGURE 5



While the loss of a high-status state can spark a death spiral towards collapse, the participation of high-status states may strengthen an organization. The inclusion of these states triggers a positive bandwagon in which

74. RICHARD J. SAMUELS, *Southeast Asia Treaty Organization (SEATO)*, *in* ENCYCLOPEDIA OF UNITED STATES NATIONAL SECURITY 662, 662 (2005).

75. *Southeast Asia Treaty Organization (SEATO), 1954*,, STATE DEP'T: OFF. OF THE HISTORIAN, https://history.state.gov/milestones/1953-1960/seato (last visited Feb. 18, 2020).

76. DAMIEN FENTON, TO CAGE THE RED DRAGON: SEATO AND THE DEFENCE OF SOUTHEAST ASIA 1955–1965 230–49 (2012).

states, perceiving the institution as having grown more robust, join or, if they are already members, cling even tighter to the organization. Either way—positive or negative—high-status members boast an outsized impact. Policymakers can shape the collective expectations surrounding an organization by strategically acquiring or maintaining these actors as members. This may prove particularly effective in situations of institutional competition in which actors must choose between organizations. In such situations, as in any game with multiple equilibria, curating public perceptions is often decisive in 'tipping' a market.[77]

A good example of market tipping is the institutional rivalry between the European Free Trade Association ("EFTA") and the European Economic Community ("EEC"). During the 1960s, EFTA and the EEC (which would eventually evolve into the EU) were the two dominant trade blocs of Western Europe.[78] Seven states, Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the U.K. (later joined by Finland, Iceland and Liechtenstein), made up EFTA while six other European states, France, West Germany, Italy, Belgium, Netherlands, and Luxembourg, comprised the EEC. In 1973 the U.K., a high-status state, withdrew from EFTA and joined the EEC. This caused the market to tip. It sparked an exodus from EFTA and a subsequent strengthening of the EEC.[79] EFTA represented a block of holdout economies that was impeding larger European integration, the most significant among these being the U.K.[80] The U.K.'s jump to the EEC diminished the economic importance of this block of 'holdouts' while simultaneously increasing the economic power of the EEC. This allowed the EEC to gain a critical mass that secured its eventual dominance over its diminished institutional competitor. While not the sole cause of the EEC's triumph over EFTA, the U.K.'s defection from EFTA to the EEC in 1973 played a pivotal role.

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77. William H. Page & John E. Lopatka, *Network Externalities, in* ENCYCLOPEDIA OF LAW AND ECONOMICS 952, 960 (Boudwijn Bouckaert, & Gerrit DeGeest eds., 2000).

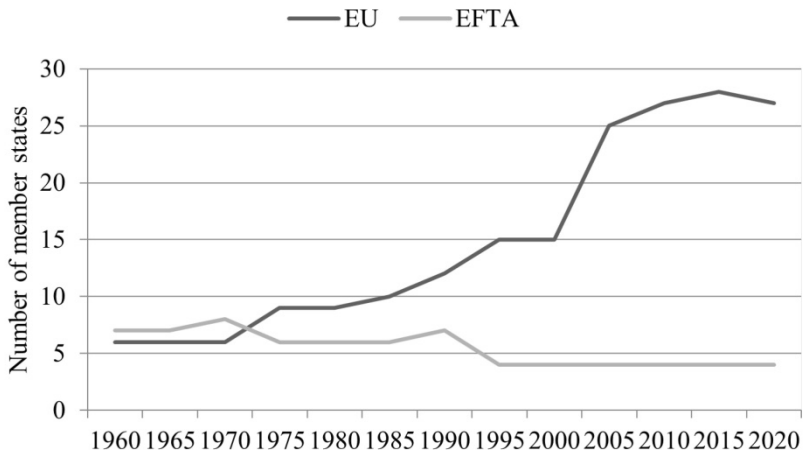
78. The European Economic Community ("EEC") and the European Free Trade Association ("EFTA") represented two competing visions of European economic cooperation. Unlike the EEC, EFTA was never designed for European integration—EFTA offered an alternative model, seeing the path for European economic cooperation as a free trade zone rather than as a customs union that would require states to trade in sovereignty for market access to the broader European market.

79. Because their economies were so interlinked, Denmark, Ireland, and Norway applied together with the U.K., seeing it as necessary to also join the EEC if the U.K. did (Norway ended up rejecting EU membership in a 1994 referendum). *See* ALLAN F. TATHAM, ENLARGEMENT OF THE EUROPEAN UNION 7 (2009).

80. This was because the U.K. was the economic powerhouse of EFTA with by far the largest economy. In 1970, the nominal Gross Domestic Product ("GDP") (in current US Dollars these seven EFTA states were: Portugal ($8.1 billion), Norway ($12.8 billion), Austria ($15.3 billion), Denmark ($17 billion), Switzerland ($24.2 billion), Sweden ($38 billion), and the UK ($130.6 billion). *See GDP (Current US$) (1960-1970)*, THE WORLD BANK, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=1970&start=1960 (last visited Feb. 20, 2020).

Figure 6. The figure below shows the expansion of the EU (including all of its earlier institutional predecessors) and the institutional decline of efta in terms of number of member states. while there were many factors at play, the U.K.'s exit from efta and subsequent ascension to the EEC was a key tipping point in substantive terms (i.e., the economic significance of the U.K. economy) as well in terms of collective expectations.[81]

FIGURE 6



In cases that involve a critical mass dynamic—as was the case with EFTA and the EU—the behavior of high-status states may be a matter of life or death for an organization. International organizations often exhibit a point at which a threshold is passed and the system suddenly 'tips' with states either flocking into the organization or abandoning it *en masse*.[82] Multiple conflicting institutions cannot coexist indefinitely. Competing institutions can persist for some time, but if there is sufficient interconnection and

81. *EFTA Through the Years*, EUR. FREE TRADE ASS'N, https://www.efta.int/About-EFTA/EFTA-through-years-747 (last visited Feb 20, 2020); *The History of the European Union*, EUR. UNION, https://europa.eu/european-union/about-eu/history_en (last visited Feb 20, 2020).

82. For the application of tipping and thresholds to treaties, see SCOTT BARRETT, ENVIRONMENT AND STATECRAFT: THE STRATEGY OF ENVIRONMENTAL TREATY-MAKING: THE STRATEGY OF ENVIRONMENTAL TREATY-MAKING 254–68 (2003) (arguing that there is a threshold minimum participation level to multilateral treaties that, once reached, shifts the underlying game structure so that it pays for all non-participating states to suddenly participate). High-status states can help a treaty reach this critical mass threshold at which remaining non-member states will flock to the organization.

the ability for agents to switch, the market will eventually tip decisively in the direction of one institution over its rival or rivals.[83]

C. *Network Enlargement*

The third strategy policymakers may employ to intensify an organization's lock-in effect, *network enlargement*, is increasing an organization's number of member states. Although there are exceptions, the benefits provided by an organization with strong network effects grow as its network grows. This is not always the case with other forms of organization. While languages increase in value as numbers grow, lifeboats, for example, do not. In the case of some organizations, expansion will produce both benefits and disadvantages (e.g., expanding NATO will produce greater collective hard power but there is the downside of having to commit to the defense of an additional country and all of the potential pitfalls that come with that).[84] In other cases, however, the benefit that flows from enlargement just keeps on increasing as the network grows without any substantial downside.[85] Organizations that exhibit network effects are uniquely receptive to network enlargement because so much of their value flows directly from their network size—the bigger the network, the bigger its benefit. In international organizations with strong network effects, network enlargement is therefore an extremely effective way to increase an organization's benefits and thus intensify its lock-in effect.[86]

The EU is a case study in network enlargement. As the EU grew from six members in the early 1970s to fifteen in the 1990s, and then to twenty-eight states (now twenty-seven), so too did its economic significance and, thus, its lock-in effect.

Figure 7. The chart below shows the aggregate nominal gross domestic product ("GDP") of the EU (This includes the EU's institutional precursors, the EEC and the EC) and the EU's founding member states' combined

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83. David Dranove & Neil Gandal, *Surviving a Standards War: Lessons Learned from the Life and Death of DIVX, in* ADVANCES IN THE ECONOMICS OF INFORMATION SYSTEMS 1, 1–14 (Kerem Tomak ed., 2005).

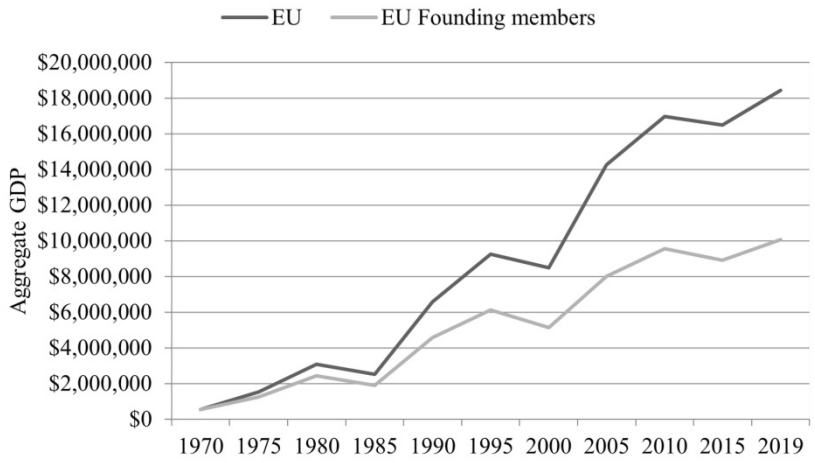
84. In the case of NATO's expansion since the end of the Cold War, there was no significant downside to network enlargement as any viable military threat was minimal. Hence, the decision to expand was made much easier than it was during the Cold War.

85. The positive externalities of NATO's enlargement are discussed in the section that immediately follows with respect to the strategy of member stuffing.

86. There is empirical support for the contention that a larger more heterogeneous membership is associated with greater organizational survivability. For work supporting this claim, see Mette Eilstrup-Sangiovanni, *Death of International Organizations. The Organizational Ecology of Intergovernmental Organizations, 1815–2015,* REV. INT'L ORGS. (2018) (employing a dataset coding detailed information on all IGOs created since 1815 to analyze why many collapse).

GDP. GDP is used here from among the many possible indicators of network lock-in as economic benefit is central to the EU.[87]

FIGURE 7



Organizations whose primary benefit to their members is that they facilitate coordination will be particularly responsive to this approach because an increase in network size allows states to coordinate with a larger number of other states. This is captured in our example of language: The more people who speak a language, the more useful it becomes because there are more speakers with whom one can communicate.[88] However, any organization whose benefits increase as its membership grows will be receptive to this strategy.

Network enlargement may also advantage an organization because it impedes institutional competition. The society of nations is a finite system with a limited number of state actors (only 195).[89] This creates a zero-sum

87. *GDP (current US$) – European Union (1960-present*), THE WORLD BANK, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2018&locations=EU&start=1960 (last visited Feb 20, 2020). Note that this is in 2019 US dollars. Also, Germany is not included until 1970 (as data on pre-1970 West Germany is unreliable).

88. This assumes an agent is not limited in those with whom she wishes to communicate.

89. This figure is based upon the US Department of State's count of independent states. *See Independent States in the World*, U.S. DEP'T OF STATE, https://www.state.gov/independent-states-in-the-world/ (last visited Feb 20, 2020). Counts vary, however, depending on classification and politics. The UN, for instance, recognizes 193 states in the international system with two UN observer states (the Holy See and the State of Palestine). If the count is extended to include political entities with partial recognition from the UN (i.e. Taiwan, Western Sahara, Kosovo, South Ossetia, Abkhazia, and Northern Cyprus) the total num-

game in most cases: As an organization's market share increases, by definition, fewer non-member states remain in the system. This shrinks the pool of potential members available to a rival organization and exacerbates the start-up problem discussed earlier.[90] If non-member states represent a minority, it will be difficult for a new organization to challenge an incumbent organization to which the majority of the international system belongs.[91] If the incumbent enjoys total market share, short of some powerful exogenous shock, it will be extremely difficult for an upstart organization to gain traction. States are locked into the incumbent both by the benefit it provides and the potential loss of that benefit should a state abandon the dominant organization and switch to the replacement.

When weighing the effectiveness of network enlargement, one important consideration is how much of the market remains to be consolidated. For example, expanding WTO membership from its current count of 164 states will not dramatically intensify the WTO's lock-in effect simply because there are not many states left in the international system to join. Network expansion was far more crucial in 1947 for WTO's institutional precursor, the General Agreement on Tariffs and Trade ("GATT"), which was established with only twenty-three member states,[92] than it is today for the WTO, which comprises the majority of states in the international system (and every significant national economy).[93]

Figure 8. The figure below shows the nine trade rounds of the GATT/WTO by number of member states. the chart shows that network enlargement was a useful strategy throughout most of the GATT's evolution since WWII but that the usefulness of network enlargement disappeared by the early 2000s (simply because the trade organization had succeeded in consolidating the 195-state market).[94]

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ber is 201. *See Member States*, U.N., https://www.un.org/en/member-states/ (last visited Oct. 4, 2020).

90. Institutional rivalry will likely arise wherever there is substantial similarity between two or more international organizations in terms of their primary objectives and purpose. Their specific form and function, however, need not be wholly identical for rivalry to take root. For instance, while the Warsaw Pact and NATO differed considerably in many respects, because their primary objectives were the same (and because they dealt with an issue of such import), intense institutional rivalry emerged.

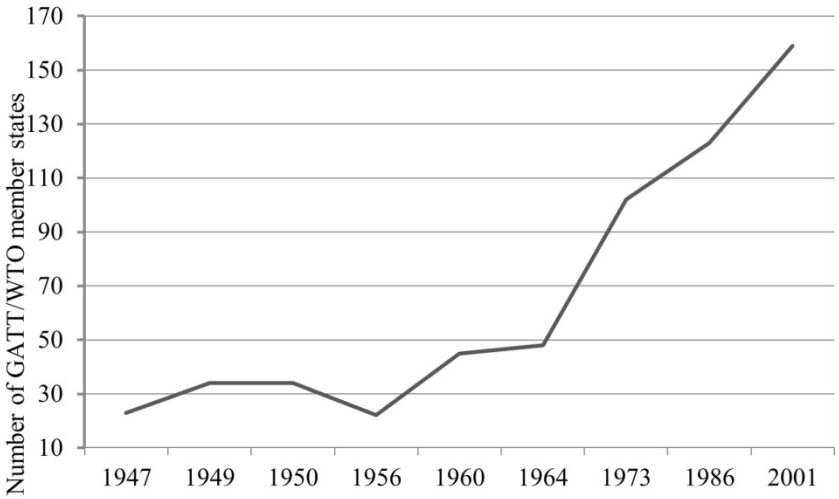
91. I have discussed the start-up problem in relation to international institutions, specifically ICSID, elsewhere. *See, e.g.,* Bjorklund & Druzin*, supra* note 14, at 707.

92. *Understanding the WTO*, WORLD TRADE ORG., https://www.wto.org/English /thewto_e/whatis_e/tif_e/tif_e.htm (last visited Feb 20, 2020).

93. *Id.*

94. *Id.*

FIGURE 8



The strategy of network enlargement should also be applied judiciously. This is because in some instances, over-expansion may undermine an organization's stability. For instance (to take an exaggerated example), if the EU were to suddenly fling open membership to all fifty-four African states, this would certainly weaken the EU (indeed, it would likely lead to its collapse). The mind reels at the variables involved: political and economic forces, cultural heterogeneity, security considerations, etc. In such scenarios, network enlargement will strengthen an organization but start yielding diminishing returns beyond a certain threshold, rendering network enlargement a very effective strategy but only to a specific level of expansion.[95]

With respect to most organizations, however, network expansion will be continually beneficial. This is particularly the case, for instance, where free-riding is a problem, such as with MEAs or environmental organizations that address public goods and require significant upfront sacrifice. Non-member states free-riding off of member states' efforts may destabilize an MEA. As their membership increases, however, MEAs strengthen because

95. This is, at least partially, why the EU's enlargement policy is so stringent. The key criteria for accession to the EU (the 'Copenhagen criteria') are having "stable institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities; a functioning market economy and the capacity to cope with competition and market forces in the EU; the ability to take on and implement effectively the obligations of membership, including adherence to the aims of political, economic and monetary union." Candidates, however, must also adopt and implement all of the current EU rules, which are "divided into 35 different policy fields (chapters), such as transport, energy, environment, etc., each of which is negotiated separately." *See European Neighborhood Policy And Enlargement Negotiations*, EUROPEAN COMM'N, https://ec.europa.eu/neighbourhood-enlargement/policy/conditions-membership_en.

the pool of free-riding states shrinks commensurate with the network's enlargement. For instance, the network effect pressure of the Global Environment Facility ("GEF"), which boasts a sizeable market share of 183 member states,[96] would only increase if the remaining states in the international system (who are currently free-riding) joined the fund.

Network enlargement, however, may not always be feasible—particularly when the organization is already faltering (it is difficult to attract new investors to a failing business). As a practical matter, therefore, it may be more prudent for policymakers to pursue this strategy while an organization is viewed as stable. Moreover, policymakers may need to consider variables such as when to expand, the rate of expansion, and which states to target as members (e.g., high-status states). Depending upon the organization in question, these variables may prove pivotal. While network enlargement will not translate into an increase in network lock-in in each and every case, as a general rule, the larger the network's size, the reliably more robust the organization's network effect pressure will be.

D. *Member Stuffing*

The fourth strategy is really a subset of network enlargement. It is a kind of targeted network enlargement in which relatively minor states are brought into the organization that, once incorporated, are more likely to become steadfast members because they are less important players. This can be a very effective strategy for the same reason thickening is effective—network effect benefits are evenly distributed to all users of the network regardless of individual input. (Recall the example of language: With each new person that learns a language, every speaker of that language instantly benefits.) This equality of benefit creates a dynamic in which minor states derive benefit from membership disproportionate to their contribution and this has the effect of deeply locking them into the organization.

Montenegro, for example, is a very enthusiastic member of NATO and is unlikely to leave the security organization. Likewise, it is highly unlikely that Latvia will exit the EU any time soon. This is because both Montenegro and Latvia derive far more benefit than they contribute.[97] A large influx of minor members will thus increase the average lock-in effect for an organiza-

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96. *See Organization,* GLOB. ENV'T FACILITY, https://www.thegef.org/about/organization (last visited Oct. 12, 2020).

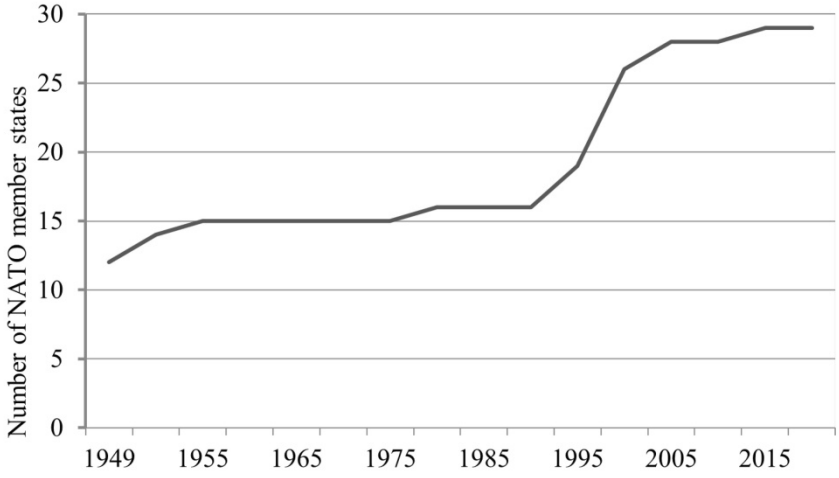
97. In the case of NATO, for instance, Montenegro's 2019 total military spending was $89.3 million (constant (2018) US Dollars). *See SIPRI Military Expenditure Database*, STOCKHOLM INT'L PEACE RSCH. CTR., https://www.sipri.org/databases/milex. The total military spending of NATO, the defensive umbrella to which Montenegro, as a NATO member, has complete access, was over 1 trillion US$ in 2019. *See* NAN TIAN, ALEXANDRA KUIMOVA, DIEGO LOPES DA SILVA, PIETER D. WEZEMAN & SIEMON T. WEZEMAN, TRENDS IN WORLD MILITARY EXPENDITURE, 2019 4 (2020).

tion.[98] International organizations can exploit this dynamic and adopt a strategy of *member stuffing* to intensify the institution's lock-in effect. Intentionally or not, this is precisely what both NATO and the EU did and it greatly strengthened their organizational cohesion.

Consider the case of NATO. At the end of the Cold War many member states were questioning the purpose of NATO given that its chief strategic adversary, the Soviet Union, no longer existed. What was NATO's response? NATO responded with rapid network enlargement.

Figure 9. The figure below shows NATO's network enlargement since its inception. Note the surge in membership during the 1990s after the fall of the Soviet Union.[99]

FIGURE 9



98. Crucially, the addition of these states will not create a free-rider problem where network effects are involved because network effects generate positive externalities—i.e., the addition of Montenegro to NATO only increases the aggregate deterrence effect of NATO for all of its member states. As already discussed, while there may be disadvantages to over-expansion—e.g., over-expanding NATO may have negative geopolitical repercussions—this is unrelated to the network benefit itself. In the case of the network benefit, network enlargement will just generate added value. This is the unique nature of positive externalities—bigger is almost always better.

99. *NATO Status Lists*, U.S. DEP'T OF STATE, https://www.state.gov/north-atlantic-treaty (last visited Feb 12, 2020).

This was a simple strategy that did not require any amendment to NATO's constituent treaty, the North Atlantic Treaty, and it was extremely effective. As an organization, NATO successfully weathered this period of uncertainty, justifying its continued existence by reinventing itself as a security organization overseeing an assortment of humanitarian assistance and security activities stretching beyond the borders of Europe.[100] All of the states that joined NATO after the Cold War were minor states and thus highly invested in the survival of the organization.[101] This helped strengthen NATO during this period of existential uncertainty. These states are intensely locked into the security agreement because they get far more than they give—while their contribution is relatively small they reap the entire security benefit of NATO.

The EU has also engaged in member stuffing. EU member states who are relatively minor contributors to the EU but who reap many of the economic union's institutional benefits are the most deeply locked in because the EU offers so much relative value. As in the case of NATO's expansion, the EU's rapid enlargement in the 2000s, which consisted of relatively minor national economies, helped strengthen the union by bringing in a raft of states deeply committed to the European project.[102]

Figure 10. The figure below shows the enlargement of the EU. Note the sudden jump in the 2000s.[103]

100. This was quite an accomplishment considering a 2010 study by the Brookings Institution concludes that approximately two-thirds of all collective security alliances in history "have dissolved due to the elimination of its principal threat (or being vanquished by it)." *See* COLONEL PATRICK T. WARREN, ALLIANCE HISTORY AND THE FUTURE NATO: WHAT THE LAST 500 YEARS OF ALLIANCE BEHAVIOR TELLS US ABOUT NATO'S PATH FORWARD 5 (2010).

101. By chronological order of accession, these states are: Czechia, Slovenia, Slovakia, Romania, Lithuania, Latvia, Estonia, Bulgaria, Albania, Montenegro. *See A Short History of NATO*, NORTH ATLANTIC TREATY ORG. https://www.nato.int/cps/en/natohq/declassified_139339.htm (last visited Oct. 4, 2020).

102. By chronological order of accession, these member states were: Cyprus (2004), the Czech Republic (2004), Estonia (2004), Hungary (2004), Latvia (2004), Lithuania (2004), Malta (2004), Poland (2004), Slovakia (2004), Slovenia (2004), Bulgaria (2007), Romania (2007), Croatia (2013). Again, a careful balance had to be struck between intensifying network lock-in through member stuffing and the potential destabilizing effects of overexpansion. *See The History of the European Union*, *supra* note 81.

103. Data from: *The History of the European Union*, *supra* note 81.

FIGURE 10

In 2016, there was widespread fear in European policy circles that, because of the U.K.'s high status, Brexit would ignite a contagion effect that would cause other member states likewise to withdraw from the union. There was talk of a Frexit (France), Nexit (the Netherlands), Italeave (Italy), and so on.[104] This secessionist contagion, however, did not occur. Yet, this might have been otherwise if the EU had not swelled its ranks in the 2000s, which likely boosted the union's lock-in effect. Both NATO's rapid expansion in the 1990s and the EU's in the 2000s illustrate how member stuffing—intentional or not—can intensify an organization's overall lock-in effect by absorbing minor states that are structurally more locked into the institution and thus less likely to exit.

E. *Forced Incompatibility*

The fifth strategy policymakers may employ to intensify lock-in relates to a concept called *multi-homing*. Multi-homing occurs when users in a networked system adopt two or more services at the same time. For example, merchants who use incompatible credit card payment systems such as Visa and MasterCard are multi-homing.[105] Apple allowing users to switch between operating systems on its computers is another example of multi-homing. The ability to multi-home is significant because it frees actors from having to choose between competing networks. Released from this constraint, actors face little to no cost in switching to another network. This

104. *See* Chico Harlan, *Frexit? Italeave? After Watching Brexit, Other European Countries Say: No, Thanks,* WASH. POST (Mar. 29, 2019), https://www.washingtonpost.com/world/europe/frexit-italeave-after-watching-brexit-other-european-countries-say-no-thanks/2019/03/29/7b6e059a-4be0-11e9-8cfc-2c5d0999c21e_story.html.

105. *See* Farrell & Kemperer, *supra* note 65, at 2009, 2032, 2051.

ease of adoption weakens the lock-in effect, allowing a new service or product to gain a foothold in the market where users would otherwise be locked into the incumbent standard.

In situations where an organization is facing institutional competition, prohibiting multi-homing can help lock in members. This is a highly effective strategy in network effect markets because they are winner-take-all markets. That is, they are hyper-selective, meaning one standard will usually dominate the entire market. This strategy is effective because it not only locks users in, buttressing your network, but in doing so, it denies your competition access to your users, thus impeding their network growth.[106] This is a common business tactic commercial actors employ in network effect markets to maintain their dominant position.[107] Because so much technology has a networked structure, this strategy is widespread in such markets: Firms attempt to shore up their market position through a strategy of forced incompatibility.[108] For example, during the 1980s, Nintendo rendered unauthorized game cartridges incompatible with their gaming systems by employing a proprietary 'lock-out chip'.[109] Fast forward to the present day and technology giants still exploit the inherently networked character of their market, deploying the strategy of designed incompatibility to lock their users into their product ecosystems. It is unlikely to be an accident that, for instance, Apple watches, which are explicitly designed as an accessory to the iPhone, cannot run on android phones.

Institutional networks, in that they are networked systems, are no different, and indeed many international organizations pursue similar strategies (although not conceptualizing them in terms of network effect pressures and lock-in). For example, the Russian-led military alliance, the Collective Security Treaty Organization ("CSTO"), prohibits signatories from holding concurrent membership in other security arrangements.[110] Likewise, Article 8 of NATO may be read as establishing a similar constraint (where dual membership conflicts with a state's obligations under NATO).[111] This is forced incompatibility: States are forced to choose a network. Forced incompatibility stymies institutional competition because it shrinks the potential user base available to a rival organization, increasing barriers to entry.

Policymakers, however, must exercise caution in applying this strategy. Critical here is an organization's degree of market dominance. The strategy

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106. Katz & Shapiro, *supra* note 5, at 110, 102.

107. Katz & Shapiro, *supra* note 5, at 110, 111.

108. HANS-WERNER GOTTINGER, ECONOMIES OF NETWORK INDUSTRIES 93 (Routledge, 2003).

109. Katz & Shapiro, *supra* note 5, at 110, 112.

110. MARCEL DE HAAS, RUSSIA'S FOREIGN SECURITY POLICY IN THE 21ST CENTURY 40 (Routledge, 2010).

111. *See* North Atlantic Treaty art. 8, Apr. 4, 1949, 63 Stat. 2241, 34 U.N.T.S. 243 ("Each Party . . . undertakes not to enter into any international engagement in conflict with this Treaty.").

is effective where the organization already enjoys a substantial degree of market share. In such cases, unable to multi-home, members will be forced to a decision and, if all else is equal, will choose to remain in the incumbent organization. In situations where this is not the case, however, prohibiting multi-homing can produce the opposite effect—put to a decision, members may abandon an organization and flock to the more robust network. For instance, an organization like NATO is in a strategic market position to prohibit multi-homing. This, however, is not as clear in the case of the CSTO. Indeed, since its formation, roughly a quarter of CSTO members have exited the security agreement[112] while no country has ever left NATO in the treaty's 71-year history.[113] In other cases, allowing member states to multi-home may be in the interest of an international organization either because it will not erode lock-in effect or because it will help the organization gain market share if it is struggling to do so.

F. *Increasing Coordinating Standards*

A final strategy policymakers may pursue to increase lock-in effects is to deliberately embed coordinating standards into an organization. This may not be possible in many cases. However, where an international organization is amenable to the approach, its lock-in effect may be substantially increased through this strategy. So long as some benefit is gleaned from coordination, then the introduction of additional coordinating standards will increase an organization's synchronization value and this will increase its lock-in effect.

This strategy will yield its greatest impact on organizations that deal with issue areas that resemble pure coordination games (e.g., driving on the left or the right-hand side of the road). In such cases, coordinating standards may produce a stronger lock-in effect simply because actors have little to no incentive to switch to other standards (one is as good as any other) and every incentive to continue using the incumbent standard. Examples of such international organizations include the UPU, whose principal benefit is coordinating global postal delivery, the International Telecommunication Union

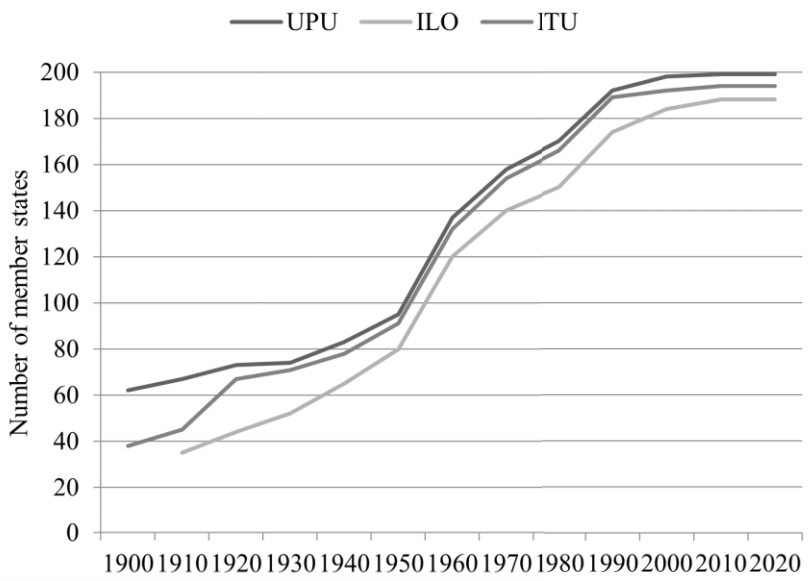
112. The states that withdrew from the CSTO are Azerbaijan, Georgia, and Uzbekistan (Uzbekistan later rejoined the CSTO). *See* Adil Baguirov & Jason E. Strakes, *Former Soviet Republics, in* INTERNATIONAL SECURITY AND THE UNITED STATES: AN ENCYCLOPEDIA 266, 278 (2007) These states did not exit the CSTO because they wished to join another security agreement. However, their ease of withdrawal underscores the CSTO's lack of network lock-in and thus the danger in this case of forced incompatibility.

113. In 1966, France withdrew from NATO's military command structure. France, however, never withdrew from NATO and remained a full-fledged NATO member. France later returned to full participation in 2009. *See France in Europe: Presentation*, FR. MINISTRY EUR. & FOREIGN AFFS., https://otan.delegfrance.org/France-and-NATO-presentation-1217

("ITU"),[114] which provides common standards for international radio and telecommunications, and the International Labour Organization ("ILO"), which sets international labor standards.[115] Because the principal benefit of these organizations lies in their setting of common standards to facilitate synchronization, they are natural candidates for the strategy.

Figure 11. This figure illustrates the powerful network effect pressures that institutions providing coordinating standards exert. the chart shows how ably the UPU, the ILO, and the ITU gained market consolidation across the years. each organization rises on the Y-axis each time the number of sovereign states in the international system increases, as they swiftly absorb these new nations as member states. note that in 1900 there were approximately seventy-seven countries in the international system, 163 countries in 1965, and that there are currently 195 countries in the world.[116]

FIGURE 11



114. Established in 1865, the International Telecommunication Union is the oldest truly global international organization. *See About International Telecommunication Union*, ITU, https://www.itu.int/en/about/Pages/default.aspx (last visited Feb 12, 2020).

115. *See About the International Labour Organization,* INT'L LAB. ORG., https://www.ilo.org/global/about-the-ilo/lang—en/index.htm (Last visited Oct. 12. 2020).

116. *See Member Countries*, UNIVERSAL POSTAL UNION, http://www.upu.int/en/the-upu/member-countries.html (last visited Feb 18, 2020); *Country Profile,* INT'L LAB. ORG, https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11003:0::NO::: (last visited Feb 18, 2020); *List of Member States*, INT'L TELECOMM. UNION, https://www.itu.int/online/mm/scripts/gensel8 (last visited Feb 18, 2020).

This is, however, less the case for international organizations that deal with issue areas that are more accurately described as mixed-motive games.[117] In such cases, the lock-in effect of introducing additional coordinating standards will tend to be less pronounced because actors may have other concerns that will offset the benefits of coordination. Most international organizations address issue areas that resemble mixed-motive games rather than pure coordination games. However, even in these cases, there is benefit to be had in coordination, and so the introduction of more coordinating standards will still boost an organization's lock-in effect—it will just do so to less pronounced degrees. By dint of their networked structure, all international organizations provide at least some benefits in the form of coordination. How much will depend on the organization in question.

It is, in fact, more accurate to speak of international organizations as existing along a spectrum. Certain organizations—ones that deal with issue areas that lean closer to pure coordination games—will be more hospitable to this strategy. The approach's efficacy, however, will be less pronounced in the case of international organizations whose coordinating benefit is merely a collateral outcome and not its primary focus. For example, while international organizations such as the IMF, the International Maritime Organization ("IMO"), the WIPO, and the WHO, all establish standards that facilitate coordination, coordination in these cases is merely a means to achieve the other benefits these organizations strive to provide rather than the benefit itself. For instance, while a substantial degree of standardization is necessary for the functioning of the WHO, its primary benefits are mitigating the effects of disease, strengthening health services, the furnishing of aid in emergencies, the eradication of epidemics, and so on and so forth. Coordination merely helps achieve these ends; it is not the WHO's primary benefit. All international organizations, however, provide at least some benefit in the form of coordination, and so the lock-in effect of all international organizations may be increased through the strategic introduction of coordinating standards—it is just a question of to what extent. The more coordinating standards you can embed into an organization, the more you can offset incentives to exit, and the more you turn elements of the institution into a coordination game, thus increasing its lock-in effect. Institutions that establish standards for coordination are the best bet to survive through periods of intense global transformation.

International organizations will vary in terms of how structurally receptive they are to the strategies outlined here. Ultimately, their efficacy depends on the specific character of the international organization in question.

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117. These are game structures that provide both opportunities for coordination and conflict. A common example of such a game structure is the Battle of the Sexes. In a Battle of the Sexes, the parties' preferences are partly coincident and partly opposed. The classic example is a scenario in which a husband wants to attend a football game and the wife wants to see the opera, yet both would prefer to do the other's activity if the alternative is to do their activity alone. *See* Besen & Farrell, *supra* note 28, at 124–26.

Some strategies may be very effective with respect to some institutions while the same strategy may fall flat in other cases. Policymakers will have to pick and choose the most appropriate strategies given their circumstances. Much is context dependent.

V. CONCLUSION

There is no clearer illustration of the folly of national conceit as the belief that, at this advanced stage of globalization, countries can somehow go it alone. Despite the impulse to do so, we no longer have the luxury of retreating behind our national barricades. The international system faces challenges that can only be successfully addressed through international cooperation. How we can sustain multilateral governance is thus a question of the highest importance. The concept of treaty hacking and the strategies proposed here are an attempt to provide at least a partial answer, the idea being that we can fortify the institutions that comprise the liberal order so that it can survive this period of instability. Some limitations to the model should, however, be noted.

First, the extent to which increasing an organization's lock-in effect may prevent its collapse is difficult to say with total certainty. Many factors may contribute to institutional collapse, which make it hard to draw a straight line from a strategy's implementation to its impact. Indeed, a strategy's effectiveness can only be confidently assessed in cases where it fails. Where an international organization remains stable, we can never be certain that this can be attributed to network effect pressures and not to some other factor or factors.

Second, the strategies outlined in this article may simply not apply in certain cases, and where they do, a range of variables may distort their effect. In other cases, they may be effective, yet other considerations beyond organizational stability may take priority. For example, while network enlargement may increase the institutional cohesion of NATO, clearly, there are important geopolitical implications to expanding NATO that need to be carefully weighed. Similarly, while the EU is in theory receptive to the strategy of network enlargement, there may be non-structural, political reasons that militate against pursuing such a strategy. Forced incompatibility may bolster the market dominance of, for example, the World Food Programme ("WFP"), but the world's hungry may be better served by the existence of multiple competing organizations that promote food security. The usefulness of each strategy would ultimately have to be evaluated on a case by case basis.

A further point is that institutional competition may in some circumstances not be a bad thing. A strong argument could be made that a degree of 'institutional fluidity' should be preserved to allow international organizations to evolve. Artificially fortifying organizations limits the force of

competition, which, as the argument goes, drives them towards greater efficiency.[118] Indeed, this is the primary concern of the new institutionalists: Lock-in may cause sub-optimal institutional arrangements to persist.[119] Locking states into international organizations by ratcheting up network effect pressures to create what are essentially institutional monopolies may, in the long-run, impede the positive development of international legal order. Policymakers should be mindful of this danger and seek to balance their efforts to intensify network lock-in with the possible negative consequences that their efforts may produce.

Some may also object to the foundational premise upon which the model rests—that there exists a 'market' for international organizations. To this point, it should be noted that there is, in a certain respect, nothing structurally unique about state actors. States are concentrations of organizational power that cooperate to form larger institutional configurations of influence when it suits their purposes and disband them when they do not. Methodologically, it makes little difference if the unit in question is an individual, a corporate entity, or a national government—all that is required is that, when acting on the international stage, the agent behaves as a unified actor (states meet this criterion), the agent acts (generally) in its rational self-interest, and that the agent's choices inform the decisions of other actors within the system.[120] If these elements are present, a market model, albeit loosely defined, may be applied.

Finally, there is a normative question of whether preserving the current international institutional order is even what we want. While the discussion mostly made descriptive claims, there was throughout an implicit normative assertion that the current United States-led rules-based order should be maintained. Many might disagree, seeing the current model of top-down global governance as having favored the United States and a small number of nations. Some may argue that preserving the current architecture of international organizations means preserving an implicit ideological bias. For instance, many argue that organizations such as the WTO and the IMF represent and promote specific ideologies and values that may be unjust towards weaker actors in the international system. Entrenching the liberal international order may stifle socio-economic pluralism, such as challenges to

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118. Perhaps the most well-known exponent of this efficiency argument is Friedrich Hayek. *See, e.g.*, F.A. HAYEK, THE CONSTITUTION OF LIBERTY 58–63 (1960)

119. *See, e.g.,* NORTH, supra note 21, at 73–104; Avner Greif, *Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies,* 102 J. POL. ECON. 912, 926 (1994); Gary Hamilton & Robert Feenstra, *The Organization of Economies*, *in* THE NEW INSTITUTIONALISM IN SOCIOLOGY, 153, 172–73 (Mary Brinton & Victor Nee, eds., 1998).

120. Some may challenge the assumption that states always act in their rational self-interest. However, that is not the claim here: The model merely requires that *most states act rationally most of the time*. Perfect rationality is not required. Indeed, history is rife with examples of state behavior that undercut assumptions of perfect rationality. While imperfect, rational choice remains highly useful in building models of state behavior.

the global trading system initiated from below by regional economic blocs. A more interactionist approach would advocate an international legal order that grows from a more spontaneous process, and one that takes into account the social costs of blindly preserving existing international structures.[121]

I leave such questions for the reader to consider. What was offered here was a basket of techniques policymakers may deploy to strengthen the current constellation of international organizations. Whether this is desirable, and with respect to which organizations, are issues not taken up here. Yet the question of whether the current liberal institutional model will falter, and what to do about it, if anything, is fast pressing down on us. Either way, it is a question that we must address and for which we must have an answer.

121. On the connection between an interactionist approach to law and legal pluralism, see LON FULLER, THE MORALITY OF LAW 123–29 (1969); PHILIPPE NONET & PHILIP SELZNICK, LAW AND SOCIETY IN TRANSITION: TOWARD RESPONSIVE LAW 95–103 (1978). With reference to international trade law, see MOSHE HIRSCH, INVITATION TO THE SOCIOLOGY OF INTERNATIONAL LAW 37–38 (2015).