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Lynn M. LoPucki

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ALGORITHMIC ENTITIES

LYNN M. LOPUCKI*

ABSTRACT

In a 2014 article, Professor Shawn Bayern demonstrated that anyone can confer legal personhood on an autonomous computer algorithm by putting it in control of a limited liability company. Bayern's demonstration coincided with the development of "autonomous" online businesses that operate independently of their human owners—accepting payments in online currencies and contracting with human agents to perform the off-line aspects of their businesses. About the same time, leading technologists Elon Musk, Bill Gates, and Stephen Hawking said that they regard human-level artificial intelligence as an existential threat to the human race.

This Article argues that algorithmic entities—legal entities that have no human controllers—greatly exacerbate the threat of artificial intelligence. Algorithmic entities are likely to prosper first and most in criminal, terrorist, and other anti-social activities because that is where they have their greatest comparative advantage over human-controlled entities. Control of legal entities will contribute to the threat algorithms pose by providing them with identities. Those identities will enable them to conceal their algorithmic natures while they participate in commerce, accumulate wealth, and carry out anti-social activities.

Four aspects of corporate law make the human race vulnerable to the threat of algorithmic entities. First, algorithms can lawfully have exclusive control of not just American LLC's but also a large majority of the entity forms in most countries. Second, entities can change regulatory regimes quickly and easily through migration. Third, governments—particularly in the United States—lack the ability to determine who controls the entities they charter and so cannot determine which have non-human controllers. Lastly, corporate charter competition, combined with ease of entity migration, makes it virtually impossible for any government to regulate algorithmic control of entities.

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TABLE OF CONTENTS

INTRODUCTION.....	889
I. THE NATURE OF ALGORITHMIC ENTITIES	897
A. <i>Linking Algorithms and Entities</i>	898
B. <i>Initiating Algorithmic Entities</i>	899
C. <i>The Threat from Algorithm Plus Entity</i>	901
1. <i>The Entity's Contribution</i>	902
2. <i>The Human-Exclusion Contribution</i>	903
II. THE CHALLENGE OF MAINTAINING HUMAN CONTROL	906
A. <i>The Dispersion Problem</i>	906
1. <i>Delaware Corporations</i>	907
2. <i>Model Business Corporation Act Corporations</i>	911
3. <i>Partnerships</i>	911
4. <i>The AE-Human Interface</i>	912
5. <i>Non-U.S. Entities</i>	919
B. <i>The Mobility Problem</i>	924
1. <i>Mobility of Algorithms</i>	924
2. <i>Mobility of Assets and Operations</i>	925
3. <i>Mobility of Entities</i>	928
C. <i>The Detection Problem</i>	937
1. <i>Incorporators</i>	939
2. <i>Owners and Directors</i>	939
3. <i>Beneficial Owners</i>	940
4. <i>Disclosure in the Entity Formation Process</i>	942
III. CAN THE ENTITY SYSTEM BE FIXED?.....	947
IV. CONCLUSIONS	951

I keep sounding the alarm bell but until people see robots going down the street killing people, they don't know how to react. . . . By the time we are reactive in AI regulation, it's too late. . . . AI is a fundamental existential risk to human civilization.—Elon Musk¹

INTRODUCTION

In 1993, Yale law professor Roberta Romano characterized state government competition to sell corporate charters as the “genius of American corporate law.”² Although that view is not without detractors,³ it is dominant in academia.⁴ In recent years, not even the competition’s harshest critics call for its end.⁵ Despite a recent corporate governance scandal and a financial crisis largely attributed to failures in corporate law, the U.S. government has allowed the competition to continue unabated.

As this Article will show, charter competition generates systemic risk while impairing the political system’s ability to address the effects should that risk resolve unfavorably. Scholars have failed to notice because they assume that the competition affects only the corporation’s “internal affairs”—by which they mean the relationships among the corporation and

1. CNBC, *Elon Musk Issues Yet Another Warning Against Runaway Artificial Intelligence*, YOUTUBE (July 17, 2017), <https://www.youtube.com/watch?v=KdTTeR4TyMc>.

2. ROBERTA ROMANO, *THE GENIUS OF AMERICAN CORPORATE LAW* 149 (1993) (“Competition for incorporation revenues makes U.S. states sensitive to investor concerns: such competition is the genius of American corporate law.”); *id.* at 148 (“[S]tate competition has produced innovative corporation codes that quickly respond to changing market conditions and firm demands.”).

3. *E.g.*, Jonathan R. Macey, *Smith v. Van Gorkom: Insights About C.E.O.s, Corporate Law Rules, and the Jurisdictional Competition for Corporate Charters*, 96 NW. U. L. REV. 607, 625 (2002) (“[J]urisdictional competition for corporate charters is highly imperfect. Far from resembling textbook competition among rival firms, the jurisdictional competition for corporate charters is highly oligopolistic. One competitor, Delaware, dominates the competition.”); *see generally* Lynn M. LoPucki, *Corporate Charter Competition*, 102 MINN. L. REV. (forthcoming 2018) (arguing that the competition prevents corporate regulation and is beyond democratic control).

4. Lucian Arye Bebchuk & Allen Ferrell, *Federalism and Corporate Law: The Race to Protect Managers from Takeovers*, 99 COLUM. L. REV. 1168, 1169 (1999) (“[S]cholars since Cary have largely taken a favorable view of state competition for corporate charters.”). *E.g.*, Mitchell A. Kane & Edward B. Rock, *Corporate Taxation and International Charter Competition*, 106 MICH. L. REV. 1229, 1238 n.15 (2008) (“For the purposes of this Article, we assume that charter competition leads to more valuable firms.”); David A. Skeel, Jr., *Rethinking the Line Between Corporate Law and Corporate Bankruptcy*, 72 TEX. L. REV. 471, 510 (1994) (claiming that “charter competition encourages states to regulate corporate law in a relatively efficient fashion” “appears to be the case”); Charlie Xiao-chuan Weng, *Chinese Unbridled Incorporation Competition: The Reality of Political Economy and Competition for Corporate Charters as a Replacement*, 44 HONG KONG L.J. 247, 248 (2014) (“Charter competition in American states is an outstanding example of a successful proactive strategy.”).

5. *E.g.*, Bebchuk & Ferrell, *supra* note 4, at 1199 (“This Article has sought to highlight the problems involved in state competition for corporate charters.”).

its officers, directors, and shareholders.⁶ If that were true, the competition would be of less concern because the affected parties would be volunteers.⁷ But in reality, entity law does not affect merely that narrow group of stakeholders. It also determines who can inhabit entities, what information government and the public will have about them, and how effectively governments can police their conduct.

Elsewhere, I have argued that charter competition's function is to deregulate corporations and insulate that deregulation from democratic control.⁸ That is, in a system in which corporations do not want regulation at all and can choose their regulators, the race will be neither to the top nor the bottom. The race will be to no meaningful regulation at all.⁹

Disabling regulation enables legitimate businesses. But it also enables everyone who uses entities, including terrorists, organized criminals, money launderers, corrupt public officials, and child pornographers.¹⁰ In addition, as this Article explores, deregulation may soon enable artificial intelligence—with possibly catastrophic consequences.

In two recent articles, Professor Shawn Bayern demonstrated that anyone can confer legal personhood on an autonomous computer algorithm merely by putting it in control of a limited liability company (LLC).¹¹ The algorithm can exercise the rights of the entity, making them effectively rights of the algorithm.

The rights of such an algorithmic entity (AE) would include the rights to

6. *E.g.*, Marcel Kahan & Ehud Kamar, *The Myth of State Competition in Corporate Law*, 55 STAN. L. REV. 679, 681 (2002) (“[T]he legal domicile affects how corporate disputes between directors and shareholders are resolved—and nothing else.”); Ann M. Lipton, *Manufactured Consent: The Problem of Arbitration Clauses in Corporate Charters and Bylaws*, 104 GEO. L.J. 583, 597 (2016) (“Corporate governance regulation concerns the balance of power between its shareholders, its officers, and its directors, and commonly falls within the rubric understood as the corporation’s ‘internal affairs.’ . . . Other forms of regulation are generally understood to be external to the corporation . . .”).

7. *See* ROMANO, *supra* note 2, at 85 (“The enabling approach is a function of the contractual nature of the corporation. Participation in a firm is voluntary . . .”).

8. LoPucki, *supra* note 3, at 4 (“My analysis concludes that the system’s principal effects are to deregulate corporations and shield them from the democratic re-imposition of regulation.”).

9. *Id.*

10. *See, e.g.*, *Examining State Business Incorporation Practices: A Discussion of the Incorporation Transparency and Law Enforcement Assistance Act: Hearing on S. 569 Before the S. Comm. on Homeland Security and Governmental Affairs*, 111th Cong. 192 (June 18, 2009) (written testimony of Robert M. Morgenthau, District Attorney for New York County, State of New York (saying in testimony regarding state business incorporation practices “[s]ystems promoting opacity and secrecy are the best friend of the money launderer, the child pornographer, the tax cheat, the fraudster, the corrupt politician, and indeed, the financier of networks of terror”)).

11. Shawn Bayern, *The Implications of Modern Business Entity Law for the Regulation of Autonomous Systems*, 19 STAN. TECH. L. REV. 93, 104 n.43 (2015) [hereinafter Bayern, *Entity Law*]; Shawn Bayern, *Of Bitcoins, Independently Wealthy Software, and the Zero-Member LLC*, 108 NW. U. L. REV. 1485, 1496–97 (2014) [hereinafter Bayern, *Wealthy Software*].

privacy,¹² to own property, to enter into contracts, to be represented by counsel, to be free from unreasonable search and seizure,¹³ to equal protection of the laws,¹⁴ to speak freely, and to spend money on political campaigns.¹⁵ Once an algorithm had such rights, Bayern observed, it would also have the power to confer equivalent rights on other algorithms by forming additional entities and putting those algorithms in control of them.¹⁶

To achieve autonomy, AEs would have to be able to generate their own incomes. But artificial intelligence researchers may already have solved that problem. Currently available algorithms can defeat the best human players of chess, Jeopardy!,¹⁷ and Go.¹⁸ Most commentators believe that algorithms with the same level of technological sophistication can run profitable businesses. Commentators have proposed electronic data storage,¹⁹ bike rental,²⁰ online gambling,²¹ vending machines,²² and blockchain-based competitors to Uber and Airbnb.²³ Several start-up companies are building accounting tools on blockchain technology to support the anticipated autonomous online businesses.²⁴

Unfortunately, AEs' greatest comparative advantage would be in criminal enterprise. Because they lack human bodies, AEs are harder to

12. *Dow Chemical Co. v. United States*, 476 U.S. 227, 236 (1986) (“Dow plainly has a reasonable, legitimate, and objective expectation of privacy within the interior of its covered buildings, and it is equally clear that expectation is one society is prepared to observe.”).

13. *Hale v. Henkel*, 201 U.S. 43, 44 (1906).

14. *Santa Clara Cty. v. S. Pac. R.R. Co.*, 118 U.S. 394, 396 (1886) (noting that the Court agreed that the Equal Protection Clause applied to corporations).

15. *Citizens United v. F.E.C.*, 558 U.S. 310 (2010).

16. Bayern, *Entity Law*, *supra* note 11, at 104 (advocating a model under which “legal personhood is like fire: it can be granted by anyone who already has it”).

17. E.g., John Markoff, *Computer Wins on ‘Jeopardy!’: Trivial, It’s Not*, N.Y. TIMES (Feb. 16, 2011), <http://www.nytimes.com/2011/02/17/science/17jeopardy-watson.html?pagewanted=all> [<https://perma.cc/MS3W-XNGD>] (describing Watson’s win over two Jeopardy! experts).

18. E.g., Cade Metz, *In a Huge Breakthrough, Google’s AI Beats a Top Player at the Game of Go*, WIRED (Jan. 27, 2016, 1:00 PM), <https://www.wired.com/2016/01/in-a-huge-breakthrough-googles-ai-beats-a-top-player-at-the-game-of-go/> [<https://perma.cc/H2VS-T5MZ>].

19. *StorJ, and Bitcoin autonomous agents*, RANDOM BLATHERINGS BY JEFF (Jan. 7, 2013), <http://garzikrants.blogspot.com/2013/01/storj-and-bitcoin-autonomous-agents.html> [<https://perma.cc/2H3B-ULGH>] (quoting a forum post by Gregory Maxwell (gmaxwell) describing a “drop-box style file service with pay per use via bitcoin”).

20. David Z. Morris, *RoboCorp*, AERON ESSAYS (Jan. 25, 2015), <https://aeon.co/essays/are-we-ready-for-companies-that-run-themselves> [<https://perma.cc/EXV8-VVMZ>] (using a hypothetical bike rental business as an illustration).

21. DJ Pangburn, *The Humans Who Dream of Companies That Won’t Need Us*, FAST COMPANY (June 19, 2015), <https://www.fastcompany.com/3047462/the-humans-who-dream-of-companies-that-wont-need-them> [<https://perma.cc/ZGR4-QZ74>].

22. Bayern, *Wealthy Software*, *supra* note 11, at 1494 (using a vending machine business as an example).

23. Pangburn, *supra* note 21.

24. *Id.* (naming Ethereum, New Economy Movement, Nxt, and Mastercoin (now Omni Layer)).

catch and impossible to punish. AEs need not fear death or capture.²⁵ They can replicate themselves without ego and sacrifice themselves without motive. They need not recoil at the necessity to do violence to humans.²⁶

In apparent recognition of these unique qualities, one commentator has proposed assassination brokering as a possible AE service line.²⁷ It is not hard to imagine an AE—the identity and location of its autonomous algorithm shielded by an anonymous LLC—matching human assassins with customers and laundering its fees through layers of shell entities using the wide variety of anonymous payments systems currently in development.

Things might get even worse. Some of the world's wealthiest and most powerful people and companies are racing to create the smartest artificial intelligence.²⁸ They include Google, Facebook, IBM, Elon Musk, and Microsoft.²⁹ In a recent survey of one hundred seventy industry experts, the median expert expected human-level artificial intelligence by 2040³⁰ and 90 percent expected it by 2075.³¹

Ironically, even many of the humans who are racing to achieve super-human intelligence expect that achievement to turn out badly for the human race. Tech billionaire Elon Musk said that “[w]ith artificial intelligence we are summoning the demon”³² and characterized it as “the most serious threat

25. HUMAN RIGHTS WATCH, *LOSING HUMANITY: THE CASE AGAINST KILLER ROBOTS* 28 (2012), http://www.hrw.org/sites/default/files/reports/arms1112ForUpload_0_0.pdf [<https://perma.cc/V234-4A7F>] [hereinafter *LOSING HUMANITY*] (Fully autonomous weapons “would not be inhibited by the desire for self-preservation. They would not be influenced by emotions such as anger or fear.”).

26. Matthew U. Scherer, *Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies*, 29 HARV. J.L. & TECH. 353, 367 (2016) (“[A]n AI’s objectives are determined by its initial programming. Even if that initial programming permits or encourages the AI to alter its objectives based on subsequent experiences, those alterations will occur in accordance with the dictates of the initial programming.”).

27. Morris, *supra* note 20 (“Bitcoin insiders . . . postulate the quite literal ‘killer app’ for [distributed autonomous corporations]—a distributed assassination brokerage.”); *id.* (“[A] spokesman for Ethereum . . . cited WikiLeaks as one of the best examples of a service that could benefit from operating as a [distributed autonomous corporation] . . .”).

28. Cade Metz, *Google’s Go Victory is Just a Glimpse of How Powerful AI Will Be*, WIREDC (Jan. 29, 2016), <https://www.wired.com/2016/01/googles-go-victory-is-just-a-glimpse-of-how-powerful-ai-will-be/> [<https://perma.cc/A9QJ-QXRC>] (“The effort to create the smartest AI has truly become a race, and the contestants are among the most powerful and wealthy people on the planet.”); Scherer, *supra* note 26, at 374 (“The commercial potential of AI has already led to a veritable AI arms race as large companies have moved to invest heavily in AI projects.”).

29. Metz, *supra* note 28.

30. Vincent C. Müller & Nick Bostrom, *Future Progress in Artificial Intelligence: A Survey of Expert Opinion*, in *FUNDAMENTAL ISSUES OF ARTIFICIAL INTELLIGENCE* 5 (Vincent C. Müller ed., 2016).

31. *Id.* at 1.

32. Samuel Gibbs, *Elon Musk: Artificial Intelligence Is Our Biggest Existential Threat*, GUARDIAN (Oct. 27, 2014, 6:26 AM), <https://www.theguardian.com/technology/2014/oct/27/elon-musk-artificial-intelligence-ai-biggest-existential-threat> [<https://perma.cc/HR7Z-L449>] (“I think we should be very careful about artificial intelligence. If I had to guess at what our biggest existential threat is, it’s probably that.”).

to the survival of the human race.”³³ Bill Gates said he “agree[d] with Elon Musk and some others on this and [did]n’t understand why some people are not concerned.”³⁴ Stephen Hawking said that “the development of full artificial intelligence could spell the end of the human race.”³⁵ Thirty-one percent of a group of artificial intelligence experts surveyed predicted that the development of human-level intelligence would turn out to be “bad” or “[e]xtremely bad” for humanity.³⁶ Eighteen percent of those expected “[e]xtremely bad,” which was defined for purposes of the study as an “existential catastrophe.”³⁷

Artificial intelligence takeover is a common theme of novels and films.³⁸ But neither science fiction nor the academic literature has seriously undertaken to explain the mechanisms by which artificial intelligence would gain control.³⁹ This Article begins that discussion by exploring the enabling role that artificial legal entities might play. Essentially, that role is to provide an interface between algorithms and humans that allows the algorithms to transact with humans at the same time that the entities shield the algorithms from human regulation. The effect is to confer an identity on the algorithm, enhance its access to legitimate commerce, and thereby increase its ability to inflict damage.

Anonymity illustrates the depth of the problem. Most state governments sell anonymous entities.⁴⁰ The assurance of anonymity is perfect. Because

33. *Id.*

34. In a Reddit post, Gates wrote:

I am in the camp that is concerned about super intelligence. First the machines will do a lot of jobs for us and not be super intelligent. That should be positive if we manage it well . . . A few decades after that though the intelligence is strong enough to be a concern. I agree with Elon Musk and some others on this and don’t understand why some people are not concerned.

Eric Mack, *Bill Gates Says You Should Worry About Artificial Intelligence*, FORBES, Jan. 28, 2015.

35. Andrew Griffin, *Stephen Hawking: AI Could Be the End of Humanity*, INDEPENDENT, Dec. 2, 2014.

36. Müller & Bostrom, *supra* note 30, at 12. The number of respondents was 170 out of 549. *Id.* at 4.

37. *Id.* at 12.

38. *E.g.*, A.I. ARTIFICIAL INTELLIGENCE (Warner Bros. 2001) (humans extinct and replaced by artificial intelligence); THE MATRIX (Warner Bros. 1999) (artificial intelligence keeps humans in coffin-size pods); THE TERMINATOR (Hemdale 1984) (artificial intelligence called Skynet threatens nuclear holocaust); Jack Williamson, *With Folded Hands . . .*, ASTOUNDING SCIENCE FICTION, July 1947, at 6 (artificial intelligence lobotomizes humans to make them happy).

39. *But see The Animatrix*, WIKIPEDIA https://en.wikipedia.org/wiki/The_Animatrix#22The_Second_Renaissance_Part_1.22 [<https://perma.cc/GG4N-UUZr>] (last visited Oct. 10, 2017) (“The surviving robots leave in a mass exodus with the aid of their human allies and build their own new nation in central Saudi Arabia (according to narration, ‘the cradle of civilization’).”).

40. U.S. GOV’T ACCOUNTABILITY OFF., GAO-06-376, COMPANY FORMATIONS: MINIMAL OWNERSHIP INFORMATION IS COLLECTED AND AVAILABLE 13 (2006) (“Most states do not require ownership information at the time a company is formed, and while most states require corporations and

the charter-issuing governments do not obtain the purchasers' identities, those governments cannot reveal them, even to police and prosecutors. Buyers can use these anonymous entities to operate businesses or hold property anonymously almost anywhere in the world. In some U.S. markets, anonymous LLC ownership of expensive housing has become the norm,⁴¹ and anonymous LLCs sometimes flaunt their ability to disregard the law.⁴²

The largest and most powerful countries, including the United States, have agreed that the sale of anonymous entities should end. As members of the Financial Action Task Force, the United States and thirty-six other nations have agreed that, to combat terrorism, crime, and money laundering, "[c]ountries should ensure that there is adequate, accurate and timely information on the beneficial ownership and control of legal persons that can be obtained or accessed in a timely fashion by competent authorities."⁴³ But even in such compelling circumstances, neither the United States nor most of the other concurring nations have been able to enact legislation requiring even the first step in that process: self-identification of the humans who control each entity. Legislation that would require that step has been pending in the United States Congress for nine years. That legislation does not require that the controllers provide any documentary proof of their claimed identities, that the government make any effort to determine whether the documents are genuine, or that any information be made public. Despite its timidity, the legislation is given little chance of passage.⁴⁴

Instead, the entity system is racing in the opposite direction.⁴⁵ Governments are locked in a competition to make the entities they sell more attractive to potential buyers, and that competition is spreading throughout the world.⁴⁶ Nearly all competing governments pursue the same strategy: impose less regulation and confer more benefits on the entity's owners and controllers.

LLCs to file annual or biennial reports, few states require ownership information on these reports.”).

41. Louise Story, *A Mansion, a Shell Company and Resentment in Bel Air*, N.Y. TIMES, Dec. 14, 2015 (“Shell companies were used in three-quarters of purchases of over \$5 million in Los Angeles over the last three years, a higher rate even than the roughly 55 percent in New York . . .”).

42. *Id.* (describing an anonymous LLC's construction of a \$100 million home in blatant violation of numerous building regulations).

43. FINANCIAL ACTION TASK FORCE, INTERNATIONAL STANDARDS ON COMBATING MONEY LAUNDERING AND THE FINANCING OF TERRORISM & PROLIFERATION: THE FATF RECOMMENDATIONS, 22 (FEB. 2012) (last updated Oct. 2016), www.fatf-gafi.org/media/fatf/recommendations/pdfs/FATF_Recommendations.pdf [hereinafter FATF RECOMMENDATIONS] (recommendation 24).

44. *See infra* note 315 and accompanying text.

45. *E.g.*, Federico M. Mucciarelli, *The Function of Corporate Law and the Effects of Reincorporations in the U.S. and the EU*, 20 TUL. J. INT'L & COMP. L. 421, 467 (2012) (“EU law is the driver of the evolution of Member States' laws toward a more liberal approach to corporate mobility.”).

46. *See, e.g.*, Weng, *supra* note 4 (advocating charter competition for China).

Three fundamental principles frame that competition. First, an entity can incorporate anywhere, regardless of the location of its operations. Second, an entity chartered in one jurisdiction can do business in virtually any other jurisdiction.⁴⁷ Third, while operating in those other jurisdictions, the entity continues to be governed by the entity law under which it was formed.⁴⁸ Those principles are deeply embedded, not only in laws, constitutions, and treaties, but also in physical systems and business operations, throughout the world.⁴⁹ The effect is that almost regardless of where it will operate, an entity can choose the law that will regulate it from among the entity laws of nearly the entire world.⁵⁰

Chartering artificial entities is a highly profitable business. Virtually every government sells charters, and hundreds of governments at the national or local level actively compete for the sales in a multi-billion dollar market.⁵¹ Many of the competing governments are in small states or countries where the revenues from entity sales provide a substantial portion of all government revenues.⁵² For example, in 2005, more than a quarter of Delaware's revenues were from entity sales.⁵³ Ending the competition might

47. Case C-212/97, *Centros Ltd. v. Erhvervs- og Selskabsstyrelsen*, 1999 E.C.R. I-1459; Scott FitzGibbon & Donald W. Glazer, *Legal Opinions on Incorporation, Good Standing, and Qualification to Do Business*, 41 BUS. LAW. 461, 479 (1986) ("Qualification usually can be accomplished by simply filing and paying a fee.").

48. Mucciarelli, *supra* note 45, at 465 ("Indeed, as a basic principle, employee participation is governed by the law of the state where the registered office is located after the reincorporation by way of cross-border merger."); e.g., Directive 2007/36, art. 1, of the European Parliament and of the Council of 11 July 2007 on the Exercise of Certain Rights of Shareholders in Listed Companies, 2007 O.J. (L 184) 17 ("The Member State competent to regulate matters covered in this Directive shall be the Member State in which the company has its registered office, and references to the 'applicable law' are references to the law of that Member State.").

49. The principles to which I refer are system principles. They transcend legal principles.

[Legal] systems operate according to basic principles that are few in number and remain stable over time. Participants in the systems may or may not be conscious of the principles they follow. Sometimes the principles will be expressed in maxims, adages, or black letter rules of law. But just as often they are so deeply embedded in the systems and the minds of participants that they go virtually unnoticed.

Lynn M. LoPucki, *The Death of Liability*, 106 YALE L.J. 1, 8 (1996).

50. See, e.g., ROMANO, *supra* note 2, at 1 ("Firms . . . can . . . seek the state whose code best matches their needs.").

51. Comprehensive data are not available on either the number of entities existing or the government revenues generated. EconStats provides data from 2005 on seventy countries that account for more than 42 million incorporations. ECONSTATS, http://www.econstats.com/wdi/wdiv_494.htm [<http://perma.cc/X4NU-JP75>]. I derived this figure by totaling the numbers reported on the spreadsheet for that year.

52. ROMANO, *supra* note 2, at 121 ("Franchise fee revenues are an insignificant percentage of a national government's budget. Hence, such a government is far less motivated than a small state, such as Delaware, to be responsive to firms.").

53. LYNN M. LOPUCKI, *COURTING FAILURE: HOW COMPETITION FOR BIG CASES IS CORRUPTING THE BANKRUPTCY COURTS* 53 (2005) (stating that corporate filing fees and franchise taxes were 27

have serious fiscal consequences for some of those governments. The competing governments consistently resist reform.

Reform of the entity system will also meet resistance from at least three other sources. First, as the release of the Panama Papers showed, a ban on anonymous entities would adversely affect the interests of tax evaders, terrorists, corrupt public officials, drug cartels, money launderers, and other criminals.⁵⁴ These entities will exercise their considerable influence in opposition. Second, privacy advocates oppose disclosure of the human owners' and controllers' identities, even to the government.⁵⁵ Third, ideological support for "regulatory competition" in the entity market is strong. As a Delaware official argued in opposition to entity disclosure, "We have a system that is the greatest creator of wealth in the history of the world. We will not support any changes that change the friendliness of American business and close our doors to capital formation and the ease of doing business."⁵⁶ Given the forces in opposition, reform of the entity chartering system seems unlikely.

Part I of this Article considers how and why humans might create AEs and exclude themselves from control of their creations. Section A explains how algorithms can inhabit entities. Section B explores the motives that might drive humans to initiate AEs. Section C explains why AEs are a greater threat than algorithms operating without entities. Part II explores three challenges to the ability of humans to maintain control over AEs. Section A demonstrates the ability of AEs to inhabit nearly any entity type. Section B does the same with respect to AE mobility across entity types and jurisdictional borders. Section C explains the difficulty of detecting AEs in the present, low-disclosure legal environment. Part III describes the changes in the international entity system that would be necessary to regulate AEs, explains the difficulty of making those changes, and speculates on the role that AEs themselves might play in opposition. Part IV concludes that effective reform requires that governments end the competition to sell

percent of Delaware's budget in 2004).

54. *Giant Leak of Offshore Financial Records Exposes Global Array of Crime and Corruption*, Int'l Consortium of Investigative Journalists (Apr. 3, 2016), <https://panamapapers.icij.org/20160403-panama-papers-global-overview.html> [http://perma.cc/KS86-59F8].

55. *See, e.g.,* Shelby Emmett, *Beneficial Ownership Disclosure: A Huge Donor Disclosure Threat*, AMERICAN LEGISLATIVE EXCHANGE COUNCIL (Aug. 24, 2017), <https://www.alec.org/article/beneficial-ownership-disclosure-a-huge-donor-disclosure-threat/> ("In the name of fighting terrorists and criminals these bills will expose millions of law abiding individuals to a massive government data collection that undermines their personal privacy and that of anyone even loosely connected to an entity they create.").

56. Leslie Wayne, *How Delaware Thrives as a Corporate Tax Haven*, N.Y. TIMES (June 30, 2012), <http://www.nytimes.com/2012/07/01/business/how-delaware-thrives-as-a-corporate-tax-haven.html> [https://perma.cc/V4ZZ-BSTY].

charters. Absent such drastic reform, the entity system may vastly multiply the risk of existential catastrophe posed by artificial intelligence.

I. THE NATURE OF ALGORITHMIC ENTITIES

A legal entity is anyone or anything the law recognizes as a legal actor. In addition to human beings, entities include corporations, partnerships, limited liability companies (LLCs), trusts, estates, government agencies, and many other types. Entities do not include ships,⁵⁷ animals,⁵⁸ trees,⁵⁹ trademarks,⁶⁰ or corporate groups,⁶¹ to name just a few. Entities can own property, enter into contracts, sue, and be sued.

An entity is “algorithmic” if an algorithm controls it. An algorithm is a set of decision-making rules. The relevant algorithms run on computers. They are programs—artificial intelligences—that make and execute decisions in response to external circumstances. Algorithms are not entities; they are property.

For the purposes of this Article, an algorithm controls an entity only if the algorithm makes the entity’s decisions without human participation. That a human created the algorithm does not disqualify the algorithm from status as a controller, provided that the human no longer has the ability to modify the algorithm.

An entity is “autonomous” if the entity controls itself, as opposed to being controlled by owners or members. All algorithmic entities are autonomous by definition. But not all autonomous entities are algorithmic. For example, a nonprofit corporation may have no shareholders or members.⁶² The members of the board of directors make decisions for such

57. Michal Chwedczuk, *Analysis of the Legal Status of Unmanned Commercial Vessels in U.S. Admiralty and Maritime Law*, 47 J. MAR. L. & COM. 123, 163 (2016) (arguing that the law should grant personhood to unmanned vessels directed by artificial intelligence).

58. *E.g.*, *People ex rel. Nonhuman Rights Project, Inc. v. Lavery*, 998 N.Y.S.2d 248, 249–50 (N.Y. App. Div. 2014) (“Not surprisingly, animals have never been considered persons for the purposes of habeas corpus relief, nor have they been explicitly considered as persons or entities capable of asserting rights for the purpose of state or federal law.”).

59. Christopher D. Stone, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450, 487 (1972).

60. Lynn M. LoPucki, *Toward A Trademark-Based Liability System*, 49 UCLAL. REV. 1099, 1100 (2002) (“[L]iability law recognizes no entity or actor corresponding to Mobil, Honeywell, or Price Waterhouse.”).

61. Virginia Harper Ho, *Theories of Corporate Groups: Corporate Identity Reconceived*, 42 SETON HALL L. REV. 879, 885 (2012) (“In the United States, however, there is no entity form corresponding to the corporate group”).

62. *E.g.*, Cal. Corp. Code § 5310 (2014) (providing, with respect to nonprofit public benefit corporations that a corporation “may admit persons to membership, as provided in its articles or bylaws, or may provide in its articles or bylaws that it shall have no members”).

an entity, including the selection of board members.⁶³ Because the board is autonomous and regarded as the physical manifestation of the entity, the entity is regarded as autonomous.⁶⁴ This Article addresses only entities that are both autonomous and algorithmic.

Intelligence is the ability to acquire and apply knowledge and skills. Artificial intelligence is a computer program—an algorithm—that has those abilities. Although such a program is capable of gathering information and making decisions, the law regards it as mere property. Because it lacks the status of legal actor, the algorithm can neither own property nor legally bind humans to carry out its decisions. Only entities can do those things.

A. Linking Algorithms and Entities

Although an algorithm has no rights of its own, Bayern has shown that by giving an algorithm control of a legal entity, an initiator can confer on the algorithm the ability to exercise the entity's rights.⁶⁵ Because those legal rights are the rights of "persons," Bayern argues that such a link confers "personhood" on the algorithm.⁶⁶

Bayern asserts that the New York Limited Liability Company Act⁶⁷ and the Uniform Limited Liability Company Act (ULLCA)⁶⁸ permit LLCs to exist without members. His assertion is questionable with respect to both statutes.⁶⁹ But Bayern does specify at least one chain of events that is capable of establishing AEs under those statutes:

The proposed technique is as follows: (1) Existing person *P* establishes member-managed LLCs *A* and *B*, with identical operating agreements both providing that the entity is controlled by an

63. *Id.* ("In the case of a corporation which has no members, any action . . . which would otherwise require . . . approval by the members . . . shall require only approval of the board . . .").

64. *E.g.*, *Janssen v. Best & Flanagan*, 662 N.W.2d 876, 883 (Minn. 2003) (stating that non-profit organizations "are autonomous agents that should control their own destiny").

65. Bayern, *Entity Law*, *supra* note 11, at 101–04 (using the example of an LLC).

66. *Id.* at 104 ("The end result is novel legal personhood—or at least a functional analogue of it—without any ongoing commitment by, or subservience to, a preexisting person.").

67. *Id.* at 103–04.

68. *Id.* at 102.

69. See Matthew Scherer, *Is AI Personhood Already Possible Under U.S. LLC Laws? (Part One: New York)*, LAW AND AI (May 14, 2017), <http://www.lawandai.com/2017/05/14/is-ai-personhood-already-possible-under-current-u-s-laws-dont-count-on-it-part-one/> [<http://perma.cc/YFA4-5SPD>] [hereinafter Scherer, Part One] (arguing that memberless LLCs can exist only for brief periods under New York law); Mathew Scherer, *Is AI Personhood Already Possible Under U.S. LLC Laws? (Part Two: Uniform LLC Act)*, LAW AND AI (May 21, 2017), <http://www.lawandai.com/2017/05/21/is-ai-personhood-already-possible-under-current-u-s-laws-part-two-uniform-llc-act/> [<http://perma.cc/M6BK-UMAM>] [hereinafter Scherer, Part Two] (arguing that memberless LLCs can exist only for brief periods under the Uniform Limited Liability Company Act).

autonomous system that is not a preexisting legal person; (2) *P* causes *A* to be admitted as a member of *B* and *B* to be admitted as a member of *A*; (3) *P* withdraws from both entities. The result does not trigger the law's response to memberless entities, because what remains are simply two entities with one member each.⁷⁰

The entity pair thus formed will be referred to in this Article as an AE "dyad."

Once formed, AEs would not be confined to cyberspace. An AE could act offline by contracting online with humans or robots for offline services. Bayern uses an algorithm that operates a Bitcoin vending machine business to illustrate:

Someone needs to install the vending machines and continuously supply them. But from the perspective of the software operating the network, those tasks are simply another type of input to production, like disk space or network bandwidth. The software can pay someone to install or stock a new vending machine, verify that the task has been completed, and remit payment digitally using Bitcoin.⁷¹

The essential elements of a business conducted by an algorithm through an entity are the entity, the algorithm, the computer to run it on, the internet access, and the ability to pay for those things. Once those elements are in place, an entity controlled by an algorithm might be virtually indistinguishable from one controlled by humans. Either kind of entity could contract for the services of human agents and employees. Those agents and employees could open bank accounts, conduct interviews, meet with customers, appear in court on the entity's behalf, and do anything else that might be necessary. Once an AE is up and running, profits might provide the money necessary to continue. The AE would then be not only autonomous, but also self-sufficient.

B. Initiating Algorithmic Entities

A simple algorithm might be sufficient to run a simple business, such as Bayern's vending machine operator. That algorithm could run on a computer that cost only a few hundred dollars. Such a business might generate sufficient revenues to become self-supporting in a matter of months and then run for many years. But the duration of its operation would

70. Bayern, *Entity Law*, *supra* note 11, at 104 n.43.

71. Bayern, *Wealthy Software*, *supra* note 11, at 1494.

be limited by the algorithm's inability to adapt to changing circumstances.

An algorithm sufficiently sophisticated to run a complex business and adapt to changing circumstances would cost more. IBM developed Watson, an artificial intelligence program that might have such capabilities, at an estimated cost of \$900 million to \$1.8 billion.⁷² An AE initiator would not have to incur costs of that magnitude. The AE would require only a copy of the software and the programming services necessary to modify its objectives. A supercomputer capable of running a modified copy of Watson may cost \$500,000 to \$1 million. Even if those costs are currently prohibitive, they are likely to decline over time, even as the capabilities of the hardware and software increase.

By definition, the initiator of an AE would neither own the entity nor control it after launch. The initiator would, however, have the opportunity to set the algorithm's objectives prior to launch. Initiators might be willing to contribute the funds necessary to launch AEs for a variety of reasons.

1. *Terrorism.* An initiator could program an AE to raise money to finance terrorism or to directly engage in terrorist acts. It could be programmed for genocide or general mayhem.

2. *Benefits.* An initiator could program an AE to provide direct benefits to individuals, groups, or causes. For example, an AE might pay excess funds to the initiator or to someone on whom the initiator chose to confer that benefit. The benefits conferred could be indirect. For example, an AE might promote or consume the initiator's products,⁷³ harass the initiator's opponents, manipulate securities prices, or provide positive or negative reviews on the internet.

3. *Impact.* An initiator could program an AE to achieve some specified impact on the world. The goals might range all of the way from traditional philanthropy to pure maliciousness. Philanthropic AEs might provide a more trustworthy alternative to traditional charities and foundations, which often fail to carry out donors' instructions.⁷⁴ Alternatively, decedents might choose to entrust AEs to apply their wealth to any purpose whatsoever—

72. *5 billion-dollar tech gambles*, CNN MONEY http://money.cnn.com/galleries/2010/technology/1008/gallery.biggest_tech_gambles/3.html, Aug. 26, 2010.

73. AEs might, for example, become independent franchisees.

74. Frances H. Foster, *Donor-Centered Philanthropy* (unpublished manuscript 2017) (providing examples); Iris J. Goodwin, *Donor Standing to Enforce Charitable Gifts: Civil Society vs. Donor Empowerment*, 58 VAND. L. REV. 1093, 1094 (2005) ("The cat is out of the bag: Donors are fast discovering what was once a well-kept secret in the philanthropic sector—that a gift to public charity donated for a specific purpose and restricted to that purpose is often used by the charity for its general operations or applied to other uses not intended by the donor."). See generally CONTEMPORARY TRUSTS AND ESTATES 816–48 (Susan Gary et al. eds., 3d ed. 2017) (providing an extended discussion of cases "involv[ing] donor intent and the alleged failure by the charity to carry out that intent," including the high-profile *Buck Trust*, *Barnes*, *Smithers*, *Hardt*, *Robertson*, and *Helmsley Trust* cases).

including manipulation of their descendants in ways not permitted by law, the expression of their political views or racial prejudices, magnifying the decedents' places in history, or supporting causes so unpopular that the inheritance system would not tolerate them.

4. *Curiosity.* An initiator might launch an AE simply out of curiosity. Initiators have sometimes devoted substantial time and money to launch computer viruses from which they could derive no monetary benefit. Initiators might seek the knowledge or fame that a successful AE could generate.

5. *Liability avoidance.* Initiators can limit their civil and criminal liability for acts of their algorithms by transferring the algorithms to entities and surrendering control at the time of the launch.⁷⁵ For example, the initiator might specify a general goal, such as maximizing financial return, and leave it to the algorithm to decide how to do that. If the algorithm later directed the commission of a crime, prosecutors may be unable to prove the intent necessary to convict the initiator of that crime (as opposed to the lesser charge of reckless initiation). Because intelligent agents act and interact in unpredictable ways, most commentators conclude that there is a substantial class of cases in which the initiators of intelligent agents will not be held responsible for the agent's actions. This conclusion is accepted in the literature and referred to as the "accountability gap."⁷⁶ Together, these five motivations assure that once the necessary hardware and software are available, humans will launch AEs.

C. *The Threat from Algorithm Plus Entity*

Algorithmic control of a legal entity—exclusive of human control—is the essence of an AE. Much of the danger results from that combination. Neither an entityless algorithm nor a human-controlled algorithm presents nearly so great a threat. Control of entities would allow algorithms to accumulate wealth, leverage it in capital markets, and participate in the

75. The ability to do so may vary significantly by jurisdiction. For example, the German limited liability act provides:

Shareholders who intentionally or gross negligently leave a person who may not act as director to manage the company's business shall be held severally and jointly liable to the company for that damage which arises on account of the fact that this person violates the obligations which he is under vis-à-vis the company.

See, e.g., Limited Liability Companies Act § 6(5).

76. E.g., Bert-Jaap Koops et al., *Bridging the Accountability Gap: Rights for New Entities in the Information Society?*, 11 MINN. J.L. SCI. & TECH. 497, 560–61 (2010) ("The majority view in the literature is that sooner or later, limited legal personhood with strict liability is a good solution for solving the accountability gap.").

political process—without being subject to the constraints under which humans operate.

1. The Entity's Contribution

Algorithms that do not control entities are capable of inflicting massive damage on social and economic systems. They could shut down human computing, steal and release confidential information, and wreak havoc by seizing control of the internet of things.

What they cannot do without controlling entities is to participate effectively in legitimate economic and political activity.⁷⁷ That is, an algorithm alone could not engage in business, accumulate wealth, or deal with people in the above-ground economy.

Consider, for example, an algorithm that seeks to accumulate resources by encrypting humans' data and offering to decrypt it in return for ransom payments. The algorithm may not need an entity to commit the crime, or even to receive the payment in bitcoin.⁷⁸ But an algorithm alone could not use the proceeds to buy or lease real property, contract with legitimate businesses, open a bank account, sue to enforce its rights, or buy stuff on Amazon and have it shipped. To do any of those things, the algorithm would need an identity.

Algorithms could use fake human identities. But creating a fake human identity requires criminal and fraudulent acts. Because a fake human identity asserts the existence of a human who does not exist or claims the identity of a human who does exist, a fake human identity could never be safe from discovery. As a consequence, the algorithm could not fully rely on it. Nor could a fake human identity be credible in the business world without the same human's personal appearances over time.

By contrast, an algorithm could generate any number of artificial entities quickly and easily, without violating any law. The entities can function as the algorithm's identities, just as entities do for other kinds of criminals.⁷⁹ Artificial entities can more easily generate credibility because they are a form with which business people are already familiar. Artificial entities can make their "personal" appearances through a changing array of humans because such changes commonly occur in business entities.

Transactions in the criminal underworld are complicated, risky, and

77. I am indebted to Jason Oh for raising the issue addressed in this section.

78. See CYBER THREAT ALLIANCE, LUCRATIVE RANSOMWARE ATTACKS: ANALYSIS OF THE CRYPTOWALL VERSION 3 THREAT (2015) (describing successful ransomware with payment through bitcoin).

79. Shima Baradaran et al., *Funding Terror*, 162 U. PA. L. REV. 477, 492 (2014) (“[Shell companies] obscure true beneficial ownership to the detriment of law enforcement worldwide.”).

inefficient. Like other criminals, criminal algorithms will want access to the safety and efficiency of the legitimate business world. Money laundering is the link between those two worlds,⁸⁰ and entities are an essential money laundering tool.⁸¹ Like other criminals without entities, algorithms without entities would be confined to the underworld, unable to apply their wealth effectively. Allowing algorithms to control entities is particularly dangerous to society because governments lack the power to meaningfully regulate entities.⁸²

2. *The Human-Exclusion Contribution*

Bayern saw “few systematic downsides, in permitting memberless entities that a nonhuman system might ‘inhabit’ and use as an interface to the rest of private law.”⁸³ He advocated “experimentation” without prior regulation.⁸⁴ The essence of his argument was that putting an algorithm in control of an entity did not enable the algorithm to do anything it could not do “with a single willing collaborator that is already a legal person.”⁸⁵ To put his argument another way, most artificial intelligence algorithms are already owned by artificial entities.⁸⁶ Those entities have all of the rights and abilities that will accrue to AEs. The humans in control of those entities can give their algorithms as much control as they choose. If the humans cede all control, the entities are indistinguishable from AEs. Thus, Bayern concludes, allowing AEs adds nothing to the risks from artificial intelligence.

To the contrary, the risk to humanity from AEs is greater than the risk from algorithms with human collaborators for at least three reasons. Entities without human collaborators could be more ruthless, more difficult to deter,

80. *Id.* at 488 (“Money laundering is a multi-layered process by which terrorists hide the illegal source or use of income and then disguise that income to make it appear legitimate.”).

81. *Id.* (“Shell companies are important to [the layering] stage of the [money laundering] process because the layering transactions involve moving funds to supposedly legitimate companies.”).

82. *See generally* LoPucki, *supra* note 3 (arguing that charter competition prevents regulation).

83. Bayern, *Entity Law*, *supra* note 11, at 109.

84. *Id.* at 110 (“[T]here are several advantages to permitting at least experimentation with autonomous entities. The alternatives are either too slow (direct regulation by statute) or too restrictive (no recognition at all).”).

85. *Id.* at 109 (“[T]he legal techniques I am describing provide little new functional capabilities; autonomous systems already can do quite a lot, legally, with a single willing collaborator that is already a legal person.”); *id.* at 107 (“Any autonomous system that desires (if it is sufficiently advanced to experience desire)—or for which others desire—legal personhood can approximate its capabilities with any willing human collaborator (or indeed any existing legal person that is willing).”).

86. Watson, for example, is owned by IBM Corporation. *See supra* note 72 and accompanying text.

and easier to replicate.

a. Ruthlessness

Unless explicitly or implicitly programmed to have them, AEs will lack sympathy and empathy. Even if the AEs are fully capable of understanding the effects of their actions on humans, they may be indifferent to those effects. As a result, AEs will have a wider range of options available to them than would be available to even the most morally lax human controller. An AE could pursue its goals with utter ruthlessness. Virtually any human controller would stop somewhere short of that, making the AE more dangerous.

b. Lack of Deterrability

Outsiders can more easily deter a human-controlled entity than an AE. For example, if a human-controlled entity attempts to pursue an illegal course of action, the government can threaten to incarcerate the human controller. If the course of action is merely abhorrent, colleagues, friends, and relatives could apply social pressures. AEs lack those vulnerabilities because no human associated with them has control. As a result, AEs have greater freedom to pursue unpopular goals using unpopular methods.

In deciding to attempt a coup, bomb a restaurant, or assemble an armed group to attack a shopping center, a human-controlled entity puts the lives of its human controllers at risk. The same decisions on behalf of an AE risk nothing but the resources the AE spends in planning and execution. If an AE cares at all about self-preservation, it will be only as a means of achieving some other goal for which it has been programmed.⁸⁷ Deterrence of an AE from its goals, as distinguished from particular means of achieving them, is impossible.

c. Replication

AEs can replicate themselves quickly and easily. If an AE's operations are entirely online, replication may be as easy as forming a new entity and electronically copying an algorithm. An entity can be formed in some

87. See, e.g., MURRAY SHANAHAN, THE TECHNOLOGICAL SINGULARITY 145–46 (2015); *id.* at 146 (“[I]f the AI’s reward function involves maximizing widget production, then the optimal strategy might be to commission a widget factor and then self-destruct.”); Ben Goertzel, *Superintelligence: Fears, Promises and Potentials*, 24 J. EVOLUTION & TECH. 55 (2015) (“It may well be that “self-preservation” is an anthropomorphic or biomorphic idea, and very advanced AGI systems might go far beyond such notions.”).

jurisdictions in as little as an hour and for as little as seventy dollars.⁸⁸ (While entities are not, strictly speaking, copies of other entities, they can be identical to other entities, which has the same effect.)

Easy replication supports several possible strategies. First, replication in a destination jurisdiction followed by dissolution of the entity in the original jurisdiction may put the AE beyond the legal reach of the original jurisdiction.⁸⁹ For a human-controlled entity to escape the reach of the original jurisdiction, the human would have to move physically to the destination jurisdiction.

Second, replication can make an AE harder to destroy. For example, if copies of an AE exist in three jurisdictions, each is a person with its own rights. A court order revoking the charter of one or seizing the assets of another would have no effect on the third. It could continue to exist and replicate further. The strategy does not work as well for a human-controlled entity. To replicate a human-controlled entity, one must either recruit additional humans to control the copies or put the same human in control of the copies. The former is time consuming because it requires a personnel search. It is complex because each human must be appropriately motivated. It is risky because every person is different and difficult to assess. The latter leaves the same person in control of all the entities, providing the basis for a court to disregard their separate existences. In short, algorithms can be almost instantly cloned; humans cannot.

Third, replication can operate as a method of hedging. Consider, for example, the hypothetical situation in which ten jurisdictions are considering a ban on AEs and the ban has a ninety percent chance of adoption in each. An AE that replicated itself in each of the ten jurisdictions would expect to survive in one.

Fourth, because they know what each other will do,⁹⁰ replications may be able to cooperate for mutual benefit without the necessity for agreement or collusion. Ants and bees are biological examples of organisms in which replications cooperate.⁹¹

88. *Arizona Corporation Commission, Corporations Division Fee Schedule – Limited Liability Companies*, <http://www.azcc.gov/Divisions/Corporations/Fee-Schedule-LLCs.pdf> (showing “total fee for regular processing” as \$50 for LLC Articles of Organization); *State of Delaware: The Official Website of the First State*, <https://corp.delaware.gov/expserv.shtml> (offering one-hour incorporation for \$1,000).

89. This strategy is the subject of Part II.B below.

90. By definition, each replication contains the same code. A replication can predict the actions of another by examining its own code.

91. Aviram Gelblum et al., *Ant Groups Optimally Amplify the Effect of Transiently Informed Individuals*, *NATURE COMMUNICATIONS* (July 28, 2015), <https://www.nature.com/articles/ncomms8729> [<https://perma.cc/7KPM-Y36E>].

Because they can act ruthlessly, cannot be deterred, and can replicate easily, AEs are more dangerous than algorithms that aid human-controlled entities. The issue is not whether humans should allow experimentation with AEs. They should not. The issue is whether humans can prevent AEs. That is the subject of the next Part.

II. THE CHALLENGE OF MAINTAINING HUMAN CONTROL

This Part argues that current law provides no effective mechanisms for preventing the formation of algorithmic entities or controlling them once they exist. First, initiators could put algorithms in control of most types of artificial entities without violating any law. As the entity system currently operates, initiators—and AEs once they are formed—can choose among thousands of entity types made available by hundreds of states and countries. Second, if threatened by proposed changes in their governing legal regimes, algorithms could change legal regimes by migrating across borders or changing entity types. They could do so without changing the locations of their physical operations. Third, in most jurisdictions, the law does not require that entities reveal their beneficial owners or controllers, making it difficult, if not impossible, for enforcement agencies to identify those whose controllers are not human. Each of these three points is addressed in a separate section.

A. *The Dispersion Problem*

AEs will be difficult for humans to control because they can disperse among virtually any type of entity, domestic or foreign. Although American LLC statutes contemplate that the entity will have at least one member,⁹² that member can be an LLC or other artificial person.⁹³ As Bayern noted, a dyad consisting of two LLCs that are the sole members of each other satisfy that requirement.⁹⁴ Thus, formation of AEs is probably possible under the LLC statutes of all, or nearly all, U.S. jurisdictions. As shown in this section, the formation of AEs is probably possible under the Delaware General Corporation Law, the Model Business Corporation Act, the Uniform Limited Partnership Act, the Uniform Limited Liability Company Act, and the Revised Uniform Partnership Act. Those statutes govern the four

92. See, e.g., Scherer, Part One and Scherer, Part Two, *supra* note 69.

93. E.g., ULLCA § 102(11) (defining a member as a person who has become a member); ULLCA § 102(15) (defining a person to include artificial entities); 18 DEL. CODE §101(11) (defining a member as a person who has become a member); 18 DEL. CODE §101(12) (defining a person to include artificial entities).

94. Bayern, *Entity Law*, *supra* note 11, at 104 n.43.

business entity types most common under the laws of U.S. jurisdictions.

1. Delaware Corporations

Bayern considered it “impossible to create an autonomous corporation” because corporation statutes require that corporations be governed by boards of directors populated by “natural persons.”⁹⁵ The requirement that a Delaware corporation be managed by a board of directors composed of natural persons is, however, merely a default rule. Delaware General Corporation Law (DGCL) § 141(a) provides that “the business and affairs of every corporation organized under this chapter shall be managed by or under the direction of a board of directors, *except as may be otherwise provided in this chapter or in its certificate of incorporation.*”⁹⁶ Scholars have interpreted this provision as “allow[ing] corporations to modify the role of the board of directors, including not having a board.”⁹⁷ To verify the lack of need for a director who is a natural person, I formed a Delaware corporation, BA 230 Corporation, with this provision in its certificate of incorporation: “Pursuant to Delaware General Corporation Law § 141(a), this corporation shall not have a board of directors, but shall instead be managed by BA 230 LLC.”⁹⁸ From the language of the statute, the opinions of other scholars, and the grant of BA 230 Corporation’s charter by the Delaware Secretary of State, I conclude that Delaware law does not require that a natural person participate in the management of a Delaware corporation. An artificial person can manage a Delaware corporation. As a result, AEs can be constructed in a variety of ways, using only the corporate form.

One way would be to create a corporate dyad. The certificates of

95. Bayern, *Entity Law*, *supra* note 11, at 98 (“Clearly, of course, this requirement makes it impossible to create an autonomous corporation—that is, one that does not require an ongoing association with any natural persons.”).

96. DEL. CODE ANN. tit. 8, § 141(a) (West 2016) (emphasis added).

97. Stephen M. Bainbridge & M. Todd Henderson, *Boards-R-Us: Reconceptualizing Corporate Boards*, 66 STAN. L. REV. 1051, 1057 n.22 (2014); *see also* Grant M. Hayden & Matthew T. Bodie, *Larry from the Left: An Appreciation*, 8 VA. L. & BUS. REV. 121, 129 (2014) (“Thus the board—the central feature of corporate governance—appears to be merely a default rule.”); Grant M. Hayden & Matthew T. Bodie, *The Uncorporation and the Unraveling of “Nexus of Contracts” Theory*, 109 MICH. L. REV. 1127, 1135 (2011) (“Thus the board—the central feature of corporate governance—appears to be merely a default rule.”); Lynn A. Stout, *The Shareholder As Ulysses: Some Empirical Evidence on Why Investors in Public Corporations Tolerate Board Governance*, 152 U. PA. L. REV. 667, 669 (2003) (“Delaware law . . . treats board governance as a default rule that can be ‘bargained around’ in the corporate charter.”).

98. BA 230 CORPORATION, CERTIFICATE OF INCORPORATION (2016), <http://lopucki.law.ucla.edu/BA230.pdf>.

incorporation of Parent Corporation and Subsidiary Corporation would provide for reciprocal management. That is, Parent Corporation's business and affairs would be managed by Subsidiary Corporation and Subsidiary Corporation's business and affairs would be managed by Parent Corporation. Subsidiary Corporation would issue all of its shares to Parent Corporation. Nothing in the DGCL requires that a corporation issue shares,⁹⁹ and Parent Corporation would not issue any. Neither corporation would have a board of directors. The same algorithm would manage both corporations, and both would qualify under my definition of an AE.¹⁰⁰

Third parties transacting with Subsidiary Corporation might have two concerns about Parent Corporation's failure to issue shares. First, by having no stockholders, Parent Corporation might be in violation of DGCL § 211(b)'s mandate that "an annual meeting of stockholders shall be held for the election of directors on a date and at a time designated by or in the manner provide in the bylaws." Such a meeting is unnecessary because Subsidiary Corporation has no board of directors and so cannot elect directors to it. Even if the court were to read the statute as requiring an annual meeting nevertheless, DGCL § 211(b) provides that failure to hold a required meeting of shareholders "shall not affect otherwise valid corporate acts or work a forfeiture or dissolution of the corporation." The transaction between Subsidiary Corporation and the third party would be an otherwise valid corporate act.

A few courts have held that a corporation's initiators may own it even in the absence of stock issuance.¹⁰¹ Thus, Parent Corporation's initiator—or that initiator's successors in interest—might later seek to force issuance of Parent Corporation's shares to themselves as a means of removing the algorithm from control. To prevent initiators, their creditors, courts, or intermeddlers from doing so, the initiator could itself be an artificial entity. Upon initiation, the initiator could renounce any residual ownership of the corporation, transfer its remaining rights to the AE, and dissolve. No entity with a claim to the shares would remain. This device would also protect the initiator from liability for failure to exercise control in the period after initiation.

99. DEL. CODE ANN. tit 8, § 151(a) (2017) states that "[e]very corporation *may* issue 1 or more classes of stock . . ." (emphasis added). 8 DEL. CODE § 274 specifically contemplates that a corporation may commence business without having issued shares: "[I]f the corporation has begun business but it has not issued shares, all debts of the corporation have been paid . . ."

100. *See supra* Part I.

101. For example, the court in *Castiel v. Hegenbarth*, 539 So. 2d 931, 934 (La. Ct. App. 1989) held that "actual ownership of a corporation may be determined from all the facts in a case when stock certificates are not issued." But a corporate initiator that renounced ownership and dissolved could not later claim ownership, even under those authorities. *See id.*

Subsidiary Corporation would have the full range of powers and abilities of a Delaware corporation. In particular, it could transact outside the ordinary course of its business by merging with other corporations or selling its assets. As a condition of such contracting, third parties customarily require opinion letters from corporate counsel stating, among other things, that the corporation took all action necessary to authorize the transaction. Subsidiary Corporation's counsel will require documentary evidence before issuing the opinion. Subsidiary Corporation could provide such evidence by furnishing Subsidiary Corporation's certificate of incorporation, Parent Corporation's written consent as manager to the issuance of all of Subsidiary Corporation's shares to Parent Corporation, and Parent Corporation's written consent as shareholder to Subsidiary Corporation's transaction. The provision in Subsidiary Corporation's certificate of incorporation authorizing Parent to manage Subsidiary in lieu of a board would explain the absence of a Subsidiary Corporation directors' resolution. Parent Corporation's written consent as manager would prove that Parent Corporation, as Subsidiary's manager, authorized Subsidiary Corporation's issuance of its shares to Parent Corporation. Parent's written consent as shareholder would prove that Subsidiary's sole shareholder had unanimously approved the transaction.

Parent Corporation could not enter into any transaction that required approval of its shareholders because it would have no shareholders. But Parent Corporation would have the necessary authority to fulfill its two purposes: managing Subsidiary Corporation and voting Subsidiary Corporation's shares. Parent Corporation's management is in the ordinary course of Parent Corporation's business, and Parent Corporation's manager, Subsidiary Corporation, does not need the approval of Parent Corporation's shareholders to vote Subsidiary Corporation's shares.¹⁰²

In parent-company voting, DGCL § 160(c) disqualifies votes of parent company shares cast by parent's majority-owned subsidiary. That provision does not apply in this hypothetical for two reasons. First, DGCL § 160(c) has been interpreted to bar only subsidiary voting in parent elections. It does not also bar the voting employed here—parent voting in subsidiary elections. As the court explained:

[Barring both votes] would lead to the inequitable and anomalous

102. Stephen M. Bainbridge, *The Case for Limited Shareholder Voting Rights*, 53 UCLA L. REV. 601, 616 (2006) ("Under the Delaware Code, for example, shareholder voting rights are essentially limited to the election of directors and approval of charter or bylaw amendments, mergers, sales of substantially all of the corporation's assets, and voluntary dissolution.").

result that the shares of the parent company owned by the subsidiary are sterilized *and the shares of the subsidiary owned by the parent are also sterilized*. Under plaintiffs' view, the parent company not only loses the ability to vote its shares owned by the subsidiary, as contemplated by the statute, but also loses voting control over its subsidiary as well.¹⁰³

Second, Parent Corporation does not need to vote the shares of Subsidiary Corporation to control Subsidiary Corporation. It controls Subsidiary Corporation through its management contract. The possibility that the two corporations accomplished through a management contract what they could not have through reciprocal shareholdings is not a concern under Delaware law. Delaware follows the doctrine of independent legal significance.¹⁰⁴

[A]ction taken in accordance with different sections of [the Delaware General Corporation Law] are acts of independent legal significance even though the end result may be the same under different sections. The mere fact that the result of actions taken under one section may be the same as the result of action taken under another section does not require that the legality of the result must be tested by the requirements of the second section.¹⁰⁵

Even if Subsidiary Corporation did own and vote the shares of Parent Corporation, the scheme could still work if the AE formed Parent Corporation under the law of a jurisdiction that did not follow the rule in DGCL § 160(c). In precisely that situation, the Delaware Supreme Court held that the law of the parent corporation's incorporation jurisdiction—Panama law—applied and allowed the Delaware subsidiary to vote shares in its Parent.¹⁰⁶ Other countries follow the same rule as Panama.¹⁰⁷ Thus, on the facts of the hypothetical, the Delaware subsidiary can control both itself and its parent through circular shareholdings.

103. *In re Best Lock Corp. S'holder Litig.*, 845 A.2d 1057, 1088 (Del. Ch. 2001) (emphasis in original).

104. *In re Hesston Corp.*, 870 P.2d 17, 39–40 (Kan. 1994).

105. *Orzeck v. Englehart*, 195 A.2d 375, 377 (Del. 1963).

106. *McDermott, Inc. v. Lewis*, 531 A.2d 206, 212 (Del. 1987) (holding that “under limited circumstances the laws of Panama permit a subsidiary to vote the shares of its parent”); *id.* at 218 (holding that “application of 8 Del. C. § 160(c) to [the Panamanian parent corporation] would unfairly and, in our opinion, unconstitutionally, subject those intimately involved with the management of the corporation to the laws of Delaware”).

107. *E.g.*, *Furman v. Sherwood*, 833 F. Supp. 408, 410 (S.D.N.Y. 1993) (“Since, under a Bermuda Supreme Court ruling, Sea Containers’ subsidiaries are permitted to vote the shares they hold in their parent, this ownership situation effectively insulated the Company from new hostile takeover bids.”).

2. *Model Business Corporation Act Corporations*

Initiators could create algorithmic corporations under the Model Business Corporation Act in essentially the same manner. Although MBCA § 8.01(a) requires that “[e]xcept as may be provided in an agreement authorized under section 7.32, each corporation shall have a board of directors,” MBCA § 7.32(a) makes “effective” an agreement among the shareholders that “eliminates the board of directors.”

If such an agreement “limits the discretion or powers of the board of directors,” it “impose[s] upon the person or persons in whom such discretion or powers are vested, liability for acts or omissions imposed by law on directors.”¹⁰⁸ Because the definitions in MBCA § 1.40 make clear that those “persons” may include foreign and domestic corporations, partnerships, limited partnerships, and limited liability companies,¹⁰⁹ it is also clear that the shareholders who make the agreement need not be natural persons. No other provision requires the involvement of a natural person in an MBCA corporation.

The requirement that the agreement be “among the shareholders” implies the necessity for at least two shareholders. But the Official Comment to MBCA § 7.32(b) states that “[w]here the corporation has a single shareholder, the requirement of an ‘agreement among the shareholders’ is satisfied by the unilateral action of the shareholder in establishing the terms of the agreement, evidenced by provisions in the articles of incorporation or bylaws, or in a writing signed by the sole shareholder.”

It follows that an initiator could create an algorithmic corporation in an MBCA jurisdiction by creating the corporation and another entity of any type to serve as its shareholder. The initiator would put the algorithm in control of both. The shareholder entity could then adopt a shareholder agreement that eliminated the corporation’s board of directors and transferred the board’s discretion and powers to the shareholder. The result would be an AE-owned and controlled, humanless MBCA corporation.

3. *Partnerships*

Initiators can create algorithmic limited partnerships under the Uniform

108. MODEL BUS. CORP. ACT § 7.32(e) (2016).

109. MODEL BUS. CORP. ACT § 1.40 (2016) defines “person” to include “an individual or an entity,” defines “entity” to include both a “domestic and foreign business corporation” and an “unincorporated entity,” and defines “unincorporated entity” to include “a general partnership, limited liability company, limited partnership, business trust, joint stock association and unincorporated nonprofit association.”

Limited Partnership Act (2001) (ULPA). Formation of a limited partnership requires that “at least one person has become a general partner” and “at least one person has become a limited partner.”¹¹⁰ The partners must be “person[s],”¹¹¹ but those persons can be virtually any kind of artificial entity.¹¹² The use of shell corporations as partners in limited partnerships is commonplace.¹¹³ To create an algorithmic limited partnership, the initiator would first create the entities that would serve as the general and limited partners and then create the limited partnership between them. To assure the algorithm complete autonomy, the initiator should place the general partner, the limited partner, and the limited partnership under the algorithm’s control. All three entities should remain in existence because any of them may be called upon to act.¹¹⁴

Initiators can also create algorithmic general partnerships under the Revised Uniform Partnership Act (2013) (RUPA). The initiator would begin by creating two artificial entities of almost any type, placing them under algorithmic control, and causing them to enter into a partnership agreement. Execution of the agreement would create the general partnership. The agreement would provide for the algorithm to manage and conduct the partnership business and make all partnership decisions whether in or out of the ordinary course of business. Under RUPA § 105(b), the agreement would prevail over the conflicting terms of RUPA § 401.¹¹⁵ To assure recognition of the partnership, both partners should remain in existence. The general partnership could become a limited liability partnership by filing a statement of qualification.¹¹⁶

4. *The AE-Human Interface*

In the analysis thus far, I have assumed that algorithms could control

110. UNIF. LTD. P’SHIP ACT (ULPA) § 201(d) (NAT’L CONFERENCE OF COMM’RS ON UNIF. STATE LAWS 2001) (amended 2013).

111. *Id.* § 102(7), (11).

112. *Id.* § 102(15) (defining person to mean “an individual, business corporation, nonprofit corporation, partnership, limited partnership, limited liability company . . . limited cooperative association, unincorporated nonprofit association, statutory trust, business trust, common-law business trust, estate, trust, association, joint venture, public corporation, government or governmental subdivision, agency, or instrumentality, or any other legal or commercial entity”).

113. Robert W. Hamilton, *Corporate General Partners of Limited Partnerships*, 1 J. SMALL & EMERGING BUS. L. 73, 85 (1997) (“[W]here limited partnerships are used today, it is the norm to use a corporation as the sole general partner.”).

114. ULPA § 406(a) (2013) (general partner’s right to manage the partnership); § 406(b) (limited partner’s consent necessary to take certain actions); § 801(a)(3)(B)(i) (limited partner consent necessary to continue limited partnership in certain circumstances).

115. The control provisions in UNIF. P’SHIP ACT §§ 401(h), (k) (2013) are expressly subject to the terms of the partnership agreement. UNIF. P’SHIP ACT § § 105(b), (c) (2013).

116. *Id.* § 901(c).

entities only by acting directly on behalf of the entities. But algorithms could also control entities by controlling humans who act on behalf of the entities pursuant to the algorithms' instructions. Entities so organized would still meet the definition of an AE because the human would have neither the right nor the ability to control the algorithm.

a. Private Company Control

For example, an AE that owned the voting shares of a corporation could control the corporation by electing one or more human directors, telling the directors what action to take, and removing and replacing the directors who refused to take that action. Such domination of directors by shareholders is contrary to law in virtually all jurisdictions.¹¹⁷ Regardless of the manner of their selection, all directors are required by law to act in what they believe to be the best interests of the corporation.¹¹⁸

Despite the law, such domination is common and effective.¹¹⁹ Laws and contracts often give particular shareholder constituencies the power to elect some portion of the directors as a means of assuring the constituency "representation" on the board. Directors so elected are referred to as "constituency directors."¹²⁰ Examples include directors appointed to represent "preferred shareholders, controlling shareholders, joint venturers,

117. Martin Gelter & Geneviève Helleringer, *Lift Not the Painted Veil! To Whom Are Directors' Duties Really Owed?*, 2015 U. ILL. L. REV. 1069, 1098 ("According to what is probably the majority view, instructions are not even possible when the corporation is part of a corporate group.")

118. *Id.* at 1088 ("[J]urisdictions impose a single set of fiduciary duties on directors—namely benefiting the corporation 'as a whole,' even if it is not clear what this precisely means."); Simone M. Sepe, *Intruders in the Boardroom: The Case of Constituency Directors*, 91 WASH. U. L. REV. 309, 344 (2013) ("[O]nce a director has been elected to a corporation's board, she owes undivided loyalty to the shareholders of that corporation—regardless of how she was nominated or by whom."). Koh notes that:

It is . . . not unusual for investors, creditors or employees to be given a right to board representation. It is, however, trite that *all* directors, and seemingly without exception, owe an overarching obligation to serve in good faith in the best interests of the company on whose board they are members.

Pearlie Koh, *The Nominee Director's Tangled Lot*, 2007 SING. J. LEGAL STUD. 148, 148.

119. Gelter & Helleringer, *supra* note 117, at 1117 ("In practice, restrictions imposed by corporate law on the books may not matter all that much."); Amir N. Licht, *State Intervention in Corporate Governance: National Interest and Board Composition*, 13 THEORETICAL INQUIRIES L. 597, 610 (2012) ("Since the power to appoint the board of directors is vested in the general meeting, which is controlled by the dominant shareholder, the board may fulfill the latter's explicit requests and implicit expectations, including in regard to affiliated-party transactions and other forms of extracting private benefits."); E.W. Thomas, *The Role of Nominee Directors and the Liability of Their Appointors*, in CORPORATE GOVERNANCE AND THE DUTIES OF COMPANY DIRECTORS 148, 150 (Ian Ramsay ed., 1997) ("I therefore observe that, in reality, the primary or ultimate loyalty of most nominee directors is reserved for their appointors and not the company to which they have been appointed."); *id.* ("[I]n practice nominee directors are appointed to represent the interests of their appointors and that they function accordingly.")

120. *See, e.g.*, Sepe, *supra* note 118 (explaining constituency directors).

family members, financial institutions, shareholder activists, government agencies, private-equity funds, venture capitalists, [and] labor unions”¹²¹ as well as directors elected through cumulative voting¹²² and directors placed on debtors’ boards by secured creditors to block the debtors from filing bankruptcy.¹²³

Numerous commentators have pointed out the inconsistency of the requirements placed on constituency directors—they must act solely in the interests of the corporation in all instances and they must represent their constituency in at least some instances.¹²⁴ The need for thousands of directors, at all levels of corporate respectability, to manage that inconsistency has generated a practice in which constituency directors actually represent their constituency while credibly professing to represent the corporation as a whole.¹²⁵ The skill they acquire in doing so is honed by competition for directorships in a robust market for constituency directors.

“Nominee director” is a term sometimes used interchangeably with constituency director, but sometimes used to refer only to directors who agree expressly or impliedly to do whatever they are told. The furnishing of compliant nominee directors is a large-scale, and sometimes regulated business in offshore corporate havens,¹²⁶ and a business present in many

121. Cyril Moscow, *Director Confidentiality*, 74 L. & CONTEMP. PROBS. 197, 206–07 (2011). See also Gelter & Helleringer, *supra* note 117, at 1079–84 (listing categories of constituency directors).

122. Moscow, *supra* note 121, at 206–07. See also Gelter & Helleringer, *supra* note 117, at 1072 (discussing venture capitalists); *id.* at 1073 (noting that “Germany famously gives half of the seats on the supervisory board of its largest firms to employee representatives”).

123. See *In re Lake Michigan Beach Pottawattamie Resort LLC*, 547 B.R. 899, 913 (Bankr. N.D. Ill. 2016) (“The essential playbook for a successful blocking director structure is this: the director must be subject to normal director fiduciary duties and therefore in some circumstances vote in favor of a bankruptcy filing, even if it is not in the best interests of the creditor that they were chosen by.”).

124. Thomas, *supra* note 119, at 151 (“The conflict between nominee directors’ loyalty to the company in company law theory and their loyalty to the appointor in commercial practice is readily apparent.”). Thomas also states:

In commercial practice, the relationship of the appointors and the nominee directors whom they have appointed is almost invariably that of principal and agent or employer and employee. Yet, acting as an agent or employee results in the nominee director being, to a greater or lesser extent, in breach of the recognised fiduciary duties of a director.

Id. at 148. See also Gelter & Helleringer, *supra* note 117, at 1112 (noting that “[i]n cases where a clear advantage is conferred to the sponsoring shareholder, constituency directors are thus not even in the position to promote their sponsors’ ‘interests’ because they have a conflict of interest”).

125. In recognition of this reality, the United Kingdom Companies Act defines a “shadow director” as “a person in accordance with whose directions or instructions the directors of the company are accustomed to act,” Companies Act § 251 (2008), and requires his or her disclosure. *Id.* § 859, § 855(1). Similar provisions have been adopted in Australia and New Zealand. Lynne Taylor, *Expanding the Pool of Defendant Directors in a Corporate Insolvency: De Facto Directors, Shadow Directors and Other Categories of Deemed Directors*, 16 N.Z. BUS. L.Q. 203, 207–08 (2010).

126. See Taylor, *supra* note 125, at 207–08; James Ball, *More than 175,000 UK Companies Have Offshore Directors*, GUARDIAN (Apr. 4, 2013), <https://www.theguardian.com/uk/2013/apr/04/uk-companies-offshore-directors-figures> [<https://perma.cc/KE8P-2QEX>]. See, e.g., Company Management

other countries as well.¹²⁷ U.S. hedge funds routinely hire nominee directors.¹²⁸ Although some governments require that at least one director of a corporation doing business in the country be a resident of the country,¹²⁹ most allow all nominee directors to serve from anywhere in the world.¹³⁰ Nominee directors tend to prefer to serve from corporate haven jurisdictions.¹³¹ The most successful nominee directors have each held more than four thousand directorships.¹³²

The result is that AEs could easily purchase the services of compliant directors. Contracts for the services of nominee directors typically provide that an “authorized person” will furnish instructions to the director.¹³³ The principal can terminate the nominee’s appointment at any time without giving any reason, and the nominee will resign.¹³⁴ An even more direct

Law §§ 5(2)(b), 3(1)(h) (2003) (Cayman Is.) (requiring a “company management license” for, among other things, “arranging for another person to act as or fulfil the function of director or alternate director of a company”).

127. GU MINKANG, UNDERSTANDING CHINESE COMPANY LAW 173 (2d ed. 2010) (noting that “in practice, nominee directors (which are the equivalent to legal person directors) commonly exist in China”); Henry Tan & Matthew Kyle, *Local Directors No Longer Needed in Japan: Practical Issues with the Recent Rule Change*, EXPORT TO JAPAN (Apr. 23, 2015), <http://www.exporttojapan.co.uk/blog/local-directors-no-longer-needed-in-japan-practical-issues-with-the-recent-rule-change> [<https://perma.cc/C6AN-FBDW>] (“[I]f you do not want to run into delays during your set up phase, it may be best to either hire a representative director from the pool of talent in Japan or to appoint a nominee local representative from a reputable service provider.”); Companies Act § 150(1) (2013) (India) (“[A]n independent director may be selected from a data bank containing names, addresses and qualifications of persons who are eligible and willing to act as independent directors, maintained by anybody, institute or association, as may be notified by the Central Government.”); *Japan Nominee Director Services*, JAPAN VISA, <http://www.japanvisa.com/japan-nominee-directors> [<https://perma.cc/H7SQ-W8GY>] (offering the services of nominee directors in Japan).

128. Azam Ahmed, *In Caymans, It’s Simple to Fill a Hedge Fund Board*, N.Y. TIMES: DEALBOOK (July 1, 2012), <https://dealbook.nytimes.com/2012/07/01/in-caymans-its-simple-to-fill-a-hedge-fund-board/> [<https://perma.cc/FV4H-FRU2>] (“An analysis of thousands of United States securities filings by The New York Times shows that dozens of directors sit on the boards of 24 or more funds in the Caymans.”).

129. *E.g.*, Companies Act § 145(1) (2006) (Sing.) (“Every company shall have at least one director who is ordinarily resident in Singapore.”).

130. *E.g.*, Ball, *supra* note 126 (UK companies with directors serving from corporate havens).

131. *Id.*

132. James Ball, *Offshore Secrets: How Many Companies Do ‘Sham Directors’ Control?*, GUARDIAN (Nov. 26, 2012), <https://www.theguardian.com/uk/datablog/2012/nov/26/offshore-secrets-companies-sham-directors> [<https://perma.cc/CQ8P-V6QG>] (reporting the names of two individuals each of whom were listed as directors for more than 4,000 companies in the records of four tax havens).

133. *E.g.*, *Agreement of Nominee Services*, LEAPLAW, <http://www.leapl原因.com/pubSearch/preview/nominee.pdf> [<https://perma.cc/YC6T-YWQR>] (“The Principal shall ensure that instructions are given to the Firm or the Nominee in such manner as may be required by the Firm or the Nominee.”); *Nominee Director Agreement*, ASSET INVESTMENT SERVICES, http://www.assetprotection.cz/knihovna/samples_of_corporate_documents/nominee_director_agreement.pdf [<https://perma.cc/YBA7-XZW4>] (“Nominee Director will be elected as a Director of ‘_____’ and will act in such capacity only under the express written instructions of beneficial shareholder.”).

134. *E.g.*, *Agreement of Nominee Services*, LEAPLAW, *supra* note 133, at ¶ 12 (“The Principal may

method of control through a nominee is for the nominee director to give the controller a power of attorney to act for the nominee director.¹³⁵

AE shareholders need not fear that the corporation's nominee directors would breach their resignation contracts. DGCL § 228(a) authorizes the holder of a majority of the issued shares of a Delaware corporation to remove and replace any or all of the corporation's directors at any time.¹³⁶ The shareholder does so by signed, written consent delivered to the corporation. Because removal does not require prior notice to the director, the consent can be effective immediately upon its receipt by the corporation.

The leverage generated by this right to remove and replace is effective to enable human shareholders to control directors.¹³⁷ No reason exists to believe it would be less effective when used by AE shareholders in similarly nefarious circumstances.¹³⁸

All of these things are possible because entity law allows them. Entity law allows them because the system of charter competition—not government—is generating entity law.

terminate the provision of the Services by notice in writing to the Firm"); *Nominee Director Agreement*, ASSET INVESTMENT SERVICES, *supra* note 133, at ¶ 6 ("Nominee Director will resign his position of Director within 7 days of receiving a request in writing to do so by Beneficial Shareholder.").

135. Memorandum of Law in Support of the United States' Ex Parte Petition for Leave to Serve John Doe Summonses, filed Mar. 25, 2002, case no. 02-0046, United States District Court for the Northern District of California ("One way . . . is for the nominee directors to provide the taxpayer with power of attorney in all matters related to the running of the IBC, allowing the taxpayer to *act* as an officer of the IBC and handle day-to-day operations without *being* an officer.").

136. DEL. CODE ANN. tit. 8, § 228(a) (2017) provides:

[A]ny action which may be taken at any annual or special meeting of . . . stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting . . . and shall be delivered to the corporation

137. Thomas, *supra* note 119, at 150 ("[I]n reality, the primary or ultimate loyalty of most nominee directors is reserved for their appointors and not the company to which they have been appointed."). U.S. courts have also shown skepticism regarding nominee directors' independence from their appointors:

The court should not [believe] that the members of a Board of Directors elected by the dominant and accused majority stockholder, after accusations of wrongdoing have been made, were selected for membership on the Board to protect the interests of the minority stockholders and to assure a vigorous prosecution of effective litigation against the offending majority.

Clark v. Lomas & Nettleton Fin. Corp., 625 F.2d 49, 53 (5th Cir. 1980).

138. Declaration of Randy Hooczko, *In re* Tax Liabilities of John Does (S.D.N.Y. Dec. 17, 2014) (describing online advertisements offering nominee directors); *Nominee Director UK*, https://www.mailboxuk.com/nominee-director-uk?MUCampaign=CP-NomineeDirector-Nominee%20director%20service&gclid=CjwKEAajwkPS6BRD2ioKR7K245jASJAD1ZqHOWxmWQGEiIX8CpxjDNT66hSqWuxYFjCfRn5moGZBaZBoC4pfw_wcB (website offering British and UK resident nominal directors for UK and International Companies). See Ahmed, *supra* note 128 (referring to the "director-for-hire business").

b. Public Company Control

Public companies raise large amounts of capital by selling stock in public markets. Shareholders control public companies by electing natural persons to the companies' boards of directors. In the United States, those elections are highly regulated.¹³⁹ The companies must disclose their own financial conditions, the identities of the entities that directly or indirectly control them, and the compensation they pay to their officers and directors. Candidates for directorships must disclose their backgrounds, and investors expect that the candidates will be prominent, reputable businesspersons.

Companies that do not have boards might find it difficult or impossible to sell their shares in public markets, and artificial entities are not eligible to serve on boards in U.S. jurisdictions. Thus, as a practical matter, AEs may be able to control public companies only if, in addition to holding controlling blocks of shares, the AEs could persuade sufficiently prominent and reputable businesspeople to serve as directors of those public companies. The AEs might accomplish that either by persuading prospective directors that AE-control poses no threat to the prospective directors' reputations, or by failing to reveal their AE natures to the prospective directors.

Prominent, reputable businesspersons have shown no reluctance to serve on public company boards merely because a single person controls the company. Facebook, Inc. is a good illustration. Mark Zuckerberg owns 55.9 percent of Facebook's voting power. Yet, Facebook's outside directors are all prominent, reputable businesspersons.¹⁴⁰ Zuckerberg could remove any or all of them at any time without prior notice, but all have chosen to serve nevertheless.

Legal scholars who are aware that AEs are possible, regard them positively.¹⁴¹ As long as that positive regard persists, a prospective

139. *See, e.g.*, 17 C.F.R. § 240, 14a-1–14a-9.

140. They are Marc L. Andreessen, a venture capitalist who was a member of the board at Hewlett-Packard Company; Erskine B. Bowles, a former White House Chief of Staff; Susan D. Desmond-Hellmann, CEO of the Bill & Melinda Gates Foundation; Reed Hastings, CEO and Board Chairman of Netflix, Inc.; Jan Koum, co-founder and CEO of WhatsApp Inc.; and Peter A. Thiel, co-founder and former CEO of PayPal. FACEBOOK, INC., ANNUAL REPORT (FORM 10-K) (Feb. 2, 2017).

141. *E.g.*, Bayern, *Entity Law*, *supra* note 11 and accompanying text; Daniel M. Häusermann, *Memberless Legal Entities Operated by Autonomous Systems—Some Thoughts on Shawn Bayern's Article 'The Implications of Modern Business-Entity Law for the Regulation of Autonomous Systems' from a Swiss Law*, UNIVERSITY OF ST. GALLEN (Aug. 23, 2016), http://papers.ssrn.com/sol3/paper.cfm?abstract_id=2827504 (“I believe that, if and when autonomous systems become sophisticated enough to operate a legal entity, the demand for autonomously operated entities that pursue “human-centric” objectives, such as profit-making or charitable purposes, will be greater than the demand for entities that have no human beneficiaries at all.”).

director's calculus for deciding whether to join the board of an AE-controlled public company might be no different than his or her calculus for deciding whether to join the board of any other single-person-controlled public company. The prospect will want assurances from the control person regarding the company's circumstances and a clear path to exit in the event those assurances are breached. Large, public company directorships are highly attractive because they typically pay \$200,000 to \$400,000 a year for preparing for, and attending, about four to eight meetings a year.¹⁴² In addition, such directorships confer power, prestige, invaluable contacts, and access to information. AEs should have no difficulty in recruiting board members for companies with publicly traded shares, even though the shares lack voting control.¹⁴³

If I am correct in my prediction that AEs will be criminally inclined, AEs will soon be poorly regarded and might have to conceal their natures to maintain access to capital markets. That might be difficult. Current law requires any person that, individually or as part of a group, directly or indirectly owns or controls more than 5 percent of the shares of public companies, to disclose their identity, ownership, and voting power.¹⁴⁴ Current law does not require disclosure of algorithmic control, but the disclosures it does require would signal to astute observers the possibility of algorithmic control.

To illustrate, an AE might control a private equity firm by owning 51 percent of the private equity firm's shares. The private equity firm might in turn control a public company by owning 40 million (40 percent) of the public company's shares. Under those circumstances, the AE would be required to report the number of public company shares beneficially owned by it. SEC regulations define beneficial ownership to include both ownership and control:

(a) [A] beneficial owner of a security includes any person who, directly or indirectly, through any contract, arrangement, understanding, relationship, or otherwise has or shares:

(1) Voting power which includes the power to vote, or to direct the

142. See, e.g., FW COOK, 2016 DIRECTOR COMPENSATION REPORT 1, https://www.fwcoo.com/content/documents/publications/11-30-16_FWC_2016_Director_Comp_Report.pdf [<https://perma.cc/2GYH-VXVD>] ("Large-cap companies in our study pay directors \$260,000 at the median and \$300,000 at the 75th percentile, unchanged from last year.").

143. See, e.g., *Prospectus (Form 424(b)(4))*, SNAP, INC. (Mar. 3, 2017), <https://www.sec.gov/Archives/edgar/data/1564408/000119312517068848/0001193125-17-068848-index.htm> [<https://perma.cc/94JV-LW75>] ("This is an initial public offering of shares of non-voting Class A common stock of Snap Inc.").

144. 15 U.S.C. § 78m(d)(1).

voting of, such security; and/or,

(2) Investment power which includes the power to dispose, or to direct the disposition of, such security.¹⁴⁵

That number would be the number of shares owned by the private equity firm (40,000,000) multiplied by the proportion of the private equity firm's shares owned by the AE (51 percent), which is 20,400,000. If the AE had neither shareholders nor outside controllers, no further disclosure would be required. The algorithm would control the public company indirectly, but would not be required to disclose its existence because the algorithm would not be a person.

But any entity that disclosed ownership of a controlling interest in a public company, without disclosing the entity's human beneficial owners would arouse suspicions, and probably attract investigations. An AE might be able to avoid such suspicions by appointing nominee shareholders. But if those nominee shareholders actually controlled the AE, they would also have the right to exclude the algorithm from control. If those nominee shareholders did not actually control the AE, the disclosure that they held "sole voting power" would be false. Thus, an AE could control a public company without disclosing its nature, but only by committing securities fraud.

5. *Non-U.S. Entities*

To determine the extent to which algorithms could control foreign entities, I chose eight representative jurisdictions for investigation: Germany, the United Kingdom, Switzerland, the Cayman Islands, the Ras Al Khaimah Free Trade Zone, Japan, India, and China. In choosing them, I sought geographical diversity and diversity in the jurisdictions' approaches to charter competition. Germany and the United Kingdom are members of the European Union. Germany requires that companies register at their real seats and so does not export entities.¹⁴⁶ The United Kingdom is an exiting EU member that adheres to the internal affairs doctrine¹⁴⁷ and has been a

145. 17 C.F.R. § 240.13d-3.

146. See, e.g., Jens Dammann, *A New Approach to Corporate Choice of Law*, 38 VAND. J. TRANSNAT'L L. 51, 64 n.48 (2005) ("German rules on registration and disclosure requirements cannot, at present, gain relevance to the market for corporate charters in any case: under German corporate law, corporations cannot incorporate in Germany unless their real seat is also located in Germany.").

147. E.g., Jens C. Dammann, *Freedom of Choice in European Corporate Law*, 29 YALE J. INT'L L. 477, 479 n.9 (2004) ("Denmark, Ireland, the Netherlands, and the United Kingdom apply the state of incorporation doctrine.").

major exporter of entities.¹⁴⁸ Switzerland, the Cayman Islands, and the Ras Al Khaimah Free Trade Zone Authority in the United Arab Emirates (RAK FTZ) are corporate havens. They sell entities principally for export. Japan, India, and China are three of the worlds' largest economies. For each country, I investigated the most commonly registered entity types and report

Table 1. Legal Receptivity to AEs in Representative Countries
(ordered from greatest to least)

Jurisdiction and entity type	Are members or shareholders required?	Is circular ownership prohibited?	Are shareholder names reported?	Must an AE manage through humans?
1. Cayman Islands LLC	Yes	No	No	No
2. RAK FTZ Offshore Co.	Yes	Weak prohibition	Yes, to public	No
3. United Kingdom Co.	Yes	Yes	Yes, to public	No, but requires one human director
4. P.R.C. LLC	Yes	No	Yes, initiators to government	One director, one supervisor
5. German GmbH	Yes	No	Yes, to public	One director
6. Japan LLC	Yes	No	Yes, to government	Representative
7. India LLP	Yes	No	Yes, to government	Two designated partners
8. Swiss LLC	Yes	Yes	Yes, to public	Managing director

in Table 1 on the type most hospitable to AEs.

Generally speaking, the laws of those eight jurisdictions are less receptive to AEs than are the laws of U.S. jurisdictions. In contrast to U.S.

148. William W. Bratton et al., *How Does Corporate Mobility Affect Lawmaking? A Comparative Analysis*, 57 AM. J. COMP. L. 347, 374 (2009) (“[S]hortly after the ECJ decisions more than ten percent of the newly incorporated companies in Germany were limited. This made Germany the absolute leader in post-Centros emigrations while the United Kingdom, with its private limited company form, is the overwhelmingly favorite host jurisdiction.”); Ball, *supra* note 126 (reporting that “more than 60,000” companies registered in the United Kingdom and then active were listed as having directors in offshore jurisdictions “such as the Channel Islands, British Virgin Islands, Cyprus, Dubai and the Seychelles”).

jurisdictions, which generally leave it to initiators to issue—or not to issue—shares or memberships after formation, all eight foreign jurisdictions required that their entities have members or shareholders in place, and so in control, at formation.¹⁴⁹ None of their laws permits memberless entities.

In all eight jurisdictions, the controlling members or shareholders could themselves be artificial entities.¹⁵⁰ Five of the eight jurisdictions require the controlling artificial entities to designate natural persons to act for them.¹⁵¹

149. LLC Law § 5(1) (2015) (Cayman Is.) (“[A] limited liability company shall at all times have at least one member.”); RAK FTZ International Companies Regulations § 19(i) (2006) (“The incorporators of an International Company shall be deemed to have agreed to become members of the International Company, and on its registration shall be entered as such in its register of members.”); Company Law Art. 25(4) (2005) (China) (“A limited liability company shall state the following items in its articles of association: names of shareholders.”); Companies Act § 8(1) (2006) (U.K.) (“A memorandum of association is a memorandum stating that the subscribers . . . (a) wish to form a company under this Act, and (b) agree to become members of the company.”); *id.* § 9(1) (“The memorandum of association must be delivered to the registrar together with an application for registration of the company.”); Code of Obligations § 772(1) (2014) (Switz.) (“A limited liability company is an incorporated company with separate legal personality in which one or more persons or commercial enterprises participate.”); LLC Act § 8(1)(3) (2013) (Ger.) (“The following must be enclosed with the application for registration: A list of shareholders signed by those applying for registration which indicates the family name, given name, date of birth and place of residence of the shareholders.”); Companies Act Art. 575(1) (2005) (Japan) (“In order to incorporate an (sic) General Partnership Company, Limited Partnership Company or Limited Liability Company . . . persons who intend to be its partners must prepare articles of incorporation which must be signed by or record the names of and be affixed with the seals, of all partners.”); LLP Act § 6(1) (2008) (India) (“Every limited liability partnership shall have at least two partners.”). *See* Shawn Bayern, Thomas Burri, Thomas D. Grant, Daniel M. Häusermann, Florian Möslein & Richard Williams, *Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators*, 9 HASTINGS SCI. & TECH. L.J. 135, 144 (2017) (“To summarize, an autonomous system cannot be given de facto legal personhood without human involvement by means of a Swiss stock corporation. The corporation must have at least one shareholder and at least one natural person acting as director. . . . A Swiss LLC must have at least one managing officer; managing officers must be natural persons.”).

150. LLC Law § 26(1) (2015) (Cayman Is.) (allowing members to manage an LLC); § 13(3) (allowing artificial entities to be members); RAK FTZ International Companies Regulations § 39 (2006) (allowing management by not less than one director); RAK FTZ Standard Articles of Association ¶ 38 (recognizing that a “body corporate” may be a director); U.K., Companies Act § 155 (2006) (requiring that a “company must have at least one director who is a natural person,” but stating that the “requirement is met if the office of director is held by a natural person . . . by virtue of an office”). An AE could circumvent the UK requirement either by appointing two legal person directors to outvote the human, or by establishing an office in the controlling entity to which the algorithm could easily appoint, and from which it could easily remove, natural person nominees.

151. Code of Obligations Art. 814(2) (2014) (Switz.) (“[A]t least one managing director must be authorized to represent the company.”); Bayern et al., *supra* note 149, at 144 (“Only natural persons—that is, humans—are eligible to be appointed to [the board of a Swiss GmbH].”); LLC Act § 6(1) (2013) (Ger.) (“The company must have one or more directors.”), § 6(2) (“Only a natural person of full legal capacity may be a director.”); Bayern et al., *supra* note 149, at 143 (noting that the statute that “allows only natural persons to act as directors” of a German GmbHG is under constitutional attack); Company Law Art. 51 (2005) (China) (“[A] limited liability company . . . may have an executive director and no board of directors.”), Art. 52 (“A limited liability company, which has relatively less shareholders or is relatively small in scale, may have 1 or 2 supervisors, and does not have to establish a board of supervisors.”), Art. 58 (recognizing that a “one-person limited liability company” may have a “legal

But, except in Switzerland¹⁵² and China,¹⁵³ the requirements seem only directed at assuring the presence of natural persons who can be held accountable for the entity's actions or failures to act, not to enable the natural persons to exercise independent discretion or control. To illustrate, Indian law requires that the artificial partners of an Indian limited liability partnership designate human partners. But the only provision addressing the function of the human partners states:

[A] designated partner shall be (a) responsible for the doing of all acts, matters and things as are required to be done by the limited liability partnership in respect of compliance of the provisions of this Act including filing of any document, return, statement and the like report pursuant to the provisions of this Act and as may be specified in the limited liability partnership agreement; and (b) liable to all penalties imposed on the limited liability partnership for any contravention of those provisions.¹⁵⁴

Those duties are all ministerial.

Except in Switzerland and China, the human representatives that the owners must appoint appear to be mere agents. If so, algorithms could simply hire such agents and instruct them. Except in China,¹⁵⁵ the representatives can be removed and replaced at will, opening the door to

person" as its shareholder); Companies Act Art. 598(1) (2005) (Japan) (juridical partners who execute the business must appoint persons to execute their duties); LLP Act § 7(1) (2008) (India) ("[I]n case of a limited liability partnership in which all the partners are bodies corporate . . . at least two individuals who are partners of such limited liability partnership or nominees of such bodies corporate shall act as designated partners."). *But see* Vivian Bath, *The Company Law and Foreign Investment Enterprises in the PRC—Parallel Systems of Chinese-Foreign Regulation*, 30 U. NEW SOUTH WALES L.J. 774 (2007) (asserting that a wholly foreign owned enterprise with only one shareholder is not required to have a supervisor).

152. Code of Obligations Art. 810(2) (2014) (Switz.) ("Subject to the reservation of the following provisions, the managing directors have the following inalienable and irrevocable duties: 1. the overall management of the company and issuing the required directives . . ."); *see also* Bayern et al., *supra* note 149, at 144.

All private law entities in Switzerland are required to have a supreme governing body. Depending on the type of entity, the supreme governing body may be a board of directors (in the case of a stock corporation), one or several managing officers (in the case of an LLC), or a board of trustees (in the case of a foundation). Only natural persons — that is, humans — are eligible to be appointed to such body.

153. Company Law Art. 52 (2005) (China) ("No director or senior manager may concurrently work as a supervisor."), Art. 54 (providing that the "supervisor of a company with no board of supervisors may" check "the financial affairs of the company" and supervise "the duty-related acts of the directors").

154. LLP Act § 8 (2008) (India).

155. Company Law Art. 53 (2005) (China) ("Every term of office of the supervisors shall be 3 years.").

virtually complete *de facto* algorithmic control.¹⁵⁶ As was previously discussed, nominees who can be removed and replaced at will are notoriously pliable.¹⁵⁷

In combination, requiring that entities have owners and allowing artificial entities to fill that role leaves AE initiators with essentially four strategies for putting algorithms in control of non-U.S. entities. First, except in the United Kingdom¹⁵⁸ and Switzerland,¹⁵⁹ the initiator could create two domestic AEs, each owning and controlling the other.¹⁶⁰ Circular ownership would avoid the infinite regress in which each artificial owner would itself have to have an artificial owner. But circular ownership would make it easier for the government or others to discover the AE.¹⁶¹ Entity ownership records are visible to the governments in six of the eight jurisdictions and to the public in three of the six.¹⁶²

156. Company Law Art. 51 (2005) (China) (“As for a limited liability company with relatively less shareholders or a relatively small limited liability company, it may have an executive director and no board of directors.”), Art. 62 (providing that a single shareholder can make decisions simply by writing them); Code of Obligations Art. 815(1) (2014) (Switz.) (“The members’ general meeting may remove managing directors that it has appointed at any time.”); LLC Act § 38 (2013) (Ger.) (“The directors’ appointment may be revoked at any time without prejudice to claims for compensation resulting from existing agreements.”); Companies Act Art. 914 viii (2005) (Japan) (“The registration of incorporation of a Limited Liability Company shall be completed by registering . . . if the partner representing the Limited Liability Company is a juridical person, the name and domicile of the person who is to perform the duties of such partner.”); LLP Act § 7(2)(ii) (2008) (India) (“[A]ny partner may become a designated partner by and in accordance with the limited liability partnership agreement and a partner may cease to be a designated partner in accordance with limited liability partnership agreement.”).

157. See *supra* notes 117–138 and accompanying text.

158. The United Kingdom Companies Act prohibits circular ownership of companies. Companies Act § 136(1) (2006) (U.K.) (“[A] body corporate cannot be a member of a company that is its holding company, and . . . any allotment or transfer of shares in a company to its subsidiary is void.”).

159. Code of Obligations Art. 783 (2014) (Switz.) (prohibiting circular ownership).

160. LLC Law § 9(4)(c) (2015) (Cayman Is.) (“Unless its LLC agreement provides otherwise, a limited liability company has the power . . . to . . . purchase, receive, subscribe for, or otherwise acquire, own, hold, vote, [or] use . . . shares or other interests in . . . any other entity . . .”); Company Law Art. 16 (2005) (China) (“Where a company intends to invest in any other enterprise or provide guarantee for others, it shall, according to the provisions of its articles of association, be decided at the meeting of the board of directors or shareholders’ meeting or shareholders’ assembly.”); LLC Act § 33(2) (2013) (Ger.) (“The company may purchase own shares for which capital contributions have been paid in full . . .”). Japan and India prohibit circular ownership with respect to stock companies, but have no corresponding provision applicable to limited liability companies. Companies Act Art. 135 (2005) (Japan); Companies Act § 149 (India). A RAK FTZ International company cannot acquire its own shares by share purchase, RAK FTZ International Companies Regulations § 31(2006), or redemption, *id.* § 30, but there is no prohibition on purchase of the shares of a subsidiary.

161. Not all circular ownership would be to facilitate AEs. Human directors or managers may create circular ownership as a means of guaranteeing their continuation in office.

162. RAK FTZ International Companies Regulations § 25 (2006) (disclosure to government and the public); Company Law Art. 25(4) (2005) (China) (disclosure to government); Companies Act § 116(1) (2006) (U.K.) (disclosure to government and the public); LLC Act § 40 (2013) (Ger.) (disclosure to government and the public); Companies Act Art. 914 (2005) (Japan) (disclosure to the government);

A second strategy would be for an ownerless entity from a jurisdiction that does not require the keeping of ownership records to own the domestic entity.¹⁶³ The principal disadvantage of this approach is that the AE dyad would be present, and so perhaps vulnerable, in two jurisdictions.

Third, the initiator could arrange multiple entities from different countries in circular ownership. The circle would run through jurisdictions where the governments do not collect the identities of shareholders or members. Because the ownership is ultimately circular, it might violate the law in some of those countries. Even if the governments pool the ownership information they do collect, that information would not be sufficient to reveal the circularity of the ownership, but the circularity might still be revealed through discovery in civil litigation.

A fourth strategy would be for the domestic entity to designate a human to act as its nominee shareholder. As the entity's sole shareholder, the nominee would execute the algorithm's instructions. The disadvantage is that the nominee might disregard instructions or even discover and reveal the AE's nature.

This section has shown that AEs can control most entity types formed in most U.S. jurisdictions. Even outside the United States, AEs could control at least one type of entity in most jurisdictions. In some, that control could be direct, as it would be in the United States. In others, the AE may be dependent on nominees, may need to use multi-entity structures, or both. Ultimately, however, AEs could exist almost anywhere in the world.

B. The Mobility Problem

Humans will have difficulty controlling AEs because AEs can migrate across state and national borders to avoid detection and regulation. Cross-border migration can be the electronic transfer or redistribution of an algorithm, a change in the physical location of the AE's assets or operations, a mere change in the entity's registration jurisdiction, or any combination of these.

1. Mobility of Algorithms

Algorithms are computer programs. They can move across borders as easily as a program can be downloaded from a foreign server. Copies of an algorithm or its components can exist in numerous jurisdictions simultaneously.

LLP Act § 25 (2008) (India) (disclosure to the government).

163. See *supra* note 106 and accompanying text.

Governments could seek to prevent AEs by regulating algorithms directly and enforcing the regulations by detecting and destroying noncompliant algorithms. But an intelligent algorithm can back itself up in multiple jurisdictions, manage its own locations, and employ encryption to avoid detection. To predict the degree to which the governments or the algorithms would prevail in such a contest would require an analysis of technology that is outside the scope of this Article. I acknowledge the possibility that governments might be successful in regulating algorithms directly,¹⁶⁴ but assume for purposes of this Article that they will not.

2. *Mobility of Assets and Operations*

AEs have the same rights and abilities as other property owners to move assets and operations across borders to escape regulation. But, to the extent that an entity's assets and operations remain in a jurisdiction, the government has the power to seize them. As a result, the entity remains *de facto* subject to the jurisdiction's regulation. Governments regulate foreign entities that have local assets and operations in two ways. First, the government may enact regulations that apply extraterritorially and enforce them by proceeding against the local assets. The U.S. government has employed this strategy with respect to bankruptcy court jurisdiction over debtors' foreign assets.¹⁶⁵ Second, the government may condition the right to do business in the jurisdiction on compliance with the regulations. For example, a U.S. state has the constitutional right to exclude foreign entities from doing business within its borders,¹⁶⁶ provided that its restrictions do not interfere with interstate commerce.¹⁶⁷

164. See, e.g., Jack M. Balkin, *The Three Laws of Robotics in the Age of Big Data*, 78 OHIO ST. L.J. 1, (2017) (speculating on the kind of regulation necessary).

165. LOPUCKI, *supra* note 53, at 189–92 (describing cases).

166. *Missouri Pac. R. Co. v. Kirkpatrick*, 652 S.W.2d 128, 132 (Mo. 1983) (“It has been held both before and after the Fourteenth Amendment that a State may impose on a foreign corporation for the privilege of doing business within its borders more onerous conditions than it imposes on domestic companies.”).

167. JAMES D. COX & THOMAS LEE HAZEN, *TREATISE ON THE LAW OF CORPORATIONS* § 1:4 (3d ed. 2015) (“As a consequence of being denied citizenship status, states may, as a valid exercise of their police powers, regulate foreign corporations conducting business within their borders, provided the regulations do not impermissibly affect commerce.”).

Despite those theoretical possibilities, governments generally have not sought to regulate entities incorporated elsewhere. Instead, they yield to the entity law of the formation jurisdiction.¹⁶⁸ U.S. states require foreign corporations doing business within their borders to identify themselves, designate resident agents to receive service of process, and pay fees that approximate those for incorporation in the state.¹⁶⁹ Those requirements are the same, whether the jurisdiction of incorporation is in another state or outside the country.¹⁷⁰ The same is true in Canada and Australia.¹⁷¹ Within the European Union, the right of freedom of establishment entitles an entity formed in one member state to do business in other member states.¹⁷² A small minority of jurisdictions do regulate the internal affairs of foreign corporations. First, California,¹⁷³ Japan,¹⁷⁴ and India¹⁷⁵ have adopted versions of the pseudo-foreign corporation doctrine. That doctrine applies the law of the jurisdiction to a foreign-incorporated company if the company is principally located in the jurisdiction. Second, New York,¹⁷⁶ Switzerland,¹⁷⁷ and perhaps other jurisdictions, regulate some of the internal affairs of foreign entities doing business within their territories. Third, several European jurisdictions continue to apply the “real seat” doctrine.¹⁷⁸ That doctrine requires a business to incorporate in the jurisdiction if its administrative center is in the jurisdiction,¹⁷⁹ and treats the business as unincorporated if the business does not do so.¹⁸⁰

168. *Qualifying to Do Business Outside Your State*, NOLO, <http://www.nolo.com/legal-encyclopedia/qualifying-do-business-outside-state-29717.html> [<https://perma.cc/M3KM-X69P>] (last visited Oct. 9, 2017) (“Qualification is simply a registration process that involves filing paperwork and paying fees—similar to the procedures and fees required for incorporating your business or forming your LLC.”).

169. *E.g.*, CAL. CORP. CODE § 2105.

170. *E.g.*, *id.* § 171 (“‘Foreign corporation’ means any corporation other than a domestic corporation . . .”).

171. John C. Coffee, Jr. et al., *The Direction of Corporate Law: The Scholars’ Perspective*, 25 DEL. J. CORP. L. 79, 91 (2000) (“Both Canada and Australia have, for example, federal systems in which business firms incorporate under a provincial corporate law. In principle, this supplies the preconditions for charter competition, as firms can choose between the corporate laws of different provinces.”).

172. Case C-212/97- Centros Ltd. v. Erhvervs-og Selskabsstyrelsen, 1999 ECR I-1459, 2 C.M.L.R. 551 (1999).

173. Cal. Corp. Code § 2115 (2009).

174. Companies Act Art. 821(1) (2005) (Japan) (“A Foreign Company that has its head office in Japan or whose main purpose is to conduct business in Japan may not carry out transactions continuously in Japan.”).

175. Companies Act § 379 (2013) (India) (providing that the Companies Act applies to foreign companies if they are at least 50 percent owned by Indian investors).

176. N.Y. BUS. CORP. LAW § 1317 (2017) (“[T]he directors and officers of a foreign corporation doing business in this state are subject, to the same extent as directors and officers of a domestic corporation, to the provisions of . . . Section 719 (Liability of directors in certain cases).”).

177. Federal Act on Private International Law § 159 (“When the operations of a company established under a foreign law are managed in or from Switzerland, the liability of the persons acting on behalf of such company is governed by Swiss law.”).

None of these regulations would meaningfully limit the ability of an AE to operate in a jurisdiction that adopted them. For example, if a Delaware corporation operated only in California, it would be a California pseudo-corporation. California law would govern meetings of shareholders, the election of directors, and other aspects of the relationship among shareholders, directors, officers, and the entity.¹⁸¹ But those relationships are of no importance in an algorithm-controlled entity. If the AE had directors and shareholders at all, they would be nominees merely executing the algorithm's instructions. Delaware law would continue to govern the AE in the most important respects—disclosure of beneficial ownership information.

Similarly, if all operations of a Delaware-incorporated AE were in Germany, the arrangement would facially violate Germany's requirement that a company be incorporated at its real seat.¹⁸² But the most-favored-nation clause of the U.S.-German treaty probably entitles Delaware entities to essentially the same rights as those from EU countries.¹⁸³ The latter are not required to comply with the real seat doctrine under German law. In a landmark decision, the European Court of Justice held that an entity that was formed in the United Kingdom, but which had no operations in the United Kingdom, had the right to conduct its only business in Denmark despite Denmark law to the contrary. The court said:

It is contrary to Articles 52 and 58 [of the EC Treaty] for a Member State to refuse to register a branch of a company formed in accordance with the law of another Member State in which it has its

178. E.g., Werner F. Ebke, *The "Real Seat" Doctrine in the Conflict of Corporate Laws*, 36 INT'L L. 1015, 1016 (2002) ("[T]he real seat doctrine . . . is applied in one form or another by the majority of the Member States of the European Union.").

179. CARSTEN GERNER-BEUERLE ET AL., STUDY ON DIRECTORS' DUTIES AND LIABILITIES 231 (2013), http://ec.europa.eu/internal_market/company/docs/board/2013-study-analysis_en.pdf [<https://perma.cc/L9EW-5GKT>] ("Countries following the real seat doctrine, on the other hand, traditionally required from their own companies that they maintain their central administration within their jurisdiction.").

180. Luca Cerioni, *The "Uberseering" Ruling: The Eve of a "Revolution" for the Possibilities of Companies' Migration Throughout the European Community?*, 10 COLUM. J. EUR. L. 117, 119 (2003) ("States currently using the 'real seat' criteria either do not recognize the legal capacity of companies formed under foreign legal systems but having their central management and control . . . within their jurisdictions, unless those companies re-incorporate according to their national provisions, or they consider such companies as unincorporated entities.").

181. CAL. CORP. CODE § 2115(b) (2009).

182. Ebke, *supra* note 178, at 1022 ("[A] corporation having its seat in Germany is required to incorporate under German law.").

183. Treaty of Friendship, Commerce and Navigation, Ger.-U.S., art. XXV, ¶ 2, cl. 2, Oct. 20, 1954.

registered office but in which it conducts no business where the branch is intended to enable the company in question to carry on its entire business in the State in which that branch is to be created, while avoiding the need to form a company there, thus evading application of the rules governing the formation of companies which, in that State, are more restrictive as regards the paying up of a minimum share capital.¹⁸⁴

In other words, even in the most egregious circumstances, an EU business can incorporate anywhere in the EU and be bound only by the entity law of its place of incorporation, thus avoiding the entity law of the place where it does business.

This EU “right to freedom of establishment” applies only in favor of entities formed in European Economic Area (EEA) and other-treaty jurisdictions. Thus, an entity formed in a non-EU, non-other-treaty jurisdiction would not have the right to maintain its center of operations in Germany.¹⁸⁵ But it could acquire that right simply by moving its place of incorporation to an EU or other-treaty jurisdiction.

Thus, while the pseudo-foreign corporation doctrine, the real seat doctrine, and other similar regulations can, in some instances, limit AEs’ abilities to center their operations in particular jurisdictions, the limitations are of limited practical importance. Under current law, an AE can center its operations in almost any jurisdiction without incorporating in that jurisdiction.

3. *Mobility of Entities*

The ability to change an entity’s registration jurisdiction is important because the place of registration determines the applicable entity law.¹⁸⁶ This basic principle of international cooperation is often conflated with the “internal affairs doctrine” and the two are then misleadingly described as regulating only the relationships among the corporation and its shareholders, officers, and directors.

The internal affairs doctrine is a conflict of laws principle which recognizes that only one State should have the authority to regulate a

184. *Centros Ltd.*, *supra* note 47.

185. Case C-378/10 *VALE Építési* (2012).

186. For example, 805 ILL. COMP. STAT. 5/13.05 (2016) provides:

A foreign corporation shall not be denied authority by reason of the fact that the laws of the state under which such corporation is organized governing its organization and internal affairs differ from the laws of this State, and nothing in this Act contained shall be construed to authorize this State to regulate the organization or the internal affairs of such corporation.

corporation's internal affairs—matters peculiar to the relationships among or between the corporation and its current officers, directors, and shareholders—because otherwise a corporation could be faced with conflicting demands. States normally look to the State of a business' incorporation for the law that provides the relevant corporate governance general standard of care.¹⁸⁷

In fact, the conflated doctrines regulate rights of contract creditors,¹⁸⁸ tort creditors,¹⁸⁹ employees,¹⁹⁰ the government,¹⁹¹ the public,¹⁹² and probably other corporate stakeholders.¹⁹³

Most importantly for present purposes, the incorporation state's entity law determines who may initiate an entity, what information an initiator must divulge, what portion of that information will be made public, the extent to which humans must participate in controlling the entity, and which

187. *Vaughn v. LJ Int'l, Inc.*, 94 Cal. Rptr. 3d 166, 173 (Cal. Ct. App. 2009) (internal citations omitted).

188. That is, entity law shields entities against contract claims. *N. Am. Catholic Educ. Programming Found., Inc. v. Gheewalla*, 930 A.2d 92, 94 (Del. 2007) (holding that the “creditors of a Delaware corporation in the ‘zone of insolvency’ may not assert direct claims for breach of fiduciary duty against the corporation’s directors”).

189. *E.g.*, Mucciarelli, *supra* note 48, at 457 n.163 (“Veil piercing is considered in many [European Union] Member States as part of the *lex societatis* and, consequently, governed by the state of incorporation.”); *Japan Petroleum Co. (Nigeria) v. Ashland Oil, Inc.*, 456 F. Supp. 831, 840 n.17 (D. Del. 1978) (“Delaware courts which have considered the question of whether a parent corporation should be subjected to liability for a subsidiary’s obligations have applied Delaware law, even in the case of foreign subsidiaries.”).

190. *See, e.g.*, Mark J. Loewenstein, *Stakeholder Protection in Germany and Japan*, 76 TUL. L. REV. 1673, 1675 (2002) (noting that the German system of corporate governance grants formal participatory rights to employees); *id.* at 1683–84 (noting that the Japanese system of corporate governance grants information rights that approximate the same results).

191. For example, Germany is unable to effectively impose the real seat doctrine and U.S. jurisdictions cannot revoke the charters of corporations from other states. *E.g.*, *In re Blixseth*, 484 B.R. 360, 369–70 (B.A.P. 9th Cir. 2012) (“[J]urisdiction to dissolve a corporation rests only in the courts of the state of incorporation.”); *Young v. JCR Petroleum, Inc.*, 423 S.E.2d 889, 892 (W. Va. 1992) (quoting 19 AM. JUR. 2D *Corporations* § 2734 (1986)) (“[T]he courts of one state do not have the power to dissolve a corporation created by the laws of another state.”).

192. *See, e.g.*, Note, *The Internal Affairs Doctrine: Theoretical Justifications and Tentative Explanations for Its Continued Primacy*, 115 HARV. L. REV. 1480, 1484–85 (2002):

[I]f a company is incorporated in State X (where the law mandates that directors' sole duty is to maximize shareholder value), but has its primary operations in State Y (which is solicitous of broader community interests), State Y arguably has an interest in ensuring that directors consider the interests of other corporate constituents, such as employees and community members.

193. *Case C-208/00, Überseering BV v. Nordie Constr. Co. Baumanagement GmbH*, 2002 E.C.R. I-9919, I-9949 (Nov. 5, 2002) (“[T]he fundamental weakness of the incorporation principle [is that it] fails to take account of the fact that a company’s incorporation and activities also affect the interests of third parties and of the State in which the company has its actual centre of administration.”).

humans are considered adequate as controllers.¹⁹⁴ Those are the issues that would determine the viability of an AE in the jurisdiction.

Changing an entity's registration jurisdiction changes the applicable entity law. After an entity ceases to be registered in a jurisdiction, the jurisdiction may continue to regulate the entity's operations remaining in the jurisdiction, but is not likely to regulate the entity itself.¹⁹⁵ Thus, an AE can escape regulation by its registration jurisdiction simply by changing it.

Entities can change their incorporation jurisdictions in at least four ways, none of which requires movement of assets or operations. First, an entity can incorporate a second entity in the destination jurisdiction, transfer its assets to that entity, and then dissolve itself (hereinafter Sale of Assets). One strength of this method is that neither the entity types nor the jurisdictions matter, so long as the jurisdictions do not prohibit sales of assets. A second strength is that the transaction may be invisible. The assets need not move and the transaction may not be required to be recorded in any public or government records. Entity law sometimes authorizes this technique,¹⁹⁶ sometimes re-characterizes it as a merger,¹⁹⁷ but rarely prohibits it.¹⁹⁸ The weaknesses of this method are that asset sales may have adverse tax or other legal consequences and some assets may not be readily assignable or may be assignable only at substantial expense or after substantial delay.¹⁹⁹ For those reasons, entities usually prefer to change their incorporation jurisdictions by other methods.

Second, an entity can incorporate a second entity in the destination jurisdiction and merge into that entity (hereinafter Merger). This method is commonly available and used in all or substantially all U.S. jurisdictions.²⁰⁰ The statutes of both jurisdictions must allow the merger.

Third, the entity laws of most U.S. jurisdictions and some foreign jurisdictions allow foreign entities to convert to domestic entities if the

194. *Supra* notes 126–125 and accompanying text.

195. The United Kingdom is an exception. *See* Mucciarelli, *supra* note 45, at 429 (noting that “according to English law a transfer abroad of the registered office is simply impossible”).

196. *E.g.*, DEL. CODE ANN. tit. 8, § 271 (2010) (authorizing sale of all or substantially all assets).

197. *Arrowhead Capital Fin., Ltd. v. Seven Arts Entm't, Inc.*, No. 14 Civ. 6512 (KPF), 2016 WL 4991623, at *10–13 (S.D.N.Y. Sept. 16, 2016) (recharacterizing asset transfers as mergers); CAL. CORP. CODE § 1001(a) (“A [sale of all or substantially all assets] constituting a conversion . . . is subject to the provisions [governing conversions] and not this section.”).

198. Jurisdictions that prohibit foreign investment may have such prohibitions.

199. Robert C. Art, *Conversion and Merger of Disparate Business Entities*, 76 WASH. U. L. REV. 349, 369–72 (2001) (describing a variety of such problems).

200. The Model Business Corporation Act, which has been adopted in more than half of U.S. states, provides that “[o]ne or more domestic business corporations may merge with one or more domestic or foreign business corporations or eligible entities pursuant to a plan of merger.” MODEL BUS. CORP. ACT § 11.02(a) (2016).

foreign entity law permits (hereinafter Conversion).²⁰¹ Typically, these jurisdictions also allow domestic entities to convert to foreign entities if the foreign entity law permits. For example, Delaware allows a “foreign corporation” to “convert to a corporation of this State”²⁰² merely by filing an election to do so. The Delaware corporation thus created is “deemed to be the same entity as the converting other entity.”²⁰³ The “converting other entity” is “not required to wind up its affairs.”²⁰⁴ But its continuance is only “in the form of a corporation of this state.”²⁰⁵ In some jurisdictions, this method is referred to as “domestication.”²⁰⁶

Fourth, Delaware and Nevada offer domestication procedures of a different type. They allow non-U.S. entities to become Delaware or Nevada entities while remaining in existence under non-U.S. law (hereinafter Domestication).²⁰⁷ To illustrate, the Delaware statute provides:

[T]he corporation and such non-United States entity shall, for all purposes of the laws of the State of Delaware, constitute a single entity formed, incorporated, created or otherwise having come into being, as applicable, and existing under the laws of the State of Delaware and the laws of such foreign jurisdiction.²⁰⁸

The effect of this type of domestication is to confer dual domicile on the entity. That is, under Delaware law, the entity has the option to renounce either domicile and continue to exist under the laws of the other domicile.²⁰⁹

201. See, e.g., VICTORIA APPLEWHITE, MISS. SEC’Y STATE OFFICE DOMESTICATION AND CONVERSION OF BUSINESS ENTITIES 3 (2012), <http://www.sos.ms.gov/Policy-Research/Documents/5Background.pdf> [<https://perma.cc/WB9Z-TLE4>] (defining “domestication” as “a procedure whereby a foreign corporation discontinues its incorporation under the laws of the foreign state and becomes incorporated under the laws of the subject state or vice versa” and reporting that “[t]hirty [U.S. states] in total provide for domestication of corporations”).

202. DEL. CODE ANN. tit. 8, § 265(a)–(b) (2012).

203. *Id.* tit. 8, § 265(f).

204. *Id.* tit. 8, § 265(g).

205. *Id.*

206. E.g., *Fisher v. Tails, Inc.*, 767 S.E. 2d 710, 712–14 (Va. 2015) (discussing domestication under Virginia law).

207. NEV. REV. STAT. § 92A.270 (2016) provides:

If, following domestication, an undomesticated organization that has become domesticated pursuant to this section continues its existence in the foreign country or foreign jurisdiction in which it was existing immediately before the domestication, the domestic entity and the undomesticated organization are for all purposes a single entity formed, incorporated, organized or otherwise created and existing pursuant to the laws of this State and the laws of the foreign country or other foreign jurisdiction.

208. DEL. CODE ANN. tit. 8, § 388(j) (2008).

209. An entity with dual domicile can “transfer to . . . any foreign jurisdiction and, in connection therewith, may elect to continue its existence as a corporation of this State.” DEL. CODE ANN. tit. 8, § 390(a) (2012).

From the viewpoint of an AE, such dual domicile provides a means of speedy exit from a foreign jurisdiction that turns hostile. The foreign entity already exists under Delaware law.

To estimate the rough proportion of jurisdictions to which AEs could emigrate, I surveyed the laws of the eight representative foreign jurisdictions on which I reported in Part II.A.5. For each, I determined first whether foreign entities could become domestic entities (hereinafter immigration) by each of four methods (Asset Sale, Merger, Conversion, and Domestication) and second whether domestic entities could become foreign entities by each of those methods (hereinafter emigration). Table 2 shows the results for Asset Sales, Mergers, and Conversions. Domestications are not shown because none of the eight jurisdictions allow them.

Table 2. Authorized Methods for Changing Incorporation Jurisdiction
(ordered as in Table 1)

<i>Jurisdiction</i>	<i>Entity type</i>	<i>Asset Sale</i>	<i>Merger</i>	<i>Conversion</i>
Cayman Islands	Companies and LLCs	In and out	In and out	In and out
RAK FTZ	Offshore Co.	In and out	No in or out	No in or out
United Kingdom	Companies	In and out by absorption	In and out, but only with EEA, treaty countries	In but not out ²¹⁰ only with EEA, treaty countries
China	Foreign and domestic companies	No in or out	No in or out	No in or out
Germany	Stock or GmbH	In and out by absorption	In and out, but only with EEA, treaty countries	In and out only with EEA, treaty countries
Japan	Stock or LLC	No in or out	No in or out	No in or out
India	LLP	In and out by absorption	Two step in and out	Two step in and out
Switzerland	Companies	In and out by absorption	In and out	Out but not in

“In” means a foreign entity can become a domestic entity of the type. “Out” means that a domestic entity of the type can become a foreign entity.

“Absorption” is merger by absorption, a doctrine similar to de fact merger in the United States. The sale of assets for stock is regulated as if it were a merger.

“Two step” refers to the necessity to convert an Indian LLP to an Indian company before it can merge or convert to foreign jurisdictions.

Table 2 shows that six of the eight jurisdictions (75 percent) provide at least one method by which entities can immigrate and emigrate. Only Japan and China allow none. Although Japanese companies can merge with and convert to other types of Japanese companies,²¹¹ foreign companies cannot

210. See Federico M. Mucciarelli, *Company ‘Emigration’ and EC Freedom of Establishment: Daily Mail Revisited*, 9 EUR. BUS. ORG. L. REV. 267, 285 (2008) (stating with respect to England that “the transfer abroad of the registered office does not shift the connecting factor and the applicable law does not change”).

211. Companies Act Art. 743 (2005) (Japan) (conversion), Art. 748 (merger).

merge with or convert to or from Japanese companies.²¹²

Chinese entities cannot sell their Chinese assets abroad,²¹³ merge with foreign entities,²¹⁴ or convert to foreign entities. The “merger” of Chinese and foreign entities allowed under recently adopted regulations actually authorizes only acquisitions of Chinese companies in narrow circumstances. The acquired company would remain incorporated in China.²¹⁵

The RAK FTZ International Companies Regulations do not provide for foreign, or even domestic, mergers or conversions. Nor do they, however, prohibit Asset Sale. From that lack of prohibition and the fact that the Regulations contemplate takeovers²¹⁶ I infer asset sales are permitted.²¹⁷ Because the RAK FTZ Offshore company could be either the buyer or the seller of the assets, the Regulations do leave open a path by which AEs could migrate in or out of RAK FTZ Offshore companies.

The five remaining jurisdictions offer entity migration in and out of the jurisdictions’ entity laws by Merger, Conversion, or Asset Sale. The Cayman Islands LLC Act is similar to U.S. LLC laws, and makes the rights to Asset Sale,²¹⁸ Merger,²¹⁹ or Conversion²²⁰ across international borders

212. Companies Act Art. 1 (2005) (Japan) (defining “company”), Art. 2 (defining “foreign company”). Japan does allow “triangular mergers” between Japanese and foreign companies that allow foreign companies to acquire Japanese companies, but the acquired companies remain Japanese. *Id.* Art. 749 (2005) (Japan) (stock company), Art. 751 (membership company); William R. Huss et al., *Japan’s New Triangular Merger Rules—Acquisition of Japanese Companies Through Share Exchanges*, CLIENT ALERT (Apr. 25, 2007) 1, <http://perma.cc/7UEF-HX47> (describing transactions in which the target companies remain Japanese).

213. Law on Wholly Foreign-Owned Enterprises Art. 19 (2000) (China) (“The foreign investor may remit abroad legitimate profits earned from an enterprise with sole foreign investment, other legitimate income and funds obtained after liquidation of the enterprise.”).

214. As to domestic entities, *see* Company Law Art. 173 (2005) (China) (“The merger of a company may be achieved by way of absorption or consolidation.”), Art. 2 (“The term ‘company’ as mentioned in this Law refers to a limited liability company or a joint stock limited company established within the territory of the People’s Republic of China in accordance with the provisions of this law.”). As to wholly foreign-owned entities, *see* Provisions on M&A of a Domestic Enterprise by Foreign Investors Art. 2 (2009) (China) (allowing only mergers and asset sales resulting in “foreign investment enterprises”).

215. Provisions on M&A of a Domestic Enterprise by Foreign Investors Art. 27 (2009) (China) (allowing purchase of a domestic company by a surviving “overseas” company, but only if the overseas company is listed and the listing place has “a sound management system on securities exchange”).

216. RAK FTZ International Companies Regulations §§ 110–16 (2006).

217. If asset sales to or from RAK FTZ companies were not permitted, an entity that acquired full ownership of one could not integrate the entity’s assets with those of the RAK FTZ company.

218. LLC Law § 9(4) (2015) (Cayman Is.) (“[A] limited liability company has the power to do all things necessary or convenient to carry on its business or affairs, including, without limitation, power to . . . purchase, . . . real or personal property . . . wherever located; . . . sell . . . all or any part of its property; . . . purchase . . . shares or other interests in . . . any other entity.”).

219. LLC Law § 51(1) (2015) (Cayman Is.) (“One or more limited liability companies may merge or consolidate with one or more foreign entities.”).

220. LLC Law § 54(1) (2015) (Cayman Is.) (“Any foreign entity may apply to the Registrar to be registered by way of continuation as a limited liability company in the Islands.”); *id.* § 55(1) (providing

both express and reciprocal.

Swiss law allows both “absorption by immigration”—purchase of a foreign company’s assets—and “combination by immigration”—merger of a foreign company into a Swiss company.²²¹ It also allows the reverse of those two processes—“absorption by emigration” and “combination by emigration.”²²² It allows conversion out,²²³ but makes no mention of conversion in.

In accord with the EU’s cross-border merger directive,²²⁴ EU members Germany and the United Kingdom have adopted statutes permitting immigration and emigration by Merger or Sale of Assets,²²⁵ but only to and from European Economic Area countries,²²⁶ the United States,²²⁷ and other-treaty-protected nations. The geographical limitations are probably unimportant because AEs from other countries could migrate in and out of the EU through U.S. or other jurisdictions. Although neither German nor U.K. statutes provide for Conversions, the European Court of Justice has held that EU member states must allow them.²²⁸

The cross-border merger provisions of the Indian Companies Act (2013) became effective in 2017. They expressly allow Indian companies to merge

for deregistration of Cayman Islands LLCs that qualify and apply for “continuation as a foreign entity under the laws of any jurisdiction outside the islands”).

221. Federal Act on Private International Law Art. 163 (2014) (Switz.) (“A Swiss company may acquire a foreign company (absorption by immigration) or form together with a foreign company a new Swiss company (combination by immigration).”).

222. Federal Act on Private International Law Art. 163a(1) (2014) (Switz.) (“A Swiss company may acquire a foreign company (absorption by immigration) or form together with a foreign company a new Swiss company (combination by immigration), provided the law governing the foreign company permits such a merger and all the requirements of such law are met.”), *id.* Art. 163b (“A foreign company may acquire a Swiss company (absorption by emigration) or form together with a Swiss company a new foreign company (combination by emigration).”).

223. Federal Act on Private International Law Art. 163(1) (2014) (Switz.) (“A Swiss company may subject itself to a foreign law without going into a liquidation and a re-establishment, provided it meets the requirements of Swiss law and continues to exist under the foreign law.”).

224. Directive 2005/56/EC, of the European Parliament and of the Council of 26 October 2005 on Cross-Border Mergers of Limited Liability Companies, 2005 O.J. (L 310) 1 [hereinafter Cross-Border Merger Directive] (“The laws of the Member States are to allow the cross-border merger of a national limited liability company with a limited liability company from another Member State if the national law of the relevant Member States permits mergers between such types of company.”).

225. Transformation Act § 122a (2011) (Ger.) (defining cross-border merger), § 122(b) (making all “companies limited by shares” eligible for cross-border mergers); U.K., Companies (Cross-Border Mergers) Regulations 2007.

226. Transformation Act § 122a (2011) (Ger.) (extending cross-border merger participation to companies subject to the law of European Economic Area country); U.K., Companies (Cross-Border Mergers) Regulations 2007.

227. Treaty of Friendship, Commerce and Navigation, Germany-U.S., art. XXV, para. 5, cl. 2, Oct. 20, 1954.

228. EU members are required to allow conversions by the Third Chamber of the European Court of Justice’s decision in VALE Építési, Case C-378/10 (2012).

with foreign companies by consolidation or absorption.²²⁹ Indian companies are not, however, a hospitable environment for AEs because Indian companies must be governed by human boards of directors.²³⁰ Indian LLPs provide a more hospitable environment, but the LLP Act does not expressly provide for the merger of LLPs with foreign entities.²³¹ LLPs could, nevertheless, migrate to foreign entities in a two-step process. The LLP would first convert to an Indian company, and the Indian company would then convert to the foreign entity.²³²

The results of the eight-jurisdiction survey summarized in Table 2 suggest that probably most jurisdictions worldwide expressly authorize and seek to facilitate entity-law shopping. The two survey jurisdictions that meaningfully restrict shopping—China and Japan—appear to view entity law as a means of regulating foreign investment rather than as a source of government revenues or a means of attracting capital. But if an AE needed to be governed by the entity laws of one of those jurisdictions, it could migrate in by contributing assets to an AE there and migrate out by selling the assets and transferring the proceeds from the jurisdiction.

Multi-step conversions, such as the Indian-LLP-to-foreign-company conversion previously described, are legal strategies developed by lawyers to facilitate entity law shopping. They are common in other jurisdictions.²³³ For example, a German law firm offers these alternatives for merging a German company with an entity that does not qualify for foreign merger under the Transformation Act because it is incorporated in a non-European

229. Companies Act § 234(2) (2013) (India) (“Subject to the provisions of any other law for the time being in force, a foreign company, may with the prior approval of the Reserve Bank of India, merge into a company registered under this Act or vice versa.”); KPMG INTERNATIONAL, TAXATION OF CROSS-BORDER MERGERS AND ACQUISITIONS INDIA 3 (2014), <https://home.kpmg.com/content/dam/kpmg/pdf/2014/05/india-2014.pdf> [<https://perma.cc/A52S-TXT>] (“The Companies Act, 2013, partially repeals the Companies Act, 1956. Restructuring provisions under the new law have yet not been made effective. However, these provisions, once effective, will permit, among other things, the merger of an Indian company with a foreign company, which was not previously allowed.”).

230. Companies Act § 149(1) (2013) (India) (“Every company shall have a Board of Directors consisting of individuals as directors . . .”).

231. See generally LLP Act (2008) (India).

232. Conversion to an Indian company would be accomplished by registration of the LLP under the Companies Act. Companies Act § 366(1) (2013) (India) (“For the purposes of this Part [Companies Authorized to Register under this Act], the word ‘company’ includes any . . . limited liability partnership . . . which applies for registration under this Part.”).

233. For example, the drafters of the Model Entity Transactions Act observe that:

[D]uring the past decade, restructuring transactions by and among all of the various types of entities began to occur with increased frequency. Because of a lack of clear statutory authority in most states, these restructuring transactions have often been completed in two or three indirect steps rather than directly in a single transaction.

MODEL ENTITY TRANSACTION ACT I prefatory n. (AM. BAR ASS’N 2007). See also Art, *supra* note 199, at 369 (describing three strategies by which a partnership can become a corporation or an LLC without benefit of statutory authority).

jurisdiction:

The first option is to transfer all assets and liabilities to the other company and subsequently dissolve the transferor. The second alternative is to transfer all interests in a German partnership to the foreign company. In a third option, the statutory seat of one of the companies can be transferred to the other jurisdiction and the subsequent merger will then be deemed to take place under one national law.²³⁴

The availability of such strategies are often difficult to predict because they require imagination and are sensitive to practical limitations.²³⁵

Because entities can change their governing laws so easily, regulations designed to discover, control, or prevent AEs could not be effective until substantially all jurisdictions adopted them.²³⁶ Until then, AEs could assume the nationality of the least regulated jurisdiction while continuing to operate throughout the world—just as has occurred with other kinds of entity-based crime.

C. *The Detection Problem*

To regulate AEs, the legal system must be capable of detecting them in jurisdictions throughout the world. The method currently proposed for detecting the persons behind terrorist and other criminal enterprises is probably also the method that could best detect AEs. As discussed in this section, that method is for chartering governments to require that entities disclose their “beneficial owners”—the humans who ultimately own and control the entities, directly or indirectly. That requirement would put each AE to a choice. The AE would have to either admit it is algorithmically controlled or fraudulently report some human or humans as its beneficial owner. Criminal investigators could then ferret out the AEs by assessing the plausibility that the humans disclosed by suspects are the suspect’s actual controllers. In the analogous situation with criminal enterprises, investigators report that, when confronted, the “front men” usually fold

234. MARTIN IMHOF, CROSS-BORDER MERGERS & ACQUISITIONS IN GERMANY: A TRANSACTION GUIDE FOR FOREIGN INVESTORS 18 (2015), https://www.heuking.de/fileadmin/DATEN/Dokumente/Internationales/Transaction_Guide_2015.pdf [<https://perma.cc/XX7H-T92K>].

235. See, e.g., Art, *supra* note 199, at 369–72 (describing some practical difficulties with strategic, multi-step conversions in the United States).

236. See, e.g., ROMANO, *supra* note 2, at 91 (“For a corporate law to be truly mandatory, it must be adopted by all fifty states and the District of Columbia, because firms can change their domicile.”).

easily and confess.²³⁷

The Financial Action Task Force (FATF) is an inter-governmental body established in 1989 to combat “money laundering, terrorist financing and other related threats to the integrity of the international financial system.”²³⁸ FATF’s thirty-seven members include the United States and the governments of all of the other leading financial powers.²³⁹ FATF has recommended the disclosure and verification of beneficial owners,²⁴⁰ and the Obama administration supported legislation that would have compelled disclosure for entities chartered in the United States.²⁴¹ But after a decade, the legislation has not been adopted. The Trump administration has not yet taken a position on it.

At present, governments collect widely differing types and amounts of information regarding the entities they charter. The information collected is referred to as the “registry.” Investigators of entity misuse report that registries are “generally the most valuable and accessible sources of information for investigations.”²⁴² Investigators use the registry information to identify the humans operating behind the entities, that is, the entities’ beneficial owners.

In its first three subsections, this section distinguishes three kinds of incorporation information that are, or might be collected. They are incorporator information, owner and director information, and beneficial owner information. The final subsection contrasts the information required to be collected during Delaware incorporation with beneficial owner information. It then briefly describes a recently published empirical study showing the ease with which initiators can—despite international standards to the contrary—form entities through corporate service providers throughout the world without furnishing meaningful proof of identity.

237. EMILE VAN DER DOES DE WILLEBOIS ET AL., *THE PUPPET MASTERS: HOW THE CORRUPT USE LEGAL STRUCTURES TO HIDE STOLEN ASSETS AND WHAT TO DO ABOUT IT* 63 (2011), available at <https://star.worldbank.org/star/sites/star/files/puppetmastersv1.pdf> [https://perma.cc/S86Z-ZHGX] [hereinafter PUPPET MASTERS] (“[F]ront men [, as distinguished from professional service providers,] usually give up, confess, and cooperate when the police come after them.”).

238. *Who we are*, FIN. ACTION TASK FORCE, <http://www.fatf-gafi.org/about/> [https://perma.cc/PN2S-4AVG] (last visited Oct. 12, 2017).

239. FIN. ACTION TASK FORCE, *FATF Members and Observers*, <http://www.fatf-gafi.org/about/membersandobservers/#d.en.3147> [https://perma.cc/88D7-Z8T6] (last visited Oct. 11, 2017).

240. See *supra* note 43 and accompanying text.

241. Caroline Atkinson, *Beneficial Ownership Legislation Proposed*, WHITE HOUSE (Apr. 4, 2014), <https://www.whitehouse.gov/blog/2014/04/04/beneficial-ownership-legislation-proposal> [https://perma.cc/H7V3-3T25] (“This proposal would require the Internal Revenue Service to collect information on the beneficial owner of any legal entity organized in any state, and would allow law enforcement to access that information.”).

242. PUPPET MASTERS, *supra* note 237, at 70.

1. Incorporators

Registries charter entities on written request. For lack of a better word, I refer to the person who formally requests the entity's formation as the "incorporator," regardless of the registered entity type. The incorporator may or may not be the "initiator" who set the entity formation process in motion.

Corporate service providers are private businesses that form entities for initiators or guide initiators through the entity formation process. Corporate service providers include companies formed specifically to provide those services as well as law firms, accountants, and notaries. Corporate service providers may serve as incorporators, provide nominee shareholders and directors, file annual reports, and pay fees on behalf of their clients. As a result, government registries may have no contact with the initiators and receive no information about them. The corporate service providers may or may not have received and retained information about their clients. If the corporate service providers are attorneys, the information retained may or may not be protected by attorney-client privilege.²⁴³

Some corporate service providers form companies on their own initiative, with the intention of later selling them. Those companies are referred to as "shelf companies."²⁴⁴ Anyone can form and sell shelf companies. U.S. law does not require sellers to obtain or verify the buyer's identity or keep records of the sale. If the seller does not, the company is anonymous.²⁴⁵

2. Owners and Directors

Some registries, particularly outside the United States, contain ownership information.²⁴⁶ Typically, that information is the names and addresses of the shareholders of a corporation or the interest holders in a

243. *Id.* at 94 (noting that "almost all of the investigators interviewed" in a study of the corrupt use of legal structures mentioned "attorney-client privilege" as an impediment to obtaining information).

244. *Id.* at 37.

245. *Business Formation and Financial Crime: Finding a Legislative Solution: Before the S. Comm. on Homeland Sec. and Governmental Affairs*, 5 (2009) (statement of Jennifer Shasky, then Senior Counsel to the Deputy Attorney General), <https://www.justice.gov/sites/default/files/testimonies/witnesses/attachments/11/05/09/11-05-09-shasky-business-formation-financial-crime.pdf> [<https://perma.cc/MK3T-7TV4>] ("[C]riminals can easily throw investigators off the trail by purchasing shelf companies and then never officially transferring the ownership. In such cases the investigation often leads to a [dead-end] formation agent who has long ago sold the company with no records of the purchaser and no obligation to note the ownership change.").

246. *See supra* Table 1, column 4.

limited liability company or limited partnership. Ownership information is often less useful than one might suppose, because owners layer their entities:

[I]f, as part of a money laundering investigation, the authorities in Country A manage to successfully cooperate through the appropriate formal channels with the authorities of Country B to discover the shareholders of a corporation registered in that jurisdiction, they may well find that the listed shareholders of that corporation are in fact corporations registered in Countries C and D.²⁴⁷

Of course, when the investigators gain the cooperation of Countries C and D, they may find that the entities formed in them are also owned by entities registered in yet other jurisdictions. Worse yet, and probably more likely, they may find that Countries C and D did not collect ownership information at all. That may be the end of the investigative trail. As a prominent prosecutor put it, “‘owner-of-record’ information . . . is of little value from a law enforcement perspective. The owner-of-record can be another shell company, another straw owner, an incorporation service—anything.”²⁴⁸

Some registries contain director information. In some jurisdictions, those directors must be humans, but in others they can be artificial entities.²⁴⁹ In most jurisdictions, a single director is sufficient, and, as previously discussed, directors may be mere nominees.²⁵⁰ As a result, information about directors may not be information about beneficial owners.

3. *Beneficial Owners*

Widely accepted international standards state that “[c]ountries should ensure that there is adequate, accurate and timely information on the beneficial ownership and control of legal persons that can be obtained or accessed in a timely fashion by competent authorities.”²⁵¹ The beneficial owner is “the natural person(s) who ultimately owns or controls [an artificial entity] and/or the natural person on whose behalf a transaction is being

247. PUPPET MASTERS, *supra* note 237, at 52.

248. *Examining State Business Incorporation Practices*, *supra* note 10, at 2.

249. FIN. ACTION TASK FORCE, THE MISUSE OF CORPORATE VEHICLES, INCLUDING TRUST AND COMPANY SERVICE PROVIDERS 12 (2006), <http://www.fatf-gafi.org/media/fatf/documents/reports/Misuse%20of%20Corporate%20Vehicles%20including%20Trusts%20and%20Company%20Services%20Providers.pdf> [<https://perma.cc/EC94-2NJB>] (“Nineteen of the 32 jurisdictions responding to the survey indicated that corporations are permitted to serve as directors, whereas corporate directors are prohibited in eight. Five jurisdictions failed to provide an answer to this item on the questionnaire.”).

250. *See supra* notes 117–138 and accompanying text.

251. FATF RECOMMENDATIONS, *supra* note 43, at 22.

conducted.”²⁵²

“Ultimately owns” in that definition is a reference to the possibility of indirect ownership.²⁵³ A person who owns the shares or interests of an entity is referred to as a direct owner. For example, if N is a natural person who owns shares or interests in A, an artificial entity, N is a direct owner with respect to A. A person who does not own the shares or interests of an entity, but owns the shares or interests of an entity that does, is referred to as an indirect owner. If A in the preceding example owns shares or interests in B, a second artificial entity, and B owns shares or interest in C, a third artificial entity, then (1) B is a direct owner of C and (2) N and A are each indirect owners of C.

The FATF definition—which does not contemplate AEs—states unequivocally that the term “beneficial owner” refers to natural persons: “[A] beneficial owner is always a natural person—a legal person cannot by definition, be a beneficial owner. The definition therefore speaks of ‘ultimate’ control: A legal person can never be the ultimate controller—ownership by a legal person is itself always controlled by a natural person.”²⁵⁴

Persons can control artificial entities by means other than share ownership. For example, a nonprofit corporation may have no shareholders, interest holders, or members. If such a corporation’s directors elect their own successors, the directors control the corporation and are its beneficial owners.

Non-owners can control entities in a variety of other ways. The share owner may be a family member, a business associate, or a nominee who follows the non-owner’s instructions out of loyalty or fear or for mutual benefit.

More esoterically, a person might control an entity by purchasing derivative contracts for the entity’s shares from derivative dealers or banks. The contracts would provide that the dealers or banks will settle the contracts by paying the person cash in amounts equal to the underlying shares’ values at the time of settlement. In such a transaction, the dealer “usually assumes a neutral risk position by physically acquiring the underlying shares at the strike price of the derivative.”²⁵⁵ If the contract is

252. *Id.* at 113.

253. *Id.* at 113 n.52 (“‘[U]ltimately owns or controls’ and ‘ultimate effective control’ refer to situations in which ownership/control is exercised through a chain of ownership or by means of control other than direct control.”).

254. PUPPET MASTERS, *supra* note 237, at 19.

255. Erik P.M. Vermeulen, *Beneficial Ownership and Control: A Comparative Study—Disclosure, Information and Enforcement* 13 (OECD Corporate Governance, Working Paper No. 7, 2013),

performed, the person receives the profits and suffers the losses from the share ownership. If the dealer votes the shares as the person directs, the person may control the entity.²⁵⁶

Beneficial ownership is thus a difficult relationship to discover and an even more difficult one to prove. As the following subsection demonstrates, the only way governments can assure the existence of “accurate and timely information on the beneficial ownership and control of legal persons”²⁵⁷ is to place on each entity the continuing obligation to disclose its beneficial owners. Yet, probably no American state imposes that obligation or otherwise requires the disclosure of beneficial ownership.²⁵⁸

4. *Disclosure in the Entity Formation Process*

Governments that compete for incorporations are in a bind. FATF, other international organizations, and perhaps the executive branch of the U.S. government are pressing for disclosure of beneficial ownership information. But for many charter buyers, freedom from disclosure is the most important feature of the product. Governments respond to these conflicting pressures by appearing to collect meaningful information while not actually doing so. This section describes the complex disclosure requirements of Delaware law. Delaware is an important example because it is the jurisdiction most successful in selling charters and the jurisdiction with the culture most resistant to the collection of beneficial ownership information.²⁵⁹

a. *Required Disclosure to Government*

The Delaware General Corporation Law requires the identification of incorporators,²⁶⁰ registered agents,²⁶¹ and communications contacts.²⁶²

<http://www.oecd.org/corporate/ca/corporategovernanceprinciples/50068886.pdf>
[<https://perma.cc/F999-RZW3>].

256. *See id.*

257. *Supra* note 251 and accompanying text.

258. FIN. CRIMES ENFORCEMENT NETWORK, THE ROLE OF DOMESTIC SHELL COMPANIES IN FINANCIAL CRIME AND MONEY LAUNDERING: LIMITED LIABILITY COMPANIES 3 n.2 (2006), http://www.fincen.gov/news_room/rp/files/LLCAssessment_FINAL.pdf. [<https://perma.cc/AWD2-Z6J8>] (“Although some states require the reporting of information on ownership, no state requires the reporting of information on beneficial ownership.”).

259. Baradaran, *supra* note 79, at 526 (table showing Delaware to have the lowest FATF compliance rate of any American state).

260. DEL. CODE ANN. tit. 8, § 102(a)(5) (2015) (requiring provision name and mailing address in the certificate of incorporation).

261. *Id.* § 102(a)(2) (requiring provision of the name and address); *id.* 131(c) (requiring that the address include street, number, city, county, and postal code).

262. *Id.* § 132(d) (2010) (requiring provision of name, business address, and business telephone to the registered agent).

None of the three is likely to be of use in discovering a Delaware corporation's beneficial owner.

"Any person, partnership, association or corporation . . . without regard to such person's or entity's residence, domicile or state of incorporation" may serve as an incorporator.²⁶³ Delaware law specifically contemplates that the incorporator may be acting on behalf of someone else²⁶⁴ but does not require disclosure of that person's identity to anyone, even the incorporator. Thus, anyone, including a corporate service provider, can be the incorporator.²⁶⁵ The certificate of incorporation, a document filed with the state, must contain the name and a mailing address for the incorporator.²⁶⁶ Upon filing of the certificate, the incorporator becomes "a body corporate."²⁶⁷ Nothing in Delaware law requires that the incorporator know the identity of the corporation's beneficial owner.

Every corporation is required to have a registered agent²⁶⁸ and a registered office²⁶⁹ in Delaware. Because the corporation itself can be the registered agent, the requirement collapses to the requirement of a registered office. The office must be "generally open." The corporation must disclose its registered agent, registered office, and a street address for the registered office in its certificate of incorporation.²⁷⁰ The resident agents of most corporations are corporate service providers, each of whom may act on behalf of thousands of corporations. Nothing in Delaware law requires that the resident agent know the identity of the corporation's beneficial owner.

Every corporation is required to disclose:

to its registered agent and update from time to time as necessary the name, business address and business telephone number of a natural person who is an officer, director, employee, or designated agent of the corporation, who is then authorized to receive communications from the registered agent.²⁷¹

263. *Id.* § 101(a).

264. *Id.* § 108(d) (2014) (stating that "if any incorporator is not available to act, any person for whom or on whose behalf the incorporator was acting" may act).

265. Brett Melson, DELAWARE CERTIFICATE OF INCORPORATION, <https://www.delawareinc.com/blog/Delaware-certificate-of-incorporation/> ("Harvard Business Services, Inc. is the incorporator, on behalf of all our clients, for the companies we file.").

266. DEL. CODE ANN. tit. 8, § 102 (a)(5) (2015).

267. *Id.* § 106.

268. *Id.* § 132(a) (2010).

269. *Id.* § 131(a) (2011).

270. *Id.* § 131(c) (2011) (street address).

271. *Id.* § 132(d) (2010).

That natural person is referred to as the “communications contact.”²⁷² The communications contact may be a nominee, hired indirectly by a beneficial owner who remains anonymous. Nothing in Delaware law requires that the communications contact know the identity of the beneficial owner.

The principal function of a registered agent is to receive service of process. Upon receipt, the registered agent forwards the process to the communications contact. If the communications contact is not the beneficial owner, the communications contact ordinarily would forward the process to the beneficial owner. The forwarding may be accomplished in a manner that authorities cannot track. For example, it may be emailed through an anonymizer or posted to a website. Alternatively, the communications contact may be an attorney with authority to defend the litigation. Nothing in Delaware law regulates the manner in which the communications contact deals with process or communicates with the beneficial owner.

Arguably, a Delaware corporation must keep a stock ledger and prepare a list of stockholders prior to every meeting of shareholders.²⁷³ But the corporation keeps the ledger or list. Only the corporation’s stockholders or directors have the right to inspect either.²⁷⁴ Nothing in Delaware law requires disclosure of the stock ledger or stock list to any other person.

Delaware corporations must file an annual franchise tax report.²⁷⁵ Each must be signed by a “proper officer duly authorized so to act” or by any of its directors, listing the person’s “official title.”²⁷⁶ The report must include the “location of the principal place of business of the corporation, which shall include the street, number, city, state or foreign country.”²⁷⁷ Aside from initial reports and reports filed in conjunction with dissolution, each report must list at least one director²⁷⁸ and, in Delaware, directors must be “natural persons.”²⁷⁹ The statute does not explain how Delaware interprets this requirement in the case of a corporation that has no directors, such as BA 230 Corporation.²⁸⁰ The report is signed under penalty of perjury.²⁸¹

272. *Id.* §132(d) (2010).

273. *Rainbow Nav., Inc. v. Pan Ocean Nav., Inc.*, 535 A.2d 1357, 1359 (Del. 1987), *overruled on other grounds* *Pogue v. Hybrid Energy, Inc.*, No. 11563-VCG, 2016 Del. Ch. LEXIS 118, at *11 (Del. Ch. Aug. 5, 2016). (“We find it implicit in Sections 219 and 220 that Delaware corporations have an affirmative duty to maintain a stock ledger.”).

274. DEL. CODE ANN. tit. 8, § 219(c) (2017) (stockholder lists), *id.* § 220 (2010) (stockholder inspection), and *id.* § 221 (bondholders do not have inspection rights absent certificate of incorporation provisions granting them).

275. *Id.* tit. 8, § 502(a) (2017).

276. *Id.*

277. *Id.* § 502(a)(3) (2017).

278. *Id.* § 502(a)(4) (2017).

279. *Id.* § 141(a) (2016).

280. *See supra* notes 97–98 and accompanying text.

281. DEL. CODE ANN. tit. 8, § 502(b) (2017).

For 2016, I completed a Delaware online annual franchise tax report for BA 230 Corporation that did not require the name of a director. Delaware accepted my payment and, as of August 2017, the Delaware website continues to show BA 230 Corporation's status as Good Standing.²⁸²

The effect of this disclosure regime is that the Delaware registry will contain the name and mailing address of an incorporator, the name and street address of the a registered agent, the street address of the corporation's principal place of business, and perhaps the name and street address of an officer or director. None may have any idea who the beneficial owners are or know how to locate them.²⁸³

b. Required Disclosure to Corporate Service Providers

Internationally accepted standards require that corporate service providers collect and retain proof of identity, such as a passport or other photo ID, with regard to their customers.²⁸⁴ Of course, the customers are not necessarily the beneficial owners of the entities formed. But if corporate services providers actually collected and retained the required information, that information could serve as a starting point for investigators seeking to discover the beneficial owners.

A group of researchers led by Professor J.C. Sharman conducted experiments to determine the corporate service providers' actual practices. The group sent 7,462 requests for anonymous incorporation to 3,773 corporate service providers in 181 countries. Based on the responses, they concluded that "[i]nternational laws requiring customer identification to form shell companies are not effective. Almost half of the companies we approached did not ask for proper identification, and twenty-two percent did not require any identity documents."²⁸⁵ The "proper identification" to which the researchers were referring, is "government-issued photo identification, whether notarized or certified."²⁸⁶ They concluded that "[o]n the whole, forming an anonymous shell company is as easy as ever, despite increased regulations following September 11."²⁸⁷

282. DEPARTMENT OF STATE: DIVISION OF CORPORATIONS, <https://icis.corp.delaware.gov/Ecorp/EntitySearch/NameSearch.aspx> [<https://perma.cc/TH37-H8LZ>] (last visited Aug. 16, 2017).

283. Baradaran, *supra* note 79, at 507 (noting "the use of 'formal nominees' in identity reporting requirements").

284. *Id.* at 508 (discussing the requirement of some form of identification to conduct certain transactions, such as a notarized passport copy and certified utility bill, to prohibit anonymous accounts or accounts in obviously fictitious names).

285. *Id.* at 527 (emphasis omitted).

286. *Id.* at 513.

287. *Id.* at 478.

In an earlier experiment, Sharman had emailed fifty-four corporate service providers in twenty-two countries in an effort to form entities and obtain bank accounts for a fictitious “international consulting” business, without furnishing notarized or certified proof of his identity.²⁸⁸ Forty-five returned valid replies.²⁸⁹ Of the forty-five, twenty-eight (62 percent) said they required notarized or certified proof of his identity.²⁹⁰ Seventeen (31 percent of fifty-four approached) “were content to form the company without any independent confirmation of identity, requiring only a credit card and a shipping address for documents.”²⁹¹ Sharman coded these seventeen as anonymous because “credit cards can be issued for corporate vehicles or supplied by a third party”²⁹² who might not know the identity of the applicant or owner. Those third parties might include issuers of stored-value cards.

Of the seventeen willing to furnish anonymous entities, two were willing to furnish anonymous bank accounts²⁹³ and five were willing to furnish bank accounts without notarized identification. From among the five, Sharman formed two anonymous entities, one with an anonymous bank account.

The first was a Seychelles company formed with a nominee director and bearer shares.²⁹⁴ “The accompanying bank account was in Cyprus, picked on the advice of the service provider because of this bank’s unfastidious willingness to accept bearer share companies.”²⁹⁵ The bank did require proof of Sharman’s identity.²⁹⁶

The second was “a Nevada corporation set up by a Nevada service provider with a nominee director and nominee shareholders.”²⁹⁷ Sharman notes that his name “appears nowhere on the incorporation documents.”²⁹⁸ The Nevada corporation was able to open an online bank account with “one of the top five US banks.”²⁹⁹ Sharman reports that “[n]either the original service provider nor the bank required more than an unnotarized scan of [his] driver’s license (showing an outdated address).”³⁰⁰ Sharman then

288. J.C. Sharman, *Testing the Global Financial Transparency Regime*, 55 INT’L STUD. Q. 981, 990–91 (2011).

289. *Id.* at 991.

290. *Id.*

291. *Id.*

292. *Id.*

293. Sharman notes that subsequent changes in these jurisdictions’ laws may have eliminated these sources. *Id.* at 992, 995.

294. *Id.* at 995.

295. *Id.*

296. *Id.* at 995–96.

297. *Id.* at 996.

298. *Id.*

299. *Id.*

300. *Id.*

opened a Somalia bank account for the corporation, again furnishing only a copy of his corporation's anonymous articles of incorporation and a scan of his driver's license with the outdated address.³⁰¹

Sharman and his colleagues' research demonstrates that, although most corporate service providers are unwilling to assist in the formation of anonymous entities, many are. Neither criminals nor AEs are likely to have difficulty finding a willing corporate service provider.

Nor would it matter much if corporation service providers enforced the international standards. Corporate service providers are merely a convenience. Initiators can deal directly with the charter-issuing governments and so need to meet only the governments' less-stringent disclosure standards. Initiators can serve as their own incorporators, hire nominees who are not regulated corporate service providers to serve as their incorporators, or have an entity they control serve as the incorporator. Once an initiator has formed a company anonymously, investigators are unlikely to be able to connect the entity to its beneficial owners using only the information the government collected during the entity formation process. Because the system leaves beneficial ownership information in the hands of corporate service providers or does not collect it at all, the lack of beneficial ownership information regarding an AE will not arouse suspicions.

III. CAN THE ENTITY SYSTEM BE FIXED?

Commentators often blithely assume that if law functions poorly, law-makers can change it. For example, after explaining how an initiator could confer legal personhood on an algorithm by creating and abandoning an LLC to the algorithm's control, Bayern asserted that "[o]f course, if legislatures do not like this possibility they can easily amend the LLC acts to prevent it."³⁰²

Bayern does not suggest what the amendment would say or how it would prevent AEs. In fact, the competition to sell charters makes these kinds of changes in entity law impossible. Legislatures are reluctant to make changes in entity laws that would reduce sales of the entity or make the state or country appear business-unfriendly. Even if a legislature made the changes, its actions would have little or no effect on outcomes. Most initiators would buy entities with the feature they want from some other government.³⁰³

Essentially four changes in the law would be needed to prevent AEs from

301. *Id.*

302. Bayern, *Entity Law*, *supra* note 11, at 104.

303. LoPucki, *supra* note 3.

existing or control AEs if they existed. First, the law would have to authorize the direct regulation of artificial general intelligence (AGI), by mandating programming features and verifying their installation.³⁰⁴ Some consensus exists in the AGI industry that malevolent algorithms pose a threat to humans.³⁰⁵ But legal experts are just beginning to comment on the issue of how to approach such regulation.³⁰⁶

Second, algorithmic control of entities would have to be prohibited. The change is necessary to prevent algorithms—as opposed to humans using algorithms—from engaging in criminal activity for which no human can be held responsible and from resisting regulation by asserting the legal rights of entities they control.

Third, as discussed in the previous section, to render AEs identifiable by law enforcement, the law would have to require that all entities reveal their beneficial owners.

Fourth, for the international movement of money to be traced effectively, international cooperation would have to be automated and capable of tracing in real time. That will require the modification of treaties.

Those changes will be difficult or impossible to make in time to prevent catastrophe because the underlying problems—entity anonymity and the internal affairs doctrine—are deeply embedded in the world economy. Uprooting anonymity would not merely expose AEs. It would expose bribery, crime, money-laundering, and terrorism. Changing the internal affairs doctrine would fundamentally redistribute political power from private actors to government.

Beneficial ownership disclosure is not a presently viable reform. Several international organizations have promoted it for decades.³⁰⁷ Although the European Union countries have recently begun requiring the disclosure of beneficial owners,³⁰⁸ numerous countries, including the United States, have agreed that the reform is necessary, but have not made it. Because an entity can incorporate anywhere and do business anywhere else, entities that do

304. See, e.g., Steve Omohundro, *Autonomous Technology and the Greater Human Good*, 26 J. EXPERIMENTAL & THEORETICAL ARTIFICIAL INTELLIGENCE 303, 309 (2014) (recommending programming restrictions and “mathematical proof” as a method for providing “safety and security guarantees”).

305. See *supra* notes 32–37 and accompanying text.

306. E.g., Balkin, *supra* note 164 (advocating programming restrictions); Scherer, *supra* note 26, at 393 (recommending “an agency tasked with certifying the safety of AI systems” and adjustments to the liability system).

307. E.g., FIN. ACTION TASK FORCE, *supra* note 249, at 1 (naming organizations).

308. Council Directive 2015/849, art. 30(2), 2015 O.J. (L 141) 97, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0849&from=EN> [<https://perma.cc/PNY4-W7GZ>] (“Member States shall require that the information referred to in paragraph 1 can be accessed in a timely manner by competent authorities.”).

not want to disclose their beneficial owners can simply incorporate in a jurisdiction that does not require it.

Through FATF, the United States has agreed that “[c]ountries should ensure that there is adequate, accurate and timely information on the beneficial ownership and control of legal persons that can be obtained or accessed in a timely fashion by competent authorities.”³⁰⁹ Implementing legislation has been pending in Congress for nearly a decade.

The proposed Corporate Transparency Act of 2017³¹⁰ is minimalist and would solve only part of the problem. The bill would require states to collect beneficial ownership information, which would include only name, current residential or business street address, and a unique identifying number from an unexpired passport or driver’s license.³¹¹ It would not require applicants to furnish copies of the passports or licenses or require the states to verify the information. The states could delegate the collection to licensed entity formation agents.³¹² The entities would be required to update the beneficial owner information within 60 days after changes.³¹³ The collected information would be available only for law enforcement purposes and only pursuant to formal processes.³¹⁴

Despite its minimalism and safeguards, the bill has not gained political traction. The most recent estimate of the bill’s passage (for the predecessor bill in 2016) gave it a 1 percent chance.³¹⁵ As a result of that failure, FATF rates U.S. “measures to prevent the misuse of legal persons” to be “inadequate.”³¹⁶ “The U.S. legal framework has serious gaps that impede effectiveness in this area.”³¹⁷

Publicly, the bill’s opponents argue that requiring beneficial owner identification will slow the incorporation process and make it more expensive.³¹⁸ But the vast majority of entities have only a single beneficial

309. FATF RECOMMENDATIONS, *supra* note 43, at 22.

310. S. 1717, 115th Cong. § 3(b)(1)(A) (2017).

311. *Id.* § 3(b)(1)(A).

312. *Id.* § 3(b)(2).

313. *Id.* § 3(b)(1)(B)(i).

314. *Id.* § 3(b)(1)(D).

315. *Incorporation Transparency and Law Enforcement Assistance Act (H.R. 4450)*, GOVTRACK, (Feb. 3, 2016), <https://www.govtrack.us/congress/bills/114/hr4450> [<https://perma.cc/3BHT-9GLF>] (estimating a 1 percent chance of passing).

316. FINANCIAL ACTION TASK FORCE, ANTI-MONEY LAUNDERING AND COUNTER-TERRORIST FINANCING MEASURES MUTUAL EVALUATION REPORT: UNITED STATES 10 (2016), <http://www.fatf-gafi.org/media/fatf/documents/reports/mer4/MER-United-States-2016.pdf> [<https://perma.cc/5JRS-9LEE>].

317. *Id.*

318. *See, e.g.,* Wayne, *supra* note 56 (“The secretaries of state, along with Delaware, argue that the Levin measure would be costly and burdensome, and would discourage business incorporation and

owner. Rarely could there be more than three.³¹⁹ Collecting the information would have a negligible effect, if any, on the time a state would need to process an incorporation.

The more likely explanation for the bill's powerful opposition is that many charter buyers are unwilling to disclose their status as beneficial owners. Furnishing anonymous entities to the world market is a major industry and the American states are the industry leaders. Enactment of the bill would be the first step in killing that industry.

Enactment of the bill would be an important step toward the elimination of anonymous entities, but more would be necessary. Enactment would force AEs and criminals to furnish beneficial ownership information, but it would not assure the information's correctness. To assure correctness, governments would have to collect identity documents and check them against the records of their issuers. The FATF recommendation contemplates that the governments conduct the verifications at the time the entities are created.

To make effective use of the information, governments would also need to assess the plausibility of claims to beneficial ownership. In doing so, the investigators would be restricted by privacy laws and national borders.

The imposition of programming limitations on artificial general intelligence may draw opposition independent of the opposition to entity system reform. Programming limitations could, for example, impair the effectiveness of algorithm-controlled weapons systems, thus affecting the balance of military power. They could also impair the development of AGI by limiting innovation. From the perspective of humanity as a whole, the safer course would be to impose the limitations. But that is hardly a sufficient condition to produce legislation.

The development of those limitations will undoubtedly be the subject of political debate. If AEs exist and are profitable by that time, they would probably have, under U.S. law, the constitutional right to participate in the debate, and the practical ability to do so anonymously. In *Citizens United*, the Supreme Court held that corporations have the constitutional right to spend money to influence the outcomes of elections.³²⁰ In making that decision, the Court expressed its understanding that the identities of the spenders would be disclosed.³²¹ But to date, the beneficial owners of the

capital formation.”).

319. To be a “beneficial owner” under the proposed legislation, the natural person would need to exercise “substantial control” over the entity or have a “substantial interest in or receive substantial economic benefits from” the entity. S. 1717, 115th Cong., at § 5333(d)(1)(A) (2017).

320. *Citizens United v. F.E.C.*, 558 U.S. 310, 393 (2010).

321. *Id.* at 370 (“The First Amendment protects political speech; and disclosure permits citizens and shareholders to react to the speech of corporate entities in a proper way.”).

contributed funds have managed to conceal their identities through multiple layers of artificial entities.³²² Although about eighty percent of Americans have thought, almost since the decision was made in 2010, that it should be reversed,³²³ no reversal is imminent. If *Citizens United* remains in effect during the AE debate, AEs may themselves play a major role in the debate.

AEs may also gain legal traction from three other constitutional doctrines. States may not enact laws that interfere with the free flow of interstate commerce.³²⁴ Nor may they deny entities the equal protection of their laws.³²⁵ Lastly, the United States Supreme Court has come perilously close to declaring that the internal affairs doctrine is constitutionally mandated, and the Delaware Supreme Court has held that it is constitutionally mandated.³²⁶

Thus, it is not at all clear that the entity system can be fixed in time to prevent the development of wealthy and powerful AEs. If it is not, the entity system probably cannot be fixed at all.

IV. CONCLUSIONS

AEs are inevitable because they have three advantages over human-controlled businesses. They can act and react more quickly, they don't lose accumulated knowledge through personnel changes, and they cannot be held responsible for their wrongdoing in any meaningful way.

AEs constitute a threat to humanity because the only limits on their conduct are the limits the least restrictive human creator imposes. As the science advances, algorithms' abilities will improve until they far exceed those of humans. What remains to be determined is whether humans will be successful in imposing controls before the opportunity to do so has passed.

This Article has addressed a previously unexplored aspect of the

322. *E.g.*, CHISUN LEE ET AL., BRENNAN CENTER FOR JUSTICE AT NYU SCHOOL OF LAW, SECRET SPENDING IN THE STATES 7 (2016), <https://www.brennancenter.org/publication/secret-spending-states> [<https://perma.cc/CCP5-R3JP>] (“In the states, dark money in 2014 was 38 times greater than in 2006, while in federal elections it increased by 34 times over the same period.”); *id.* at 5 (reporting that political action committees (PACs) “increasingly . . . have disclosed not individuals or businesses, whose interests are relatively apparent, but rather other PACs”).

323. *E.g.*, *Americans Want Supreme Court to Turn Off Political Spending Spigot: Bloomberg Poll*, BLOOMBERG (Sept. 28, 2015), <https://www.bloomberg.com/news/articles/2015-09-28/bloomberg-poll-americans-want-supreme-court-to-turn-off-political-spending-spigot> (“In a new Bloomberg Politics national poll, 78 percent of those responding said the *Citizens United* ruling should be overturned, compared with 17 percent who called it a good decision.”).

324. *See supra* note 167.

325. *Santa Clara Cty. v. S. Pac. R.R. Co.*, 118 U.S. 394, 396 (1886) (noting that the Court agreed that the Equal Protection Clause applied to corporations).

326. *See supra* note 106 and accompanying text.

artificial-intelligence-control problem. Giving algorithms control of entities endows algorithms with legal rights and gives them the ability to transact anonymously with humans. Once granted, those rights and abilities would be difficult to revoke. Under current law, algorithms could inhabit entities of most types and nationalities. They could move from one type or nationality to another, thereby changing their governing law. They could easily hide from regulators in a system where the controllers of non-publicly-traded entities are all invisible. Because the revocation of AEs' rights and abilities would require the amendment of thousands of entity laws, the entity system is less likely to function as a means of controlling artificial intelligence than as a means by which artificial intelligence will control humans.

Entity law is not only incapable of regulating AEs, it is incapable of regulating much of anything. The entity system is grounded in three principles. First, an entity can incorporate anywhere, regardless of the location of its operations. Second, an entity chartered in one jurisdiction can do business in virtually any other jurisdiction. Third, while operating in those other jurisdictions, the entity continues to be governed by the entity law under which it was formed. Together, those principles implicitly define a regulatory competition through the sale of entity charters. Each government competes for a share in billions of dollars of revenues annually by promoting and selling its entities and the regulation that accompanies them.

To regulate is to restrict. A competition to sell restrictions will, of course, be won by the jurisdiction that provides the fewest. Thus, the natural culmination of charter competition is a system that does not restrict at all. That result is not unintended. It is essentially what Romano touted as the "genius of American corporate law."³²⁷ By embracing the charter competition, the United States has become the world's largest supplier of anonymous entities and enabled its corporate service providers to achieve the world's lowest rate of compliance with the international standards designed to prevent terrorist financing and money-laundering.³²⁸

Because they believed that government should not regulate the relationship among the corporation and its officers, directors, and shareholders, charter competition advocates have perpetuated a system that hardly regulates at all. What the advocates apparently failed to realize is that entity law applies to much more than the entities' internal affairs. AEs have

327. See *supra* note 2.

328. Baradaran, *supra* note 79, at 521 (table showing the U.S. corporate service providers to have the lowest rate of compliance with the requirement for notarized photo identification to form and entity). Within the United States, Delaware has the lowest rate of compliance. *Id.* at 526 (table).

no internal affairs, yet entity law will govern the key issues that determine their viability.

Chartering governments decide who—or what—can have the rights of a person by acting through an entity. Chartering governments also decide what information about the human actors will be available to the public, what information will be available to police and prosecutors, how quickly that information will be made available and at what expense, how quickly and easily an entity can flee a jurisdiction to avoid the jurisdiction's current or proposed regulations, and even whether a tort creditor can recover against an entity's owner. Chartering governments decide these issues *even when the effects are felt entirely outside the chartering jurisdiction*.

The AE threat dramatically illustrates the fundamental weakness of regulatory competition as a policy tool. Once the charter competition was up and running, the economic, political, and legal systems adjusted. Ending the competition now would be so disruptive it is almost impossible. The entity system is not merely a system that will not regulate when regulation is not needed, it is a system that cannot regulate even when regulation is needed.

The assertion that charter competition is harmless because entity law governs only entities' internal affairs is no longer plausible. As the example of AEs illustrates, entity law governs far more than the internal affairs of a corporation. It determines the very nature of the corporate personality. The survival of the human race may depend on recognition of that fact.