# 1AC

### 1AC---Blockchain ADV

#### Contention 1 is BLOCKCHAIN.

#### Blockchain development is inevitable, but beyond the scope of antitrust---the narrow focus on the ‘firm’ is fundamentally inapplicable, that creates an anticompetitive environment that’ll centralize applications and limit uptake.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 134-136

5 A WIN-WIN THEORY

The creation of a legal fiction around blockchain nuclei will benefit both antitrust and blockchain communities. By facilitating the enforcement of the rule of law, blockchain participants will indeed be able to enforce antitrust laws or be sanctioned when infringing them.

5.1 A Win for Antitrust

The theory of granularity helps create a legal fiction for public permissionless blockchains and private ones (whose governance is not vertical). Surely, other legal fictions will be proposed in the coming years. Regardless of its name, creating a legal fiction is a prerequisite for applying the rule of law to blockchain layer 1. The ability to do so is crucial.

First, the creation of a legal fiction ensures that blockchains do not escape antitrust enforcement for theoretical reasons. This is a prerequisite before discussing the technical barriers to enforce antitrust against illegal practices (see the following chapters). Second, assigning liability to the right entity ensures that whoever controls blockchains will have a strong(er) incentive to comply with legal requirements. The urge to play by the rules is always stronger when one knows that the rules could actually be enforced. As such, antitrust will not only protect actors that lie outside of blockchain ecosystems; it will also protect those inside the blockchain who cannot stop the anticompetitive practices. Antitrust will free blockchain layer 1 from these practices.

5.2 A Win for Blockchain

Creating a distinct legal fiction centered on blockchains’ nucleus will present an important step forward for related ecosystems. First, the creation of such fiction will attribute rights to blockchains’ nuclei. This will legitimize collaboration between blockchain participants in the nucleus that would otherwise have been prohibited. Indeed, I have explained that antitrust law defines a legal fiction (e.g., the firm) and then applies only to the effects that occur outside of it. Decisions that produce an effect outside of the blockchain nucleus will be submitted to antitrust law. In contrast, decisions taken by the nucleus whose effects are purely internal to that entity will be exempt from antitrust scrutiny.98

Second, creating a legal fiction will increase legal certainty pertaining to the application of antitrust law and regulation. Decades of research suggest that doing so will encourage investments,99 and will make entrepreneurs want to “embark” on the creation of innovative products and services.100 Blockchain communities say so themselves: regulatory issues and accompanying legal uncertainty are the most important reasons preventing greater investment and adoption of blockchain technology.101 The sooner a legal fiction is created, the better for the ecosystem. In its absence, one could imagine court decisions holding all blockchain participants liable for wrongdoings, even though most of them will not have the power to prevent these illegal practices.

Finally, the creation of a legal fiction will give the nucleus the right to institute legal actions and claim damages in cases of antitrust violation, whether caused by another nucleus or a non-blockchain entity. Going back to Christopher Stone’s writing, blockchain’s legal fictions will be able to institute legal actions in their name; courts will calculate injury to them, and relief will be run to their benefit. For example, one could imagine that a blockchain layer 1 (illegally) excluded from the market by another blockchain that engaged in predatory pricing could introduce a valid claim before the courts or antitrust agencies. In the following chapters, I will explain how this will play out when it comes to collusion and monopolization practices.

For all these reasons, creating an antitrust-related legal fiction will be invaluable for blockchain ecosystems and, ultimately, for decentralization. It will protect them from illegal practices that could hinder blockchain’s capacity to decentralize the economy. There is no doubt that centralized companies will multiply illegal behaviors toward blockchain ecosystems in the years to come, as we will see in the coming chapters. Being recognized as a legal entity will allow them to protect their interests and innovate toward decentralization.

6 CHAPTER SUMMARY AND BEYOND

In this chapter, 1 have used the theory of granularity to open the blockchain “black box.” First, I have discussed blockchain governance and shown how the influence of different participants neutralize their position. As no block- chain participant can control the blockchain by itself - and ensure its survival - I have explained that a group of participants may want to come together to achieve common goals. By doing so, they free themselves from other participants’ constraints and end up forming the blockchain nucleus.

The blockchain nucleus gives rise to an entity that should benefit from rights, but could also be held liable for illegal conducts. I have shown how this would work by analyzing relevant markets and market power, evaluating anticompetitive practices and assigning liability.

#### Anticompetitive exclusions and lack of legal certainty over the applicability of antitrust dry up investment and innovation, which artificially consolidates digital ecosystems.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 74-77

2 THE SPECTER OF NEUTRALIZATION

I hope to have convinced readers that antitrust law and blockchain contribute to similar, if not identical, objectives (i.e., preserving agents’ ability to act freely in the market, which entails the decentralization of decision-making processes).42 For that reason, one might expect that both communities would work hand in hand to achieve decentralization. And yet, despite pursuing a common goal, blockchain and antitrust may end up canceling each other out. Here’s why.

2.1 One Goal, Two Methods

Blockchain seeks the decentralization of decision making by eliminating intermediaries, while antitrust aims to achieve it by eliminating anticompetitive practices. They converge toward the same objective. That said, one should not be candid about how easy it will be to make them cooperate. First, the Sherman Act is concerned with trusts43 - hence the name “anti-trust”. Since there is no trustee in the sense of a third-party fiduciary in blockchain’s first layers, the target of antitrust laws is absent.44 Blockchain may thus undermine the *raison d'etre* of antitrust law, which will trigger epidermal reactions.

Furthermore, blockchain and antitrust may at times attack each other. Blockchain may be used to implement anticompetitive practices and be enforcement resistant, while antitrust may reinforce the role of intermediaries in the economy (by protecting them from different forms of anticompetitive exclusions) and label various blockchain behaviors as anticompetitive - regardless of the overall usefulness of these blockchain features.

In fact, antitrust law and blockchain ecosystems seek decentralization at two different levels. Antitrust law prohibits certain categories of conduct, creating tensions with tech communities without focusing much on digital architectures. Blockchain, on the contrary, seeks to decentralize by providing its users with a specific digital architecture. It does not prohibit (anticompetitive) practices where code allows. This creates tensions between them, as I show in Part 2 of this book. Their cooperation will require the identification of ways to deal with these mutual provocations, as I will explain in Part 3.

As things stand, both of these communities exhibit what Veblen called “trained incapacity” - the difficulty to think beyond a set of constraints and assumptions. Policymakers tend to believe that the law should be the most important constraint organizing our lives. For that reason, legal rules are often applied without looking for ways to coordinate with other constraints, including digital architectures.45 In the meantime, blockchain communities tend to view legal enforcement as an adversary, and not as an ally. As John Perry Barlow stated in 1996: “I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.” After all, the law liberates, but it also implies illegality, lawsuits, liability assignment and sanctions. The antitrust and blockchain communities will gain from over- coming these biases.

2.2 The (Long) Road Ahead

If we want antitrust and blockchain to collaborate on a long-term basis, we need to talk about the problems that their cooperation will encounter along the way. The challenge before us is intricate.46 On the one hand, it is a matter of getting legal minds to recognize that technology can help achieve objectives that the law cannot achieve on its own. There are three reasons for this. First, blockchain provides a technical approach to the subject. It serves as a framework for decentralizing the economy by default, while antitrust mostly applies ex post by correcting past behaviors.47

Second, antitrust agencies’ detection rate remains low, meaning that illegal behavior often goes unpunished.48 And enforcement is costly, which makes it impossible to pursue all potentially illegal practices. This is particularly problematic in a world where illegal practices can be implemented through coding that quietly and immediately affects billions of users. Also, the rule of law is (unfortunately) inapplicable in some places. This is the case when the state bypasses legal constraints,49 and when jurisdictions are mutually unfriendly and do not enforce foreign laws.50 For example, enforcement of U.S. court judgments abroad can prove especially difficult in light of divergent rules on jurisdiction, requirements for special service of process, reciprocity and some foreign countries’ public policy concerns,51 including in Europe.52

Finally, antitrust law is complex and cannot be fully mastered by all companies - the compliance costs are high and many firms unwittingly infringe the law. Blockchains could therefore supplement antitrust by creating an architecture that leads to fewer anticompetitive practices.

On the other hand, blockchain communities would gain from working with (not against) antitrust law enforcers. That is because antitrust would eliminate practices that artificially centralize blockchain ecosystems and that blockchain architecture cannot stop or prevent. 1 will analyze them in Part 2. Doing so would also provide legal certainty, thus fostering investments and benefiting all the actors involved in commercial activities that rely on blockchain. For these reasons, one should think of antitrust and blockchain as allies - not enemies - as they both seek the same objective, while presenting complementary strengths and defects. Doing so would lead policymakers to promote and implement a new “law + technology” approach that recognizes that the benefits of cooperation outweigh those of one-off confrontations. A game theorist would represent that approach as illustrated in Figure 5.1.

#### Averting the consolidation of blockchain allows scalable transaction validation.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 271-273

2 BLOCKCHAIN INTERNAL FACTORS

The evolution of blockchain also depends on internal balances in terms of design and governance. Overall, choices that will be made within each blockchain will prove important for their evolution. As I show, it all comes down to human interactions.

2.1 The Trifecta: Intra-blockchain Evolution

A blockchain trilemma has emerged in the literature over the last several years. It can be summed up as follows: ensuring blockchain’s decentralization, scal- ability and security entails tradeoffs, at least in the short term. Although this makes sense on a technical level, it does not capture the entirety of our subject. Let us take a closer look. I have discussed decentralization at length through- out this book. It is blockchain’s central feature, in terms of both architecture and philosophy. “Scalability” refers to the ability to validate large volumes of transactions rapidly. Last, blockchain’s security hinges upon its ability to maintain integrity: that only desirable transactions take place - for example, by preventing double spending.42

To a certain extent, we have seen together that the mechanisms that ensure decentralization at different blockchain layers may conflict with security.43 This is what Awemany’s story in Chapter 1 revealed. Decentralization implies the distribution of power, limiting the ability to act unilaterally in case of an emergency. At the same time, decentralization can also affect the scalability of blockchain: Proof of Work is decentralized by nature, but it prevents the rapid validation of large transaction numbers. Conversely, a private blockchain can restrict access to the ledger or certain functions, raising security and scalability issues.44

In the long run, however, these three objectives are mutually reinforcing. The more a blockchain is decentralized, the more it stands out from the centralized platforms and services that readers know only too well. By differentiating themselves, blockchains attract users by offering a different value proposition. In turn, this generates scalability. The same goes for security, as the more participants use a public blockchain, the harder it becomes to alter the registry or perform a 51 percent attack. The blockchain trilemma is thus useful for thinking about what needs to be done, but it cannot provide a coherent analytical framework in the long term. It will become less relevant with technical advances, to the point where some blockchains will maximize these three objectives. Those who manage to do so will prosper.

#### That is vital to secure critical infrastructure (CI) AND the integrity of the IoT.

Dr. Amit Kumar Tyagi et al. 22, PhD, Assistant Professor, Vellore Institute of Technology; Ishani Tibrewal, Senior Electrical Engineer, Technocrats Robotics. Vellore Institute of Technology; Manas Srivastava, Software Engineer, Optum. Vellore Institute of Technology, "Blockchain Technology for Securing Cyber-Infrastructure and Internet of Things Networks," in Intelligent Interactive Multimedia Systems for e-Healthcare Applications, 2022, pg. 337-343.

Today’s Internet of things is mostly used smart devices in many applications. Internet of things when integrates together, they create a network of smart devices called computing infrastructure. This computing infrastructure needs to be properly maintained and secure against many available beaches or critical attacks. Internet of things is an emerging collaborative research environment for today’s researchers, because it creates/provides many other benefits like building cyber physical system and autonomous cars. But, when these devices are being used on a large scale and generate a lot of data, and this data is stored at cloud (public, private and hybrid). This data needs to be protected against many serious attacks, and this task can be fulfilled by “Blockchain technology”. Blockchain technology concept in 2008– 2009 by anonymous user/group of users in cryptocurrency [1], and this concept has been introduced in many applications [2] like finance, manufacturing, medical care, agriculture and autonomous cars.

The Internet of things (IoT) will connect not only computers and mobile devices, but it will also interconnect smart buildings, homes and cities, as well as electrical grids, gas and water networks, automobiles, airplanes, etc. IoT will lead to the development of a wide range of advanced information services that need to be processed in real-time and require data centres with large storage and computing power. The integration of IoT with cloud and fog computing [3, 4] can bring not only the required computational power and storage capacity, but they enable IoT services to be pervasive, cost-effective and can be accessed from anywhere using any device (mobile or stationary). However, IoT infrastructures and services will introduce grand security challenges due to the significant increase in the attack surface, complexity, heterogeneity and number of resources. Some of the examples of IoT technology usage and major implications during cyber-attacks are:

1. Maritime shipping: There are multiple usage of IoT technology in Maritime shipping as the shipping companies have equipped their fleets with a variety of sensors to monitor critical vessel systems, weather and sea conditions, and cargo. The Marine industry can be impacted cyber-attack [5] on terminal computer system, navigation system and point of sale system. Possible consequences are business interruption, damage to data, theft of property through alternation of shipping contacts, bodily injury and property damage.
2. Aviation: There are several usage of IoT in both commercial and military aviation [6]. Connecting IoT to aviation will help to access real-time data for engine performance improvement, accurate weather forecast and pilot monitoring. The cyber risk in aviation may allow hackers to gain access to some sensitive data such as the location of troops or detailed mission plans for IoTconnected military planes. There could be remote terrorism acts where the hacker could gain access to an aircraft’s control system and weaponry, similar to drone hacks, and use it against the enemy.
3. Smart City: A Smart City [7] can be equipped with IoT platform has multiple usages such as smart parking, public safety and traffic balancing. Smart grid is one of the examples which are implemented in Smart City to realize great cost savings and efficient troubleshooting. If there is no effective cyber security maintained, Hacker can gain access to such public infrastructure from his computer to shut down an entire city’s electrical supply.
4. Critical infrastructure: Because of the networked nature of IoT, i.e. that each connected object uses data from other connected objects–there is also the risk that a malfunction could lead to catastrophic system failure. The critical infrastructure like dams, bridges embedded with censors to monitor structural integrity as well as environmental conditions are vulnerable to cyber threats. Malfunctioning of these sensors may bring risk of a catastrophe if those objects fail and could lead to massive property damage or even loss of life.

Amit and Shamila [8] discussed some more examples, where Internet of things devices can be enhanced/used in everyday examples.

On another side, such infrastructure requires secure cyber security mechanisms, i.e. no more breaches/attacks on public networks. This chapter has provided introduction of Industry 4.0/smart manufacturing using IoT [9] while mapping the relevant security and privacy challenges, threats, risks and attack scenarios. This chapter presents an IoT security framework for smart infrastructures such as smart homes (SH) and smart buildings (SB) [10]. Also, it presents a general threat model that can be used to develop a security protection methodology for IoT services against cyber-attacks (known or unknown) with provisioning several issues and challenges in respective IoT-based cyber-infrastructure. The vast diffusion of connected devices in the IoT has created enormous demand for robust security in response to the growing demand of millions or perhaps billions of connected devices and services worldwide. The number of threats is rising daily, and attacks have been on the increase in both number and complexity. Not only is the number of potential attackers along with the size of networks growing, but the tools available to potential attackers are also becoming more sophisticated, efficient and effective.

Cyber-infrastructure is a word commonly used but lacking a single, precise definition. One recognizes intuitively the analogy with infrastructure, and the use of cyber to refer to thinking or computing but what exactly is cyber-infrastructure as opposed to information technology infrastructure? [11] propose definition of cyberinfrastructure as: “cyber-infrastructure consists of computing systems, data storage systems, advanced instruments and data repositories, visualization environments, and people, all linked together by software and high-performance networks to improve research productivity and enable breakthroughs not otherwise possible”. In this chapter, we discuss the origin of the term cyber-infrastructure based on the history of the root word infrastructure, discuss several terms related to cyber-infrastructure and provide several examples of cyber-infrastructure. Cyber security is a necessary task in building and proposing an attack-free infrastructure (using by public users). Note that some elements of cyber security are application security, information security, network security, disaster recovery/business continuity planning, operational security, end-user education. Also, some benefits of using/requirement of cyber security to secure an infrastructure:

* Business protection against malware, ransomware, phishing and social engineering.
* Protection for data and networks.
* Prevention of unauthorized users.
* Improves recovery time after a breach.
* Protection for end-users.
* Improved confidence in the product for both developers and customers.

Internet of things (IoT) is an emerging concept describing a wide ecosystem where interconnected devices and services collect, exchange and process data in order to adapt dynamically to a context. IoT is tightly bound to cyber physical systems and in this respect is an enabler of smart infrastructures by enhancing their quality of service provisioning. Cyber physical systems and autonomous applications are IoT-based application development, major development/invention of the previous decade. Both the IoT critical infrastructures and cloud are subject to cyberattacks [12]. Cloud environments experience the same threats (at a high level) as traditional data centre environments; the threat picture is the same. That is, cloud computing runs software, software has vulnerabilities, and adversaries try to exploit those vulnerabilities. However, unlike information technology systems in a traditional data centre, in cloud computing, responsibility for mitigating the risks that result from these software vulnerabilities is shared between the cloud service provider (CSP) and the cloud consumer. A secure cyber-infrastructure is need of many organization/research communities (especially computer science) around the world. Hence now, the remaining part of this chapter is organized as (in further sections):

Sect. 2 discusses work related to Blockchain used to secure Internet of things (IoTs)-based cyber-infrastructure smart contact, i.e. evolution of smart contract with Blockchain technology’s growth.

Sect. 3 discusses motivation behind this work, i.e. intention behind choosing area related to Blockchain-enabled and IoT-based cyber-infrastructure.

Sect. 4 discusses necessity of secure cyber-infrastructure today and tomorrow, i.e. in current century.

Sect. 5 discusses tools or mechanisms available for securing a cyber-infrastructure and Internet of things-based infrastructure

Sect. 6 discusses many issues, problems and challenges in using Blockchain technology during securing respective (cyber) infrastructure.

Sect. 7 discusses opportunities for future researchers and computer science community.

Finally, this chapter is concluded in Sect. 8 with some future research directions (including some research gaps).

2 Related Work

Internet of things (IoT) as a technological term is around 16 years old, but the actual idea of connected devices had been around longer, at least since the 70 s and at that time it was referred to as “embedded Internet” or more as to say “pervasive computing”. The coining of the actual term “Internet of things” was done by Kevin Ashton during his work at P&G in the late 20 s. Kevin used to manage supply chain optimization and wanted to attract senior management’s attention to a new exciting technology called RFID, now as because the Internet was one among the burning trends during the late 20 s so it somehow made sense, he called his presentation “Internet of things” and thus giving a new identity to the technology. By the year 2010, the Internet of things (IoT) started gaining popularity because of the leakage of information of Google took people into guesses that it might be Google one of the new strategies to index not only the Internet but also the entities in the physical world. Followed by this, in the consecutive years the technology took off after which different countries, market research companies and many other organizations took over it very seriously and started researching into this particular emerging new phenomenon and now it is predicted that by the end of 2020, IoT would have gained a huge stake over the market. Currently, the technology has outgrown to such an extent that there has been mass-market awareness. From dominance motivation behind the present, a critical number of the establishments that help and oversee current lives, social requests and work practices will appear to be dull, level and still. The more settled the establishment, the more certified this feels: we consider boulevards until we can drive impact on them, and thereafter in a flash neglect (until induced by setbacks, advancement and vehicle over-burdens to re-examine). We drink from the city water supply until we cannot, and a short time later examine water. Once here, amazing establishments appear as everlasting, unsuspected, even regular features of contemporary life. This sort of naturalization and disregarding is critical to the ampleness and significant estimation of establishment and is to be certain maybe the most raised want. Be that as it may, it in like manner makes it attempting to audit what is being referred to with establishment (which winds up being an extensive sum) or to plot the methodology by which systems create and change. This is an insightful issue for capable understudies of history and social scientists; for would-be makers of a system, it is something more. Computerized establishment was developed with the arrangement to help customers with winning through our high IT aptitudes and to get new work open entryways in India and help in the country’s social improvement. CIS continues creating at a pace of 300% consistently. Advanced structure continues developing its assortment of organizations and advancement portfolio to get new markets and spaces. Advanced establishment encounters critical improvements with respect to structure, bunch size and overall reach.

Hence, this section discusses work related to Internet of things, cyberinfrastructure, also Blockchain role in IoT-based applications in detail. In next section, we will discuss motivation behind this work in brief.

3 Motivation

Internets of things (IoTs) are used in building cyber physical systems, i.e. largescale cyber-infrastructure. For that, we require proper rules and cyber security to prevent from any breaches/attacks. In general terms, cyber security is safeguarding the Internet-connected systems, including hardware and software data, from cyberattacks, whereas information security, which is devised to preserve the confidentiality, integrity and availability (CIA) of data, is a fragment of cyber security. There are many cyber threats like malware, ransomware, social engineering and phishing on existed infrastructure (build by integration of IoT/smart devices). Such infrastructure requires strong and secure mechanism/algorithms to provide reliable and efficient services to end-users. As we have discussed many popular attacks have been mitigated (in the past decade) like Stuxnet [13], this attack has downgraded many nuclear facilities in Iran in 2010. Further, [14, 15, 16] have discussed many examples of cyber-crime in their work. But, due to getting rapid growth in innovation, we need Blockchain type of solution to secure an infrastructure. Hence, Blockchain technology has been started using in many applications for protecting critical system/infrastructure. Providing efficient and reliable services to end-users and more security to the same users is our higher (main) priority. Blockchain [17] concept fulfilled this goal in this current era. So, we started to write some important work on Blockchain, which can play an essential role in IoT-based cloud infrastructure or IoT-based infrastructure in making a secure cyber-infrastructure. Hence, this section discusses motivation behind this work, and it provides answer to many questions, i.e. related to topic of interest and how this work will be useful to society or researchers/readers. Now, next section will discuss the necessity of cyber-infrastructure or IoT-based cyber-based physical systems in current century.

4 Necessity of Cyber-Infrastructure in Current Century

There exists a positive national framework for the general public for its smooth working and thus making it powerful. The significance of these is generally comprehended and has since quite a while ago perceived the requirement for interest in their creation and upkeep. Such frameworks will, in general, give widespread administrations, range national and universal limits and are inherently depended upon by people and associations. The need for the digital framework is difficult to disparage, and even generally minor disappointments can affect huge quantities of individuals. Disappointments can bring about genuine ramifications for the working of society, and this has additionally been perceived by assailants who have focused on these national frameworks as a method for disturbing enormous quantities of individuals generally effectively. While the profoundly interconnected nature of pc frameworks can experience challenges related to frameworks security, it can likewise be utilized as a method for upgrading it as well. A considerable lot of the techniques and advantages that identify with the utilization of processing for the basic foundation have as of late gone to the fore. Organized frameworks can give expanded vigour against both focused on assaults and incidental disappointment. These incorporate perception procedures to give mindfulness and displaying capacities; frameworks of frameworks security to all the more likely comprehend the security results of associations between numerous frameworks. Utilizing these methods in a bound together manner will give benefits as far as better seeing, ongoing mindfulness and the improvement of security strategies customized to assurance against disappointment and assault of basic framework frameworks. The genuine advantage to be picked up from combining the strategies digital foundation is to give procedures that length innovative limits. cyber-infrastructure that help our general public are produced using an accumulation of frameworks and systems worked over registering advancements and data frameworks. cyber-infrastructure are going under expanding dangers, the insurance of basic foundations requires a superior comprehension of how the control should be structured to cover all the parts of these frameworks.

Hence, this section discusses “why we require cyber-infrastructure in today’s era”? Now, next section will discuss several tools available for securing cyberinfrastructure/IoT-based infrastructure in detail.

5 Tools Available for Securing Cyber-Infrastructure and Internet of Things-Based Infrastructure

There is a great significance of tools that are being developed to secure cyberinfrastructure; Blockchain is one of them. Risks, vulnerabilities, threats, cyber-crimes and frauds are increasing exponentially with the world being digitalized. To get a shield from these potential threats, Blockchain is gaining tradition today but still, significant phases of the world are unaware of it. Critical infrastructure in many countries will soon become vulnerable to cyber terrorism. Ingenious uses for Blockchain technology are already becoming incorporated of fields other than cryptocurrencies [18] and can be exclusively useful to boost cyber security. Several security techniques and approaches have been developed using Blockchain that plays a major role in securing many IoT applications. A Blockchain system depends upon the participation of allocated nodes to build a loyal chain-connected network, in which every decision is made based on the consent. The required system is proposed to have specific major components such as Blockchain-based distributed data repository and verification platform, Internet of things (IoT)-based noticeable environment and cloud-based versatile assistance delivery system. The parts sum up together to develop an infrastructure and a dynamic functional operational environment for overall entities in generation, transmission and delivery. As IoT is an ordinary result of the sensing technology and wireless sensor network, IoT technology will in future enter into each segment of the energy system and connects with other components of the cyber-infrastructure (Blockchain and cloud).

Blockchain takes the involvement of very basic technologies into IoT to make it secure. First of all, it decentralizes the data storage which is its backbone and uses consensus mechanism, this structure ensures data is not traceable nor even tamper able thus as a result giving a no-point fault system so that it can be used in the upper-level application. The connection between the blocks of data is done with a smart contract which is based on contrasting application logic. The information in Blockchain is transferred on a trusted mechanism that verifies and authorizes the user based on agreements, intellectual property rights and so on. In summary, Blockchain along with IoT in phases of cloud coordinated can work together to form a guarded, effective, service-oriented environment, which can strongly support various applications in various domains. Blockchain has promising applications across the domain of network security. IoT can contribute to big data at any level of abstraction, data acquisition could be applied at any level but the main point of data security lies in hands of Blockchain. The complete infrastructure has complete reliability and dependency on its security parameters which should be fault-tolerant, which can be smoothly accomplished through Blockchain. The monitor, control and coordination of units of the cyber-infrastructure should be supported by a dynamic cyber physical system. In any of the proposed cyber-infrastructure model, the cyber-infrastructure is mainly the backboned level of abstraction and security achieved. Under reliable supervision of IoT through Blockchain could help us in attaining a better cyberinfrastructure for a better tomorrow.

#### BUT widespread adoption is reliant on further innovation AND continued decentralization.

Dr. Amit Kumar Tyagi et al. 22, PhD, Assistant Professor, Vellore Institute of Technology; Ishani Tibrewal, Senior Electrical Engineer, Technocrats Robotics. Vellore Institute of Technology; Manas Srivastava, Software Engineer, Optum. Vellore Institute of Technology, "Blockchain Technology for Securing Cyber-Infrastructure and Internet of Things Networks," in Intelligent Interactive Multimedia Systems for e-Healthcare Applications, 2022, pg. 346-349.

Blockchain technology (in near future) will attract attention from several research communities and can be used in the following areas like Internet-connected things, banking, retail and health care. Such applications are requiring Blockchain, due to the property of distributed digital data (encrypted form, using Hash Keys). Many applications or future uses of Blockchain have been included in Fig. 2. Such functionality in Blockchain is provided by distributed ledger. Using Blockchain technology (a decentralized technology), in respective application, we can secure/store data safely with efficient authentic mechanism at remote location (also in form of Cloud). Data stores at remote location are in inconvertible and immutable using Blockchain/distributed ledger in it.

Blockchain technology has its powerful use in business domain, insurance being one of the prime commercial commodities. The trend of Blockchain within insurance will help in transforming insurance into Insurtech (i.e. Insurance + Technology). One of the many examples where Blockchain can help is in Travel Insurance, i.e. delays and cancellation of flights, can be prevented by Travel Agencies using Blockchain. Blockchain, which was just a virtual ledger, is spreading like a wave across extensive number of industries. Also, businesses are expected to spend colossal amount of money on this powerful technology in this year. From Insurance to gaming to cannabis, almost all industries are looking to develop and apply Blockchain technology, there is hardly any domain not looking for Blockchain applications because this technology is more likely to transform the industries.

Since Blockchain technology does not hold any central supervision and acts on decentralized platform, it has made Blockchain having a prominent feature of being resistant to fraud.

Diagram

Description automatically generated

Companies are striving hard to implement Blockchain technology as it will provide veracity to the stored digital data information. Here are many other industries who are mobilizing the power of Blockchain technology:

* Speculative Funds: With a vast range of Numerai, systems have started adopting hedge fund model with a firm support included by First Round Capital and Union Square Ventures, it involves employment of a group of stockbrokers and quants and then regionalizing it. The distribution of data through Numerai is done when it sends its numerous quants to various distinct locations, encrypts the datasets and then is preceded by building protective models and the one among with best of them is awarded with Numerai token known as Numeraire [19]. Further, the strategy is to strategize and develop a meta-model to make trades.
* Medical Management: The medical reports associated with a person are one of the vital parameters of an individual’s security, preserving this data is sole responsibility of the organization whosoever beholds it. While sharing the data among different platforms, the data may get leaked which may lead to some unavoidable circumstances. So in order to prevent this data to falling into dangerous hands, Blockchain technology allows hospitals [20], other institutions/organizations and payers to split access to their networks without compromising or suspecting data security and integrity.
* Public Mobility: Due to increase in use of public transport of vehicles, it becomes difficult for government in cities to know the status of public transportation being used, so on implementing Blockchain technology will help the cities to know and understand that how the public mobility is being used by their residents and how can they develop some different options for transportation.
* Track of Credit History: On the basis of past records, lenders tend to reduce the risk that is posed by lines of credit or loans to small ventures which also makes credit bureau to have all powers in terms of loans. It also works as a trusted platform where business owners can build a trusted network.
* Charity: Using Blockchain technology in charity institution or organization will help donators to track where their donations are going and who is going to use it. Blockchain will provide transparency and security to all the financial records and will give a greater visibility to the donors.

As mentioned above, there are many other similar industries that have great potential future with implementation of Blockchain in them like loyalty programs, natural resource management, education, advertisement, public assistance, publishing, gaming, travelling and even more. Moreover this, some other opportunities with Blockchain in near future are summarized (also included in Fig. 3) here as:

* Improve social media functionalities
* Digital ownership revolution
* Keeping our ID (Identification) and personal information secure
* Keep your identity safe and location privacy safe.

Blockchain provides digital freedom by using smart contracts: It means that the system is not governed by any central authority so that any kind of manipulation cannot be done by them. Note that Blockchain is more popular in mortgage industry, i.e. with its transparent system, speed (when compared to the typical mortgage underwriting process) and immutability that will secure your home for as long as you own it. Hence, this section discusses several opportunities for future readers and research communities. Now, next section will wrap up this work (including some research gaps) in brief.

8 Summary

Blockchain is the necessity of the future in building trust among peers and providing more privacy-preserving too many applications (like location-based services, etc.), also security to computing environments. This concept is enhancing everyday with its uses in many applications. Today’s Blockchain is the most trusted technology among all existing mechanisms (for protecting an infrastructure). Generally, Blockchain technology allows distribution of digital information in decentralized manner, but not duplicated. Blockchain also allows us to own digital assets, goods and data through its novel concept. Similarly, we face several cyber-crimes and attacks on many critical or cyber-infrastructure, [21] discussed several privacy issues), for that we suggested Blockchain to be used for the same infrastructure for providing sufficient level of security layers. This chapter has discussed several interesting components of Blockchain with Internet of things-based infrastructure and other cyberinfrastructure. We also discuss several benefits, disadvantages, issues and challenges (including opportunities) of Blockchain in securing an infrastructure, and this information will help future researchers/scientists or readers in continuing their research work in near future. In near future, some possible changes are possible with Blockchain are “Distributed Web (new Internet with Blockchain)”, “Decentralized Autonomous Blockchain” and “Blockchain-based Cloud”. For providing more efficient services, the world is watching and waiting for more innovations in technologies.

#### Attacks against CI are imminent, vicious, and incalculable.

Ted P. Delacourt 22, Supervisory Special Agent, Mission Critical Engagement Unit, Cyber Division, Federal Bureau of Investigation. MA, Science & Technology Intelligence, National Intelligence University. MBA, Finance & Economics, University of Chicago. BS, Accounting, Georgetown University, "Cyberattacks on Critical Infrastructure as The New WMD," HS Today, 02/01/2022, https://www.hstoday.us/featured/cyberattacks-on-critical-infrastructure-as-the-new-wmd/.

Should the acronym WMD, which stands for “Weapons of Mass Destruction,” be updated to “Weapons of Mass Disruption?” I think it is a timely question in this Digital Age as we connect and integrate billions of new digital devices into our lives and business processes and when a cyber-attack against one supply chain provider can lead to cascading effects on entire communities across the globe. Cyberattacks on Critical Infrastructure (CI) can cause mass economic and societal impacts. Fewer strategies than cyber-attacks can offer better plausible deniability and can cause greater anxiety and instability to our society than targeting the systems and networks that enable our day-to-day activities. Consider that 20 years ago terrorists killed 3,000 Americans and disrupted the entire U.S. and global economies with only four planes. Given the growth and ubiquity of technology today we must consider how the exponential growth of cyberattacks on CI might be similarly leveraged by adversaries and criminal actors as Weapons of Mass Disruption, the new WMD.[1]

Cyberattacks take many forms, often progressing through multiple phases as they escalate in severity. Malicious actors often initiate a network intrusion through phishing campaigns or the purchase of compromised user credentials on the dark web. What begins as the hijack of a single user profile expands in severity. Intruders move laterally across internal systems, conducting surveillance and gathering intelligence on network environments before escalating to data theft, service disruptions, and ransomware extortion.

The goals of these actors may be both strategic and economic in nature, and targets may be government and/or the private sector. Cyberattacks perpetrated on CI elements develop into the new WMD when the intended and unintended consequences cause widespread damage and societal impacts. A disruption of essential services, even if brief, can occupy significant civilian and military resources in a region or entire country.[2]

Russian military doctrine views the battle of the information space, to include cyber activities, as unending.[3] As such, the bar to initiate cyber-attacks appears low and the past two decades have witnessed numerous cyberattacks on CI around the world. The march toward a more interconnected and networked world increases the likelihood that cyberattacks against CI could be used as the new WMD. In this new threat environment, more than ever we need to increase and leverage government and private-sector partnerships to mitigate and neutralize these cyber threats.

Cyber Threat Technology

Cyber threats combine numerous attack vectors and strategies in a single attack. Common attacks include malware, denial-of-service attacks, phishing, structured query language (SQL) injection, and zero-day exploits. Some attacks specifically target critical nodes, software, or people, while others overwhelm internet websites with massive, automated amounts of data requests. Malware attacks install malicious code, transmit sensitive data, and corrupt, destroy or deny access to data by overwriting or encrypting files, often referred to as ransomware. Phishing attacks target users with false messages that request they open a file or access a link that secretly installs malware. SQL injection attacks insert malicious code into servers running SQL database software to reveal sensitive data not normally available. Vectors for SQL injections include inserting malicious code in search boxes of vulnerable web pages. These attack opportunities persist due to inconsistent patch implementation and failure by end users to employ cyber best practices, often called cyber hygiene, which increase the risk of cyber-attack on vulnerable systems. Zero-day exploits, alternatively, may be known vulnerabilities that lack immediate solutions. Even if a zero-day exploit is known, the threat continues until a patch is developed and the end user installs it. The combination of attack vectors with new and old malware options creates opportunities for both intelligence gathering and development of mass disruption strategies of CI operations by and against U.S. adversaries.[4]

Critical Infrastructure Sectors

Presidential Policy Directive 21 (PPD-21) on Critical Infrastructure Security and Resilience identified 16 sectors and identified specific federal agencies charged with their security. PPD-21 addressed the reality that advances in technology led to increases in each sector’s interconnectivity and reliance on online and networked resources to accomplish their fundamental missions. [5]

[Figure omitted]

CI elements do not stand alone, but rather are interconnected and interdependent. This interconnectivity makes them vulnerable to direct and indirect cyber threats. An attack on one may initiate a failure in another or cascade to the entire interconnected CI network. The mix of public, private, and non-governmental operations across each CI sector complicates remediation of identified vulnerabilities and information sharing on actual or potential attacks. The ubiquitous nature of these CI sectors and the distribution of their physical and networked assets across a wide geographical area, often spanning the entire country, make CI sectors attractive targets. State, non-state, and criminal actors continually seek victims of opportunity across all CI sectors for monetary and strategic gain.[7]

Past Attacks on Critical Infrastructure

The threat against CI elements is neither theoretical nor improbable. Cyberattacks have occurred independently and as part of multi-domain conflicts involving Russia, China, and others over the past two decades. Connell and Vogler described the Russian military view of cyber operations as part of the larger concept of information warfare, and not a distinct tactic. They assessed that in line with traditional Soviet military thinking, Russian decision-makers view the battle for the information space as unending. Such a doctrinal view of an information space in constant conflict stands in sharp contrast to the U.S. view. Furthermore, Russian decision-making informed by this view likely sets a low bar for the initiation of offensive cyber operations.[8]

In 2008, cyberattacks attributed to Russia disrupted Georgian government websites, financial institutions, private telecommunications companies, and other organizations in the opening stages of the military conflict between the two countries over breakaway regions. Given the limited nature of Georgian information technology at the time, the impact of the cyber operations was reduced. This application of cyberattack methodologies, however, stands as the first large-scale use of cyber operations in support of a military conflict. In this multi-domain example, a cyberattack designed to cause widespread disruption preceded a physical attack. [9]

In December 2015, the Ukrainian Energy Minister attributed the first known power outage caused by a cyberattack to Russian actors, when three power distribution companies were targeted. The timing and coordination among the attacks across central and regional facilities pointed to a high level of sophistication. The subsequent investigation revealed an initial intrusion occurring at least six months prior, allowing the actors to gather intelligence on company operations and likely remediation responses. This surveillance allowed the cyber actors to insert additional malware to wipe key recovery servers and computers to stymie restoration efforts. The attack left approximately 225,000 customers without power for six hours in the middle of a Ukrainian winter. The investigation also revealed the attack could have been larger, and the damage permanent, but the cyber actors chose to limit the scope. This points to the scalability of damage from the spectrum of cyberattack methodologies and their potential as a WMD.[10]

In the spring and summer of 2020, the People’s Liberation Army (PLA) of China and the Indian Army were involved in multiple skirmishes in the vicinity of the Actual Line of Control that defines their common border in the Himalayas. One such engagement resulted in the deaths of 20 Indian soldiers. Unwilling to back down, that August the Indian Army seized additional strategic locations. In an apparent tit-for-tat response, hostilities escalated and entered the cyber domain when a power outage struck the power utility in the Indian state of Maharashtra, which includes India’s financial capital Mumbai. The attack was attributed to a group known as RED ECHO, potentially a state-sponsored group affiliated with China’s PLA Strategic Support Forces. In response to the cyberattack, India mobilized additional troops to the disputed region and expanded the hostilities into the economic domain – India banned Chinese mobile apps, limited Chinese investments in India, and joined an informal grouping of the U.S., Japan, and Australia dedicated to limiting Chinese advancement in Indo-Pacific. In this multi-domain example, the cyberattack causing widespread disruption was a response to the physical attack, which was met with economic sanctions.[11] Such an attack against such a large power grid and financial capital could be characterized as a WMD attack.

In their 2021 study, Izycki and Vianna defined a cyberattack as an operation conducted with a kinetic intent or result. Using this definition, they identified seven significant cyber-attacks between 2010 and 2019. Their results are illustrated in the table below.[12]

[Figure omitted]

The attributions noted by Izycki and Vianna, if accurate, highlight how various actors employed cyber weapons across a wide range of political conflicts and actors. The authors concluded that the small number of campaigns highlighted the rarity of what they termed “kinetic attacks” against CI assets. Cyberattacks on CI sectors like those noted by Izycki and Vianna have the potential to cause massive disruptions and societal displacement if the underlying interconnected computer systems were destroyed or disabled for extended periods.[13]

Discussion of the Threat

Cyberattacks on interdependent CI sectors have the potential for secondary and tertiary effects in addition to the cascade of physical disruption that follows.[14] Beyond impairing physical assets, cyber-attacks on the foundational services of a society also function as psychological and strategic weapons. CI disruptions may undermine confidence in the state to provide security or basic services. Such attacks may serve as existential threats to unstable regimes. As strategic weapons, cyberattacks on CI causing mass disruptions have the potential to tie up significant military and economic resources at the same time the nation faces a military threat. Such attacks have the potential to fully occupy the time and attention of decision-makers as well as field commanders, causing them to miss or ignore other pending threats. This exemplifies the multi-domain use of cyberattacks.[15] Recently, plans purportedly developed by units within Iran’s Islamic Revolutionary Guard Corps (IRGC) leaked to a British reporter described various cyberattack strategies for cargo ships, building HVAC systems, and fuel pumps manufactured in the U.S. and sold worldwide. If authentic, such plans highlight in detail how CI sectors might be attacked via the cyber domain.[16]

Based on the attacks studied, the threshold for initiating a cyberattack appears low, and not all attacks produce an immediate or identifiable impact. Attacks may occur unnoticed, with bad actors lying dormant within systems for an extended time period. The nature of an attack may change over time, in that an intrusion may progress to an intelligence-gathering operation and data theft, before escalating into a denial-of-service or ransomware attack. The progression of an attack may change depending on the nature of the actor. The goal of non-state or criminal actors in conducting cyberattacks may be profit-driven or center on causing economic damage, while state actors may favor intelligence gathering and the creation of strategic options or outcomes. In the case of North Korea, the goals may be both financial and intelligence gathering, as they gather technical knowledge and the financial means to purchase necessary materials and equipment. The ubiquity of networked systems and the wide availability of cyber intrusion tools leave no country or critical infrastructure sector immune.[17]

Determining attribution for an attack is difficult. The use by cyber actors of Virtual Private Networks (VPNs), leased server infrastructure, and the cross-border nature of the internet complicate attribution efforts. Intelligence services can be reluctant to publicly disclose sensitive techniques and classified information in order to explain attribution conclusions. Additionally, public prosecution of these malicious actors may risk disclosure of investigative techniques, particularly in national security investigations. Complicating the matter further, cybercriminal organizations frequently operate from countries unwilling to arrest and extradite malicious actors to the United States. As a result, there appears to be limited consequences levied on adversaries for intrusion or intelligence-gathering activities. For example, in July 2021, in the same week the U.S. and NATO allies publicly identified the Chinese Ministry of State Security (MSS) as the perpetrator of the hack of the Microsoft Exchange email server uncovered three months prior, the U.S. Department of Justice filed motions to dismiss visa fraud charges against five Chinese scientists accused of concealing their ties to the PLA. This public shaming of cyber aggression by the MSS did not include economic sanctions against China, while a similar public disclosure in April 2021 about Russia included economic sanctions its cyber actions related to election interference.[18]

Conclusions and Judgments

Cyber intrusions utilize a volume attack scenario, leveraging automated software to continually probe end points and network connections for vulnerabilities. Hackers count on the incomplete implementation of software patches and poor cyber hygiene to provide illicit access. The assessment, based on this research, is cyberattacks on CI will continue to grow in number and frequency and continue to escalate in severity. As the world becomes more reliant on systems connected to the internet the attack surface expands. CI sectors are no exception, and their interconnectivity creates a risk of a failure cascade. Furthermore, cyberattacks are becoming automated and more anonymized. Consequently, if we have not yet met the threshold, we may soon, where cyberattacks against CI with large-scale impacts may be characterized as WMD.

#### Malware spreads between interlinked systems---causing use or lose pressures AND nuclear use.

James M. Acton 20, holds the Jessica T. Mathews Chair and is Co-Director of the Nuclear Policy Program at the Carnegie Endowment for International Peace, “Cyber Warfare & Inadvertent Escalation,” Daedalus, vol. 149, no. 2, MIT Press, 03/23/2020, pp. 133–149

The vulnerability of nuclear forces and C3I systems creates the risk of inadvertent escalation: that is, escalation resulting from military operations or threats that are not intended to be escalatory. So-called crisis instability, for example, could arise if a state were afraid of being disarmed more or less completely in a preemptive strike by an adversary, whether or not such fears were well founded.4 In the most extreme case, “use-’em-or-lose-’em” pressures could lead the state to employ nuclear weapons, conceivably in its own preemptive attempt to disarm its adversary, but more likely in a limited way to try to terrify the opponent into backing down. In less extreme scenarios, a state afraid of being disarmed might take steps–issuing nuclear threats, for example, or dispersing mobile nuclear forces– that raised the likelihood of nuclear use later.

This danger is likely to be exacerbated by any cyber vulnerabilities affecting nuclear forces and C3I systems. Most directly, the existence of such vulnerabilities could intensify existing fears of being disarmed–fears that are already acute in China and Russia (as well as in Pakistan and, most likely, North Korea).5 However, because of their unique characteristics and effects, cyber threats could create at least three qualitatively new mechanisms by which a nuclear-armed state might come to the incorrect conclusion that its nuclear deterrent was under threat. First, the purpose of cyber interference could be misinterpreted. In particular, espionage could be mistaken for an attack. Second, a cyberattack could have a more significant effect than intended. Malware implanted into information technology (IT) systems associated with non-nuclear weapons could accidentally spread into more sensitive nuclear-related systems, for instance. Third, the initiator of a cyber operation could be misidentified. An operation carried out by a third party, for example, could be misattributed by one state in a bilateral confrontation to its opponent. What makes these pathways so pernicious is that the catalyst for escalation could appear to its initiator to be a relatively benign action.

To make matters worse, such pathways could lead to inadvertent escalation even if the target of the cyber interference were not afraid of being completely disarmed. Today at least, this description fits the United States. If, in a conflict against Russia, say, the United States wrongly concluded that its strategic early-warning system was under cyberattack, it might reason that Moscow was seeking to undermine U.S. missile defenses, which use early-warning data, prior to launching a nuclear attack.6 Given that U.S. declaratory policy explicitly highlights the option of a nuclear response to non-nuclear attacks on nuclear C3I assets, such a “misinterpreted warning” might lead Washington to use nuclear weapons.7 But even if it did not, its response, which might include nuclear threats, could still be escalatory.

My focus here is narrowly limited to inadvertent cyber threats against, or interference with, one state’s nuclear forces or C3I systems by another nuclear-armed state (C3I systems encompass not only communication capabilities, but also the intelligence, surveillance, and reconnaissance capabilities, including early warning, that would be critical to decision-making). To be sure, cyber vulnerabilities probably create other escalation risks too, though, in my judgment, they are less serious.8 For example, while no state would likely try to detonate another’s nuclear weapons, a nihilistic terrorist group might (though it is unclear whether such a group could obtain the requisite cyber capabilities). Separately, vulnerabilities associated with conventional forces or their C3I systems could increase the likelihood of a conventional war’s escalating to a higher level of violence, thus making nuclear use more credible.9

Cyber interference with nuclear forces and C3I systems can involve two (not mutually exclusive) types of operations: espionage and attack. Cyber espionage involves collecting data from a target IT system without otherwise damaging it. A cyberattack involves undermining the operations of the target system, typically by compromising the integrity or availability of data. Cyber tools suitable for surveilling or attacking nuclear forces or C3I systems have innumerable differences from noncyber tools, which are themselves quite varied. Six of these differences are particularly salient to the risk of inadvertent nuclear escalation.

First, cyber espionage offers the potential to obtain information about an adversary’s military forces and operations that cannot plausibly be obtained in any other way. By accessing an adversary’s C3I systems directly, cyber tools may be capable of exfiltrating exceptionally sensitive information, such as the locations of mobile delivery systems. This is not to suggest that cyber surveillance is infallible. As a security measure, for example, a state could choose not to track the movements of its mobile delivery systems (or it could do so only approximately). Alternatively or additionally, it could try to use a cyber intrusion in its networks to feed misinformation to the adversary. In spite of these and other limitations, however, cyber espionage almost certainly offers unique advantages. For example, no practical constellation of high-resolution surveillance satellites in low Earth orbit could provide continuous coverage of a given location on Earth’s surface.10 Cyber surveillance, by contrast, may allow for continuous monitoring of an adversary’s military posture.

Second, cyber weapons offer an unparalleled capability to manipulate the data that go into decision-making. Other types of weapons, by destroying or disabling sensors or communication systems, can also deny data to decision-makers. However, their use generally alerts the target to the fact it is under attack. By contrast, if a well-designed cyber weapon is used, a loss of data may appear to be, say, the result of a malfunction, potentially allowing the attacker to conduct surprise follow-on attacks. Even more significant, cyber weapons can be used to feed false information to decision-makers. For example, the Stuxnet virus, which was reportedly developed by the United States and Israel, was designed not only to destroy centrifuges at Iran’s Natanz enrichment plant, but also to hinder plant operators from discovering the cause of these failures by producing falsely reassuring readings on monitoring equipment.11 In a similar vein, sophisticated cyber weapons offer a unique capability to shape an adversary’s perception of a battlefield by feeding misinformation into C3I systems.12 To be sure, information operations have always been a part of warfare. However, cyber weapons represent a sea change because their effects can be tailored with great precision in real time, and because they could be used to directly influence the perceptions of high-level decision-makers.

Third, cyber operations–whether conducted for espionage or offensive purposes–can present particularly significant risks of unanticipated collateral effects, that is, of affecting IT systems other than the intended target.13 Noncyber weapons can, of course, lead to collateral damage. Yet such effects are inherently constrained by geography. Moreover, the likelihood of physical collateral damage can be often quantified, at least to some extent (military planners may be able to estimate, for example, the probability of an incoming weapon missing its military target and hitting a nearby civilian facility).14 The risks of collateral effects in cyberspace are much more difficult to estimate. Minimizing such effects relies, in part, on detailed intelligence about the target network and on connections between it and other networks. Obtaining the requisite intelligence is potentially much more difficult than identifying what surrounds a target in physical space (as is verifying that the resulting picture is complete). To complicate matters further, sophisticated malware must generally be tailored to each target and, if revealed, will become ineffective once the adversary can clean its networks and fix whatever exploit was used to gain access. As a result, the effects of cyber weapons cannot usually be understood through testing, further increasing the likelihood of unanticipated collateral damage (simulations can be used but they are only as good as the available intelligence on the target).

Fourth, in peacetime, malware used to enable a cyberattack may often be inserted into an enemy’s networks–but not activated–in the hope that it will remain undetected and thus can be used in a potential future crisis or conflict. (In theory, not only can a vulnerability in an operational IT system be exploited in this way, but so too could security weaknesses in the supply chain for the system’s components.) Noncyber weapons, by contrast, are generally used as and when the decision to authorize a strike on a particular target is taken.15 One consequence of this difference is that, if a state discovers dormant malware in its networks, it can be faced with the challenge of attributing it–that is, identifying which entity is responsible for its implantation–before activation. The equivalent challenge rarely arises with the kinds of noncyber weapons typically used in interstate warfare (though it does arise in irregular warfare or counterterrorism with unexploded ordnance).

Fifth, and relatedly, cyberattacks are generally easier to conceal than other forms of attack. As a result, decision-makers may be more inclined to authorize them. In fact, if the goal is for a cyber weapon to have either a persistent effect or an effect when triggered at some future time, the malware used in the attack must remain hidden to be effective because exposure could enable the adversary to take countermeasures.

Sixth, and finally, distinguishing between offensive operations and espionage is significantly more challenging in cyberspace than in other domains.16 To be sure, the line dividing espionage and offensive operations in physical space is not always entirely clear. Aircraft–unmanned aerial vehicles (UAVs), in particular –are used for both surveillance and offensive operations. But the distinction is much murkier in cyberspace. One challenge is that identifying the purpose of a piece of malware–understanding whether it can be used for espionage, offensive purposes, or both–can be time-consuming. In a fast-moving conflict or crisis, this process might move slower than decision-making. Moreover, even if a state quickly and confidently established that a piece of malware could be used solely for espionage, it could not be confident that whatever vulnerability was used to introduce the malware would not also be exploited for offensive purposes–at least until it had identified and fixed the vulnerability.

States can threaten each other’s nuclear forces through a combination of offensive “counterforce” operations to target nuclear-weapon delivery systems preemptively, and air and missile defense operations to intercept whatever remained. The United States openly acknowledges it would seek to limit the damage it would suffer in a nuclear war.17 Russian doctrine is believed to embrace a similar concept.18 India may be moving in the same direction.19

The question of whether, in practice, a state could actually succeed in limiting the damage it would suffer in a nuclear war to an extent that decision-makers would consider meaningful is currently a subject of considerable debate.20 However, from the perspective of inadvertent escalation, what matters is not whether damage-limitation operations would actually prove effective, but whether a potential target believes they might. In this context, Chinese and Russian fears that the United States is seeking the capabilities–non-nuclear capabilities, in particular–to negate their nuclear deterrents could prove escalatory in a crisis or conflict by generating “crisis instability,” that is, pressures to use nuclear weapons before losing the capability to do so.21 And even though the United States is not concerned today about the possibility of being disarmed, Washington appears to be less sanguine about the future, given growing threats to its C3I assets, in particular.

Cyber capabilities could contribute to damage-limitation operations in two distinct ways. First, cyber espionage could prove useful in collecting intelligence that might increase the effectiveness of counterforce attacks and air and missile defenses, especially if complemented by effective analytic tools for synthesizing large amounts of data from multiple sources.22 If cyber espionage helped reveal the locations of mobile weapons, for example, it could enable preemptive attacks against them. And if it helped to reveal targeting data, it could assist defenses in intercepting missiles and aircraft after launch.

Second, cyber weapons could be used, alongside other capabilities, to conduct counterforce strikes. A hypothetical cyber “kill switch” that could permanently shut down an adversary’s nuclear C3I systems would certainly be attractive to any state with a damage-limitation doctrine. In practice, this kind of perfect capability seems fanciful, not least because a state could find analog or even nonelectronic ways to use its own nuclear forces given enough time (in fact, some states may even prepare such means in advance). At best, therefore, a cyberattack could be a “pause button” that delayed an adversary’s ability to use its nuclear weapons. Real cyber weapons are likely to be still less effective, however. All nuclear-armed states likely operate multiple C3I systems with some degree of redundancy between them. Cyber operations would probably not prove equally effective against these different systems, potentially delaying the target from using some elements of its nuclear forces for longer periods of time than others.

Even given these limitations, however, cyberattacks could still assist with damage limitation. They could buy more time for counterforce operations to attrite an opponent’s nuclear forces and reduce the coherence of any retaliatory attacks, somewhat simplifying the task of air and missile defenses. Moreover, the potential for cyberattacks to shape an adversary’s perceptions could prove valuable. For example, an attacker might try to “blind” its adversary’s early-warning system just before launching counterforce strikes on its nuclear forces.

Just how effective cyber-enabled damage-limitation operations might prove in an actual conflict is far from clear, not least because of the difficulty of testing cyber weapons. That said, any state that has made the enormous investments necessary to develop damage-limitation capabilities is likely to spend relatively modest additional sums on developing complementary cyber tools, and it might reach a different conclusion about their potential efficacy. Even more important, from the perspective of inadvertent escalation, its potential adversaries might do so too.

China, in particular, appears to be concerned about cyber-enabled damage limitation. Summarizing the thinking of their peers on this subject, two Chinese scholars, Tong Zhao and Li Bin, have concluded that “Chinese analysts have demonstrated an acute awareness of the potential vulnerabilities of the country’s nuclear C3I system, particularly against cyber infiltrations.”23 Russian views have been less aired. In fact, a dichotomy has emerged in what little public discussion there has been. For example, three respected experts, including a former general officer in Russia’s Strategic Rocket Forces, have recently played down the threat, arguing that “because the command-and-control systems of strategic nuclear forces are isolated and highly protected, they are, in all probability, not vulnerable to cyber attacks.”24 At about the same time, however, another influential Russian scholar argued that, among the emerging non-nuclear technologies that could threaten nuclear forces, “probably the most dangerous development is cyber weapons, which could be used for non-nuclear disarming and decapitating attack by completely paralysing the entire command-and-control system.”25 News reports that Russia has created cyber defense units for its nuclear forces suggest that the Russian military may be less than sanguine about the cyber threat.26

Fears about cyber-enabled damage limitation may be particularly pernicious because of the potential difficulty of detecting a cyberattack. A sophisticated cyberattack on nuclear forces or C3I systems could conceivably occur without being detected. In the extreme case, a state might only find out that it had been attacked when it attempted to launch nuclear weapons and discovered that its ability to do so had been impeded in some way. If a state believed that it would be unlikely to detect an ongoing cyberattack, then it could rationally conclude that it might be under attack even in the absence of attack indicators. The simple belief that an opponent had highly sophisticated cyber capabilities could, therefore, precipitate a false positive–the incorrect assessment that an attack was underway–by itself. By contrast, if a state’s nuclear forces were under assault from kinetic strikes, the target would likely be aware. To be sure, it is still not entirely impossible that a state could wrongly come to believe it was under kinetic attack. Early-warning systems, for example, have produced false warnings of incoming ballistic missile strikes.27 But mistakes of this kind could be identified once the incoming weapons ceased to exist (though the window of time before they disappeared could be particularly dangerous).

To make matters worse, a state that was concerned about its nuclear forces and C3I systems coming under cyberattack might be inclined, especially in a crisis or conflict, to interpret ambiguous indicators in the worst possible light. For example, if one of its nuclear C3I systems malfunctioned because of, say, bad design or aging components, it might wrongly attribute the failure to a cyberattack (in fact, the temptation among operators to do so might be particularly strong if they would otherwise be held responsible for an internal failure). Regardless of precisely how it arose, however, a false positive that occurred in a crisis or conflict could generate significant escalation pressures.

Concerns about the potential for cyber operations to enhance the effectiveness of damage limitation can have effects beyond generating crisis instability at a time of heightened tensions or during a conflict. In peacetime, such concerns may induce nuclear-armed states to take steps to try to ensure that nuclear weapons could be employed when duly ordered in a crisis or conflict, even at the expense of exacerbating the danger of inadvertent or unauthorized use. Concerned states, for example, could remove permissive action links–electronic “locks” designed to prevent the unauthorized use of nuclear weapons–because of the perceived danger that they could be hacked and thus subverted to prevent authorized use.28

Alternatively or additionally, states could make plans to predelegate the authority to use nuclear weapons down the chain of command to guard against the possibility of the communication links serving national leaders being severed. The dangers of predelegation depend, in part, on the degree of flexibility afforded to commanders in determining whether and how to use nuclear weapons. Nevertheless, certain risks are inherent in any model. A localized communications failure might be mistaken for an attack, for example, leading to inadvertent use.29 Predelegation also increases the risk of unauthorized use because a field commander could order the use of nuclear weapons in a scenario in which he or she was not permitted to do so. This danger becomes greater as more people are granted launch authority. In this respect, cyber threats could promote a particularly dangerous form of predelegation by inducing a state to entrust launch authority to the relatively large number of lower-level officers who are capable of issuing a launch order without electronic communications.

Surveillance operations in cyberspace, even if conducted exclusively for defensive purposes, pose unique risks of escalation. Cyber surveillance of an adversary’s nuclear forces can serve purposes besides damage limitation. In any dyad involving two nuclear-armed states, each has a strong incentive to monitor the status of the other’s nuclear forces at all times–and particularly during a crisis or conflict–including for the exclusively defensive purpose of spotting any preparations for nuclear use. Several intelligence collection techniques, including overhead imagery and signals intelligence, are likely used for this purpose. Given the potentially unique advantages of surveillance in cyberspace, however, states may see good reason to adopt it alongside these other approaches, especially if they judge that the likelihood of cyber espionage being detected is small.

Depending on the sophistication of the malware used and the target’s defenses, the true likelihood of being detected may or may not be small, but the consequences of being caught could be significant. In fact, if the target detected ongoing cyber espionage of networks associated with its nuclear forces or C3I systems, inadvertent escalation could result from either of two concerns that are distinct from those that might plausibly be generated by other forms of surveillance.

First, even if the target of cyber interference were convinced that the operation was being conducted exclusively for the purpose of espionage, it might worry that the data being collected could be used against it in damage-limitation operations. Intelligence collection in physical space could also enable damage limitation, but it differs from cyber surveillance in one critical respect. In a crisis or conflict, a state would generally have no way of knowing whether or not countermeasures against physical surveillance (such as camouflage or concealment) had proved effective–unless its nuclear forces were successfully attacked. By contrast, if it detected an ongoing effort to collect intelligence through its C3I networks, it would know definitively that at least some of its cyber defenses had failed. This realization might lead the state to fear that attacks on its nuclear forces were imminent.

Second, because of the difficulty of rapidly distinguishing cyber espionage from a cyberattack, espionage against nuclear forces or C3I systems would risk being misinterpreted as an attack. In theory, the use of armed UAVs for surveillance of an adversary’s nuclear forces could generate a similar risk. However, a state motivated by purely defensive considerations would have strong and obvious reasons not to use armed UAVs in this way.

The risks resulting from cyber espionage being mistaken as an attack would depend on who had initiated the operation and who was the target. China or Russia might assess that U.S. cyber surveillance was actually an offensive effort intended to undermine–or, more likely, give Washington the option of undermining– Beijing’s or Moscow’s ability to launch nuclear weapons, thus potentially generating crisis instability. By contrast, because Washington is apparently more confident in the survivability of its nuclear deterrent, cyber espionage directed against U.S. nuclear forces or C3I systems would be less likely to have the same result. Nonetheless, such operations would likely be of real concern to Washington and could, for example, be misinterpreted as a prelude to nuclear use by China or Russia.

Even if the two states involved in a crisis or conflict did not engage in any kind of deliberate cyber interference with one another’s nuclear forces or C3I systems, one of them might wrongly conclude that the other had. Such a misperception, which could be the result of collateral effects or third-party action, could also induce escalation through crisis instability or misinterpreted warning.

A state that eschewed cyber operations of any kind against an opponent’s nuclear forces or C3I systems might still launch such operations against adversary military networks involved exclusively in non-nuclear operations. If, because of design flaws, imperfect intelligence, or mistakes in execution, the malware used in such attacks spread and infected networks that were involved in nuclear operations, the target might conclude that its nuclear forces or C3I systems were under deliberate cyberattack or cyber surveillance.

There could be collateral effects even if a state’s networks for nuclear operations were entirely isolated; air-gapping (physically isolating one particular network from others) is, after all, not a cyber security panacea.30 Moreover, achieving perfect isolation could prove difficult in practice.31 To give but one reason, every nuclear-armed state, apart from the United Kingdom, has dual-use delivery systems, which can be used to deliver nuclear or non-nuclear weapons. Such delivery systems represent a potential point of contact between the C3I systems supporting nuclear operations and those supporting non-nuclear operations.

In practice, some nuclear-armed states–perhaps many or even all of them– have not tried to isolate their nuclear C3I systems. The United States, for example, has a number of dual-use C3I assets for communications and early warning that support both nuclear and non-nuclear operations.32 Other nuclear-armed states, including China and Russia, may as well, but are less transparent.33 Because the networks supporting dual-use C3I assets are likely to be connected directly to others involved in non-nuclear operations, there may be a particularly high risk of their being subject to collateral effects.

#### It triggers nuclear retaliation.

Dr. Scott D. Sagan 21, Caroline S.G. Munro Professor of Political Science, the Mimi and Peter Haas University Fellow in Undergraduate Education, and Senior Fellow at the Center for International Security and Cooperation and the Freeman Spogli Institute at Stanford University, PhD in Political Science from Harvard University, and Allen S. Weiner, JD from Stanford University, Senior Lecturer in Law, Director of the Stanford Program in International and Comparative Law, and Director of the Stanford Center on International Conflict and Negotiation, “The U.S. Says It Can Answer Cyberattacks With Nuclear Weapons. That’s Lunacy.”, The Washington Post, 7/9/2021, https://www.washingtonpost.com/outlook/2021/07/09/cyberattack-ransomware-nuclear-war/

Over the July 4 weekend, the Russian-based cybercriminal organization REvil claimed credit for hacking into as many as 1,500 companies in what has been called the largest ransomware attack to date. In May, another cybercriminal group, DarkSide, also apparently located mainly in Russia, shut down most of the operations of Colonial Pipeline, which supplies nearly half the diesel, gasoline and other fuels used on the East Coast — setting off a round of panic buying that ended only when the company handed over a ransom. These incidents were bad enough. But imagine a much worse cyberattack, one that not only disabled pipelines but turned off the power at hundreds of U.S. hospitals, wreaked havoc on air-traffic-control systems and shut down the electrical grid in major cities in the dead of winter. The grisly cost might be counted not just in lost dollars but in the deaths of many thousands of people.

Under current U.S. nuclear doctrine, developed during the Trump administration, the president would be given the military option to launch nuclear weapons at Russia, China or North Korea if that country was determined to be behind such an attack.

That’s because in 2018, the Trump administration expanded the role of nuclear weapons by declaring for the first time that the United States would consider nuclear retaliation in the case of “significant non-nuclear strategic attacks,” including “attacks on the U.S., allied, or partner civilian population or infrastructure.” The same principle could also be used to justify a nuclear response to a devastating biological weapons strike.

But our analysis suggests that using nuclear weapons in response to biological or cyberattacks would be illegal under international law in virtually all circumstances. Threatening an illegal nuclear response weakens deterrence because the threat lacks inherent credibility. Perversely, this policy could also wind up committing a president to a nuclear attack if deterrence fails. While the American public would indeed be likely to want vengeance after a destructive enemy assault, the law of armed conflict requires that some military options be taken off the table. Nuclear retaliation for “significant non-nuclear strategic attacks” is one of them.

The Biden administration is now conducting its own review of the U.S. nuclear posture. The 2018 Trump change is an urgent candidate for reevaluation, but people have generally ignored it up to now. As officials work on this process, they have the chance to take full account of what could be called the “nuclear law revolution” — a growing recognition that international-law restrictions on warfare, and especially those that protect civilians, apply even to nuclear war.

Most Americans are aware of the strategic revolution that nuclear weapons themselves kicked off: The massive destruction they created made deterrence the highest national security priority. Soon after the bombing of Hiroshima in 1945, for example, Bernard Brodie, a preeminent early Cold War strategist, wrote: “Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them.”

Inherent in the idea of deterrence for decades was the notion that the United States would rain “assured destruction” on the cities of any nation that attacked us or our allies with nuclear weapons. During the height of the Cold War, for instance, U.S. nuclear war plans were designed to destroy “at least 70% of the urban industrial bases of the USSR and Communist China” and expected to kill “30% of the people,” according to declassified top-secret documents from the Nixon administration written in 1969 and 1971.

But such plans were manifestly not reconcilable with the central principles of the international law of armed conflict. This helps explain why the U.S. government asserted at the time of its negotiation that the 1977 Protocol I to the 1949 Geneva Conventions did not apply to nuclear weapons. That later treaty codified the obligation of all state parties to follow in war the principles of distinction (drawing a line between military targets and civilians), proportionality (making sure the unintended or “collateral” civilian harm resulting from a legitimate attack does not exceed the military advantage of that attack) and precaution (doing everything feasible to avoid or at least minimize collateral civilian deaths). U.S. nuclear war plans in the 1970s didn’t follow any of these rules.

In 2013, however, the Obama administration’s official nuclear weapons employment guidance announced that henceforth, “all plans must also be consistent with the fundamental principles of the Law of Armed Conflict.” From then on, even nuclear war plans would apply the principles of distinction, proportionality and precaution.

The Obama guidance document was categorical: “The United States will not intentionally target civilian populations or civilian objects.” According to Gen. C. Robert Kehler, the head of U.S. Strategic Command from 2011 to 2013, implementing this guidance led the command to develop nuclear delivery “tactics and techniques to minimize collateral effects,” and to “expand non-nuclear strike alternatives and add significant flexibility to our contingency plans.” The Trump administration’s 2018 Nuclear Posture Review reaffirmed the U.S. commitment to “adhere to the law of armed conflict” in any “initiation and conduct of nuclear operations” — but its interpretation of the law (allowing nuclear weapons to be used in response to a massively destructive biological or cyberattack) was flawed.

The unambiguous embrace of the application of international law to nuclear weapons means that if a future president ordered a Hiroshima-like attack, striking a city to kill as many enemy civilians as possible, it would be an illegal order that senior generals would be required to disobey. This would be true even if the order came in response to a nuclear attack on an American city; nations are not permitted to flout the rules of war protecting civilians simply because their enemies do. (A theory called “belligerent reprisal” holds that states may strike back at civilian populations in a proportionate way if the intent is to get the enemy to stop its own illegal warfare. We and other scholars have argued that this practice is not compatible with current understandings of international law.)

Yet it is not only pundits and the public that have failed to notice this legal revolution. Some writings by nuclear strategists, even those seeking to limit the dangers of nuclear war, have ignored the shift. In 2018, for instance, the late Princeton research scholar Bruce Blair proposed a policy of what he and others have called “minimal deterrence”: His version involved cutting the U.S. arsenal to fewer than 700 warheads, from some 2,000 today, and aiming them to guarantee “the annihilation of scores of [Russian] cities housing banking and oil infrastructure as well as key manufacturing and leadership facilities.” But a policy targeting civilian infrastructure would clearly violate international-law rules that Washington recognizes apply to nuclear targeting.

This is not to say that the laws of war preclude all use of nuclear weapons (a conclusion that some legal scholars have embraced). The principle of proportionality permits some U.S. nuclear attacks against military targets — for example, when the harm such a strike would prevent to U.S. and allied populations would exceed the foreign collateral damage it caused. (Any associated civilian deaths would have to be truly incidental and unavoidable. Deliberately causing purported “collateral” civilian damage to force an enemy to stand down would be illegal.) Those planning a nuclear counterattack would also be obliged to use the lowest-yield weapons necessary to destroy or neutralize the legitimate military targets they place in their sights.

If the laws of war strictly constrain nuclear retaliation for a nuclear attack on the United States, they all but certainly bar such a strike in response to a cyber- or biological attack — even one causing many civilian casualties. In almost any imaginable scenario, the use of nuclear weapons would violate the principle of precaution, the requirement to minimize harm to civilians if feasible. That’s because the formidable U.S. military has the capacity to halt, or to induce the adversary to halt, ongoing cyberattacks through conventional or cyber-responses that would cause less harm to foreign civilians than would a retaliatory nuclear strike.

There are a few possible, but largely hypothetical, exceptions to this rule. One would be if the individuals or organization responsible for the cyber- or biological attack were in an underground bunker that couldn’t be destroyed any other way. Another hypothetical option, a nuclear demonstration strike against an isolated military target, might be legal, but it would be strategically stupid, as it would actually demonstrate lack of resolve. A stronger response would directly target — through conventional means — the perpetrators and their ability to launch further attacks on us or our allies.

Using nuclear threats to deter cyberattacks is also inherently less credible than threatening retaliation with conventional weapons or in kind (that is, with cyber-retaliation). The states that we worry most will launch cyberattacks — Russia, China and North Korea — also have nuclear weapons, and their leaders might reasonably calculate that any U.S. president would be reluctant to use nuclear weapons against a nation that can retaliate in kind. An adversary might also believe that the U.S. military would refuse to use nuclear weapons in response to non-nuclear attacks precisely because of questions around legality. Such suspicions undermine the deterrent force of nuclear weapons; in contrast, if the United States were to commit to only conventional or cyber-retaliation to “significant non-nuclear strategic attacks,” adversaries would have fewer doubts that we would follow through.

Not only might a U.S. nuclear threat against a cyber- or biological attack be perceived as a bluff, it could be doubly dangerous if it subjected the president to what has been called the “commitment trap.” If Washington threatens a nuclear response to deter a cyberattack, but adversaries go ahead anyway because the threat is deemed not credible, then there would be increased pressure on the president to order a nuclear strike to rebut domestic political claims of weakness and shore up international perceptions about the credibility of future threats. But succumbing to such political pressure or the urge for vengeance would create an unacceptable risk of further nuclear escalation.

#### CI collapse metastasizes---extinction.

Benjamin Monarch 20, University of Kentucky College of Law, J.D. May 2015, LLM in Energy, Natural Resources, and Environmental Law and Policy from the University of Denver Sturm College of Law, Deputy District Attorney at Colorado Judicial Branch, and Term Member at the Council on Foreign Relations, “Black Start: The Risk of Grid Failure from a Cyber Attack and the Policies Needed to Prepare for It,” Journal of Energy & Natural Resources Law, vol. 38, no. 2, Routledge, 04/02/2020, pp. 131–160

In the industrial world, when a switch is flipped, we take for granted that it will produce light, boot a computer, illuminate a stadium or activate a power plant. We know, of course, that power losses can and do occur. Many of us have lit candles during a thunderstorm or brought out extra blankets when a blizzard takes down transmission lines. As of this writing, the most populated state in the United States, California, is experiencing rolling blackouts.1 Yet even in prolonged power outages, we expect that electricity will be restored and, consequently, life will return to normal. Perhaps we need ask, however, what if power cannot be restored in a timely manner? Concern is growing that in the not-too-distant future our electricity supply could be irreparably compromised by a cyber attack. The issue when considering a systemic grid failure of this nature is twofold: how did we reach a point where something so critical to routine life now presents an existential threat, and what can we do to mitigate the risk of a catastrophic grid attack?

This article posits that the emergence of cyber attacks on industrial control systems, as a means of war or criminal menace, have reached a level of sophistication capable of crippling those systems. This article argues that a new grid security policy paradigm is required to thwart catastrophic grid failure – a paradigm that recognises the inextricable link between commercial power generation and national security. In section 5, seven policy recommendations are outlined that may, in part, mitigate a future where grid attacks pose existential risk to nations and their citizenry. Those recommendations are: first, develop a comprehensive insurance programme to minimise the financial risk of grid disruption; second, train more cybersecurity professionals with particular expertise in industrial control systems; third, institute a federally mandated information-sharing programme that is centralised under United States Cyber Command; fourth, subsidise and/or incentivise cybersecurity protections for small to mid-size utilities; fifth, provide university grants for grid security research; sixth, integrate new technologies with an eye towards securing the grid; and, lastly, formulate clear rules of engagement for a military response to grid disruption.

The purpose of this article is to provide the reader with an introduction to this complex topic. It is the aim of the author to give orientation to this issue and its many branches in the hope that better understanding will animate further curiosity and, ultimately, positive action on the part of the reader. Although many skilled and earnest people work tirelessly to prevent a grid failure scenario, it is essential that more be added to their ranks each day. Advisors, engineers, regulators, private counsel to power generators, and many others who play roles in electric power production are crucial to this subject. So, while this article provides entrée to the topic of grid security, its long-term objective is to spur action by the entire energy-related community. In the end, no one is immune to consequences of grid failure and, therefore, everyone is responsible, in part, for promoting grid integrity.2 In this regard, lawyers who represent various actors in the energy sector are going to be faced with questions and potential legal risks of a magnitude that they have never experienced before.

1.2. Turning the power back on in a powerless world

‘Black start’, not to be confused with the term ‘blackout’, is the name given to the process of restoring an electric grid to operation without relying on the external electric power transmission network to recover from a total or partial shutdown.3 At first glance, this description is unremarkable, but it implies a disturbing catch-22 – how might one restore power if the entire external transmission network is compromised?

If an electric disruption occurs at a household level, some homes may be equipped with a modest gasoline generator to temporarily restore power. If a hospital loses power, it will almost invariably be resupplied by automatic, industrial-scale generators. These micro considerations hardly give anyone pause; they are hiccups on a stormy night or a snowy day. In other words, their ‘black start’ is a quick and effective process for restoring power. But what happens, at a macro level, when an electric grid supplying power to large portions of the United States goes black, or worse, what happens if all of the United States’ electric grids go down simultaneously?4 In that scenario, how might enough non-grid power be harnessed and transmitted to turn the United States’ lights back on? Moreover, how might such a catastrophe occur in the first place? Perhaps the more ominous question is not how, but whether or not we can survive such circumstances if they persist in the long term.

The United States electric grid (‘the grid’) is the ‘largest interconnected machine’ in the world.5 It consists of more than 7000 power plants, 55,000 substations, 160,000 miles of high-voltage transmission lines and millions of low-voltage distribution lines.6 The scale and complexity of the grid in the context of the modern digital world are beyond comprehension because within it are innumerable industrial control systems; incalculable connections to digital networks; millions, if not billions, of analogue or digital sensors; many thousands of human actors; and trillions of lines of programming code.7 Further complexifying the grid is that it is comprised of generations of technologies, stitched together in ways that are not inherently secure in a world of cyber threats.8 The vastness of the grid makes security of it challenging. Likewise, the vastness of the grid makes the opportunities for intrusion seemingly infinite.

By any measure, grid failure will unleash a parade of horrors. Stores would close, food scarcity would follow, communication would cease, garbage would pile up, planes would be grounded, clean water would become a luxury, service stations would yield no fuel, hospitals would eventually go dark, financial transactions would stop, and this is only the tip of the iceberg – in a prolonged grid failure social chaos would reign, once-eradicated diseases would re-emerge and, increasingly, hope of returning to a normal life would fade.9 The notion of complete grid failure, once relegated to science fiction comics or James Bond movies, is now not only possible but also one of the most pressing national security threats today.10

#### IoT enables effective climate mitigation.

Huawen Tian et al. 22, Law, Shandong University of Science and Technology; Liwen Jiang, Economics & Management, Shandong University of Science and Technology; Jie Zhang, Management, Shandong University of Technology, "Construction of Wireless Sensor Model for Carbon Neutralization and Environmental Protection From The Perspective Of Energy Internet Of Things Transformation," Journal of Sensors, 01/17/2022, Hindawi.

Climate change has a profound impact on the earth’s environment, which is a great challenge facing mankind [1]. In order to cope with global climate change and realize the progress of human civilization and the sustainable development of the earth’s ecosystem, the 21st United Nations Climate Change Conference adopted the Paris climate agreement, which proposed to achieve the goal of “net zero emission” of CO2 around 2050, that is, carbon neutralization [2]. Broadly speaking, carbon neutralization refers to the dynamic balance between carbon source systems such as human fossil energy utilization, land use, and natural volcanic eruption carbon emission and carbon sink systems such as earth’s carbon cycle system, marine carbon dissolution, and biosphere carbon absorption. In a narrow sense, carbon neutralization refers to the CO2 emission of an organization, group, or individual in a period of time, which is offset by forest carbon sink, artificial transformation, geological storage, and other technologies to achieve “net zero emission” [3]. Carbon neutralization is an important way to effectively control the rapid rise of global temperature, promote the green transformation of energy utilization, and promote green, low-carbon, and other technological progress [4]. It is a new driving force for world economic development and growth [5]. Realizing carbon neutralization will improve the earth’s ecological environment on which human beings depend and reduce environmental problems caused by human activities [6]. In 2019, the World Health Organization announced that air pollution and climate change ranked first among the top ten health threats in the world [7]. It is estimated that from 2030 to 2050, climate change will cause about 250000 new deaths from malnutrition, malaria, diarrhea, and excessive temperature in the world every year, and 7 million people will die prematurely from diseases such as cancer, stroke, heart disease, and lung disease every year [8]. Carbon neutralization will promote the transformation of human energy system to green, low-carbon, and carbon-free, realize the substitution of carbon-free new energy for high-carbon fossil energy, and drive the growth of jobs and GDP in the field of new energy industry [9]. It is estimated that by 2050, the average annual investment in the field of global energy low-carbon transformation will exceed US $3.2 trillion, the cumulative investment will exceed US $95 trillion, and more than 100 million jobs will be provided [10]. Carbon neutralization is the common goal and pursuit of all mankind. The global cooperation mechanism with consultation as the main body is the premise and guarantees to achieve carbon neutralization [11]. In the process of actively promoting carbon neutralization all over the world, it is necessary to carry out carbon neutralization research guided by scientific issues [12].

The automatic identification center established by MIT proposed a radio frequency identification system-item loading sensing equipment [13]. Through the application of RF technology, it is connected with other objects to realize the interconnection of objects and form an intelligent control system [14]. Internet of things is another widely concerned network in the network field after the Internet. It is based on standards and has the ability of self-configuration and management [15]. The Internet of things supports the direct information interaction between people and things, and wireless sensor networks only support the information exchange between things, in order to provide users with the environmental information they need [16]. Therefore, wireless sensor network is the technical basis of the Internet of things and a branch network of the Internet of things. From the historical background of the emergence of wireless sensor network technology, wireless sensor network has experienced wireless data network, wireless ad hoc network, and wireless sensor network [17]. The traditional environmental detection method is to manually obtain various material samples in the environment, such as air, water, and soil, and test the collected samples on the instruments in the laboratory [18]. Such a sample acquisition method can only collect limited data, and the data is not reliable. In order to meet people’s demand for various resource monitoring in the future and maintain the sustainable development of economy and environment, we need to obtain a large amount of environmental information timely and accurately [19]. Because of its own characteristics, wireless sensor networks are different from traditional fixed networks. They have the characteristics of limited resources, self-organization, dynamic network, wide scale, and high density [20]. The characteristics of wireless sensor network, such as single deployment, low cost, network self-configuration, and no manual maintenance, make it suitable for the field of environmental monitoring. Multiple nodes carrying various sensors are distributed in the required monitoring environment, and the nodes cooperate to complete the remote monitoring task [21]. Although the research time of wireless sensor network is very short, a large number of sensor network research and application make its technology develop rapidly. With the continuous exploration of wireless sensor networks all over the world, the application of wireless sensor networks has widely existed in all fields of production and life [22]. It is the research focus and application technical basis of wireless networks in the future. Wireless sensor networks (WSNs), which combine sensor technology, microelectronics technology, and wireless technology, are a powerful network. It has been widely used in road traffic, military safety, environmental monitoring, intelligent life, and other aspects. Today’s society is affected by the technology and application of WSN [23]. Wireless sensor networks play an important role in monitoring, such as the concentration of carbon dioxide in the air, air humidity, and light intensity. The monitoring of these indicators can well reflect the results of carbon neutralization and provide an important basis for the early realization of carbon neutralization. This paper analyzes the development background and research status of energy Internet of things technology at home and abroad and determines the overall design scheme of environmental monitoring Internet of things system. Then, the wireless sensor network model is applied to the detection of air quality in the environment to detect the content of CO2 in the air more accurately, which is of great significance to achieve the goal of carbon neutralization as soon as possible.

2. Related Work

The Internet of things takes data networking as the essential core, while the energy Internet of things has a large number of users and devices, and the data collected by its measurement and perception is very valuable. On the one hand, the use of massive data enables the energy industry to fully understand its own characteristics and provide new technical support means for low-carbon green development, energy efficiency improvement, energy conservation and consumption reduction, economic operation, and system planning of the energy industry; on the other hand, data analysis and processing based on deep learning, artificial intelligence and other technologies can improve the production efficiency of the energy system, provide better consumer services for users, and provide more efficient decision support for system operators. The Internet of things and wireless sensor networks have been widely favored all over the world. In 1991, the concept of “pervasive computing” proposed by the United States involved perceptual technology, and then, MIT first proposed the “Internet of things” [24]. IBM announced the “smart earth” plan to the outside world in November 2008. Immediately, the plan received strong support from the government and jointly developed smart grid and smart medicine [25]. Carbon neutralization means that enterprises, groups, or individuals calculate the total amount of greenhouse gas emissions directly or indirectly generated within a certain period of time to offset their own carbon dioxide emissions through afforestation, energy conservation, and emission reduction, so as to achieve “zero emission” of carbon dioxide. As a new form of environmental protection, carbon neutralization has been adopted by more and more large-scale events and conferences. Some other developed countries have also set development goals and taken a number of feasible measures to promote their rapid development. In the field of agricultural environmental monitoring, data transmission technology and environmental data acquisition technology have been developed [26]. In terms of data transmission, there are two measures to ensure the correctness of data transmission: the optimal network protocol and the appropriate network deployment [27]. The correctness of agricultural environmental data transmission first needs the optimal network protocol. The agricultural environment monitoring based on wireless sensor network needs to deploy the network according to the characteristics of the monitoring area. When wireless sensor networks need a single network in a small-scale agricultural monitoring environment, the physical layer and data link layer of the network protocol are the same [28]. However, when wireless sensor networks need composite networks in complex environments, different network layer and application layer specifications are formulated due to specific network protocols. It can be seen from the literature that the fusion between networks requires standards to agree on the communication between different networks [29]. According to different monitoring environments, the research focus of routing algorithm is also different. It can be seen from the literature that the protocols related to wireless sensor networks are appropriately tailored to meet the characteristics of agricultural monitoring environment. Second, select the appropriate topology to deploy the network nodes to make the network reach the optimal state, so as to transmit data reliably [30]. Wireless sensor networks deployed in various regions as the experimental field of project research have promoted the rapid development of Internet of things related technologies. Gong and Jiang [31] proposed a smart city Internet of things system for monitoring indoor temperature, humidity, and CO2. It uses PIC24F16KA102 chip as the main control and NRF24L01 RF module with 2.4 GHz bandwidth as the transmitting and receiving node to collect temperature, humidity, CO2, and other sensing data, transmit it to PC through USB, and transmit the data to mobile phone app through the Internet, so as to obtain, save, and process environmental data. Liu et al. [32] proposed a low-power Internet of things system for long-term monitoring of outdoor environment. It is composed of sensor node, gateway node, application server, and back-end alarm equipment. The sensor node collects temperature data through the main control and sends the sensor data to the gateway equipment through CC1150 RF module; the gateway device collects RF data through the 433 module and drives the GPRS module to transmit the data to the application server through the main control module; the application server stores and provides data support for the back-end alarm device; the back-end alarm device runs data query and alarm functions. Vijayalakshmi et al. proposed a real-time environment monitoring Internet of things system using solar energy self-power supply [33]. It is composed of solar panel, power management module, main control module, XBee RF module, and sensor module. Solar panels generate electric energy during the day, provide electric energy for system operation, and charge 50 f capacitors; The main control module collects the information of temperature, humidity, CO, CO2, and LDO sensors and transmits the data through XBee module. The power consumption of the whole system is about 4.907 mW. At the same time, the 50 F capacitor can be charged to 4.6 V by the solar module during the day; when the operating voltage of the system is between 3.6 V and 4.6 V, the 50 F capacitor can provide the power of the whole system for 12 hours at night [34]. Muthukumaran et al. [35] put forward a cloud service monitoring system for diabetes patients. In the system, the sensor node layer is composed of two parts. One part collects indoor environmental information, such as temperature, humidity, time, location, and air quality, and the other part collects patient information, such as heart rate and body temperature; the gateway is responsible for local data storage, data packaging, data push, and other functions; the cloud service layer is responsible for cloud data storage, data query, and other functions; the equipment terminal can view the information of patients and rooms in real time. The sensor node layer communicates through a 2.4 GHz radio frequency module; the sensor node and gateway transmit data through WiFi module.

3. Research Methods and Key Technologies

3.1. Transformation of Energy Internet of Things

This paper will explore the path description and research methods of energy Internet of things transformation and discuss how to use power system, Internet of things, and social factors to strongly support energy transformation. In 2015, the proportion of nonfossil energy power generation was 30%. The schematic diagram of energy transfer path is shown in Figure 1, showing the change curve of the proportion of renewable energy in primary energy. Under the goal that the proportion of nonfossil energy power generation will reach 80% in 2050, there can be different paths to achieve this goal, and different paths will have different effects on the national economy. How to plan the energy transfer path can take into account the constraints of coordinated economic development and carbon emission, which is worthy of in-depth research.

[Figure omitted]

In many paths, the transformation task can be allocated to each year by linear method; we can also increase the amount of renewable energy as soon as possible, so as to obtain carbon emission benefits as soon as possible and save resources. However, due to immature technology and other reasons, the investment will increase. Or use the opposite method to accumulate experience at the beginning and accelerate the pace of transformation when the technology is mature. Therefore, among many paths, how to find a feasible method to compare different paths and select the optimal path has become an urgent problem to be solved. The proportion of nonfossil energy power generation is used as the characteristic quantity of energy transformation, as shown in Figure 1. The time series trajectories of different transformation curves are marked with typical power functions. The power of the transformation curve is represented by , the linear transformation curve is a special case where the power is equal to 1, and represents the power of the transformation curve. represents the initial proportion of new energy, represents the target proportion, and represent the starting year and target year, respectively. In year , the proportion of new energy can be expressed as

[Equation omitted]

3.2. Key Technologies of Energy Internet of Things

The network nodes in the energy Internet of things can ensure the comprehensive monitoring of the external environment and improve the overall quality of data transmission. In environmental monitoring, we need to improve the security and stability of data transmission. Combined with the actual characteristics of the Internet of things, we can optimize the design of link layer data transmission and enhance the security of data. We can also establish the reliability analysis method of data transmission of the Internet of things system and take corresponding management measures to ensure the overall effect of data transmission of the Internet of things. The Internet of things system mainly includes three parts: application layer, perception layer, and network layer. The sensing layer is composed of various sensor devices, including reader, terminal camera, and GPS. It can sense the external environment and collect a variety of signals and physical information. The network layer refers to the IOT network communication system, including information processing center and intelligent control center, which can process information quickly and timely.

A large number of microsensor nodes are arranged in the monitoring area to realize the self-organizing network system by means of wireless communication. Various microsensors can be integrated to realize the real-time reception and transmission of information. Wireless communication transmits various data information, and the information obtained by the sensor can also realize the development of integration, miniaturization, and networking, as shown in Figure 2. Wireless sensor network integrates embedded computing, sensor technology, wireless communication technology, and modern network technology, which can enhance the perception ability of the whole device. It is an important prospect in the field of Internet of things.

[Figure omitted]

3.3. Construction of Wireless Sensing Model under Energy Internet of Things Technology

Under the condition of Internet of things technology, it is necessary to analyze the application characteristics of ecological environment, meet the overall needs of system architecture, and improve the overall quality of service monitoring. Wireless sensor nodes with self-organizing function are connected in the form of wireless transmission, which can conduct three-dimensional and comprehensive monitoring of the ground, underground, and air environment, forming a 3D Internet of things environment monitoring system, as shown in Figure 3. The detection system uses Ethernet to monitor different indicators in the environment, such as temperature and humidity. Then, it is transmitted to the remote client through the network.

[Figure omitted]

The core node design of the Internet of things needs to be composed of control and information processing unit, storage unit, and communication unit, and the distributed power supply is used to provide support. Build a monitoring system suitable for the ecological environment of different villages and towns, analyze it combined with the Internet of things node technology and ecological environment sensing data, and develop a sensor module to meet the monitoring of multi environmental parameters such as gas, water, and soil. In order to improve the security and reliability of data and information transmission in the Internet of things, it is necessary to effectively control the nodes of the whole data transmission, design specific methods such as error recovery, congestion control, and flow control, establish sensor models, comprehensively optimize the deployment and coverage of regional sensor nodes, and take corresponding management measures to ensure the quality of information transmission.

The whole IOT monitoring system can realize two working modes to adapt to different application environments.

The situation in the working mode of the area coverage monitoring system is as follows. As shown in Figure 4, the regional monitoring system includes LAN nodes, main control module, and data cloud platform. It can carry out real-time environmental monitoring for large areas, upload data to the data platform in real time, and synchronously monitor the information of each node (impact, temperature, humidity, light and general ad data, etc.).

[Figure omitted]

The working mode of the fixed-point direct connection monitoring system is as follows. Based on the regional coverage monitoring system, the fixed-point direct connection monitoring system removes the monitoring ability of multinode environment and retains the passive wireless impact sensor node network. Its environmental data collection mainly comes from the data collection of the main control module (impact, temperature, humidity, light, dust, general AD data, etc.). At this time, the monitoring range of fixed-point direct monitoring becomes smaller, but the data acquisition frequency increases, which is mainly applicable to scenes with high data requirements. Its design architecture is shown in Figure 5.

[Figure omitted]

4. System Test and Analysis

This chapter mainly tests the environment monitoring Internet of things system, including passive wireless impact sensing module, area coverage monitoring system, and fixed-point direct connection monitoring system, tests and detects the overall function of the system, and verifies the function of the whole system.

4.1. Node Circuit Test

For the node circuit, it is necessary to test the energy storage capacitance and the operation of the control circuit. The energy storage capacitor is a 10 uF tantalum capacitor. After receiving the DC voltage converted by the impulse signal, its voltage test is shown in Figure 6. As can be seen from the figure, the maximum output voltage can reach about 7.2 V, and the voltage shows an exponential attenuation trend with time, which can realize the storage of electric energy and meet the power supply of ultralow power RF module. Since the back-end control circuit will turn on when it is above 3.2 V, the output voltage is the energy storage capacitor voltage, and the voltage of 7.2 V will burn the ultralow power RF module chip, a voltage stabilizing diode must be added at the output voltage to protect the RF chip.

[Figure omitted]

Add the control circuit after the energy storage capacitor and test its output voltage, as shown in Figure 7. When the energy storage voltage of the energy storage capacitor increases from 0 V to 3.2 V, the voltage of the control circuit is 0 V; when the voltage of the energy storage capacitor is greater than 3.2 V, the voltage of the control circuit changes with the voltage of the energy storage capacitor; after that, the voltage of the control circuit will always follow the voltage of the energy storage capacitor to drop to about 1.6 V, and then turn off the output. The control time of the whole control circuit is about 40 ms, that is, the normal working time of ultralow power RF circuit; the voltage output is 1.6 V to 3.2 V, closely following the voltage change of the energy storage capacitor. The design function of the control circuit is verified.

[Figure omitted]

4.2. Overall Function Test

In the overall function test, the fixed-point direct monitoring Internet of things system will be tested in the field. Through the real-time monitoring of the surrounding environment, the data of dust, temperature, humidity, and illumination of the surrounding environment will be collected in real time to verify the working condition and stability of the whole system. The monitoring time is one hour, and the change curve of each environmental information is obtained, as shown in Figure 8. The system works stably, and all sensing data curves are displayed and saved in real time. At the same time, it can be seen from the data that the system can stably monitor all kinds of data information in the outfield environment.

[Figure omitted]

According to the above tests, the basic functions of the whole Internet of things system have been realized, including the alarm function of passive wireless impact sensing, the cloud real-time monitoring function of environmental data, and the real-time sending function of cloud instructions. The real-time monitoring of indoor and outdoor environment has been realized under two working modes, and the task objectives set in the early stage of the whole system have been realized. The test results show that the environmental monitoring Internet of things system can realize the real-time acquisition and data transmission of passive wireless impact sensing signals, use 10 uF tantalum capacitor to store energy and complete about 20 m RF data transmission with about 42 uJ energy supply; the completed area coverage monitoring system uses five ZigBee sensor nodes and master control nodes to collect a variety of sensor data (temperature, humidity, and light) and interact with the data instructions of ONENET cloud platform, with stable operation and reliable performance; the completed fixed-point direct connection monitoring system can collect a variety of sensing data and interact with the data instructions of Alibaba cloud platform, with strong reliability and stable operation. The system achieves the expected design and functional objectives.

5. Conclusion

Internet of things technology can automatically analyze the concentration, emission, and emission speed of toxic and harmful substances in the natural environment. It can also transmit data information to the environmental monitoring and management department in real time, formulate scientific and reasonable pollution management strategies, and ensure the rapid and timely treatment of pollution problems. Wireless sensor networks are widely used in environmental monitoring. Atmospheric monitoring is mainly online monitoring or mobile monitoring. Online monitoring can realize synchronous monitoring and monitoring prediction. Comprehensively analyze the future atmospheric environment conditions, and install fixed monitoring equipment at the discharge of pollution sources to form a distributed network to comprehensively control specific pollutants. Various wireless sensor network devices can be used to collect the data of sulfur dioxide and inhalable particles of nitrogen oxides in the atmospheric environment in an all-round way and use the network to transmit the real-time data to the monitoring center to automatically analyze the environmental quality and clarify the overall effect of environmental data processing. Aiming at the environment under the background of carbon neutralization, this paper carries out the research on the technology of environmental monitoring Internet of things system, focuses on the key technologies such as multisensor terminal, local area network communication, wide area network communication, and data cloud platform, and develops a complete set of Internet of things system, which realizes the monitoring of dust, light, temperature, and real-time monitoring of humidity and other environmental parameters, and on this basis, support the scalability of the system to meet the needs of different environmental conditions. We have added relevant contents as follows: today’s world is experiencing great changes that have not been seen in a century. The ecological environment is related to human survival and sustainable development, which requires the unity and cooperation of all countries to jointly meet the challenges. Carbon neutralization is a consensus reached by mankind in response to global climate change. Countries all over the world actively commit to achieving the goal of carbon neutralization. Carbon substitution, carbon emission reduction, carbon sequestration, and carbon cycle are the four main ways to realize carbon neutralization, and carbon substitution is the backbone of carbon neutralization.

#### Absent that, extinction.

Simon Beard et al. 21, Centre for the Study of Existential Risk, University of Cambridge; Lauren Holt, Centre for the Study of Existential Risk, University of Cambridge; Asaf Tzachor, Centre for the Study of Existential Risk, University of Cambridge. Cambridge Global Food Security Interdisciplinary Research Centre, University of Cambridge; Luke Kemp, Australia National University; Shahar Avin, Centre for the Study of Existential Risk, University of Cambridge; Phil Torres, Institute of Philosophy, Leibniz University Hannover; Haydn Belfield, Leverhulme Centre for the Future of Intelligence, University of Cambridge, "Assessing Climate Change’s Contribution to Global Catastrophic Risk," Futures, Vol. 127, March 2021, ScienceDirect.

While most of the impacts of climate change so far have fallen within the range of what was experienced during the Holocene, the rate of change is faster than in the Holocene and we are now beginning to see climate change push beyond these boundaries. In the latest edition of the planetary boundaries’ framework, climate change is placed in the zone of increasing risk, implying that while this boundary has been breached, there remains some potential for normal functioning and recovery (Steffen et al. 2015). It thus lies between what the authors identify as the ‘safe zone’ and other ‘high risk’ transgressions, such as disruption to the biochemical flows of nitrogen and phosphorus and loss of biosphere integrity.

As part of their discussion of BRIHN Baum and Handoh (2014) note that climate change is the planetary boundary for which the risk to humanity has received most meaningful consideration and they suggest that this attention is deserved. Yet little research attention has been paid to climate change’s extreme or catastrophic effects. Kareiva and Carranza (2018) argue that, despite currently falling outside of the area of high risk, climate change has the clear potential to push humanity across a threshold of irreversible loss by “changing major ocean circulation patterns, causing massive sea-level rise, and increasing the frequency and severity of extreme events… that displace people, and ruin economies.” Even if humanity was resilient to each of these individual impacts, a global catastrophe could occur if these impacts were to occur rapidly and simultaneously.

One scenario that has received comparatively more attention is that of the global climate crossing a tipping point that would trigger environmental feedback loops (such as declining albedo from melting ice or the release of methane from clathrates) and cascading effects (such a shifting rainfall patterns that trigger desertification and soil erosion). After this point, anthropogenic activity may cease to be the main driver of climate change, making it accelerate and become harder to stop (King et al. 2015).

Other scenarios can be discerned from the numerous historical cases in which the modest, usually regional, climatic changes experienced during the Holocene have been implicated in the collapse of previous societies, including the Anasazi, the Tiwanaku, the Akkadians, the Western Roman Empire, the lowland Maya, and dozens of others (Diamond 2005, Fagan 2008). These provide a precedent for how a changing climate can trigger or contribute to societal breakdown. At present, our understanding of this phenomena is limited, and the IPCC has labelled its findings as “low confidence” due to a lack of understanding of cause and effect and restrictions in historical data (Klein et al. 2014). Further study and cooperation between archaeologists, historians, climate scientists and global catastrophic risk scholars could overcome some of these limitations by identifying how the impacts of climate change translate into social transformation and collapse, and hence what the impacts of more rapid and extreme climatic changes might be. There is also the potential for larger studies into how global climate variations have coincided with collapse and violence at the regional level (Zhang 2005; 2006). However, these need to be interpreted and generalized with care given the differences between pre-industrial and modern societies.

Societies also have a long history of adapting to, and recovering from, climate change induced collapses (McAnay and Yoffee 2009). However, there are two reasons to be sceptical that such resilience can be easily extrapolated into the future. First, the relatively stable context of the Holocene, with well-functioning, resilient ecosystems, has greatly assisted recovery, while anthropogenic climate change is more rapid, pervasive, global, and severe. Large-scale states did not emerge until the onset of the Holocene (Richerson et al, 2001), and societies have since remained in a surprisingly narrow climatic niche of roughly 15 mean annual average temperature (Xu et al, 2020). A return to agrarian or hunter-gatherer lifestyles could thus have more devastating and long-lasting effects in a world of rapid climate change and ecological disruption (Gowder 2020).[12] Second, modern human societies may have developed hidden fragilities that amplify the shocks posed by climate change (Mannheim 2020) and the complex, tightly-coupled and interdependent nature of our socio-economic systems makes it more likely that the failure of a few key states or industries due to climate change could cascade into a global collapse (Kemp 2019b).

A third set of plausible scenarios stem from climate change’s broader environmental impacts. Apart from being a planetary boundary of its own, Steffen et al. (2015) point out that climate change is intimately connected with other planetary boundaries (see Table 1). Climate change is thus identified by the authors as one of two ‘core' boundaries with the potential “to drive the Earth system into a new state should they be substantially and persistently transgressed.” This transformative potential was elaborated on in subsequent work exploring how the world could be pushed towards a ‘Hothouse Earth’ state, even with anthropogenic temperature rises as low as 2°C (Steffen et al. 2018).

[Figure omitted]

The connection between climate change and biosphere integrity (the survival of complex adaptive ecosystems supporting diverse forms of life) is particularly strong. The IPCC is highly confident that climate change is adversely impacting terrestrial ecosystems, contributing to desertification and land degradation in many areas and changing the range, abundance and seasonality of many plant and animal species (Arneth et al. 2019). Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has reported that climate change is restricting the range of nearly half the world’s threatened mammal species and a quarter of threatened birds, with marine, coastal, and arctic ecosystems worst affected (Diaz et al. 2019). According to one estimate, climate change could cause 15-37% of all species to become ‘committed to extinction’ by mid-century (Thomas et al. 2004).

Disruption to biosphere integrity can have profound economic and social repercussions, ranging from loss of ecosystem services and natural resources to the destruction of traditional knowledge and livelihoods. For instance, desertification, which threatens a quarter of Earth’s land area and a fifth of the population, is already estimated to cost developing nations 4-8% of their GDP (United Nations 2011). Many other rapid regime shifts involving loss of biosphere integrity have been observed, including shifts in arid vegetation, freshwater eutrophication, and the collapse of fish populations (Amano et al. 2020). There is a theoretical possibility of still more profound regime shifts at the global level (Rocha et al. 2018). However, the contribution of loss of biosphere integrity to GCR is yet to be assessed. Kareiva and Carranza (2018) argue that it is unlikely to threaten human civilization, due both to a lack of plausible mechanisms for this threat and the fact that “local and regional biodiversity is often staying the same because species from elsewhere replace local losses.” However, in their classification of GCRs, Avin et al. (2018) suggest the potential for ecological collapse to threaten the safety boundaries of multiple critical systems with diverse spread mechanisms at a range of scales, from the biogeochemical and anatomical to the ecological and sociotechnological. Note that both these studies were conducted for largely conceptual purposes and should not be taken as rigorous analyses of this risk, this topic warrants further investigation.

3.2 Classifying Climate Change’s Contributions to Global Catastrophic Risk

Climate change's contribution to GCR goes well beyond its impact on the earth system. Taking Avin et al.’s list of critical systems, we note that previous studies have mostly focused on the effects of climate change on physical and biogeochemical systems (e.g. global temperature and sea-level rise) or the lower-level critical systems that are most directly related to human health and survival (e.g. Heath Stress). However, these represent a very limited assessment of risk as it only accounts for climate change as a direct hazard/threat and our "ontological" vulnerabilities to it. A more comprehensive risk assessment must consider the higher-order critical systems threatened by climate change passively (through a lack of alternatives) and actively (through intentional design).

The probability of a global catastrophe is higher when socio-technological and environmental systems are tightly coupled, creating a potential for reinforcing feedback loops. If environmental change produces social changes that perpetuate further environmental change, then this could actively work against our efforts at adaptation. When this change has the potential to produce significant harm, via human vulnerabilities and exposure, we describe such loops as ‘global systems death spirals.’ These spirals could produce self-perpetuating catastrophes, whereby the energy and resources required to reverse or adapt to collapse are beyond the means of dwindling human societies. Feedback loops like this could thus create tipping points beyond which returning to anything like present conditions would become extremely difficult. Global systems would shift to very different states in which the prospects for humanity would likely be bleaker.

In the rest of this section, we explore just one potential spiral, between an ecological system (the biosphere) and two sociotechnological systems (the human food and global political systems). We explore each system and its interactions. Figure 2 illustrates our model of this spiral.

[Figure omitted]

The human food system

Climate change’s impact on biosphere integrity (discussed in the previous section) could harm the human food system due to loss of ecosystem services, disruption of the cycles of water, nitrogen and phosphates, and changes in the dynamics of plant and animal health (Bélanger and Pilling 2019). Crossing this planetary boundary is already having severe implications for global food security, including loss of soil fertility and insect-mediated pollination (Diaz et al. 2019).

Systems for the production and allocation of food are already enduring significant stress. The sources of stress include climate change, soil erosion, water scarcity, and phosphorus depletion. The natural resource base, arable land and freshwater upon which food production rely are being degraded. While global food productivity and production has increased dramatically over the past century to meet rising demand from an expanding global population and rising standard of living, these constraints and risks are increasing the vulnerability of our global food supply to rapid and global disruptions that could constitute global catastrophes (Baum et al. 2015).

Climate change will further reduce food security in at least three interconnected ways. First, it will affect growing conditions, including direct threats to agricultural yields from heat, humidity, and precipitation in many regions; although initially improving conditions in some (Lott, Christidis and Stott 2013). Second, it will increase the range of agricultural pests and diseases (Harvell 2002). Third, it will increase the occurrence of extreme weather events that impair the integrity of food production and distribution networks, from production to harvest, post-harvest, transport, storage, and distribution, thereby increasing our vulnerability and exposure to supply shocks (Bailey et al. 2015). The IPCC estimates, with medium confidence, that at around 2°C of global warming the risk from permafrost degradation and food supply instabilities will be ‘very high’, while at around 3°C of global warming the risk from vegetation loss, wildfire damage, and dryland water scarcity will also be very high (Arneth et al. 2019). Very few studies have considered the impacts of 4°C of global warming or more; however, the IPCC highlighted one study finding that any potential agricultural gains from climate change will be lost by this point and there could be a decrease of 19% in maize yields and 68% in bean yields in Africa, an 8% reduction in yields in South Asia, and a substantial negative impact on fisheries by 2050 (Porter et al. 2014). Furthermore, multiple extreme weather events could disrupt food distribution networks (Baily and Wellesley 2017).

While there are opportunities to adapt, disruption to the entire global food system cannot be resolved via food aid alone. Indeed, there is the potential for isolationist or heavy-handed responses that would do more harm than good. Given the high degree of interconnectivity and feedback within the global food system, our initial research suggests that any one of these climate change effects could trigger scenarios that would critically undermine the global food system’s ability to meet the minimum nutrition for well-being; making food security for all an unachievable goal, let alone rise to the challenge of continuing to grow (Tzachor 2019a; 2020); this would constitute what Kuhlemann (2019) terms a ‘threshold of significance.’

The global political system

Disrupting the global food system can create and exacerbate conflict and state failure (Brinkman and Hendrix 2011). However, once again, this needs to be seen against the backdrop of a global political system under stress, with climate change as a significant contributing factor. Climate change influences political systems in many ways, from being a locus of activism and a stimulus for reform to driving rising inequality and population displacement (Arneth et al. 2019, Diffenbaugh and Burke 2019). This is not a new phenomenon, changes in the climate are believed to have contributed to conflict between people and states throughout human history, driven by resource scarcity, population displacement, and inequality (Lee 2009, Mach et al. 2019). As part of a comprehensive risk assessment of climate change, David King and colleagues (2015) conducted an extensive literature review on climate change and conflict and used this to inform a series of international wargaming exercises. These found that climate change is expected to increase international conflict while highlighting the role that population displacement, state failure, and water and food insecurity would play in this (see also Natalini, Jones and Bravo 2015, Mach et al. 2019).

Quantitative studies of the impact of climate change on violence and conflict have provided more mixed results. A survey of empirical studies by Detges (2017) found that there may be multiple differing trends: extreme weather events appear to have more significant effects on violence than do long-term climate trends, while levels of small-scale conflict and interpersonal violence appear to be more affected than large-scale conflicts and international war. Empirical studies also highlight how climate change’s impact on conflict is predominantly as a risk multiplier and intensifier. Thus, climate change may contribute more by increasing our vulnerability to other conflict-inducing factors, such as loss of livelihood, forced migration, environmental change, and food insecurity, than by acting as a direct cause of conflict (Schubert et al. 2008, Hsiang et al. 2013, Abel et al. 2019).[13]

Of particular relevance to GCR is the effect of climate change on the risk of nuclear war (Parthemore, Femia and Werrell 2018). However, to our knowledge, this has never been rigorously assessed, although the potential is certainly there. One recent model of the risk of nuclear war highlighted how varied, and common, incidents with the potential to trigger a nuclear exchange are (Baum, de Neufville and Barrett 2018). It outlined 14 different causal pathways to an exchange, including the escalation of conventional wars and international crises, human error, and the emergence of new non-state actors. For all but two of these, they identify historical examples of potentially precipitating incidents, with 60 incidents in total (i.e. a little less than one a year). This suggests that the absence of nuclear war was less due to a lack of potential causes, than the global political system’s ability to defuse them. Thus, the real significance of climate change may be its capacity to undermine this system: the combination of social, political, and environmental disruption, a lingering sense of global injustice, and rising food, water, and energy insecurity could increase the probability that crises escalate or that false alarms are mistaken for genuine emergencies. This topic needs further research.

3.3 The emergence of a global systems death spiral

Yet, we should not conclude that a nuclear exchange is the only, or even most likely, scenario in which political instability might produce a global catastrophe. Conflict and political instability, even of moderate severity, are themselves two of the most significant drivers of biodiversity loss due to breakdowns in monitoring, governance, and (public and private) property rights (Baynham-Herd et al. 2018). This closes a potentially reinforcing feedback loop between loss of biosphere integrity, food insecurity and political breakdown.

The mechanisms by which these cascading failures might spread include many of the natural, anthropogenic, and replicator effects identified by Avin et al. (2018), making them harder to contain. At the natural level, climate change involves changes to the global atmospheric and biogeochemical systems and poses other naturally spreading harms, like global ecological collapse. At the anthropogenic level, the global interconnectedness of sociotechnological systems means that while small shocks are easier to recover from, larger shocks can be harder to contain and control. Finally, biological and informational replication can also spread the negative impacts of climate change, from vector-borne diseases and invasive species to climate fatalism and dangerous geoengineering technologies.

Given these numerous spread mechanisms, critical system failures could precipitate global catastrophes. Furthermore, the spiral we have explored is unlikely to be the only set of interlinked systemic disruptions that climate change could initiate (other death spirals could involve bio-insecurity and disease), nor are these the only causal connections between these three systems. Until we understand the nature of such death spirals better, we must act cautiously. We now turn to consider what this would mean.

#### Federal antitrust signals a balanced, light-touch approach that reinvigorates U.S. global leadership on blockchain.

Matt Sandgren 21, Former Staff Director of the Senate Republican High-Tech Task Force, Former Senior Counsel on the Senate Judiciary Committee, Final Chief of Staff to Senator Orrin G. Hatch, Executive Director of the Orrin G. Hatch Foundation, “How New Regulations from Washington Could Lead to a Blockchain Brain Drain”, The Hill, 10/27/2021, https://thehill.com/blogs/congress-blog/technology/578834-how-new-regulations-from-washington-could-lead-to-a-blockchain

The internet is what it is today—with its ability to connect people across countries, time zones, and cultures—thanks to the friendly regulatory climate it was born into. Sadly, the regulatory climate of 2021 is far less welcoming to disruptive technologies. This is bad news for the future of U.S. innovation and the emerging blockchain industry.

Whether Washington takes a heavy-handed or a light-touch approach to crypto regulation over the next few months could make a multitrillion-dollar difference over the next few years. To understand how much we stand to lose as a result of bad blockchain policy, it’s first important to understand just how much we have gained as a result of good internet policy in the ’90s.

It’s easy to forget that the success of today’s internet behemoths was anything but certain in the early years of the tech boom. During the Dotcom Bubble of the late '90s, for example, many companies were dismissed as scams (and some of them were). But even the most promising companies were still seen as speculative bets, and their stock prices were subject to extreme volatility.

It’s also easy to forget that the very concept of the internet was foreign to most people in its early years. By today’s standards, it was slow, overly complex, and difficult to use by anyone without a strong technical background. Many dismissed the internet as a fad, including Nobel Prize-winning economist Paul Krugman, who made this prediction in 1998: “By 2005 or so, it will become clear that the internet’s impact on the economy has been no greater than the fax machine’s.”

Noted.

“A scam,” “a fad,” “a bubble,” “overly complex,” “too volatile.” Does any of this sound familiar? History doesn’t rhyme so much as it plagiarizes. And it’s impossible to ignore that the crypto skeptics of today use the same vocabulary as the internet naysayers of yesteryear.

Now imagine if U.S. policymakers had heeded the words of the internet’s critics in the mid-to-late ’90s. Imagine if they had cracked down on e-commerce, digital publishing, and fledgling social media platforms to preserve the old way of doing things. Imagine if they had shaped regulations to stem the free flow of physical goods, ideas, and information made possible by the internet.

The American people would have missed out on trillions of dollars in economic opportunity—and the bounties of the digital age would have gone to countries with more tech-friendly policies.

This is the risk we face today.

We find ourselves at the dawn of a new age of American innovation. Like the internet before it, crypto has the potential to redefine everything we know about how business, politics, media, finance, and even relationships work. But if legislators give in to crypto’s critics by taking a draconian approach to regulation, the U.S. will fail to reap the economic rewards of this world-changing technology—and entrepreneurs will flee to friendlier shores.

Even now, the stage is being set for a blockchain brain drain. Take the Senate-passed infrastructure bill, which includes a provision that would define crypto miners, validators, and even software developers as “brokers,” requiring them to report information to the IRS about anonymous blockchain participants that they would have no way of obtaining. In effect, this provision would kill the nascent DeFi (decentralized finance) industry and make it almost impossible for everyday Americans to invest in new cryptocurrencies. In other words, this latest move sends a hostile message to blockchain advocates: “We don’t want you here.”

At best, the Senate proposal belies a gross misunderstanding of how cryptocurrencies work; at worst, it exposes regulatory capture and the willingness of legislators to give in to special interests.

Sadly, the threat of bad regulation doesn’t end there. SEC Chair Gary Gensler has expressed his belief that many digital assets are not commodities but securities and should be regulated as such. Following this same logic, he’s signaled his intent to crack down on the use of stable coins—cryptocurrencies pegged to the value of the U.S. dollar. Americans are using stable coins to earn 4 to 8 percent APY on their savings through various lending programs. But the SEC wants to put a stop to these lending programs, ostensibly “to protect investors.” (What’s unclear is which government agency will protect investors from the unlimited money printing that is devaluing their dollar savings at a rate of 5.3 percent per year.)

Washington has gotten off on the wrong foot when it comes to crypto. But it’s not too late to correct course.

Regulation of crypto is not necessarily a bad thing. In fact, it’s a key step on the path to mainstream adoption. It’s critical, however, that policymakers shape regulation in a way that minimizes the risks of this new technology without eliminating its benefits. Congress found a way to do this with the internet in the ’90s. Section 230—while far from perfect and in need of reform today—paved the way for a flexible regulatory environment that allowed for many online companies to thrive. In the famous words of Jeff Kosseff, Section 230 contains “the 26 words that created the internet” (and, it’s worth adding, “trillions of dollars in economic wealth”).

Indeed, regulatory clarity is key to extracting maximum value from the emerging crypto economy, whether that value comes from DeFi protocols, decentralized forms of social media, tokenized assets, NFTs, or some other application of blockchain technology that we can’t even imagine today.

As policymakers seek to find the right balance on regulation, they should remember that the U.S. didn’t become the tech capital of the world by choking innovators with red tape. The U.S. became what it is today by taking a prudential approach to regulation—one that enabled the entrepreneurial spirit.

This is the same entrepreneurial spirit that inspired the private sector technological advances that made the Apollo moon landing possible. It’s the same spirit that brought about smartphones millions of times more powerful than the Apollo 11 guidance computers. And it’s the same spirit that has motivated a group of visionaries to push the boundaries of the digital frontier through blockchain technology.

Will Washington’s leaders stifle that spirit to the detriment of our economy and our reputation as a global leader in innovation? Or will they nourish that spirit to usher in the next chapter of the digital revolution?

Let’s hope they choose the latter.

#### That allows international standard-setting that leverages it for public benefits internationally.

Lou Kerner 18, Head Crypto Analyst at Quantum Economics, Partner at Blockchain Coinvestors Acquition Corp, MBA from the Stanford University Graduate School of Business, BA in Economics from UCLA, “A Call For U.S. Leadership in Crypto”, Medium, 7/6/2018, https://loukerner.medium.com/a-call-for-u-s-leadership-in-crypto-4b74d6deb4ad

Despite the striking fact that most of the programmers the U.S. has ever known are alive and working today, despite the fact that the U.S.’s technical capabilities are growing exponentially, despite that, the vast stretches of the unknown and the unanswered and the unfinished still far outstrip our collective comprehension.

No man can fully grasp how far and how fast we have come, but condense, if you will, the 50,000 years of man’s recorded history in a time span of but a half-century. Stated in these terms, we know little about the first 40 years, except at the end of them man had learned to use the skins of animals to cover them. Then 10 years ago, under this standard, man emerged from his caves to construct other kinds of shelter. Five years ago man learned to write and use a cart with wheels. The printing press came this year, and two months ago, the steam engine provided a new source of power. Last month electric lights and telephones and automobiles and airplanes became available. Only last week did we develop penicillin and television. Two days ago the internet browser was introduced. And earlier today, Satoshi wrote his white paper.

This is a breathtaking pace, and such a pace cannot help but create new ills as it dispels old, new ignorance, new problems. Now, when refer to “Crypto”, I mean the four technologies (blockchain, cryptocurrency, smart contracts, and zero knowledge proof), which collectively enable decentralization, all fueled by community. Surely these technologies promise disruption and high reward.

So it is not surprising that when it comes to Crypto our government would have us stay where we are a little longer to rest, to wait. But this city of New York, and this country of the United States was not built by those who waited and rested and wished to look behind them. Technological breakthroughs are driven by those who move forward — and we will continue to do so.

If this capsule history of our progress teaches us anything, it is that man, in his quest for knowledge and progress, is determined and cannot be deterred. The development of Crypto will go ahead, whether the U.S. regulators joins in or not. And I believe Crypto is one of the great adventures of all time, and no nation which expects to lead the world in technology can expect to lead while staying behind in the development of Crypto.

Our forefathers made certain that the U.S. rode the first waves of the industrial revolutions, the first waves of modern invention, and the first wave of the internet. This generation does not intend to founder in the backwash of the coming age of Crypto. We mean to be a part of it — we mean to lead it. For the eyes of the world will increasingly look at Bitcoin and blockchain and beyond. And those of us in Crypto are working to see it governed by a banner of freedom. We have vowed that we shall not see Crypto filled with scammers, but with scalable protocols that make the world a better place.

Yet the promise of Crypto can best be fulfilled if we in this Nation are there, and leading the way. In short, our leadership in technology, our hopes for a better future, our obligations to ourselves as well as others, all require us to make this effort, to solve these mysteries, to solve them for the good of all men, and to become the world’s leading Crypto nation.

We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people. For Crypto, like all of technology, has no conscience of its own. Whether it will become a force for good or ill depends on [hu]man[s], and only if the United States occupies a position of pre-eminence can we help decide how this new technology evolves. I do not say that we should or will go unregulated against the misuse of Crypto any more than we go unprotected against the hostile use of cyber warfare. But I do say that Crypto can be developed and mastered without repeating the mistakes of past regulatory overreach.

Crypto’s development deserves the best of all [hu]mankind and its opportunity for community. But why, some say, Crypto? Why choose this as our next computing platform? And they may well ask why climb the highest mountain? Why, 75 years ago, fly the Atlantic?

We choose to to develop Crypto, and do the other things, not because they are easy, but because they are hard, because the goal of decentralization will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win.

It is for these reasons that I’m concerned by the inaction of our government to provide greater regulatory clarity. In the last months, we’ve seen progress in scaling like the Lightning Network. We’ve seen securities infrastructure like Templum and OpenFinance and Polymath being built.

To be sure, from a regulatory standpoint, we are behind. But we should not stay behind. This year, we should make up and move ahead. The growth of our science and education will be enriched by new knowledge of Crypto, by new decentralized governance mechanisms, by new token economics.

The Crypto community itself, while still in its infancy, has already created a great number of new companies, and tens of thousands of new jobs. Crypto is generating new demands in investment and skilled personnel, and New York and the U.S. can share greatly in this growth.

To be sure, all this comes with uncertainty of the role of government and fiat in the future. I recognize that the belief in Crypto’s potential is in some measure an act of faith , for we do not now know what benefits await us.

But I believe that we can develop a decentralized currency that can be used as a means of exchange. I believe we can leverage blockchain technology to provide identity for the 23 million children on this planet without identity papers. I believe we can use these technologies for voting purposes, and ensuring our elected officials follow through on their promises.

However, if we’re going to do all those things, and countless other positive things for mankind, then we must pass accommodating regulations. I‘m encouraged that New York and the United States are playing a big part in the development of Crypto,. With more regulatory clarity, we can solidify our leading position in Crypto, the greatest adventure on which [hu]man[ity] has ever embarked.

#### Globally collaborative blockchains prevent nuclear war from miscalc, accidents, and arms racing AND builds global co-op, stopping existential threats.

Dr. Lyndon Burford 21, PhD in Politics and International Relations from the University of Auckland, Visiting Research Associate at the Centre for Science and Security Studies at King’s College London, Member of the New Technologies for Peace Working Group, a Part of the Vatican’s COVID-19 Commission, “Could Blockchain Technology Help Advance Nuclear Disarmament?”, Medium International Affairs Blog, 2/19/2021, https://medium.com/international-affairs-blog/could-blockchain-technology-help-advance-nuclear-disarmament-6efaab35e277

New and maturing technologies are often seen as possible drivers of conflict, not least in the context of rising nuclear risks. In 2019, for example, the UK House of Lords Select Committee on International Relations concluded, “The risk of the use of nuclear weapons has increased, in the context of rising inter-state competition, a more multipolar world, and the development of new capabilities and technologies.” In a recent policy report published by the Centre for Science and Security Studies at King’s College London, I explored the flipside of that coin. The trust machine: blockchain in nuclear disarmament and arms control verification looks at how blockchain technology could help to reduce nuclear risks, by strengthening systems to verify the dismantlement of nuclear warheads.

The ‘trust machine’

Blockchain is best known as the technology that underpins the cryptocurrency Bitcoin, but it already has a wide range of alternative uses in areas such as medicine, transport, manufacturing, finance and governance. During the COVID-19 crisis, blockchain was used to produce a cheap, reliable solution for contact tracing. In Syria, blockchain is being used to create a permanent record of potential war crimes, increasing the security and integrity of the data and strengthening its admissibility as evidence in future war crimes prosecutions.

Contests of legitimacy and value: the Treaty on the Prohibition of Nuclear Weapons and the logic of…

Blockchain is a de-centralized, digital record-keeping technology. It combines cryptography and social/economic incentives to build a shared, permanent, and virtually un-hackable record of events, without needing to trust a third party authority to manage the data. Unlike Bitcoin, which is a ‘public’ network that allows anyone to interact with it, a private blockchain creates a ‘permissioned’ network of participants who collectively store and manage data in a way that allows them to maintain extremely high confidence in the integrity of the data. The result is a shared, digital record of events — a blockchain — that is practically immutable, establishing a single, collective, and irrefutable ‘truth’ about the nature and sequence of events within the network. In a post-truth world, blockchain thus offers an invaluable technical foundation for cooperation among parties that have a limited basis to trust each other, leading to its nickname, ‘the trust machine’.

Blockchain as a disarmament mechanism

At present, extremely low levels of international trust hamper efforts to advance nuclear disarmament. The ongoing development of new nuclear weapons, warheads and increasingly capable ballistic missile defences are undermining the theories and practices of deterrence, and point to the resurgence of a spiral of mistrust that characterized the Cold War nuclear arms race. Developing robust, multilateral verification tools and processes could help to mitigate the trust deficit. It would enable countries to pursue their shared interests in nuclear disarmament — reduced costs, less chance of escalation and nuclear use, greater scope to cooperate on global threats like climate change and pandemics — by increasing confidence that other countries are fulfilling their disarmament commitments in good faith. One way to strengthen verification would be to use a private blockchain to manage and store the data that a disarmament process creates.

In a verified disarmament process, parties need to track and record things like the status and movements of individual inspectors and weapon parts, and the status and material holdings of different facilities. These activities create large amounts of data that need to be stored in a secure, permanent and transparent manner that also allows for its easy retrieval by permissioned actors. The core attributes of blockchain correspond closely to these requirements. The technology would allow parties to maintain very high confidence in the immutability of verification data, creating a strong technical foundation for future cooperation from a shared, trusted baseline.

International collaborations like the 25-country International Partnership for Nuclear Disarmament Verification and the Quad Nuclear Verification Partnership (made up of Norway, Sweden, the United Kingdom and the United States) are already exploring how nuclear-armed and non-nuclear-armed states can cooperate in verifying the dismantlement of nuclear warheads without revealing sensitive information. Blockchain could complement their approach, enabling countries to create a permanent, immutable record of verification data.

Nuclear weapons threaten the survival of humanity and divert tens of billions of dollars each year away from efforts to address other collective security challenges like mitigating and adapting to climate change and responding to pandemics like COVID-19. As such, we all share an interest in disarmament processes that can reduce the likelihood of deliberate or accidental nuclear explosions and free up urgently needed resources for other global security priorities. We owe it to ourselves and to future generations to consider all options that could help to advance nuclear disarmament. In addressing the regular obstacle of distrust between the nuclear powers, blockchain is one technological option that we should be exploring.

#### It ensures a credible verification system.

Michal Onderco & Madeline Zutt 21, Associate Professor, International Relations, Erasmus University Rotterdam; Research Associate, Erasmus University Rotterdam, "Emerging Technology and Nuclear Security: What Does the Wisdom of The Crowd Tell Us?" Contemporary Security Policy, Vol. 42, Issue 3, pg. 299-302, 2021, T&F.

Our third finding focuses on whether emerging technologies could enhance or impede nuclear disarmament efforts. Some work has already exposed how new technologies have the potential to strengthen nuclear disarmament and verification measures. A prototype “SLAFKA” was recently jointly developed by a nuclear regulator in Finland (STUK), the University of New South Wales in Australia, and the Stimson Center in the United States which tests whether a distributed ledger technology (DLT) can effectively safeguard nuclear material (Stimson Center, 2020). A DLT platform is “a system of electronic records that enables independent entities to establish consensus around a “ledger”—without relying on a central coordinator to provide the authoritative version of the records” (Rauchs et al., 2018, p. 23). Blockchain is the most well-known type of distributed ledger. Importantly, blockchain is structured in such a way that all who participate in the shared ledger must agree upon a set of records or data, and this data cannot be changed or tampered with by one actor alone (Rockwood et al., 2018). When it comes to accounting for nuclear materials, blockchain could be used by member states to confidentially and securely provide data to the IAEA (Vestergaard, 2018). By using a shared ledger system, the transmission of data by a member state would be visible to other member states, while maintaining the anonymity of participants (Rockwood et al., 2018).

In a recent report, Burford (2020) notes that the characteristic features of blockchain, namely its immutability and security as a data management tool, are uniquely suited to “help to build technical capacity among [non-nuclear weapons states] and habits of cooperation among NPT parties, while protecting proliferation-sensitive data” (p. 21). Finally, others have noted that advances in image-recognition software combined with the increased sophistication in and availability of satellite imagery could open up space for more actors to get involved in verification activities (Kaspersen & King, 2019). This would make verification more robust by allowing a greater number of states to participate in what has traditionally been the domain of states that are more technologically superior.

The security, transparency, and confidence-building features of these emerging technologies could thus enhance verification by strengthening the safeguards system as well as increasing trust and cooperation among states normally suspicious of one another. These features could prove useful in helping to close both institutional and compliance gaps within the non-proliferation regime. That said, as with any other global governance regime, a compliance gap is very difficult to fully bridge. On this point, Sagan notes that even with advances in verification technology “there will remain the problem of what to do if an erstwhile nuclear nation is caught secretly preparing to rearm” (see Sagan in Sagan & Waltz, 2010, p. 90). While the inclusion of new technologies in verification and safeguards will not wipe away the challenges associated with verification, emerging technologies can play a role in strengthening verification and safeguarding measures.

Since we were interested in whether the experts and policymakers considered the positive applications of new technologies on disarmament efforts, our final question in the survey asked experts to express their views on nuclear disarmament.

Table 3 illustrates that the majority of our experts across regions agreed that complete nuclear disarmament would happen when leaders are confident that technology will allow for its verification, underlining the pivotal role verification plays in disarmament. This was echoed by some of the policymakers whom we spoke to who said that AI and remote sensing could help make verification measures more robust (Interviewee I & F). On the other hand, Table 3 also highlights that European and American experts are more skeptical (than experts in other regions) of the fact that nuclear disarmament will occur when leaders believe new technologies make nuclear weapons unnecessary.

#### Policy must be certain and originate at the federal level to signal U.S. commitment to accommodative blockchain policy.

Michele Benedetto Neitz 21, Professor of Law at the Golden Gate University School of Law, Member of the California Blockchain Working Group, Affiliated Scholar at LexLab at the U.C. Hastings College of the Law, “How to Regulate Blockchain's Real-Life Applications: Lessons from the California Blockchain Working Group”, Jurimetrics Journal, 61 Jurimetrics J. 185, Winter 2021, Lexis

A. Why Create Laws Related to Blockchain Technology?

1. Protecting the Public from Harm

Blockchain technology is a complicated field, and innovation in this space is developing rapidly. This innovation will occur regardless of a legislature's reluctance or willingness to draft laws to regulate this industry. As state and federal legislators are struggling to define a regulatory scheme, members of the public who are excited about the possibilities of investing in something new like digital assets may suffer from harm.

This has, of course, already happened in various ways. In a recent high-profile example, members of the public were invited to invest in initial coin offerings (ICOs), buying tokens as a way to invest in start-up companies. 25 One study reported that approximately 78 percent of the ICOs offered in 2017 were actually scams. 26 In the United States, 33 percent of ICO investors believe that ICO operators "deceived them or withheld information from them." 27 The ICO market significantly cooled as federal prosecutors and the SEC began aggressively taking action against leaders of fraudulent ICOs, demonstrating how regulatory enforcement can indeed protect investors from harm. 28

[\*190] However, cryptocurrency scams are persisting beyond the ICO craze. The FTC recently warned the public that scammers are continually finding new ways to "trick people." 29 Members of the public are clearly at risk of a multitude of foreseeable--and unforeseeable--problems as applications of this technology develop, including fraudulent investments, breaches of privacy on blockchain platforms, digital identity theft, and insufficient data protection. Given these threats to the public, it is not appropriate for regulators to dawdle as blockchain applications continue to rapidly advance.

2. Attracting Innovation

While they work to protect the public, legislators and regulators can also use laws to signal their commitment to attracting blockchain-related companies to their locations. Some jurisdictions, including countries like Estonia and Switzerland 30 and U.S. states like Wyoming, 31 have already implemented regulatory schemes designed to win the interjurisdictional competition for blockchain business. 32

The resulting tension between protecting the public while promoting innovation lies at the heart of regulating digital assets and other applications of blockchain technology, as discussed in more detail in Section III.A. Despite the need for blockchain-related regulation, numerous challenges exist for lawmakers seeking to draft laws in this area--starting with the fact that the word "blockchain" does not have a commonly understood definition.

B. The Legislative Definition Problem

What is the legal definition of blockchain? This simple question has proved to be exceedingly difficult to answer. States considering blockchain legislation have focused on different characteristics of this new technology, meaning that "[d]efinitions in legislation introduced in 2018 in California, Florida, Nebraska and Tennessee differ[ed] from those of industry groups and from each other." 33 In some cases, the definitions were in conflict. 34 These inconsistent definitions [\*191] are problematic, as they "actually introduce legal uncertainty where it did not previously exist, and invite unnecessary and expensive litigation." 35

A clear definition of blockchain is necessary for legislative purposes as well, as it is required to help a jurisdiction create clear policies. 36 Moreover, a state's definition should enable policymakers and the public to focus on "the most unique value that the technology can deliver. It should be accessible to and understandable by the public, and yet technically specific enough to ensure that the [jurisdiction] can reap maximum benefit." 37 With such a high bar, legislators have understandably struggled to construct a working definition for this new technology.

The California Blockchain Working Group, after much discussion and debate, created a new definition of blockchain in 2020 for state legislative purposes:

"Blockchain" is a domain of technology used to build decentralized systems that increase the verifiability of data shared among a group of participants that may not necessarily have a pre-existing trust relationship.

Any such system must include one or more "distributed ledgers," specialized datastores that provide a mathematically verifiable ordering of transactions recorded in the datastore. It may also include "smart contracts" that allow participants to automate pre-agreed business processes. These smart contracts are implemented by embedding software in transactions recorded in the datastore. 38

The New York Senate took a simpler approach, defining blockchain as "a mathematically secured, chronological, and decentralized consensus ledger or database, whether maintained via internet interaction, peer-to-peer network, or otherwise used to authenticate, record, share and synchronize transactions in their respective electronic ledgers or databases." 39

Both of these definitions are technically correct, and they both reflect the policy decisions of their respective states. For example, California deliberately used the more flexible term "datastore," instead of "record" or "log," to reflect the verifiability of data shared amongst participants, the many use cases of this type of ledger, and the fact that many datastores could exist at once. 40

[\*192] One could argue that the lack of a uniform statutory definition is partly responsible for the patchwork nature of state blockchain regulation. After all, without a similar definition, it is nearly impossible to set policy goals and pass parallel legislation in multiple jurisdictions. However, the problem of inconsistent definitions is just the tip of the iceberg of interjurisdictional competition. 41 This competition is unlikely to subside even if the federal government or the Uniform Law Commission enacted a well-accepted, standardized definition of blockchain technology.

C. The Fast Pace of Blockchain Technology Development

Law always moves slower than technology. 42 This is partly because lawmakers and agencies can "struggle to capture emerging technologies in dusty regulatory frameworks." 43 For example, securities laws drafted in the 1930s could not have anticipated the sale of digital assets. 44 Even more recently drafted laws and regulations relating to the Internet do not fit blockchain technology. 45 Lawmakers must decide whether to fit this revolutionary technology within existing legal frameworks or start all over with new legislative schemes.

The constantly evolving nature of blockchain technology presents another challenge. This "industry is in its early stages of maturation," making it difficult to determine the initial policy choices that would lead to effective regulation. 46 There are also technical concerns still lurking within blockchain technology, such as locating the "weak points" that might be "gamed by bad actors," which could give rise to unanticipated legal problems. 47

Finally, even at this early stage, lawmakers must consider which aspects of the technology are important enough to regulate. Some of these are obvious, such as cryptocurrency and other forms of digital assets that involve sales to members of the public. But even within this category, it is "still too early to tell exactly which of the drivers of digital asset excitement is dominant," putting [\*193] "regulatory bodies in a tough position." 48 In this way, the wide variety of blockchain projects and the speed at which they are developing creates an additional barrier to effective regulation.

As an example, imagine a developer creates a brand-new digital asset and offers it to the public. How should regulators approach the regulation of this asset? Should regulators first consider the substance of the project, its connection to a decentralized ledger, its effect on consumers' privacy and security, or its potential to evade anti-money laundering and "[k]now [y]our [c]ustomer" laws 49 (or all of the above)? An effective regulatory scheme would need to include rules that are flexible enough to manage future technical developments as well as today's technologies. Otherwise, laws may need to be reconsidered and amended whenever a new technical application emerges.

D. Blockchain Technology's High Learning Curve for Lawmakers

Blockchain technology can be complicated and intimidating, and few lawmakers have training in computer science. A 2016 survey found only that only four of the 535 members of Congress had formal computer science degrees. 50 While the technical aspects of blockchain can be difficult to explain, most legislators can learn enough to understand the fundamentals. 51

New York's State Senate offers a case in point. The Senate's technical advisor reported that in 2019, "staffers and senators asked basic questions about blockchain and distributed ledger technology, prompting [the technical advisor] to develop an explainer presentation." 52 One year later, in 2020, many of the senators "appear more comfortable with the technology, which helps them see the value of [potential] legislation." 53

Legislators need not dive into minor technical details of blockchain to be able to regulate it. It is more important for legislators to focus on the function of blockchain and its practical applications, asking not "what is blockchain?" but [\*194] "what can blockchain do?" 54 Policymakers should focus on the use cases of blockchain, rather than its underlying technology. 55

Professor Angela Walch offered prescriptive recommendations for regulators learning about blockchain, advising them to cultivate their expertise (including self-education), consult with other regulators, follow the activity of standards organizations and academia, and "[w]atch and [l]earn" as the technology stabilizes. 56 Professor Walch also counsels lawmakers to "[a]dopt a [c]ritical [m]indset" in this educational process, to ensure they are not unduly influenced by hype or unreliable sources. 57

Legislators could also learn more about blockchain through the use of legislative working groups or task forces. For example, California's Blockchain Working Group drafted a report in accessible language, enabling state legislators to learn more about the technology and its potential applications for California in one comprehensive document. 58 The federal government has tried to follow this path. In 2019, a bipartisan group of senators proposed a bill directing the Secretary of Commerce to establish a federal Blockchain Working Group in 2019. 59 However, the bill, entitled the "Blockchain Promotion Act," is still currently in committee. 60

As a law professor who taught the first Blockchain and the Law class in San Francisco, I can anecdotally report that blockchain and cryptocurrencies are not easy concepts for nontechnical learners to grasp. However, over the course of one semester, my law students (most of whom did not have any technical training beforehand) were able to draft final reports and presentations not just describing the technology, but also analyzing the use cases deploying the technology. With a bit of time and effort, state and federal lawmakers can understand the potential for blockchain to transform their jurisdictions.

II. FIVE FACTORS FOR LEGISLATIVE CONSIDERATION

In light of the difficult nature of regulating blockchain, this Part offers five factors lawmakers should consider as they work to draft blockchain and crypto regulation.

[\*195] A. Policy Decision: Innovation vs. Protecting the Public Interest

In an ideal world, governments would be able to promote both innovation and the public interest. In reality, however, legislators usually need to debate and choose whether they will prioritize innovative technological development or consumer/public protection. This is especially true in the context of blockchain, since the public perception of blockchain varies widely. Many members of the public first heard of blockchain through Bitcoin, the digital currency. But early illegal use cases of blockchain technology also made headlines, including the infamous Silk Road darknet marketplace 61 and repeated cases of fraudulent theft through Initial Coin Offerings. 62 While the technology is neutral, blockchain can be used in malicious ways that harm the public. 63 Even well-meaning technology can implicate privacy and data protection concerns. 64

It is therefore "essential for both the industry and society that consumers and the capital market are protected from abuse." 65 No state or federal jurisdiction should enable blockchain technology to develop without guardrails to protect the public. The question is where those guardrails should lie. If states wait too long to regulate, the public may be harmed, and the costs of imposing requirements on industries that have already been established will be too great. However, if states develop restrictive regulations too early or the laws "become onerous," 66 businesses will relocate to more friendly jurisdictions. States in this position risk killing off innovation or pushing it to other states. 67 [FOOTNOTE] Blockchain businesses will move for regulatory reasons. See Daniel Kuhn, The Cryptocurrency Act of 2020 Is 'Dead on Arrival,' Washington Tells Sponsors, COINDESK (Mar. 11, 2020, 1:19 P.M.), https://www.coindesk.com/the-cryptocurrency-act-of-2020-is-dead-on-arrival-washington-dc-tells-sponsors [https://perma.cc/AP8X-KULR] ("Many projects are simply choosing to move elsewhere" because of regulatory uncertainty.). [END FOOTNOTE]

Part of the reason blockchain technology's applications are so challenging to regulate is that it "is difficult, if not impossible, for regulators to construct a framework that achieves clear rules, market integrity, and financial innovation." 68 This complex question explains the spirit of experimentation among states discussed in Part V, with some choosing restrictive regulatory structures, some choosing permissive approaches, and others choosing the middle. Regardless [\*196] of a jurisdiction's ultimate direction, legislators drafting blockchain legislation must evaluate how to protect the public while encouraging creative technological development.

B. Ethical Considerations

California was the first (and so far, the only) state to consider ethical considerations in the early stages of regulation. This author published the first law review article analyzing ethics in the blockchain industry in December 2019, 69 and also served as the primary drafter of the Ethical Considerations section in California's Blockchain Working Group report. 70

Depending on the type of blockchain at issue, numerous ethical issues may come up for regulators. For example, the increasing centralization of permissionless blockchains and the rise of permissioned blockchains may raise concerns about personal ethics, such as bias and conflicts of interest. As trends suggest that governance of blockchain systems is moving toward centralization, 71 individuals may have power to influence decisions made on that blockchain. If so, there is a potential for that individual's bias and conflicts of interest to come into play. 72

Although ethical discussions around blockchain appear slower to develop than the technology itself, several paradigms have been put forth advocating ethical considerations in this industry. 73 For example, the World Economic Forum recently asked participants and policymakers to sign on to its "Presidio Principles," an agreement to consider transparency and accessibility, agency and interoperability, privacy and security, and accountability and governance. 74 MIT's Digital Currency Initiative included the topic of blockchain ethics at its 2019 "Cryptoeconomics Systems Summit." 75

[\*197] In addition, the Beeck Center for Social Impact + Innovation at Georgetown University published the "Blockchain Ethical Design Framework," with a focus on six "root issues": "governance, identity, access, verification and authentication, ownership of data, and security." 76 This structure more specifically applies to developers, and is not a code of conduct or a legislative model, but it reiterates the idea that "we all share the responsibility to . . . demand intentional ethical approaches in the design and application of data and technology for social good." 77

California's Blockchain Working Group considered ethical issues related to social impact, including fairness, equity, accessibility, trust and transparency, and sustainability. 78 The Group proposed an ethical framework for the adoption of blockchain technology that is directed toward lawmakers as well as industry players. 79 This framework encompasses three main principles:

i. Address key ethical design goals

a) Seek societal benefit: Maximize good and minimize bad. b) Equity: Does this benefit all Californians, or only a few? c) Efficiency and effectiveness: How can we achieve ethical design and use cases without slowing innovation?

ii. Consider ethical uses of blockchain technology

a) Fairness: Is this technology designed and deployed in a fair, nondiscriminatory manner? b) Accessibility: Design to include the most vulnerable user. c) Responsibility: Anticipate and design for all possible uses. d) Sustainability: Create technology to advance sustainability, public health, and corporate social responsibility.

iii. Minimize unintended consequences

a) Are there unintended biases or conflicts in the design or use of this technology? 80 [\*198] b) Are any populations being unintentionally harmed by the way this technology is developing? c) Does this technology promote violations of local, national, or international law? 81

This useful framework offers guidance to regulators seeking to make sure they do not inadvertently violate ethical considerations, especially with hastily drafted legislation. Two examples illustrate the usefulness of this approach. First, it could be relatively easy to create a certification process for blockchain developers who provide services to the State of California. But will that certification process limit approval to developers with degrees from elite institutions? This type of action would raise equity concerns, as the blockchain industry should be working more toward diversity in gender, cultural backgrounds, and perspectives of industry participants. Second, could companies who advance environmentally sustainable blockchain development receive tax credits from the state? Although different jurisdictions may embrace different ethical principles, legislators should discuss these issues as they contemplate ways to regulate this new technology.

C. Transparency

Since "the rule of law requires transparency," 82 jurisdictions in the United States are governed by transparency laws. The federal government's administrative agencies must abide by the Administrative Procedure Act, which (among other things) orders federal agencies to act "transparently and fairly." 83 California's Bagley-Keene Act requires state boards or commissions (including working groups) to "publicly notice their meetings, prepare agendas, accept public testimony and conduct their meetings in public unless specifically authorized to meet in closed session." 84

Legislators are likely already aware of the government transparency laws in their jurisdiction, but there are other reasons transparency is especially important in the context of blockchain regulation. First, all stakeholders should be given the opportunity to weigh in on laws governing this nascent industry. 85 The industry players on the front line have valuable perspectives to share with legislators, and input from various stakeholders will create more efficient regulation. Moreover, the technology is moving quickly, and there may be applications of blockchain in development that legislators do not even know about yet. As the Cryptocurrency Act of 2020 revealed, 86 drafting laws without the collaboration of diverse stakeholders is ineffective.

[\*199] Second, although blockchain technology may eventually touch all areas of business, members of the public may be unaware of blockchain technology's potential. Legislative debates could double as community education opportunities, allowing people who would not ordinarily be interested in blockchain to attend Working Group meetings, task force briefings, and other public discussions of this new technology. Such meetings could be advertised to nontechnical professions and community organizations, and should be held in easily accessible public places and online. Legislators themselves could reach out to their nontechnical constituents and offer ways to connect them to educators and leaders in the blockchain industry. Such transparency could create a culture of innovation in a particular jurisdiction, while increasing public credibility for whatever regulations eventually develop.

D. Interjurisdictional Competition

States have been competing with each other since the beginning of the republic, and the competition has not decreased as our economy has become more complex. 87 In corporate law, interjurisdictional competitions are a common affair. The state that "wins" the race, creating the environment to attract the most businesses to that state, can secure both tax revenue and additional jobs for state residents. Delaware indisputably won the fight for corporate charters among states, with over 1.5 million legal entities, including 67 percent of all Fortune 500 corporations, incorporated there. 88 The reasons for Delaware's success include specialized legislation that is updated each year to adapt to technical and other changes, as well as a corporate-specific chancery court that can move cases quickly along. 89

When Limited Liability Companies (LLCs) were created in Wyoming in 1977, another interjurisdictional race was on. 90 Despite concerns that interstate LLCs would have problems without uniform LLC statutes among the states, "most states enacted LLC statutes before efforts to develop standardize statutes came to fruition." 91 As a result, only twelve states ultimately adopted uniform acts, and there is less uniformity for LLC statutes than for other business forms. 92

The same is happening now with statutes related to blockchain technology. States who can win the race to attract blockchain businesses to incorporate and domicile in their state can earn more than just increased tax revenues from start-up companies. Such a state could also create a reputation for being friendly to [\*200] technological innovation, a reputation that would have impacts beyond blockchain technology. For this reason, some states (including Wyoming, the first state to draft LLC statutes in 1977) jumped out first to enact permissive blockchain-and crypto-friendly regulations. 93

Before enacting regulations, however, state legislatures should ensure they are clear on the policies underlying those regulations. For example, as discussed in Section II.A above, states should consciously strike a balance between protecting the public and encouraging innovation. Without establishing prioritized policies in advance, a state may win the interjurisdictional competition in the short term but create unintended consequences, such as unnecessary litigation or public harm, in the long term.

E. Uniformity

As a member of the California Blockchain Working Group, this author asked industry leaders in late 2019 what they preferred to see in blockchain regulation. Each of them clearly and unequivocally stated that uniformity of regulation across the United States would be good for business. It would be much easier for blockchain businesses to plan and expand their operations if states were aligned on regulatory issues, particularly in the area of digital assets.

The Uniform Law Commission (ULC) has made several attempts to create a standardized approach to digital asset regulation. 94 In 2017, the ULC proposed the Uniform Regulation of Virtual-Currency Businesses Act to provide "a statutory framework for the regulation of companies engaging in 'virtual-currency business activity.'" 95 An accompanying "Supplemental Act" in 2018 provided rules related to commercial law and the Uniform Commercial Code. 96

These model acts had a short and controversial lifespan. No state enacted the model legislation, and only a handful of states introduced it. 97 Wyoming actively resisted the ULC's request to withdraw Wyoming's pending blockchain [\*201] legislation in favor of adopting the ULC's approach. 98 Wyoming's legislators noted that the ULC's model acts had not yet been enacted by any jurisdictions, and explained why they considered Wyoming's regulatory approach to be the superior one. 99 One month later, the ULC recognized the need to convene a committee to study how the Uniform Commercial Code could be amended in order to "deal with emerging technologies." 100 The ULC urged "states to refrain from enacting legislation pending the result of the committee's work," 101 an act suggesting that the ULC recognized flaws in its proposed acts. 102 Given the ongoing interjurisdictional race described in Section II.D, it seems absurd to ask states to wait on enacting blockchain legislation.

As of December 2020, only one state (Louisiana) had passed a virtual currency licensing statute based on the ULC's uniform act. 103 It is clear that, much like the race for corporate and LLC charters, the uniformity train has left this station. In the absence of federal legislation or effective model acts, states have already invested time and energy into drafting new laws. States like Wyoming, which has "actively decided to lead the charge in ensuring solvent, blockchain based" companies, 104 will not willingly give up their leading positions in this area.

III. THE CURRENT UNEASY MIX OF FEDERAL AND STATE BLOCKCHAIN REGULATION

Federal and state regulators are struggling to keep up with the fast pace of blockchain technology development. This Part will demonstrate how this struggle is creating a wide variety of regulatory approaches.

[\*202] A. Patchwork Agency Regulation

The federal government's attempt to regulate blockchain technology, particularly cryptocurrencies, is (to put it bluntly) a mess. Federal authorities interpret laws relating to blockchain and cryptocurrencies differently. 105 This confusing, piecemeal approach is epitomized by the struggle to determine how to even classify digital currency for regulatory purposes. The Internal Revenue Service (IRS) views cryptocurrency as property, the Securities and Exchange Commission (SEC) classifies such currencies as securities, and the Commodity Futures Trading Commission (CFTC) considers cryptocurrency to be a commodity. 106 There is clearly a need for a unified methodology, even just within blockchain's narrow use case of cryptocurrencies, but this confusion is not a surprising result when "neither Congress nor the SEC has formally elucidated which digital assets are securities and which are not." 107

Different agencies are sending different messages, creating "regulatory whiplash." 108 Some, like the CFTC, are inclined toward experimentation to support blockchain and cryptocurrency development, while others are more cautious. 109 All of the agencies seeking to regulate blockchain technology and its applications would benefit from consideration of the five factors listed in Part III. Below is a short explanation of three distinctive agency approaches.

[\*203] 1. SEC Safe Harbor Provision--A Work in Progress

The SEC missed its chance to establish a clear regulatory framework early in the life span of blockchain technology, instead adopting an approach characterized by delay and a series of reversals on important decisions. 110 The SEC's delay "simultaneously encouraged unscrupulous actors to take advantage of ambiguous regulations" and issue fraudulent tokens to Americans, while "driving away conscientious developers and entrepreneurs" to places with more developed laws. 111 The SEC's attempt to clarify its position in a limited area with the April 2019 issuance of a "Framework for 'Investment Analysis' of Digital Assets" has been called "too little too late." 112

In the meantime, SEC Commissioner Hester Peirce has earned the nickname "Crypto Mom." 113 In early 2020, she offered her take on the legislative problems related to blockchain technology, saying "[i]t is important to write rules that well-intentioned people can follow. When we see people struggling to find a way both to comply with the law and accomplish their laudable objectives, we need to ask ourselves whether the law should change to enable them to pursue their efforts in confidence that they are doing so legally." 114 Peirce clearly views law and regulation as a way to promote, not thwart, the development of blockchain and its use cases.

In February 2020, Peirce proposed a safe harbor provision for firms in the cryptocurrency space selling tokens to the public. 115 Peirce described her proposal as recognizing "the need to achieve the investor protection objectives of the securities laws, as well as the need to provide the regulatory flexibility that allows innovation to flourish." 116 The safe harbor proposal includes disclosure requirements for issuers and good faith obligations to ensure that token issuers are not fly-by-night companies. It also sets forth rules related to the purpose of token issuances and efforts to create liquidity for token users. 117

[\*204] The idea underlying the proposal is to "give new projects some breathing room where they can do their work without fear of being fined, arrested or having their offices raided." 118 This also filters "out the bogus projects that have no intention of building a workable, decentralized product." 119 Peirce appears to be seeking a way to protect consumers from unscrupulous token issuers while allowing companies to move forward with technical developments.

Many members of the blockchain industry welcomed the safe harbor proposal. The General Counsel for a cryptocurrency exchange declared, "Today we both congratulate and thank SEC Commissioner Hester Peirce . . . . This is a great day for the blockchain industry and the United States." 120 But the proposed safe harbor is just that: a proposal. It is not yet law, and may never become law. 121 Even so, the willingness of Commissioner Peirce to think outside of the box with this proposal has reinforced her reputation (and her nickname) within the blockchain community.

2. The Federal Reserve's Digital Dollar

The Federal Reserve revealed in February 2020 that it was working toward a potential central bank digital currency (CBDC). 122 A CBDC, colloquially [\*205] known as a "digital dollar," is not a token based on a decentralized blockchain. 123 It would instead be a "debt notation on a centralized ledger maintained by the Federal Reserve," which would use a centralized database to track consumer or business balances. 124 Individuals could "access funds through digital dollar wallets, which would also be managed by the Fed." 125

Although the digital dollar is different from a crypto asset on a blockchain, the policy issues at hand are quite similar. The Federal Reserve recognizes that these policies include financial stability and legal considerations, such as privacy concerns and protections for data and digital identity safety. However, the Federal Reserve clearly wishes to be on the cutting edge of the digital dollar debate, with one of its members noting that "it is essential that we remain on the frontier of research and policy development regarding CBDC." 126

At the time, there was pressure on the Federal Reserve to begin researching a digital dollar. China is creating a digital yuan, 127 and some argue that the United States is already "falling behind" other countries in developing a CBDC. 128 In addition, the surprise release of Facebook's Libra in 2019 (now rebranded as "Diem") apparently inspired the Federal Reserve to accelerate its research on the potential of a CBDC. 129 The arrival of the COVID-19 pandemic expedited the discussion, as millions of people around the world moved toward cashless payments. 130

The discussion of a digital dollar jumped quickly during the pandemic from the Federal Reserve to Congress. Drafts of congressional emergency pandemic relief legislation in March 2020 included a digital dollar concept to speed up the delivery of stimulus payments. 131 A Congressional Task Force on Financial [\*206] Technology held hearings on the issue in June 2020. 132 Indeed, "the question might be not if digital currencies will find their way into the financial system, but when--and how." 133 As federal lawmakers move toward the creation and regulation of a CBDC, they should be pondering how to encourage innovation while protecting consumers. In addition, anyone involved with the CBDC should consider transparency issues involving the input of multiple stakeholders, as well as ethical considerations such as concerns for unbanked populations.

3. Treasury Department Regulations to Increase Cryptocurrency Transparency

Unlike SEC Commissioner Hester Peirce and the Federal Reserve, U.S. Treasury Secretary Steven Mnuchin has taken a more cautious (and arguably negative) approach to cryptocurrency. 134 In February 2020, Secretary Mnuchin told the Senate Finance Committee that the Treasury Department would be enacting "stricter regulations around digital currencies to help expose 'secret' accounts and other nefarious activities." 135 Although Mnuchin acknowledged that "[w]e want to make sure that blockchain technology moves forward," he also noted that "[w]e want to make sure cryptocurrencies aren't used for the equivalent of old Swiss secret number bank accounts." 136

The goal of Treasury regulations will be to "ensure law enforcement can see where the money is flowing, and that it's not used for money laundering." 137 A March 2020 press release from the Treasury Department announced that the Department had held a meeting of "industry thought leaders and compliance [\*207] experts" on the issue of cryptocurrency regulation. 138 The press release also explained that as these regulations develop, Treasury will remain focused on preventing illegal conduct by "money launderers, terrorist financiers, and other bad actors." 139 The repeated use of such negative terms indicates the Department's adverse stance toward cryptocurrencies, as well as an example of lawmakers and regulators "still cling[ing] to an outdated trope where cryptocurrencies are used to underwrite criminal activity." 140

What can we make of this patchwork approach to regulation among U.S. federal agencies? Some may argue that it is better for the federal government to allow the blockchain industry and cryptocurrency markets to evolve before finalizing a regulatory structure. There can also be benefits to regulatory divergence, such as enhanced innovation as agencies compete to become the preferred regulator in a particular field. However, the absence of "intelligent rules and regulations that provide a clear and predictable framework for investors, issuers, and their lawyers" is complicating that evolution. 141 How can lawyers advise clients--such as start-up companies desiring to operate in the cryptocurrency sphere or offer tokens to investors--if it is unclear how such assets would be regulated? Policymakers are not sufficiently considering important factors, including transparency and uniformity, under this current approach.

Perhaps the problem is a lack of unity among federal agencies, who appear to be tripping over themselves to get in on the digital asset regulatory action. Federal policymakers may be concerned that they are not yet educated enough to make cohesive decisions about overarching regulatory frameworks, or they are waiting for Congress to step up. In any case, this confusion at the federal level is wreaking havoc on the blockchain industry in the United States. Innovative companies must risk inadvertently violating regulations (and having to pay the ensuing fines) just to push the industry forward. 142 Alternatively, companies are choosing to leave the U.S for other jurisdictions with better regulatory [\*208] clarity. 143 Piecemeal regulation among federal agencies is "not a substitute for transparent legislation or judicial rulings to guide market participants." 144

### 1AC---FTC ADV

#### Contention 2 is FTC.

#### FTC credibility is tanked by both unwillingness to launch bold antitrust AND a track record of losing in court, but Khan’s appointment is a window to revamp its policy.

Kiran Stacey 21, Washington Correspondent for The Financial Times, Graduated from Oxford University, Postgraduate Diploma from City University, London, Former South Asia Correspondent, “Washington vs Big Tech: Lina Khan’s Battle to Transform US Antitrust”, Financial Times, 8/10/2021, Lexis

Since taking over at the FTC, Khan has quickly begun to remodel it. Some of these changes look like technical internal reforms, while others are major policy statements. Almost all have been fiercely opposed by Republicans and the business community.

In the past few weeks, Khan has begun holding commission meetings in public - something Democrats say makes the commission more open to scrutiny, but which the two Republican commissioners say makes it harder for them to negotiate compromises.

She has banned staff from making public appearances such as conference panel sessions, saying the commission has too much work to do. She has passed a rule which allows FTC staff greater leeway to pursue investigations in certain priority areas, giving them the power to issue their own subpoenas for documents and testimony.

Khan is also promising to help rewrite the US merger guidelines, a complex set of documents laying out what kinds of evidence regulators look for when deciding whether a merger is illegal.

And, in a pair of crucial decisions, she and her fellow Democratic commissioners voted to rescind two key FTC policy statements.

The first was written in 1995 during Bill Clinton's first term as president, and deemed that companies that had previously proposed unlawful mergers no longer had to notify the FTC before completing future transactions in the same market.

By undoing that policy, Khan said she hoped to stop companies simply trying again and again to complete a merger even after it had been rejected by regulators. The second statement was written in 2015 during the Obama administration and set down limits on when the FTC would prosecute a company for socalled "unfair methods of competition".

"These changes are going to make dealmakers think about things differently," says one senior Democrat working for the commission. "They are not filing an application, we are investigating as to whether there is a violation of the law. That is a fundamentally different way of thinking about things."

Meanwhile, the White House has given the FTC the even bigger task of helping rewrite the rules that underpin the American economy. Under the terms of a sweeping order signed by Biden last month, the commission has been asked to devise rules which would ban companies from stopping employees moving to rivals, and prevent pharmaceutical companies from paying generic rivals not to enter a certain market for a period of time.

The moves have delighted progressives, who say Khan's willingness to push through reform quickly shows she is serious about putting the commission back at the heart of Washington rulemaking and enforcement.

"The commission has been lazy," says Matt Stoller, director of research at the American Economic Liberties Project and a former colleague of Khan at the Open Markets Institute. "It has been a place where you send political cronies who don't have to do any work if they don't want to.

"This is such a different form of politics from the normal bullshit."

Republican concerns But if the reforms have pleased Khan's supporters, they have worried conservatives who say the commission lacks both the legal authority and the institutional capacity to do what is being asked of it.

For example, Khan says she wants to renew the commission's appetite for bringing cases against companies for "unfair methods of competition" - a vague category of corporate behaviour which allows the FTC to act even when there is no merger in question or when a company is not large enough to be a monopoly. She and fellow progressives argue that by not pursuing such cases the FTC has taken away one of its most powerful weapons.

Such behaviour is often very hard to prove, however. When the FTC charged Abbott Labs in 1994 with trying to rig a bid to supply the Puerto Rico government with infant formula, for example, it alleged the company's choice not to bid in one of the rounds provided evidence of collusion with rivals. Abbott Labs' lawyers, however, successfully used game theory to explain why a "no bid" could in fact have made rational economic sense.

More controversial is the idea that the commission is going to start writing wide-ranging new rules of its own, as envisioned in Biden's competition order. This would test the limits of the FTC's powers in both court and on Capitol Hill, critics say, and could end in Congress clipping its wings as it did in 1980 when the FTC was forced to subject its rules to Congressional review.

Sean Heather, senior vice-president for antitrust at the US Chamber of Commerce, says: "The FTC is writing its own rules and acting as prosecutor, judge and jury. This is deeply concerning for a regulatory agency with broad powers."

Christine Wilson says: "I believe competition rulemaking is institutional suicide."

If Khan wanted an indication of how courts might view her approach, she got one within weeks of taking over the commission. In June, a federal judge dismissed the commission's complaint against Facebook, its most high-profile in years.

The commission had argued the social media company had engaged in anti-competitive conduct for years, including by buying up potential rivals such as WhatsApp and Instagram. In June, however, a federal judge ruled the commission had failed to prove that Facebook had monopoly power.

Khan's critics worry that if the commission loses a series of high-profile court cases it will fatally undermine its authority. "If you lose enough cases your credibility evaporates," says William Kovacic, a former Republican chair of the commission. "You can lose it all - not right away, but you can lose it all."

For Khan's supporters, however, this criticism borders on the absurd. "Don't you think the FTC is already seen as weak?" says Rohit Chopra, a Democratic commissioner.

Progressives argue the FTC has for years only enforced competition rules against large companies in a fraction of the cases it should have. "Do you think there are only 10 anti-competitive mergers a year?" says Chopra. "I'm not sure it can get any worse."

"The FTC can put together legal teams that can match the best in the bar, punch for punch, in a major case," says Kovacic. "But the number of those teams is a couple, it is not 10."

For years the commission's budget and staffing levels have been chipped away. It now has roughly 50 per cent of the staff it had in 1980 and is currently trying to review a record number of mergers. In the first nine months of this fiscal year, the FTC received 2,573 notifications ahead of a large merger - already 50 per cent more than were received in the whole of last year.

Last week, the commission published a statement warning that it would not be able to review all mergers within 30 days of a notification being made, as required by law. Instead, the FTC said, if it had not had time to review a merger before it took place, it would reserve the right to take action even after it had been completed.

The commission is also facing an uphill battle to retain staff. Some people say they feel demoralised by the pace of change and irritated they have not yet met their new chair - something Khan's allies say is an unfortunate result of the pandemic. "There are only so many times you can hear that your institution has failed for years before you start to doubt your place in it," says one staff member.

#### Specifically, blockchain is key.

Dr. David Morris 21, PhD in Media Studies from the University of Iowa, Former Academic Sociologist of Technology, CoinDesk’s Chief Insights Columnist, “Biden’s New FTC Chair Could Be a Big Web 3.0 Ally”, The Crypto Daily News, 6/16/2021, https://thecryptodailynews.com/2021/06/bidens-new-ftc-chair-could-be-a-big-web-3-0-ally/

Yesterday, the Biden administration named Lina Khan, a 32-year-old Columbia Law professor, as the brand new head of the Federal Trade Commission. Khan, who would be the youngest FTC head ever, is called a fierce critic of massive tech monopolies like Amazon. While there’s typically a knee-jerk resistance to regulation and regulators amongst blockchain advocates, Khan’s considerations make her a potential ally on huge points like privateness. Her antimonopoly work might additionally create substantial market alternatives for brand new sorts of tech companies – together with these constructing decentralized techniques and “Web 3.0.”

Enforcing U.S. antitrust regulation is a main a part of the FTC’s mandate, and Khan might be greatest identified for serving to redefine simply what a “monopoly” is. She has been essential, together with throughout seven years on the Open Markets Institute, in growing and selling the concept a firm could be a monopoly even when its practices drive prices down – even, the truth is, if its product is free to customers. That principle largely hinges on how the companies collect and use knowledge: Khan has been among the many loudest critics of the way in which Amazon makes use of knowledge gathered by its storefront, akin to by leveraging sales data to compete with third-party sellers who’re, a minimum of buyers, its prospects.

#### Failing to control blockchain violations will outstrip federal enforcement capacity, making traditional antitrust completely ineffective.

Drew Stanko 21, JD Candidate at St. John's University School of Law, BS in Economics from Villanova University, “Recent Developments and the Need for Nuance”, Journal of Civil Rights & Economic Development, 4/8/2021, https://www.jcred.org/shortreads/efforts-to-modernize-antitrust

I. IS NEW SCHOOL OFFICIALLY HERE?

In January 2007, the Economic Analysis Group at the Department of Justice Antitrust Division published a Discussion Paper entitled "Does Antitrust Need to be Modernized?" The paper reviewed whether "globalization and rapid technological change" necessitated changing federal antitrust laws. This Discussion Paper has proven prescient; it identified as a "key issue" the growing need for improving antitrust enforcement of alleged exclusionary conduct related to intellectual property.

Bipartisan support for antitrust reform has grown immensely since January 2007 due to heightened market concentration and Mergers & Acquisitions (M&A) rates in an increasingly complex digital economy. Senator Amy Klobuchar introduced antitrust reform legislation in February that would provide substantial funding increases to the FTC and the DOJ Antitrust Division, and the Biden Administration appears to be supporting efforts to modernize antitrust enforcement.

Recently, President Biden indicated intent to name two prominent "New School" antitrust attorneys and scholars, Lina Khan and Tim Wu, to positions in his administration. Kahn, who rose to prominence as a student at Yale Law School for "Amazon's Antitrust Paradox" and has since held positions at the Open Markets Institute and the FTC, will reportedly be nominated to serve as the Commissioner of the Federal Trade Commission. Wu is famous for coining the term "net neutrality" and authoring "The Curse of Bigness: Antitrust in the New Gilded Age," and he will serve on the National Economic Council as a special assistant to the president for technology and competition policy. Kahn and Wu have helped establish and develop the "New School" of antitrust jurisprudence, and both have taught related courses at Columbia Law School. Generally, the New School aims to prioritize "innovation, entrepreneurship, privacy, freedom of the press, and economic and civil liberties" rather than strictly focusing on "consumer welfare."

II. SENATOR KLOBUCHAR'S COMPETITION AND ANTITRUST LAW REFORM ACT:

Senator Amy Klobuchar, who spoke passionately about her concerns related to antitrust enforcement throughout her Presidential campaign, introduced antitrust reform legislation in February.

Sen. Klobuchar's proposal, the Competition and Antitrust Law Reform Act, aims to "give federal enforcers the resources they need [to] . . . strengthen prohibitions on anticompetitive conduct and mergers, and make additional reforms to improve enforcement." In order to accomplish these goals, the proposal would provide increased funding for the DOJ Antitrust Division and the FTC and would create a new FTC "Market Analysis" Bureau. While these structural and administrative reforms may receive bipartisan support, Sen. Klobuchar's proposal would also substantially alter the legal standards used to evaluate antitrust challenges under the Sherman and Clayton Acts, a change likely to be met with pushback by conservative economists and lawmakers. Sen. Klobuchar's proposal aims to accomplish important goals, but some argue the Sherman and Clayton Act amendments included in the legislation would "add friction to M&A Activity, stalling capital markets, reducing innovation and investment, and frustrating economic growth."

1. CLAYTON ACT REFORMS

Senator Klobuchar's proposal would modify the Clayton Act to "restore its original intent by amending it to include reference to 'exclusionary conduct.'" The legislation would define exclusionary conduct as "any conduct that would materially disadvantage . . . actual or potential competitors, or foreclose the ability of or incentive to compete." Currently, antitrust challenges require the plaintiff provide prima facie evidence that alleged anticompetitive effects of proposed mergers would result, and "proponents of the merger are then permitted to rebut by providing evidence that the merger will not have the feared anticompetitive effects."

The amendments would shift the presumption that "exclusionary conduct" presents a violative "appreciable risk" where such conduct is taken by a firm with a market share greater than 50% or otherwise wields significant market power. In turn, the burden would be on firms to prove the procompetitive market effects of the challenged conduct or merger rather than on the challenging entity to establish the anticompetitive impacts of the conduct that would result.

While it is important that antitrust reform efforts prioritize enforcement of anticompetitive exclusionary conduct, the legislation arguably defines the term overbroadly. Accordingly, the proposal may result in disincentivizing innovation that would ultimately benefit consumers and the overall economy. By presuming the illegality of any conduct taken by large firms that disincentivizes market entry or competition, the proposal risks unintentionally penalizing firms for achieving beneficial economies of scale or otherwise innovating to provide higher quality products more cheaply than competitors. Arguably, threatening firms with costly antitrust litigation whenever they undertake innovative conduct that negatively impacts competitors risks disrupting market incentives and stalling economic growth.

2. SHERMAN ACT REFORMS

Similarly, the Sherman Act would be modified to allow civil penalties of either 15% or 30% of a firm's US revenues for anticompetitive exclusionary conduct. Sen. Klobuchar has indicated that civil penalties are necessary because the existing remedies—injunctions, equitable monetary relief, and private damages—have not sufficiently deterred anticompetitive conduct. This may be true, but civil penalties of this size likewise risk stifling and disincentivizing innovation.

3. FUNDING ENFORCEMENT AGENCIES, FINANCING NEW "MARKET ANALYSIS BUREAU"

While the Sherman and Clayton Act reforms are unlikely to garner significant support from conservative lawmakers, the funding increases and creation of the FTC Market Analysis Bureau are more likely to win bipartisan support.

Increasing the funding available to the FTC and the DOJ would enable the agencies to hire more attorneys and would finance the creation of the Market Analysis Bureau. The MA Bureau would supplement the FTC's existing Competition, Consumer Protection, and Economics Bureaus. It would be tasked with conducting market, industry, and retrospective merger analyses aimed at helping the FTC develop a better understanding of the competitive conditions and underlying economic dynamics affecting complex markets. The creation of the MA Bureau is likely to gain support because it would demonstrate a commitment to ensuring continued reliance on empirical analyses rather than judicial or political discretion. Accordingly, these reforms would likely bolster enforcement efforts without necessarily adopting the "Big is Bad" approach that has historically divided lawyers and economists.

III. MODERNIZING ANTITRUST ECONOMICS

The Market Analysis Bureau would theoretically improve enforcement agencies' understanding of the economics underlying complex markets. This would provide enforcers with the tools needed to prosecute anticompetitive conduct that may have otherwise skirted enforcement due to the difficulty of establishing the negative economic effects of the conduct in question.

The complexity of the digital economy and increasing market concentration has made it more difficult for prosecutors to prove these anticompetitive results, but advances in machine learning and computational antitrust may assist in identifying and consistently enforcing antitrust violations.

While computational antitrust is certainly in its nascent stages of development, the early returns from Stanford's new Computational Antitrust Project are promising. The project's seminal article, authored by Project Director Thibault Schrepel, defines computational antitrust as a "new domain of legal informatics which seeks to develop computational methods for the automation of antitrust procedures and improvement of antitrust analysis." There are more than fifty global antitrust enforcement agencies participating in the project, including both the US FTC and the DOJ Antitrust Division.

Schrepel situates computational antitrust within "Antitrust 3.0," which he explains "is emerging but remains incomplete." At the core of Antitrust 3.0 is the goal of developing consistent enforcement frameworks designed to combat anticompetitive conduct in digital markets.

IV. OUTLOOK

In "The End of Antitrust History Revisted," Kahn "reviews" Wu's The Curse of Bigness and explains that the "task facing reformers is to translate their critiques into a positive vision, including legal rules and analytical frameworks." These analytical frameworks will be critical to ensuring that antitrust law promotes free market economics, rather than subjects firms to inconsistent judicial interpretation and prosecutorial discretion.

The majority of federal antitrust law applicable today was authored prior to 1915, and the unique challenges associated with prosecuting exclusionary conduct in digital markets have presented concerns for nearly twenty years. While bipartisan support for antitrust reform and emerging scholarship both provide legitimate reason to be optimistic about efforts to modernize federal antitrust law, it is important that reforms are nuanced enough to confront the complex problems they are enacted to address.

Accordingly, while Senator Klobuchar's proposal is certainly "well-intentioned," the budgetary reforms and creation of the Market Analysis Bureau should be separated from and passed without the proposed Sherman and Clayton Act amendments included in the legislation. The newly-appointed experts in the Biden Administration should be afforded the requisite resources to capitalize on the promise of New School antitrust jurisprudence and the development of Antitrust 3.0. By providing these resources, those leading antitrust modernization efforts will be equipped with the tools needed to create nuanced legal frameworks that reflect modern critiques and ensure consistent enforcement practices.

#### It creates a legitimacy crisis that threatens the foundational credibility of the FTC.

Dr. Thibault Schrepel 19, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, “Collusion by Blockchain and Smart Contracts”, Harvard Journal of Law and Technology, 33 Harv. J. Law & Tec 117, Fall 2019, Lexis

V. CONCLUSION

Blockchain is a new and yet little-explored territory. It is, amongst other things, the Amazon 228 of tomorrow's collusive agreements: full of different life forms and new possibilities, the technology will give rise to unidentified creatures and dangerous species that we do not really know how to approach.

I have first shown that blockchain will be used to enhance the functioning of collusive agreements as we know them and that new forms of collusion linked to the technology conditions of access and use will appear as well. Second, blockchain will increase the stability of collusive agreements, providing them with a good life. Depending on whether the blockchain is public or private, a double paradox could emerge. One paradox is related to the visibility of all practices to colluders while ensuring their opacity to non-colluders. The other is associated with the fact that collusive agreements will be more robust during their lifetime by eliminating a large proportion of deviant behaviors, but will die in more brutal ways.

For these reasons, one can expect an increase in the number of collusive agreements along with an increase in their profitability, but not necessarily in their duration. The number of leniency applications may also drop because blockchain will reinforce trust during the lifetime of collusive agreements. This is largely due to the potential use of smart contracts because once again, "[o]ne of the greatest checks on crime is not the cruelty of punishments, but their inevitability," 229 which is precisely what smart contracts provide by automating punishments.

[\*164] The time has now come to detect collusion by blockchain and smart contracts, however difficult that may be. I have shown that some blockchains are more likely to induce collusive agreements than others. Antitrust and competition authorities may start with focusing their efforts on these blockchains and creating safe harbors for the others, for instance, by ensuring that no sanction will be imposed under antitrust and competition law for a specified number of years. Antitrust and competition authorities may also, when sending questionnaires to undertakings, ask whether they use blockchain, and if so, what type of blockchain, using which consensus, and for what purpose.

But perhaps it is even more urgent to adapt existing legal toolboxes before they become entirely ineffective, which implies considering a "law is code" approach and, generally speaking, transforming part of antitrust and competition law to become allies to blockchain core developers rather than mere threats. 230 It is said that "it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail." 231 As true as this statement is, all we have in existing laws is one size of pliers. With the wrong tools, the most sophisticated technology requiring great precision will not be as adjusted as it could be. Antitrust and competition agencies are currently not equipped to fight collusive agreements by blockchain. This may cause a legitimacy crisis for antitrust and competition law that may become ineffective sooner than expected. Indeed, it is more than likely that the use of current regulatory tools will be prevented by the technical characteristics of blockchain. Agencies further need to start analyzing code and software programming. Without doing so, most illegal activities on blockchain will remain safe. The same is true for all practices outside of blockchain which use the Internet. To date, antitrust and competition agencies refuse to analyze the programming of platforms and software. This creates a legal loophole and encourages companies to commit anti-competitive strategies precisely here. 232

Without fundamental research on this subject, palliatives will continue to be present, risking the survival of blockchain 233-- or antitrust [\*165] and competition law. 234 Some propose the creation of an identity management system so that the real identities of blockchain users can be revealed. 235 Others have suggested "adding a regulatory node in the blockchain" to spy on it 236 or imposing fines to the core developers when blockchain is used for illegal activities. 237 Going even further, it has been said that public blockchains "governed by international institutions from the legal tradition" such as the United Nations should be created. 238 But in fact, these solutions are either ineffective or would jeopardize the utility of the technology as its applications rely on the key characteristics that I have exposed in our introduction and that would be challenged by these various initiatives. Let us recall first and foremost that blockchain is a fundamental technology that may create good for the world. 239 The creation of safe harbors 240 and regulatory sandboxes 241 will enable competition agencies to respond quickly to the challenges posed by blockchain, but in the end, only a re-conceptualization of the law will provide a satisfactory answer. 242 Without it, antitrust and competition law will face a second legitimacy crisis arising from the absence of decentralized regulatory mechanisms. After all, how can decentralized transactions be properly regulated by pyramidal rules and institutions?

#### Failure of FTC legitimacy crushes the effectiveness of the agency.

William E. Kovacic 15, Global Competition Professor of Law and Policy at the George Washington University Law School and Non-Executive Director of the United Kingdom Competition and Markets Authority, “Creating A Respected Brand: How Regulatory Agencies Signal Quality”, George Mason Law Review, 22 Geo. Mason L. Rev. 237, Lexis

Introduction

One determinant of a government agency's effectiveness is its reputation, or "brand." Much like a commercial enterprise, an agency develops a brand that signals quality to various observers. A good reputation can help the agency recruit skilled personnel, gain deference from courts, build credibility with business managers, and build popular support that can yield larger budgets and enhancements to its powers. An agency with a strong brand stands a greater chance of being effective than one with a weak brand.

This Essay considers how branding can affect the performance of the Federal Trade Commission ("FTC") and other agencies responsible for economic regulation. It analyzes how investments in building a good brand enable the regulatory agency to signal quality to various observers - insiders such as agency staff and outsiders such as businesses, consumer groups, courts, and legislators. Part I of this Essay defines the concept of a brand for public agencies. Part II then discusses why an agency's brand can be important to its effectiveness and identifies what types of agency activities either enhance or degrade an agency's brand.

The examination of agency branding has several purposes. One aim is to improve our understanding of how public agencies build a reputation, and to study the role of reputation in determining effectiveness. A closely related goal is to give public officials a better understanding of how they should approach the task of deciding what their agencies must do to prosper.

A further aim is to underscore the impact of institutional design and managerial incentives on agency performance and to illuminate how design choices and incentive schemes influence the development of a well-respected, coherent agency brand. Various design choices - for example, whether to give the competition agency a single function or a multi-purpose substantive mandate, whether to govern the agency by a single executive or [\*238] by a board, whether to integrate the tasks of prosecution and adjudication in a single body or to unbundle them among distinct entities - affect the capacity of the agency to enhance the quality of its brand. Incentives that give incumbent leaders reason to make investments in long-term agency capacity and quality have the same effects.

I. Brands and Public Institutions

Public institutions, such as competition or consumer protection agencies, build reputations or "brands" that the agency's own employees and external observers associate with the agency. 1 Brands perform two functions for the public agency. The first function is informational. 2 A good brand conveys a good sense of what an agency does. It communicates, at least in a general way, the scope of the agency's responsibilities and the aims that motivate the agency in the exercise of its powers.

A brand also signals institutional quality. For an agency such as the FTC, the foundations for a good brand are sound substantive programs (e.g., cases, regulations, reports), sound procedures (e.g., meaningful disclosure of information, rigorous testing of evidence, regular assessment of outcomes), strong capabilities (e.g., deep expertise in economics and law), and a healthy culture (e.g., thoughtfulness, integrity, courage, and a commitment to continuous improvement). 3 For several reasons, explained below, a strong brand is a valuable asset for a regulatory agency.

#### Its credibility’s key to global cooperation to contain spyware.

Ari Schwartz 12, Deputy Director of the Center for Democracy and Technology, “Federal Trade Commission Reauthorization”, Hearing Before the Subcommittee on Interstate Commerce, Trade, and Tourism of the Committee on Commerce, Science, and Transportation United States Senate One Hundred Tenth Congress First Session, Government Printing Office, https://www.govinfo.gov/content/pkg/CHRG-110shrg75970/html/CHRG-110shrg75970.htm

Mr. Schwartz. Thank you very much, Chairman Dorgan. Thank you for holding this public hearing today and inviting CDT to participate.

As more consumers' services move online, consumer protection agencies are facing new challenges. The Federal Trade Commission has played a leadership role to meet these challenges, including overcoming such difficulties as locating the perpetrators of online schemes, keeping up with the rapid pace of technological evolution, and following the increasing financial motivation of Internet fraudsters.

In particular, the FTC has been the lead law enforcement agency in the world in the fight against spyware. Spyware has become one of the most serious threats to the Internet's future. Consumer Reports magazine estimates that consumers will lose $1.7 billion this year to spyware attacks alone. The magazine estimates that almost 1 million consumers simply gave up fixing their spyware-riddled computers and had to throw them away.

The good news is that consumer losses are down dramatically from 2006, when they peaked at $2.6 billion. The main reasons for this decrease in the spyware threat are, first, the improvement in anti-spyware technology; second, the public pressure on companies advertising with nuisance or harmful adware; and, finally, the enforcement of consumer protection law, led by the work of the FTC and some State attorneys general.

The FTC recognized the profound threat posed by the rising tide of spyware early, and actively moved to limit its spread. The Commission has been the leading enforcer against spyware, pursuing 11 cases to fruition in the past two and a half years, including three based, at least in part, on the petitions brought my organization, the Center for Democracy and Technology. CDT has learned, through our own research, that, as consumer fraud increases, the FTC's ability to work internationally becomes more important. Congress passed the SAFE WEB Act late last year to provide the FTC powers to promote international cooperation. The FTC's ability to use this new law, and staff resources that it will need, will be very important to monitor.

#### Spyware norms are solidifying but require strong U.S. leadership---success stops human rights crackdowns.

Marietje Schaake 21, International Policy Director at Stanford University’s Cyber Policy Center, Senior Advisor for Tech & Geopolitics at Eurasia Group, President of the Cyberpeace Institute, “We Need a New Global Standard to Curb Intrusive Spyware”, Financial Times, 11/10/2021, Lexis

After more than a decade, democratic governments are finally waking up to the hazards of commercial spyware. Recent media coverage has exposed how authoritarian regimes are using NSO Group’s Pegasus software to spy on journalists and politicians. The EU has now tightened its rules on the export of surveillance technology, and the US Department of Commerce last week determined that Israel-based NSO Group and three other hacking companies were “engaging in activities that are contrary to the national security or foreign policy interests of the United States”. However, these modest steps do not go far enough: what’s needed is a global standard to reign in technologies that violate the rights to privacy, free assembly as well as free expression.

From ~~crippling~~ [devastating] ransomware to questionable neural algorithms which use AI to identify suspicious non-verbal activity, to face and emotion-detecting technologies, there is a proliferation of software applications which conflict with liberal democratic values.

Traditionally, export controls are imposed on products that threaten national security, such as those that could boost the manufacture of nuclear weapons. The EU has recently extended its export regime to include spyware technologies, and added human rights violations as a criterion for potential harm. But since the NSO Group is based outside the EU, it lies outside Brussels’ jurisdiction. Without a wider international agreement, options for curbing these companies are limited.

The absence of global restrictions brings further credibility risks: how can liberal democracies lobby against human rights abuses by authoritarian regimes, when they are in effect permitting the development and marketing of digital weapons?

While restricting exports may help prevent the flow of intrusive technologies from democracies to dictatorships, imports and domestic uses remain unaddressed. The Pegasus Project revealed how, in the heart of the EU, Hungarian prime minister Viktor Orban has deployed commercial surveillance systems to target the few remaining independent media outlets within his own country.

Even some democratic states, such as the Netherlands, are guilty of procuring hacking and surveillance systems, but do not disclose which ones. Undoubtedly, they will claim these are only ever used to track down the most serious criminal and terror suspects. Yet this lends credibility and capital to an exceedingly harmful industry. If democracies are serious about curbing surveillance, they should exercise greater transparency and lead by example.

More than ad hoc measures or restrictions applied to individual companies, the US should partner with the EU and other willing countries to set a new international standard for the use of, and trade in, spyware. This would be a tangible outcome for President Biden’s upcoming Summit for Democracy, a US-led virtual meeting in early December aimed at preventing authoritarianism, fighting corruption, and promoting human rights.

Beyond spyware, a variety of other technologies deserve greater scrutiny and regulation. Illegitimate mass surveillance systems, facial recognition software and tools used for illegal cyber operations are traded across borders to facilitate repression, conflict, and instability. Poor cyber security is now a source of systematic risk which threatens national resilience. Greater co-ordination is necessary to ensure that technologies which are currently legal do not provide the means for widespread rights violations.

Moreover, an international agreement between democratic states against malicious uses of technology will help set multilateral norms. UN human rights experts this week raised the alarm once more about how tech companies serve as modern-day “mercenaries”. “Private actors provide a wide range of military and security services in cyber space, including data collection, intelligence and surveillance,” they warned.

In the future, a licensing requirement should be the default for tech companies that contravene the human rights standard of democratic states. This would ensure better controls of end use and exports. Regulation would also allow for mapping of how software is being deployed, and enable greater transparency. Equally, companies should strengthen their own risk-management. The very credibility of democracies is at stake when tech companies can undermine global security unhindered.

#### Those trigger nuclear conflict.

Gregory Treverton 17, Chair of the National Intelligence Council, Office of the Director of National Intelligence, National Intelligence Council Unclassified Strategic Assessment Of Global Trends, Authored by ODNI Personnel Including the Chairman of the NIC, “The Near Future: Tensions Are Rising”, 2017, <https://www.dni.gov/index.php/global-trends/near-future>

These global trends, challenging governance and changing the nature of power, will drive major consequences over the next five years. They will raise tensions across all regions and types of governments, both within and between countries. These near-term conditions will contribute to the expanding threat from terrorism and leave the future of international order in the balance.

Within countries, tensions are rising because citizens are raising basic questions about what they can expect from their governments in a constantly changing world. Publics are pushing governments to provide peace and prosperity more broadly and reliably at home when what happens abroad is increasingly shaping those conditions.

In turn, these dynamics are increasing tensions between countries—heightening the risk of interstate conflict during the next five years. A hobbled Europe, uncertainty about America’s role in the world, and weakened norms for conflict-prevention and human rights create openings for China and Russia. The combination will also embolden regional and nonstate aggressors—breathing new life into regional rivalries, such as between Riyadh and Tehran, Islamabad and New Delhi, and on the Korean Peninsula. Governance shortfalls also will drive threat perceptions and insecurity in countries such as Pakistan and North Korea.

* Economic interdependence among major powers remains a check on aggressive behavior but might be insufficient in itself to prevent a future conflict. Major and middle powers alike will search for ways to reduce the types of interdependence that leaves them vulnerable to economic coercion and financial sanctions, potentially providing them more freedom of action to aggressively pursue their interests.

Meanwhile, the threat from terrorism is likely to expand as the ability of states, groups, and individuals to impose harm diversifies. The net effect of rising tensions within and between countries—and the growing threat from terrorism—will be greater global disorder and considerable questions about the rules, institutions, and distribution of power in the international system.

Europe. Europe’s sharpening tensions and doubts about its future cohesion stem from institutions mismatched to its economic and security challenges. EU institutions set monetary policy for Eurozone states, but state capitals retain fiscal and security responsibilities—leaving poorer members saddled with debt and diminished growth prospects and each state determining its own approach to security. Public frustration with immigration, slow growth, and unemployment will fuel nativism and a preference for national solutions to continental problems.

* Outlook: Europe is likely to face additional shocks—banks remain unevenly capitalized and regulated, migration within and into Europe will continue, and Brexit will encourage regional and separatist movements in other European countries. Europe’s aging population will undermine economic output, shift consumption toward services—like health care—and away from goods and investment. A shortage of younger workers will reduce tax revenues, fueling debates over immigration to bolster the workforce. The EU’s future will hinge on its ability to reform its institutions, create jobs and growth, restore trust in elites, and address public concerns that immigration will radically alter national cultures.

United States. The next five years will test US resilience. As in Europe, tough economic times have brought out societal and class divisions. Stagnant wages and rising income inequality are fueling doubts about global economic integration and the “American Dream” of upward mobility. The share of American men age 25- 54 not seeking work is at the highest level since the Great Depression. Median incomes rose by 5 percent in 2015, however, and there are signs of renewal in some communities where real estate is affordable, returns on foreign and domestic investment are high, leveraging of immigrant talent is the norm, and expectations of federal assistance are low, according to contemporary observers.

* Outlook: Despite signs of economic improvement, challenges will be significant, with public trust in leaders and institutions sagging, politics highly polarized, and government revenue constrained by modest growth and rising entitlement outlays. Moreover, advances in robotics and artificial intelligence are likely to further disrupt labor markets. Meanwhile, uncertainty is high around the world regarding Washington’s global leadership role. The United States has rebounded from troubled times before, however, such as when the period of angst in the 1970s was followed by a stronger economic recovery and global role in the world. Innovation at the state and local level, flexible financial markets, tolerance for risk-taking, and a demographic profile more balanced than most large countries offer upside potential. Finally, America is distinct because it was founded on an inclusive ideal—the pursuit of life, liberty, and happiness for all, however imperfectly realized—rather than a race or ethnicity. This legacy remains a critical advantage for managing divisions.

Central and South America. Although state weakness and drug trafficking have and will continue to beset Central America, South America has been more stable than most regions of the world and has had many democratic advances—including recovery from populist waves from the right and the left. However, government efforts to provide greater economic and social stability are running up against budget and debt constraints. Weakened international demand for commodities has slowed growth. The expectations associated with new entrants to the middle class will strain public coffers, fuel political discontent, and possibly jeopardize the region’s significant progress against poverty and inequality Activist civil society organizations are likely to fuel social tensions by increasing awareness of elite corruption, inadequate infrastructure, and mismanagement. Some incumbents facing possible rejection by their publics are seeking to protect their power, which could lead to a period of intense political competition and democratic backsliding in some countries. Violence is particularly rampant in northern Central America, as gangs and organized criminal groups have undermined basic governance by regimes that lack capacity to provide many basic public goods and services.

* Outlook: Central and South America are likely to see more frequent changes in governments that are mismanaging the economy and beleaguered by widespread corruption. Leftist administrations already have lost power in places like Argentina, Guatemala, and Peru and are on the defensive in Venezuela, although new leaders will not have much time to show they can improve conditions. The success or failure of Mexico’s high-profile reforms might affect the willingness of other countries in the region to take similar political risks. The OECD accession process may be an opportunity—and incentive— for some countries to improve economic policies in a region with fairly balanced age demographics, significant energy resources, and well-established economic links to Asia, Europe, and the United States.

An Inward West? Among the industrial democracies of North America, Europe, Japan, South Korea, and Australia, leaders will search for ways to restore a sense of middle class wellbeing while some attempt to temper populist and nativist impulses. The result could be a more inwardly focused West than we have experienced in decades, which will seek to avoid costly foreign adventures while experimenting with domestic schemes to address fiscal limits, demographic problems, and wealth concentrations. This inward view will be far more pronounced in the European Union, which is absorbed by questions of EU governance and domestic challenges, than elsewhere.

* The European Union’s internal divisions, demographic woes, and moribund economic performance threaten its own status as a global player. For the coming five years at least, the need to restructure European relations in light of the UK’s decision to leave the EU will undermine the region’s international clout and could weaken transatlantic cooperation, while anti-immigration sentiments among the region’s populations will undermine domestic political support for Europe’s political leaders.
* Questions about the United States’ role in the world center on what the country can afford and what its public will support in backing allies, managing conflict, and overcoming its own divisions. Foreign publics and governments will be watching Washington for signs of compromise and cooperation, focusing especially on global trade, tax reform, workforce preparedness for advanced technologies, race relations, and its openness to experimentation at the state and local levels. Lack of domestic progress would signal a shift toward retrenchment, a weaker middle class, and potentially further global drift into disorder and regional spheres of influence. Yet, America’s capital, both human and security, is immense. Much of the world’s best talent seeks to live and work in the United States, and domestic and global hope for a competent and constructive foreign policy remain high.

China. China faces a daunting test—with its political stability in the balance. After three decades of historic economic growth and social change, Beijing, amid slower growth and the aftereffects of a debt binge, is transitioning from an investment-driven, export-based economy to one fueled by domestic consumption. Satisfying the demands of its new middle classes for clean air, affordable houses, improved services, and continued opportunities will be essential for the government to maintain legitimacy and political order. President Xi’s consolidation of power could threaten an established system of stable succession, while Chinese nationalism—a force Beijing occasionally encourages for support when facing foreign friction—may prove hard to control.

* Outlook: Beijing probably has ample resources to prop up growth while efforts to spur private consumption take hold. Nonetheless, the more it “doubles down” on state owned enterprises (SOEs) in the economy, the more it will be at greater risk of financial shocks that cast doubt on its ability to manage the economy. Automation and competition from lowcost producers elsewhere in Asia and even Africa will put pressure on wages for unskilled workers. The country’s rapidly shrinking working-age population will act as a strong headwind to growth.

Russia. Russia’s aspires to restore its great power status through nationalism, military modernization, nuclear saber rattling, and foreign engagements abroad. Yet, at home, it faces increasing constraints as its stagnant economy heads into a third consecutive year of recession. Moscow prizes stability and order, offering Russians security at the expense of personal freedoms and pluralism. Moscow’s ability to retain a role on the global stage—even through disruption—has also become a source of regime power and popularity at home. Russian nationalism features strongly in this story, with A Chinese man rides a bike among luxurious cars. China’s dramatic economic growth has highlighted greater gaps between rich and poor.

President Putin praising Russian culture as the last bulwark of conservative Christian values against the decadence of Europe and the tide of multiculturalism. Putin is personally popular, but approval ratings of 35 percent for the ruling party reflect public impatience with deteriorating quality of life conditions and abuse of power.

* Outlook: If the Kremlin’s tactics falter, Russia will become vulnerable to domestic instability driven by dissatisfied elites— even as a decline in status suggests more aggressive international action. Russia’s demographic picture has improved somewhat since the 1990s but remains bleak. Life expectancy among males is the lowest of the industrial world, and its population will continue to decline. The longer Moscow delays diversifying its economy, the more the government will stoke nationalism and sacrifice personal freedoms and pluralism to maintain control.

An Increasingly Assertive China and Russia. Beijing and Moscow will seek to lock in temporary competitive advantages and to right what they charge are historical wrongs before economic and demographic headwinds further slow their material progress and the West regains its footing. Both China and Russia maintain worldviews in which they are rightfully dominant in their regions and able to shape regional politics and economics to suit their security and material interests. Both have moved aggressively in recent years to exert greater influence in their regions, to contest the US geopolitically, and to force Washington to accept exclusionary regional spheres of influence—a situation that the United States has historically opposed. For example, China views the continuing presence of the US Navy in the Western Pacific, the centrality of US alliances in the region, and US protection of Taiwan as outdated and representative of the continuation of China’s “100 years of humiliation.”

* Recent Sino-Russian cooperation has been tactical, however, and is likely to return to competition if Beijing jeopardizes Russian interests in Central Asia and as Beijing enjoys more options for cheap energy supply beyond Russia. Moreover, it is not clear whether there is a mutually acceptable border between what China and Russia consider their natural spheres of influence. Meanwhile, India’s growing economic power and profile in the region will further complicate these calculations, as New Delhi navigates relations with Beijing, Moscow, and Washington to protect its own expanding interests. A Chinese development firm—with links to the Chinese Government and People’s Liberation Army— today announced that it recently purchased the uninhabited Cobia Island from the Government of Fiji for $850 million. Western security analysts assess that China plans to use the island to build a permanent military base in the South Pacific, 3,150 miles southwest of Hawaii.

Russian assertiveness will harden anti-Russian views in the Baltics and other parts of Europe, escalating the risk of conflict. Russia will seek, and sometimes feign, international cooperation, while openly challenging norms and rules it perceives as counter to its interests and providing support for leaders of fellow “managed democracies” that encourage resistance to American policies and preferences. Moscow has little stake in the rules of the global economy and can be counted on to take actions that weaken US and European institutional advantages. Moscow will test NATO and European resolve, seeking to undermine Western credibility; it will try to exploit splits between Europe’s north and south and east and west, and to drive a wedge between the United States and the EU.

* Similarly, Moscow will become more active in the Middle East and those parts of the world in which it believes it can check US influence. Finally, Russia will remain committed to nuclear weapons as a deterrent and as a counter to stronger conventional military forces, as well as its ticket to superpower status. Russian military doctrine purportedly includes the limited use of nuclear weapons in a situation where Russia’s vital interests are at stake to “deescalate” a conflict by demonstrating that continued conventional conflict risks escalating the crisis to a large scale nuclear exchange.

In Northeast Asia, growing tensions around the Korean Peninsula are likely, with the possibility of serious confrontation in the coming years. Kim Jong Un is consolidating his grip on power through a combination of patronage and terror and is doubling down on his nuclear and missile programs, developing long-range missiles that may soon threaten the continental United States. Beijing, Seoul, Tokyo, and Washington have a common incentive to manage security risks in Northeast Asia, but a history of warfare and occupation along with current mutual distrust makes cooperation difficult. Continued North Korean provocations, including additional nuclear and missile tests, might worsen stability in the region and prompt neighboring countries to take actions, sometimes unilaterally, to protect their security interests.

Competing Views on Instability

China and Russia portray global disorder as resulting from a Western plot to push what they see as self-serving American concepts and values of freedom to every corner of the planet. Western governments see instability as an underlying condition worsened by the end of the Cold War and incomplete political and economic development. Concerns over weak and fragile states rose more than a generation ago because of beliefs about the externalities they produce— whether disease, refugees, or terrorists in some instances. The growing interconnectedness of the planet, however, makes isolation from the global periphery an illusion, and the rise of human rights norms makes state violence against a governed population an unacceptable option.

#### Containing spyware prevents the complete erosion of Indian democracy

Mauktik Kulkarni 21, Trained in Engineering at the University of Pune, Biophysics at the University of Illinois at Urbana-Champaign, and Neuroscience at Johns Hopkins University, Author at The Fair Observer, Writer for National Public Radio, All India Radio, BBC Marathi, National Geographic, LiveMint, Times of India, and The Hindu, “Why Americans Should be Alarmed by the Pegasus Spyware Controversy in India”, Scroll, 8/2/2021, https://scroll.in/article/1001373/why-americans-should-be-alarmed-by-the-pegasus-spyware-controversy-in-india

Under a collaboration called the Pegasus Project, 17 media organisations from around the world have recently released startling information about the way several governments have allegedly used spyware made by Israeli firm NSO to snoop on perceived adversaries.

Pegasus spyware, classified as a weapon to be used against criminals and terrorists, was allegedly used in India to spy on opposition politicians, bureaucrats and journalists, among others. While the Indian government has denied the charges, all the evidence points to the executive branch running amok.

The unravelling of Indian democracy offers important lessons for the United States, especially with recent revelations regarding former President Donald Trump’s final days in office and the reluctance of his Republican Party in the legislature to hold him accountable.

The destruction of Indian democratic institutions under Narendra Modi since he came to power in 2014 is well documented. If these new allegations are left unaddressed, which is the most likely outcome, their chilling effect on society will ensure India’s swift decline into a sham democracy like Russia.

If true, the implications of such surveillance are not limited to political, bureaucratic, journalistic, or judicial opponents of the current government. They will affect the economic climate, open-minded academic inquiry, and spirited debates among students and civil society, which are all essential for a thriving democracy.

#### Backsliding obliterates containment of disease, pollution, and nukes---extinction.

Akshai Vikram 21, Doctoral Candidate in Security Studies at the University of Central Florida, Roger L. Hale Fellow at the Ploughshares Fund, M.A from Johns Hopkins University SAIS and B.A. from Johns Hopkins Baltimore, “Indian Democracy Is on The Ropes. The US Must Act”, Defense One, 6/12/2021, https://www.defenseone.com/ideas/2021/06/indian-democracy-ropes-us-must-act/174679/

Even as the U.K. hosted President Biden on a visit to “rally the world’s democracies,” Britain’s reopening is under threat from a new strain of the COVID-19 virus. This new variant, which originated in India, is directly related to Narendra Modi government’s disappointing and less-than-democratic handling of the pandemic. The new coronavirus strain is just one example of the threat that awaits U.S. interests if India, the world’s largest democracy, should complete its slide into authoritarianism. Thankfully, the U.S. still has a number of options to combat, if not prevent, democratic backsliding in India.

Democratic or not, India’s relevance is assured. Its size alone guarantees this. India’s largest state, Uttar Pradesh, boasts a population of over 200 million people, larger than any individual country in Africa, Europe, or Latin America. This hard fact has led Republicans and Democrats to agree on India’s importance, with both sides emphasizing its potential role as a regional counterweight to China. The Trump administration’s National Defense Strategy stressed the benefits of a “free and open Indo-Pacific region” and promised to “strengthen our alliances and partnerships in the Indo-Pacific…to preserve the free and open international system.” The Biden administration made similar pronouncements in its Interim National Security Guidance, saying it will “reinvigorate and modernize our alliances and partnerships,” partially to “hold countries like China to account.” The Biden administration specifically promised to “deepen our partnership with India” as part of this effort.

This strategic logic presumes the United States will be dealing with a democratic India that prefers a “free and open international system,” rather than an authoritarian India that domestically more closely resembles “countries like China” than it does a full-functioning democracy.

But the pace of Indian democratic backsliding has noticeably quickened. It was an ominous warning when Narendra Modi, who was banned from the United States for turning a blind eye to a virtual pogrom against Muslims while chief minister of Gujarat, was elected Prime Minister in 2014. After seven years in power, Modi and his Hindu nationalist Bharatiya Janata Party, or BJP, have further eroded Indian democracy, leading the nonprofit Freedom House to rank India as “partly free” for the first time in 30 years.

Modi’s authoritarian actions have ranged from the pseudo-scientific and laughable to the egomaniacal and lethal. Most notoriously, the BJP sought in 2019 to openly discriminate against Muslim immigrants. The law passed, and when it drew mass protests across the country, the BJP met them with authoritarian force. Later in the year, India stifled the Internet in Kashmir.

India’s democratic backsliding has also hurt its lackluster COVID-19 response. Modi’s BJP has propagated a number of inane myths about the disease, especially quack cures. Party leaders from Modi on down have set bad examples, appearing at large rallies, without masks, and turning the Hindu Kumbh-Mela festival into a superspreader event because “the faith in God will overcome the fear of Covid-19.”

The Modi government has also moved to stifle dissent, especially investigative journalism on its pandemic response. In April, the chief minister of Uttar Pradesh threatened to seize the property of people propagating “rumors” of oxygen shortages. And just last month, when information on the Indian variant was desperately needed, a top Indian virologist on a government panel to investigate the variant suspiciously resigned, after he had been quoted in the New York Times criticizing the government. All this suggests that continued democracy in India is no sure thing.

A fully authoritarian India could take a number of forms, with disparate effects on its relationship with the United States. Shared concerns about China could lead the U.S.-India relationship to mirror the path of American relations with Vietnam, where the two countries have managed to work constructively despite their tempestuous past and Vietnam’s one-party rule.

Perhaps more likely, India under Modi could present a challenge not dissimilar to that of the Philippines under Duterte, a country too strategically important for the U.S. to ignore in its efforts to counter Chinese influence in the region, but one whose authoritarian streak routinely impedes greater cooperation.

Most detrimentally for the United States, India could even one day seek to follow the path of Russia, prioritizing allegiance to right-wing authoritarian ethno-nationalism rather than its historical and geographic disputes with China. This worst case scenario is not as far-fetched as it once might have seemed: in the last few months alone, Russia and India have taken eerily similar steps to stifle Twitter in response to domestic critics.

No matter how authoritarian the government in New Delhi becomes, the United States will need to engage with it constructively on certain issues, especially transnational threats like climate change and nuclear weapons. Fortunately, the Biden administration has already demonstrated its capability to do just that by cooperating constructively with Russia on nuclear arms control and with both China and Russia on climate change, while at the same time confronting both countries on other issues as necessary.

However, there is no scenario where further democratic backsliding in India would make life easier for the United States. At the very least, an increasingly authoritarian Indian would jeopardize the push for cooperation among ‘like-minded’ democracies, especially when it comes to countering China.

International partnerships, like the recent project of coordinated vaccine production from the emerging ‘Quad’ countries—India, Australia, the U.S., and Japan—could conceivably continue even if India moves further from the democratic camp. Even so, they would surely be less resilient if based solely on common interests rather than common values. Efforts by the European Union to increase ties to India would also likely be undermined.

#### The plan solves:

#### 1. UPDATING.

#### Prohibiting violations at the infrastructure level establishes a collaborative relationship between blockchain and antitrust that infuses technological principles into legal enforcement.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 247-249

1.2 Enforcement

1.2.1 Not this...

Enforcement is the second pillar of a collaborative approach between law and tech, antitrust and blockchain. I realize that this may seem counterintuitive; enforcement is, by definition, confrontational. In reality, distinct types of enforcement can lead to varying degrees of confrontation: some harm the entire blockchain, while others target the sole perpetrators of illegal practices. One should avoid the former, as it would reduce blockchain’s usefulness and thus deprive policymakers and regulators of an important ally. It is in the interests of both communities to encourage the latter.

I concluded the first part of this book by underlining that making law and tech work toward the same objective implied bearing with some assaults by each on the other. This means that blockchain communities should not only tolerate antitrust sanctions, but also facilitate them, because they ultimately lead to further decentralization. It also means that antitrust agencies and courts should direct their enforcement activities in a specific way. Overall, they should seek to preserve blockchain. This will be challenging, as agencies generally conduct their enforcement activities one case after the other, without such a long-term objective. That being said, agencies could still achieve the overall goal of enabling blockchain technology to flourish while ensuring case-by-case enforcement.

For that, agencies should avoid enforcement activities against practices that directly arise from the intrinsic characteristics of a blockchain. For example, public permissionless blockchains distribute information throughout the marketplace, including the number of transactions implemented by specific users, the fees being paid and so on. This transparency could lead to antitrust concerns, especially when it comes to tacit collusion.14 Nevertheless, because this essential feature makes markets more fluid and mitigates information asymmetry,15 enforcement activities should not be directed at it.

The same goes for the opacity that blockchains create. As we have seen together, the identity of a blockchain’s participants and the content of their transactions are protected by encryption. Yet one should not consider this a relevant element in European competition law for presuming the intention to collude (moral component), for systematically making cartelization on block- chain a restriction “by object” rather than “by effect,” or for easing the burden of proof on antitrust agencies. Doing so would deter legal uses of blockchain.

More generally, it is important to underline that all blockchain participants agree to the same set of rules. That should not be seen as an illegal agreement between them, even though it affects their economic behavior. Agreeing to the same rules is, in fact, necessary for blockchain’s survival, as it creates consistency in the blockchain ledger in the absence of central coordination. It solves the Byzantine Generals Problem, according to which a central power is always needed to coordinate actions and maximize outcomes. That applies to forks, which should only rarely be seen as illegal (as I discussed in Chapter 8), because they create checks and balances within each blockchain. Let me reiterate that without consensus regarding the rules and their modification, the whole system would collapse, as the ledger integrity could not be maintained. All practices engaged by the blockchain nucleus to ensure survival, such as their forks and modifications of the core client, should thus be presumptively legal as far as antitrust enforcement is concerned.

1.2.2 ...but that!

I recommend that antitrust agencies focus their enforcement activities on practices that affect the “real space”, and on practices that defeat blockchain’s purpose.

As I discussed in Chapters 9 and 11, the first type of practice covers the use of blockchains to support firms’ efforts to collude or monopolize markets. These practices have a strong and direct impact on consumers. Detecting this type of behavior will require proactive actions by antitrust agencies. If they engage in such actions, enforcement in the field will increase consumer welfare.

The second category concerns practices that centralize blockchain ecosystems artificially. More specifically, agencies should target practices that centralize the infrastructure level of a blockchain. As I have explained, that level has a critical influence on the decentralization of other levels. Prohibiting artificial forms of centralization at that layer will free most of the ecosystem from coercive forms of power. In doing so, it will make blockchain a more potent ally to antitrust law. Furthermore, this type of enforcement will prove increasingly important over time. If blockchain adoption continues to increase, it could very well become a key infrastructure for the world economy. At that point in time, the artificial centralization of blockchain will become antitrust agencies’ top enforcement priority.

Overall, directing enforcement activities toward these two types of practices would free blockchain, and its economic ramifications, from the most restrictive practices without diminishing its usefulness or creating resentment within blockchain communities. Antitrust would thus become the ally of blockchain ecosystems and would start being perceived as such.

#### 2. LEADERSHIP.

#### Going bold builds FTC’s brand and secures a foothold for future experimentation.

Philip J. Weiser 17, Hatfield Professor of Law and Dean Emeritus at the University of Colorado Law School, Former Senior Advisor for Technology and Innovation to the National Economic Council Director in the White House, “Entrepreneurial Administration”, Boston University Law Review, 97 B.U.L. Rev. 2011, December 2017, Lexis

Introduction

A core failing of today's administrative state and modern administrative law scholarship is the lack of imagination as to how agencies should operate. On the conventional telling, public agencies follow specific grants of regulatory authority, use the traditional tools of notice-and-comment rulemaking and adjudication, and are checked by judicial review. In reality, however, effective administration depends on entrepreneurial leadership that can spearhead policy experimentation and trial-and-error problem-solving, including the development of regulatory programs that use non-traditional tools.

Entrepreneurial administration takes place both at public agencies and private entities, each of which can address regulatory challenges and earn regulatory authority as a result. Consider, for example, that Energy Star, a successful program that has encouraged the manufacture and sale of energy efficient appliances, is developed and overseen by the Environmental Protection Agency ("EPA"). 1 After the EPA established the program, Congress codified it and, eventually, other countries followed suit. 2 By contrast, the successful and complementary program encouraging the construction of energy efficient buildings, the well-respected Leadership in Energy and Environmental Design ("LEED") standard, was developed and is overseen by a private organization. 3 After it was developed, a number of governmental authorities endorsed it and [\*2013] have encouraged LEED-certified construction projects with both carrots 4 and sticks. 5 Significantly, although neither the Energy Star program nor the LEED standard were originally anticipated by any regulatory statute, both have had tremendous impacts.

The Energy Star and LEED case studies exemplify the sort of innovative regulatory strategies taking root in the modern administrative state. 6 Despite the importance of entrepreneurial administration in practice, scholars have failed to examine the role of entrepreneurial leadership in spurring policy innovation and earning regulatory authority for an agency (or private entity). 7 This oversight is most unfortunate in the case of technologically developing fields where experimental regulatory strategies - as opposed to traditional notice-and-comment rulemaking or adjudication - are often essential. 8 In short, administrative law needs an account of agency action that explains why entrepreneurial leadership matters in government and how agencies should operate. 9

[\*2014] This Article: explains that the conventional view of agency behavior - following the specific direction of Congress or the President and using notice-and-comment rulemaking or adjudication processes - does not capture how public agencies and private entities develop innovative regulatory strategies and earn regulatory authority as a result. In particular, this Article: explains how governmental agencies like the EPA and private entities like the United States Green Building Council ("USGBC") (which oversees the LEED standard) depend on entrepreneurial leadership to develop experimental regulatory strategies. It also explains how, in the wake of such experiments, legislative bodies have the opportunity to evaluate regulatory innovations in practice before deciding whether to embrace, revise, reject, or merely tolerate them. To be sure, such experimental strategies are not always preferable to traditional administrative rulemaking and adjudication, but considering experimental strategies and evaluating whether they would be more effective than traditional regulatory approaches is.

Legal scholarship on experimental regulation is well-developed in the context of states serving as laboratories of democracy. 10 Scholars have not, however, discussed the significant role that federal agencies and private bodies can play in experimenting with regulatory strategies in advance of congressional action. 11 Scholars have also failed to examine the role of entrepreneurial leadership in developing successful experiments. This Article: does just that, highlighting the importance of entrepreneurial leadership in government, discussing a number of [\*2015] emerging regulatory experiments, and suggesting how Congress should evaluate such experiments.

This Article: proceeds in four parts. Part I examines the traditional model of regulation and the emerging alternative models of agency action through co-regulation, developing best practices through convening, and encouraging private regulation. In so doing, it underscores that entrepreneurial leadership and a culture of experimentation and trial-and-error learning is essential to developing the best solution. Part II discusses the relevant criteria for evaluating such experiments and examines potential objections to the earned regulatory authority model. Part III discusses four case studies of experimental regulatory strategies: (1) the USGBC's development of the LEED standard; (2) the Federal Trade Commission's ("FTC") oversight of information privacy and data security practices; (3) the National Institute of Standards and Technology's ("NIST") development of a strategy for cybersecurity readiness; and (4) the Department of Health and Human Services' ("HHS") oversight of electronic health records. In all of these cases, the private body or federal agency acted to oversee an emerging technology or issue (often in advance of explicit congressional direction and guidance), allowing Congress to observe the strategy in action and evaluate it after the fact. Part IV examines the concept of policy entrepreneurship, explaining both the barriers and opportunities it faces in the modern administrative state.

I. The Traditional Model and Emerging Realities

The traditional model of regulation relies on notice-and-comment rulemaking and agency adjudication. 12 Under this model, the output - the starting point for traditional administrative law analysis - is generally a form of positive law developed and enforced by a government agency through traditional tools (rulemaking or adjudication). 13 As Professors Charles Sabel and William Simon have observed, this model, "pejoratively called command and control, is identified with rule-bound bureaucracy and deference to ineffable expertise." 14

The traditional model can be depicted neatly as a hierarchy. 15 Congress sets a specific policy direction and empowers an administrative agency to implement that policy. The agency, in turn, uses either its rulemaking or adjudication authority to implement that direction. Finally, owing to the agency's expertise and congressional authorization, courts review the agency's action with deference.

[\*2016] Driven by technological changes and globalization, regulatory agencies increasingly are looking to alternative regulatory strategies, many of which fit under the "New Governance" label. 16 In some cases, innovative regulators experiment with new approaches to address emerging issues and fill gaps in the existing regulatory regime. In other cases, an agency might experiment with a co-regulatory strategy (where the agency integrates its authority with private sector efforts); exercise its authority in creative ways, such as developing best practices through convenings; or rely on private regulation. In that last category, as is the case with Energy Star, the government agency (or private entity, for that matter) can certify compliance with best practices, thereby sharing valuable information with the public and shaping norms of behavior. 17 In each of the above examples, the regulatory agency acts not within a hierarchy, but within a network. 18

[\*2017] The traditional, hierarchical model follows a familiar, step-wise approach to regulation. 19 The first step is establishing a standard of conduct. 20 The second step is implementing that standard of conduct, generally through a monitoring regime. 21 The final step is enforcement, in which parties are sanctioned for any failures to comply with the rules. 22 This model of regulatory action still holds strong in some areas, but it is no longer - and should not be - the exclusive strategy for addressing emerging policy issues.

In the emerging, networked environment, regulatory agencies find themselves with a range of options and tools for developing standards of conduct, monitoring behavior in the marketplace, and enforcing or encouraging compliance. The conversation around such emerging solutions has taken a number of forms, sometimes under the headings of "responsive regulation," "experimentalism," or "New Governance." However framed, there is a pressing need for more adaptable approaches that can operate effectively in technologically changing environments or in fields where the circumstances differ across geographic (or other) contexts. 23 To address emerging challenges, regulatory agencies will increasingly be called upon to experiment with non-traditional regulatory strategies, requiring legislatures to monitor and evaluate the effectiveness of innovative regulatory initiatives after the fact.

A. The Limits of the Traditional Regulatory Approach

The traditional model of regulation is coming under strain in the face of increasing globalization and technological change. 24 Consider, for example, the traditional model of drug and medical device approval used by the Food and Drug Administration ("FDA"). The legacy model of regulation envisioned the FDA reviewing a drug and making an up-or-down decision on whether to approve the marketing of the drug. 25 By putting all of the pressure on the front [\*2018] end (ex ante), the legacy model creates two sets of challenges: (1) the pre-approval process takes a long time, costs a lot of money, and, in some cases, unnecessarily delays access to potentially beneficial drugs; and (2) the lack of a post-approval review process allows drugs to "be marketed despite evidence that they were doing unanticipated harm." 26 Unfortunately, the second type of error - a lack of responsiveness to on-the-ground realities - reinforces the first type of error, creating more pressure on the FDA to withhold approval until it satisfies itself that the relevant drug or device will not cause harm. 27

Congress is well aware of the limits of traditional ex ante regulation. In the food and drug arena, it has worked to update the FDA's model of regulation. In the Food and Drug Administration Amendments of 2007, for example, Congress gave the FDA increased flexibility to approve drugs and require ongoing research as to how the drugs work, called for an improved Adverse Event Report System at the agency, and mandated a framework for monitoring drug efficacy in practice. 28 More recently, the FDA established fast-tracks for approving drugs and medical devices that promise life-saving breakthroughs. 29 As the FDA explained with respect to the medical device review process, "reducing premarket data requirements while increasing postmarket requirements for devices subject to a [Pre-Market Approval], when appropriate, can assist the FDA in making medical devices available to patients sooner than if following the traditional premarket review pathway." 30

[\*2019] This Article: , while sympathetic to the need to reform existing regulatory structures, does not focus on this issue. 31 Rather, it explains how considerable flexibility for a range of alternative options exists within current structures and is already being used by agencies and private entities to great effect. As such, this Article: describes the underappreciated model of earned regulatory authority, calls for a more self-conscious use of this model, and explains how agencies can spearhead and implement this model successfully through entrepreneurial leadership and a culture of trial-and-error problem solving. 32

The role of a more imaginative approach to regulation relates back to the "responsive regulation" movement led by Ayres and Braithwaite. On their account, regulatory strategies can be conceptualized as an "enforcement pyramid," with "persuasion" on the bottom and "license revocation" at the top (as the regulatory equivalent of the death penalty for a regulated firm). 33 In all cases, a responsive regulation approach emphasizes dialogue and engagement around the impact of regulatory efforts in practice. 34 In so doing, it underscores that regulators need not always use their traditional tools (notice-and-comment rulemaking and adjudication). Rather than reflexively adopting traditional approaches, regulatory agencies can (1) embrace and oversee self-regulation (enforced self-regulation or co-regulation), (2) convene stakeholders to develop best practices, or (3) persuade parties to develop private regulatory initiatives. The next three Sections discuss each strategy in turn.

[\*2020]

B. The Promise of Co-Regulation

Even when using its traditional authority, an agency can operate more nimbly and effectively by integrating its efforts with private bodies who have expertise in the field. Where that integration involves the explicit embrace, oversight, and enforcement of actions by private bodies, the model of regulation is aptly described as "co-regulation." 35 For a successful use of co-regulation, consider the FCC's use of frequency coordinators to assign rights to use the wireless spectrum. As I have explained previously:

One notable self-regulatory program that the FCC has overseen is the use of frequency coordinators, which manage voluntary cooperation in the use of point-to-point microwave links and private land mobile radio systems. In that context, the coordinator evaluates requests for new licenses and certifies that such new licenses will not cause undue interference to established users. Consequently, while the FCC is the authority that grants or denies licenses as a formal matter, it routinely relies on and defers to the judgment of the frequency coordinator. This deference to the frequency coordinator facilitates cooperation around the use of the relevant licenses. 36

The importance of this co-regulation model is that the FCC's delegation of authority enables practical problem-solving on the ground by the frequency coordinator. As Dale Hatfield, a former Chief Engineer at the FCC, explained, this system works because it encourages the local engineers to "sit down together, solve these problems, and say let's figure out how to do it," limiting the need for the FCC to use its backstop authority. 37

The FTC's partnership with the Better Business Bureau's National Advertising Division ("NAD") operates in a functionally similar fashion to the FCC's use of frequency coordinators. 38 Notably, the NAD has developed an [\*2021] effective model of dispute resolution around misleading advertising issues, deciding an array of issues and referring cases, where necessary and appropriate, to the FTC. 39 Because the NAD has developed such a trusted program, FTC leaders have praised its work and relied on it to carry the laboring oar in this area, 40 leaving the FTC's residual authority as a backstop. In particular, the NAD refers cases to the FTC where a party refuses to participate in its process or comply with a decision. 41

Learning from the NAD model, the European Union is working with the European Advertising Standards Alliance to develop a similar approach to overseeing false advertising claims. 42 In this case, however, the governmental authority is actively involved in developing and supporting this body rather than integrating its work after the body developed on its own. 43 In short, government can either embrace existing bodies as part of a co-regulation strategy or stimulate and steer the development of new ones.

C. The Role of Best Practices and Agency Convened Efforts

For many regulatory agencies, the opportunity to act as a "convenor," to develop best practices, and to create "soft law" or norms is an important part of their mission. As former FTC Chair Bill Kovacic explained with regard to the FTC, "Congress gave the FTC capacity to serve as a convenor - to engage in a diverse array of activities that facilitate norms development," including "what we now call "soft law' measures (e.g., self-regulatory standards, proposed guidelines)." 44 In particular, Congress specifically authorized the FTC to collect information and develop reports on topics not immediately related to cases or regulatory matters before the Commission. 45 In Kovacic's view, the FTC has used its convening authority effectively, "improving understanding, building consensus, and supplying focal points for norms development" through thoughtful reports that distill key issues. 46

[\*2022] For a range of agencies, the role of developing and championing best practices is on the rise, 47 reflecting a number of trends. First, many agencies find themselves without sufficient authority to promulgate binding rules as new technologies emerge. Second, even where an agency may have formal authority, it might be reluctant to use it in the face of an emerging technology where it needs to act more quickly than formal notice-and-comment rulemaking allows. Third, the agency may lack sufficient confidence that a prescriptive rule is warranted and thus leaves open a range of options, merely narrowing the field of possibilities and pointing entities in the right direction. 48

To develop best practices effectively, an agency must invest significant resources in the enterprise. Stated generally, this effort involves "horizontal modeling rather than hierarchical direction" and is "a method of regulation in which central administrators provide advice and disseminate information, instead of mandating a one-size-fits-all regulatory scheme." 49 In an increasing number of cases, best practices focus not only on U.S. firms, but also those across the world, requiring that the regulatory agency coordinate its international counterparts. 50 Moreover, to develop emerging best practices, it is important that agency staff take the time to learn the details of "the regulated entities first-hand, develop a strong sense of emerging processes, and … [share] knowledge of these processes with staff at other locations." 51

Where an agency (or a private entity) identifies and disseminates a best practice, it acts as a "norm entrepreneur." 52 As discussed in Part III, the FTC has performed this role in the online privacy and data security contexts, articulating and recommending a set of best practices. 53 One virtue of this role - like soft law more generally - is that it may well make the adoption of more formal regulation less necessary. 54 To the extent that the articulation of the relevant [\*2023] norm itself does not overcome the collective action problem and catalyze compliance with a norm, a certification regime (like Energy Star) for those who are compliant (along with naming and shaming) might do so.

One path for catalyzing compliance, which can be labeled as "jawboning" or "threats," involves the use of apparent legal authority - say, opening up an investigation - to achieve a desired result. In a provocative article, Professor Tim Wu defends the use of "threats," calling for norm entrepreneurship by agency leaders and the development of limiting principles for the practice. 55 In criticizing Wu's argument, some commentators have characterized it as condoning lawless conduct. 56 In that spirit, I previously criticized the FCC's use of its merger review authority to secure outcomes in other contexts that were not specifically related to the merger. 57 I also called the FCC's use of "arm twisting" controversial when done without full transparency and a willingness to take formal action. 58 Finally, I noted that the tactic is "dangerous" if the agency is not willing and able to follow through with formal regulation if the called-for behavior does not take place, as the meaningless nature of the threat will become plain and the agency will lose credibility. 59

Any agency that develops best practices should be aware of the potential risks of such an effort. For starters, if an agency's identified best practices are allowed to become stale, some private actors might stick with them and fail to improve their practice. Second, given that there is no judicial oversight of best practices development, 60 it is important that agencies pre-commit to a level of procedural regularity and fairness in how they develop them. Third, without either carrots or sticks related to best practices, an agency may find it difficult to generate attention or catalyze compliance. 61

[\*2024]

D. Private Regulation

As exemplified by the LEED building standard, a private regulatory initiative can drive behavior toward a social goal. Given the need to respond to emerging issues more adaptably than traditional regulatory processes allow, public agencies may be tempted to rely on private bodies. 62 In the internet environment, for example, a range of issues are managed by multi-stakeholder organizations, which use "dialogue to develop voluntary norms and best practices." 63 Similarly, in the environmental field, a range of "private activity generates pressure on environmental behavior without resulting in a statute, regulation, agency enforcement action, or court decision for review by scholars and policymakers." 64

The role of private, multi-stakeholder efforts in internet governance is the U.S. government's official policy. 65 Since the development of the internet's basic technical standards in the 1980s and 1990s by groups like the Internet Engineering Task Force ("IETF") and the World Wide Web Consortium ("W3C"), "these entities have largely established the norms and standards for the global internet, but they are little known to the general public." 66 The U.S. government recently fully embraced this model, recognizing the need for internet policy and governance issues to be developed in an adaptable and global fashion. 67 This embrace includes supporting the Internet Corporation for Assigned Names and Numbers ("ICANN") as an independent, international body to oversee the internet's numbering system. 68

In the internet context, two private regulatory efforts bear notice, as both exist in tandem with legal and regulatory oversight. First, the Copyright Alert System (overseen by the Center for Copyright Information) was a cooperative effort between broadband providers and content providers focused on addressing [\*2025] piracy in peer-to-peer networks. 69 This initiative, which existed for four years, 70 provided some measure of guidance to the broadband industry on what sort of "repeat infringer" policy was reasonable. 71 In light of recent court decisions holding a broadband provider liable for failing to develop an appropriate repeat infringer policy, the guidance from this organization could be considered best practice and protect a provider from liability, 72 although its cessation of operations may limit its impact. Second, the Broadband Internet Technical Advisory Group ("BITAG") is a multi-stakeholder organization that seeks to define best practices and broadband network management ahead of any FCC action under its network neutrality regime. 73 In its most recent regulatory decision on network neutrality, the FCC highlighted its openness to "obtaining objective advice from industry standard-setting bodies or similar organizations," specifically citing BITAG as an example. 74

Both the Center for Copyright Information and BITAG relied on a mix of industry representatives and public interest advocates and operated in an open, transparent, and consensus-based manner. 75 Like frequency coordinators and the [\*2026] NAD, the bodies confronted the challenge of earning their legitimacy and claim to regulatory authority. If such efforts succeeded, the FCC and copyright courts would regard their guidance as meaningful, just as the FTC and courts do with respect to the actions of the NAD. 76

In the environmental realm, the Marine Stewardship Council ("MSC") is an instructive case study on how a multi-stakeholder private regulatory initiative can have a major impact. The MSC, founded by the World Wildlife Fund and Unilever, was launched to address the concern about fisheries operating in a sustainable fashion. 77 As one commentator explained, "the MSC administers standards for sustainable fisheries, updates the standards periodically with input from a stakeholder advisory group, evaluates fisheries, and allows those fisheries that meet certain criteria to label their fish as MSC-certified." 78 The MSC standard focuses on three core concerns: (1) maintaining sustainable fish stocks; (2) minimizing any adverse environmental impact; and (3) managing the fishery effectively, including compliance with relevant legal requirements. 79 Under the MSC-administered regime, independent private auditors must assess compliance with the relevant standards and compliant products can be labeled as such. 80 Indeed, the MSC regime allows any organization with concerns related to certification to make a formal objection during the certification process. 81

[\*2027] The MSC provides a powerful example of how private regulation can work even when not reinforced by public regulation. 82 By 2012, sixty percent of the fish caught in U.S. fisheries for human consumption were MSC-certified and major corporations, such as Wal-Mart and McDonald's, had committed to selling only MSC-certified, wild-caught fish. 83 Moreover, the MSC's private regime drove compliance with the nonbinding Code of Conduct, developed by the United Nations Food and Agriculture Organization, by making it part of its requirements. 84 After surveying this regime and formal regulatory efforts to address the issue, one commentator concluded that the MSC model was more successful than traditional regulatory efforts in this area and that "private regulation is best situated to address the complex problem of fisheries depletion." 85

In short, private regulatory efforts, such as those led by multi-stakeholder organizations, can influence private behavior whether they operate in tandem with public regulatory oversight or in a vacuum created by a lack of regulatory oversight. Whether they operate in the backdrop of public oversight or as a standalone effort, private bodies need to establish their legitimacy to influence behavior on the ground. To do so, they must have sufficient independence from those they oversee, enabling both regulators and consumers to trust their judgments (including determinations of compliance). 86

[\*2028]

E. Hacking the Bureaucracy

In most situations, Congress and agencies think along traditional lines and agency leaders continue on the established path of agency regulation, under-utilizing the alternative models discussed above. 87 There are a number of reasons for this dynamic, including the power of "path dependency and bureaucratic entrenchment." 88 Even more powerfully, the incentives for policymakers are often to avoid Type 1 errors - those visible errors of commission - that arise when trying a new strategy that might fail. By contrast, the hidden Type 2 errors - ones of omission - are permissible and a regular feature of bureaucratic inertia. 89

On one account, the challenge of leading a bureaucracy is captured by the reality that governmental employees, who enjoy civil service protection, can tell their politically-selected leaders, "I was here long before you arrived and will be here long after you are gone." In practice, such explicit defiance is the exception. Regardless of whether bureaucratic inertia is willful or based on an entrenched tradition governmental agencies are built to continue the same course. Consequently, any course corrections require energetic leadership. 90 And governmental employees are generally conditioned "to be quiet, take orders, and do their jobs in a repetitive way." 91 On the positive side, governmental employees tend to have a service orientation and are mission driven, meaning [\*2029] that effective engagement around the mission and purpose of the agenda can catalyze innovation and collaboration. 92

Bureaucratic inertia and autopilot administration not only prevent innovative programs from being developed, but also can lead existing programs to be administered badly. Take, for example, the development of the healthcare.gov website. After Congress passed the Affordable Care Act, a health care economist, David Cutler, encouraged the White House to treat the administration of the law more like "launching a start-up than passing a law." 93 In particular, Cutler made clear that the default strategy - using the existing personnel at the Center for Medicare and Medicaid Services ("CMS") - for administering the law was a recipe for failure. 94 In an assessment ignored by the White House, he explained that CMS "is demoralized, the best people have left, IT services are antiquated, and there are fewer employees than in 1981, despite a much larger burden." 95

Cutler's call for an entrepreneurial approach to implementing the Affordable Care Act was rejected by President Obama. 96 Perhaps fearing the need to manage political warfare with House Republicans or responding to the HHS' interest in protecting its turf, President Obama agreed to, in Cutler's words, pile "new responsibilities onto a broken system." 97 As this episode underscores, even when the current system is flawed, the pressure to use it is powerful. As a result, the healthcare.gov website cost $ 800 million to develop, whereas Twitter, which serves a similar number of users and is of comparable complexity, cost only $ 60 million. 98

The redeeming part of the healthcare.gov story is that it demonstrates that treating a government project like a startup can work. After the failed rollout of healthcare.gov (which only enabled six people to sign up for insurance on its first day), President Obama essentially embraced Cutler's recommendation, [\*2030] authorizing Todd Park, Mikey Dickerson, and a team of entrepreneurs to operate in a new structure that was called "tech surge." 99 This project, like a good startup, approached the challenge of building an effective website from first principles. Rather than ask how the government had done IT projects before, the team innovated (for government) in a number of important ways, including using Amazon Web Services to support the site. 100 In developing the new website, it broke from the traditional bureaucratic process of "waterfall" development (where every step is prescribed and locked-in) and used "agile" development (where the process is iterative and evolves along the way). 101 Finally, the team built a login system for $ 4 million (with annual maintenance costs of $ 1 million) to replace the initial version that did not work well and cost $ 250 million to build (with $ 70 million annual maintenance costs). 102

In an important legacy of this effort, Park and Dickerson continued to work in government after fixing healthcare.gov, developing the new U.S. Digital Service ("USDS"). 103 The goal of the USDS is to lure a range of talented technology professionals to the federal government, including data scientists, product managers, and product designers. 104 The USDS, in turn, provides guidance to government agencies on questions like how they can use Amazon Web Services. 105 In short, the USDS supports entrepreneurial leadership in government; and as Park said, it develops "people who can hack the technology, as well as people who can hack the bureaucracy." 106

The healthcare.gov story now has two parts. The first is the cautionary tale about government's traditional inertial default setting - that is, to do things as they were done before. The second underscores that entrepreneurial leadership [\*2031] in government is both possible and important, and can lead to transformative results. 107

The positive legacy of the healthcare.gov story is that entrepreneurial leaders in government can free their agencies from "the mental grip of conventional structures on the capacity to consider alternatives." 108 In so doing, such leaders can facilitate the development of alternative regulatory strategies. Similarly, governmental agencies face the challenge of overcoming the institutional bias that "experts may myopically focus on issues within their area of expertise and thereby fail to recognize that a decision would benefit from accessing other bodies of knowledge or ways of thinking." 109 In short, an important role of entrepreneurial leadership in government is to examine issues through the lens of first principles. 110

The concept of policy entrepreneurship recognizes that an entrepreneurial mindset and skillset can be applied to governance to foster innovative results. Professor Adam Sheingate, for example, defines the concept as the "skillful manipulation of politics [that] somehow results in the creation of a new policy or a new bureaucratic agency, creates a new institution, or transforms an existing one." 111 This type of leadership can also be seen in the development of, for example, the MSC program, the FTC's oversight of online privacy, and the Energy Star program. In a world where the best solutions may well require new models of regulation, it is critical that agency leaders experiment with new solutions. 112

[\*2032] A significant hurdle for entrepreneurial leadership in government - and a foundation of the inertial default setting - is the lack of acceptance of failure as an outcome. In practice, this means that governmental agencies often reflexively turn to traditional regulatory models and do not consider untested alternatives (often out of fear of failure). 113 This instinct mirrors the old private sector saw that "nobody got fired for buying IBM." 114 Citing the fear of failure and risk aversion, former Massachusetts Governor Deval Patrick explained, "there may be no industry less susceptible to innovation than government." 115 There are, however, exceptions, including the Defense Advanced Research Projects Agency ("DARPA"), which makes a conscious effort to promote a "risk-taking and failure-tolerant culture." 116

In the entrepreneurship environment, failure is a normal state, providing data, an opportunity to iterate, and a spur to refine a product offering. 117 Consequently, entrepreneurs celebrate the need to "fail fast" on new experiments by trying them on a small scale and determining as quickly as possible whether they can work. 118 As two advocates of innovation in government put it, "[a] [\*2033] culture of innovation means continuously exploring and adopting new processes in an ecosystem where risk is incentivized, not precluded." 119 Similarly, entrepreneurial leadership in government authorizes calculated risk-taking and, more importantly, provides cover for trial-and-error learning when the trials do not produce the envisioned results. 120 Unfortunately, leaders who support experimentation and are willing to accept the inevitable failures, are the exception, not the rule. 121

The basic entrepreneurial methodology of experiment-measure-iterate is captured in Eric Ries's classic book, The Lean Startup. 122 A core thesis of the book, widely accepted in the entrepreneurial community (and ignored by most legal scholars), 123 is that companies should develop and market a "minimum viable product," solicit feedback from actual customers, and improve it based on that data. 124 At Facebook, this philosophy was adopted and embodied in its mantra, "done is better than perfect." Citing that mantra, one commentator explained that "had Facebook waited so much as a year to perfect its model, the company might very well be where MySpace is today." 125

The Ries philosophy is famously captured in a feedback loop representing the cycle of innovation. 126 The core idea is to embrace experimentation, gather data [\*2034] (whether it signals success or failure), and iterate. 127 The lean startup model, represented by the following diagram, focuses on taking ideas from prototype to feedback to improvement: 128

This lean startup model echoes the style of software development championed by open source software, which calls for releasing code that can be viewed and improved by a community of users and developers. In what Eric Raymond dubbed "Linus's Law," in honor of the founder and coordinator of Linux, the open source maxim is "given enough eyeballs, all bugs are shallow." 129 This approach has spread far beyond open source, enabling "business webs where focused companies partner others to innovate and create value." 130 Although this [\*2035] approach and a commitment to prototyping and testing solutions is novel in government, it is starting to take root, with promising results. 131

With respect to the fear of failure, government operates quite differently than the entrepreneurial world. In government, the perceived costs of failure are sufficiently high that many governmental leaders decline to introduce a new initiative for fear it will fail or refuse to admit that an existing program is failing, even though that admission is a necessary predicate for improvement. To be sure, there are cases like the initial healthcare.gov rollout where the failure is readily apparent and must be fixed. In other cases, however, governmental leaders stand by programs where the data backing up its effectiveness is either uncertain or doubtful.

For an instructive case of governmental leaders refusing to acknowledge the limitations of a program, consider the case of the EPA's Performance Track program. When created, the program was supposed to highlight those companies with stellar environmental records. 132 In practice, however, it ultimately became, as EPA Administrator Lisa Jackson put it, "just one of those window-dressing programs that has little value." 133 Similarly, the EPA Inspector General criticized the program as ineffective, noting that it did not provide "a new model for achieving" its stated goals and very few companies met their stated goals. 134 Nonetheless, the Bush Administration did not make any real changes to the program before the Obama Administration cancelled it. 135

The Performance Track program story, like the failure to acknowledge the failings of the healthcare.gov website earlier, underscores that the hesitancy to acknowledge failure is a major challenge in governmental administration. If governmental leaders refuse to acknowledge failures, they undermine the ability to learn - and iterate - from mistakes and instead allow failed programs to [\*2036] continue during a period of denial. 136 Or, as Lawrence Summers put it while reflecting on the healthcare.gov debacle, it is crucial to resist the "overwhelming temptation for everyone involved [in a project] to circle the wagons and promise rapid repair so as to hold critics at bay." 137

Another challenging dynamic for governmental leaders to address is the impact of unconscious bias. It is normal for those involved in a project to believe that it is working, following what Nobel Laureate Daniel Kahneman calls "confirmation bias." 138 As one commentator put it, a challenge for those evaluating regulatory experiments is that those "deeply involved in the implementation of a particular regulation are likely to see the benefits of such a project far more clearly than the costs." 139 As commentators have explained, there are a number of strategies for overcoming this bias, including using red team-blue team exercises, appointing a Devil's Advocate, and creating a process for deliberate decisionmaking. 140 Of course, as happened in the Performance Track situation, new leadership is able to bring a fresh perspective. Ideally, however, existing leaders can step back and ask, "if a new leader came in and took a fresh look, what would she do?" 141

[\*2037] The role of entrepreneurial leadership in encouraging candid reflection and criticism is essential. As former FTC Chair Bill Kovacic and David Hyman explain, agencies develop an institutional culture and a reputation (or a brand, as they put it). 142 In some cases, that brand can be one of reliability and commitment to data-driven decisionmaking. An important role of an entrepreneurial leader is to develop and maintain that commitment. In the case of Underwriters Laboratory ("UL"), for example, its early leadership did just that, building up "UL's reputation for reliability by creating organizational structures, administrative routines, and oversight systems designed to prevent mistakes and misconduct." 143 To get past the natural status quo bias, an entrepreneurial leader should welcome diverse ideas, criticism, different options, and experimentation. 144 In Part II, to explain how policy entrepreneurship can earn regulatory authority, I discuss how experimental initiatives need to establish their effectiveness, legitimacy, and accountability to be embraced as lasting regulatory regimes.

#### AND improves resource efficiency and investigation accuracy.

Almudena Arcelus 21, Principal at Analysis Group, Mihran Yenikomshian, Vice President at Analysis Group, and Noemi Nocera, Associate at Analysis Group, “Mitigating Antitrust Concerns When Competitors Share Data Using Blockchain Technology”, Harvard Journal of Law and Digital Technology, Harv. J.L. & Tech. Dig. (2021), Spring 2021, Lexis

C. Transparency for regulators

Implementing transparency in the network design can improve regulators' ability to investigate claims of antitrust violations. First, blockchain networks could be designed to provide antitrust investigators with a clear audit trail of the life cycle of an asset as it moves through a firm's supply chain, providing critical information to investigators as they assess when and how a firm's products transformed from raw materials to a finished good. Second, networks can be designed to provide investigators with more accurate, reliable, and comprehensive transaction data across an entire firm, rather than the piecemeal and inconsistent data that regulators often receive. Last, we could imagine the development of a blockchain, potentially accessible only by select parties or regulators, that contains industry-wide transaction data, which could provide an unmatched tool for investigators. Furthermore, the standardized data format in a blockchain may lead to faster resolution of potential antitrust investigations.

Whether or not these particular strategies would be effective in a real-world setting will depend on the industry or business context, the design of the blockchain network at issue, and the effectiveness of governance and regulatory oversight.

V. CONCLUSION

Because of its potential to change the way many governments' and firms' services currently operate, blockchain technology has attracted extensive press coverage. Although antitrust concerns exist in relation to blockchain adoption and data sharing between competitors (including access to information, collusion, abuse of dominance, and enforcement), blockchain serves mainly as a data management tool. How it affects competition will depend on network design and regulatory oversight, among other things. When examining antitrust concerns, industry observers as well as regulators should assess blockchain technology according to its specific implementation and its role in the wider framework within which it is used.

### 1AC---Solvency

#### Contention 3 is SOLVENCY.

#### Prohibiting anticompetitive practices by the blockchain nucleus creates a principled basis to apply antitrust to distributed ledgers without overbroadening liability for all users.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 110

2 BLOCKCHAIN’S LEGAL FICTION

In this section, I introduce the theory of granularity and outline how it enables the application of antitrust law to blockchains. Transactional by nature, that theory aims to explain public permissionless blockchains beyond the simple cost reduction framework. It seeks to translate accurately the governing reality of such blockchains, creating for the purpose a new legal fiction that encapsulates blockchain without forcing it into inadequate boxes.

2.1 Dynamics of Blockchain Governance

The theory of granularity, to which one may want to provide a semantic explanation, frames blockchain governance as a new transactional institution. By doing so, it fills the gap created by the impossibility of applying the theory of the firm to public permissionless blockchains.

2.1.1 Semantic explanation

In “The Nature of the Firm”, Ronald Coase distinguished between organizations and organisms.3 While firms are organizations, blockchains are clusters of organisms that, by nature, are spontaneous. Their functioning must be analyzed and understood this way so that antitrust and competition law can be properly applied when necessary.

The present chapter introduces the theory of granularity for the purpose. Generally, the notion of granularity defines the size of the smallest element in a system - that is, an organism. Thus, this theory aims to analyze the role played by each component of a blockchain. Unlike the firm, where vertical control is exercised over its components, blockchains are made up of horizontal governance mechanisms. This reinforces the importance of each organism, as one cannot merely assume that they will follow one coordinated direction.4 One must then study blockchain’s smallest organisms, the role they play and their dynamism.5 It is only by analyzing the granularity level that blockchain governance can be properly understood.6

2.1.2 Understanding blockchain governance

Blockchain is a space in which different forms of power are being exercised. However, unlike the firm, in which one exercises a power of command and control, I have explained that no single actor can entirely control a public permissionless blockchain.7 As a result, multiple interests can compete within the same blockchain; they may even be opposed. Blockchain “contribute[s] to the realization of a number of individual objectives which no one knows in their totality”8 For that reason, one must study the different types of power that are generally found within public permissionless blockchains to understand which interests may eventually prevail over others. In doing so, we should keep in mind that “people who think the purpose of blockchains is to completely expunge soft mushy human intuitions and feelings in favor of completely algorithmic governance (emphasis on ‘completely’) are absolutely crazy.”9

I study blockchain power games by analyzing what I have described as the fifth blockchain level in Chapter 4: the governance layer. That level sits on top of more technical ones, and it appears to be central in defining the activities at the levels above. Furthermore, different constraints come into play in blockchain governance - namely, economic, political, logical, sociological, architectural and legal ones. Understanding how these constraints interact is a challenge; but it is essential in order to get a grip on who holds control over blockchain layer 1 and how that power is exercised over other participants.

A distinction between all three categories of public permissionless blockchain participants is helpful in this regard - namely, between founders or core developers (I will often present them together for the sake of simplicity), users and miners. I show that although each blockchain has its specificities, the above-mentioned groups will use the same mechanisms to express their preferences,10 and will encounter the same limits if they act on their own. Eventually, their powers may suffer from four constraints that Lawrence Lessig described with his “pathetic dot theory”: law, markets, social norms and architecture.11

As for private blockchains, I have explained that they mimic that structure to different degrees, depending on their original design. The closer they are to public permissionless blockchains, the less the theory of the firm will be transposable to them. The following developments then become relevant for public permissionless as well as private blockchains.

2.1.2.1 The power of founders and core developers'2

Blockchain founders and core developers are those who implement the original rules of a blockchain.13 They design the code software and determine which consensus protocol will be used.14

Although core developers work on the fourth level of blockchain - its infra- structure - they interact with other blockchain participants at the fifth level. Indeed, one may stress that the blockchain architecture limits their power, as they lose any form of direct control over other participants once they put the blockchain online.15 For most blockchains (but not all!),16 founders and core developers cannot unilaterally impose any changes17 or control who may propose protocol updates.18 For instance, any Bitcoin Improvement Proposals must be voted upon, according to miners’ computing power, before they get implemented.19 Indeed,“[t]he nature of Bitcoin is such that once version 0.1 was released, the core design was set in stone for the rest of its lifetime,”20 unless the majority agrees to change it.

The more participants are included in those voting procedures, the more decentralized that blockchain layer is.21 The opposite is also true. For instance, Decred22 and Tezos23 are cryptocurrencies with more centralized governance systems. One of Tezos’ principal characteristics is the ability to amend its consensus when necessary.24 The presence of off-chain and side-chain governance mechanisms, usually controlled by developers, should also be closely studied.25

It remains that core developers do not control who can use the blockchain at the platform layer26 or who can build applications on top of it.27 That is because blockchain founders and core developers cannot impose changes on the blockchain code, interface, application, data or benefice.28 Their main role is thus close to that of “advisors,”29 but their influence is limited by blockchain participants’ desire to maximize their own benefit, which may lead them, should they disagree with core developers, to refuse the implementation of new rules, to move to a rival ecosystem or to fork the blockchain.30 Social norms further limit them because they may fear not being influential enough to prevent hard forks.

Hard forks result in backward-incompatible software updates. When they do not obtain a sufficiently broad consensus among miners,31 hard forks cause the chain to split in two, permanently. Indeed, miners who do not follow the new block validation requirements will be unable to add their blocks to the latest version of the blockchain, as the core client will automatically reject them as non-compliant. Instead, a new chain of blocks will form, creating a split: two chains following different rules. These forks limit the core developers’ willingness to act against the interests of other participants.32 And core developers may also fear soft forks, although to a lesser degree. Soft forks happen when new rules are implemented, but when the blocks following the original rules are not rejected from the chain. These modifications are backward-compatible, accommodating miners who implement the change and those who do not. Nevertheless, one should underline that these limits on core developers’ power are linked to the decentralized nature of blockchain governance, which is not a necessary feature, but needs to be enacted.33 New blockchains may appear in which greater power is given to the founders and core developers.34

However, such blockchains will suffer from two inherent limits. First, the extent to which a (re)centralized blockchain could thrive remains to be seen.35 Such blockchains could deplete trust by confining power in the hands of a few, thus disincentivizing users from joining them. Second, a (re)centralized block- chain could function less efficiently than a truly decentralized one, because all its participants would no longer be in a position to improve it. This lack of efficiency, even if it only concerned certain types of transactions, could hinder these blockchains - which probably explains why, to this day, they have not prospered.

2.1.2.2 The power of users36

On permissionless public blockchains, users propose new transactions. Anyone can become a user.37 Users exercise substantial power over the blockchain, since their decision to use it (or not) is central to the blockchain’s economic and social value.38 Their influence extends from influencing transaction fees39 to providing additional value by developing and using applications running on top of the platform layer.40 They can also force hard forks on the blockchain.41 However, their power is limited by the fact they cannot (easily) exercise coordinated control, as their actions are highly decentralized and spontaneous.42 This creates an architectural limit and makes their behavior primarily dependent on prices.43

2.1.2.3 The power of miners44

On permissionless public blockchains, miners validate transactions assembled into blocks. Any participant can become a miner.45 Miners follow the rules encoded in the fourth blockchain level (e.g., the Bitcoin Core client).46 They can comply with a different set of rules, but they will then waste computing power by producing an orphaned block, thus losing potential rewards. Following the main client’s rules is miners’ dominant strategy.47 If they coordinate their behavior, miners can influence a blockchain by realizing a 51 percent attack,48 thus forcing a soft fork.49 The risk is higher when miners are grouped into mining pools.50 In such a scenario, the blockchain protocol is changed to loosen the rule-set enforced by full nodes.51 Such a change occurs when enough hashing power, or energy expended to mine a cryptocurrency, is devoted to it.52 The power of miners to start soft forks is nonetheless limited by both the blockchain’s architecture53 and social norms - they must convince blockchain participants operating as nodes to run the new version of the software.54 Miners also suffer from market constraints, as initiating a soft fork may decrease the value of the tokens they own.55 The price mechanism also guides their actions, creating a strong market-related constraint. Finally, even if a fork were created, the new community would have the strenuous task of convincing other users to join it.56 For example, Bitcoin had been forked over 100 times at the time of writing. Over 30 of them are considered failures, while another 29 projects are no longer capable of transacting. Among the remaining forks Just a few are considered valuable.57

2.1.3 The blockchain power game

This overall balance of power, common to all public permissionless block- chains, is the general analytical framework (as illustrated in Figure 7.1) within which to analyze whether one of these groups, on a case-by-case basis, has sufficient influence to qualify as control under antitrust or competition law.

On top of all that, core developers, users and miners may also store a copy of the blockchain ledger. When doing so, their computers are labeled as light nodes if they store only a subset of the blockchain ledger and full nodes if they store a copy of the entire blockchain.58

Although these nodes are passive and cannot be designated as actors in the blockchain, they ensure its integrity. This role carries power. First, blockchain participants who are nodes may alter their copy of the blockchain.59 Second, they may also (threaten to) validate blocks in which there is double spending.60 Their job is indeed to prevent users from spending the same token twice by allowing miners to verify the proposed transaction against a list of previous unspent transaction outputs. They protect blockchains value. However, their power is mainly limited by the fact that they cannot either control or influence transactions.61

This is the blockchain power game. It is well balanced, and technical solutions (called “layer 2” solutions) are constantly provided to maintain that balance. But these solutions are insufficient to maintain balance when different groups of blockchain participants come together to escape these constraints to the detriment of the broader ecosystem. When this occurs, they are exercising control over the blockchain.

2.2 The Blockchain Nucleus

Thus far, the theory of granularity has allowed me to determine the different forms of power enjoyed by blockchain participants. I must now detail how to identify a legal fiction controlling the blockchain.62 To this end, I explain what a blockchain nucleus is and then analyze its influence over other blockchain participants. 1 then describe how to define such a nucleus.

2.2.1 Usefulness and challenges

2.2.1.1 The nucleus

None of the three types of blockchain participants - core developers, users and miners - can impose their power on other groups to the point of taking complete control over the blockchain. Blockchains are indeed decentralized. They prevent the exercise of vertical power, and this differentiates them from firms in which a group, or sometimes even an individual, can control the other participants and “force them to collaborate,” so to speak.

That being said, even with horizontal and decentralized governance, a group of participants may achieve a form of control over the blockchain by collaborating, by circumventing (some of) the constraints imposed on them,63 and by changing them in the long run.64

I contend that such a coalition exists for each blockchain (at least, for the surviving ones),65 and I call it the nucleus. The nucleus includes all the participants who have a personal interest (albeit transiently) to collaborate toward the same long-term goal: ensuring the blockchain’s survival.66 Its members do not compete as they are, together, trying to maintain and expand their blockchain. Their short-term interests may diverge from time to time67 - for example, when two miners are racing to mine new blocks.68 Still, they seek to ensure blockchain integrity and systematically promote the same blockchain instead of other ones.

2.2.1.2 Usefulness

Assessing which participants have joined forces and are thus part of the nucleus is essential to determine who ultimately controls the blockchain. Put differently, it leads to identifying the participants that can be held liable for a breach of antitrust law when it is shown that they have anticompetitively exerted their influence.69 Identifying the nucleus amounts to creating a legal fiction to which the law can be applied, but also to which rights can be granted (see Figure 7.2).

The nucleus should indeed become a legal fiction that can be liable for anticompetitive practices, but also able to claim damages. In that regard, determining the nucleus size will prove central. It will prove useful in cases of anticompetitive practices directed at a blockchain nucleus. When a legal entity - whether a blockchain nucleus or a firm - infringes antitrust law and causes damages to another nucleus, the latter must have the means to introduce a legal action, stand by its rights and claim damages. Assigning liability and granting rights to blockchain ecosystems are thus two sides of the same coin.

3 DEFINING THE NUCLEUS SIZE

Courts and antitrust agencies will face the task of determining the nucleus size. The further away a participant will be from the nucleus’s center, the more difficult it will become to genuinely include her or him in the nucleus. With distance, it will prove harder to show that she or he could have influenced other participants’ behavior. Only a case-by-case analysis can elucidate this question. This analysis should nevertheless be based on concrete and quantifiable frameworks to ensure legal certainty, limit legal errors and reduce regulatory costs. To this end, agencies should focus their investigation on economic agents’ ability to exert a horizontal power of command and control. They should also consider their capacity to interfere with the blockchain’s economic value and influence norms.70

Let me be more specific. The first element that should be factored in to determine which participants are part of the nucleus is the technical ability to exert a horizontal quasi-power of command and control. One must assess each blockchain’s architectural characteristics to determine whether a few users may impose such decisions on others. The more a group of users can control others, the more they can single-handedly contribute to the block- chain’s survival, and therefore be considered part of the nucleus. In fact, the original design of a blockchain can give one of the three groups of users more or less power. It can put them in charge of implementing the execution of transactions, designate them as miners or even enable them to change the design a blockchain’s design unilaterally. Some blockchains might also use several mechanisms based on the platform layer to create governance (whether off-chain or side-chain).71

The second element is the ability of each participant to interfere with the blockchain’s economic value.72 When some users govern the pricing structures, the blockchain’s attractiveness or economic incentives, they have indirect control over the blockchain. This ability can be assessed by looking at technical elements. For instance, the capacity to change the size of each block, which may alter the number and types of transactions, is a sign of control. The same goes for the power to propose modifications to the core code to attract new participants. Finally, the more a participant has invested in the blockchain, the more he has an incentive to control its economic value.73 For that reason, previous investments in a blockchain can show agencies where to look for the nucleus.

The third element is the ability to influence a blockchain’s norms.74 Here, “norms” are defined as the “constraints imposed not through the organized or centralized actions of a state, but through the many slight and sometimes forceful sanctions that members of a community impose on each other”75 - that is, the unwritten rules that one often feels compelled to follow.76 The more a participant can incentivize others to behave in a certain way - on pain of rejection from the community - the more they exercise control over the blockchain’s general direction.77 For example, when core developers can influence other participants into accepting all of the modifications they would like to apply to the core (e.g., by arguing about the necessity for technical upgrades, security failures, bugs...), they effectively pilot part of the blockchain.

4 THE THEORY OF GRANULARITY IN ACTION

The theory of granularity would enable agencies to identify a blockchain’s nucleus. It would thus permit the creation of a legal fiction to which antitrust can be applied. In turn, this would impose new obligations upon blockchain participants while simultaneously giving them new means to challenge anti- competitive behavior. This theory would make it possible to analyze relevant markets and market power in antitrust proceedings. The theory of granularity would also make it possible to impute anticompetitive practices to a given set of blockchain participants.

#### Antitrust is limited by application only to the ‘firm’, defined by vertical control---modifying this with targeted prohibitions prevents blockchain centralization.

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 79-94

The second part of this book is dedicated to artificial centralization - namely, anticompetitive behaviors that take place on blockchains or are facilitated by them. 1 contend that studying these practices is essential to make blockchain and antitrust law function as allies; indeed, no sustainable cooperation is possible without addressing (and preparing for) the situations in which mutual aggressions will occur.

To this end, I first analyze the extent to which antitrust laws are currently applicable to blockchains. I show that the theory of the firm is central to modern antitrust (Chapter 6) and that it cannot be transposed to all blockchains. For that reason, I propose a new approach - dubbed “the theory of granularity”- which allows for the creation of a legal fiction, placing blockchain’s activities (back) under the rule of law (Chapter 7). I explain that implementing that approach would benefit all the players in the blockchain ecosystem. This would clear the way for law enforcers to apply the rule of law and, in turn, would help eliminate the most harmful practices and encourage investments. Once the question of applicability has been cleared up, I turn to how antitrust law could be applied to anticompetitive practices. To this end, I begin by looking at collusive practices, whether they concern the blockchain itself (Chapter 8) or make use of the blockchain to affect the “real space” (Chapter 9). 1 explain that these practices tend to centralize decision making power and thus contribute to the “artificial” centralization of different levels of block- chain ecosystems and the economy.

Part 2 closes by examining abuses of market power. I first show that the analysis of market power on blockchain raises several difficulties, and I offer suggestions to overcome them (Chapter 10). I then analyze the practices that may result from such power and show that they are heterogeneous (Chapter 11). I draw a risk map. Finally, I conclude by studying different forms of blockchain concentration (Chapter 12). I draw a distinction between hostile and mutually agreed concentrations and explain how these may recentralize blockchain.

6. The theory of the firm

1 LEGAL FICTIONS

The concept of “legal fiction” is central to all legal systems, although regulation and court decisions refer to it only infrequently. I first explain its meaning by taking a brief detour through... trees and forests. I then show why it is useful for the present study.

1.1 Trees as a Legal Fiction

Christopher D. Stone is a law professor in the United States. In 1965, after a stint at the University of Chicago,1 he joined the University of Southern California Law School, where he taught several subjects, including public international law and property law. One day in the fall of 1971, as he was nearing the end of a class, he asked his students the following question: “What would a radically different law-driven consciousness look like?” As he walked out of the classroom, down the corridor to his office, he wondered why he had asked such a strange thing. “How could a tree have rights,” after all? Days went by, and still he continued to wonder. He soon became convinced that the answer to his question should be positive and decided to make it known.

In October that same year, he got in touch with the Southern California Law Review's editor in chief. The Supreme Court had taken up a case, Sierra Club v. Morton, that touched upon his question. Although Stone did not think he would be able to publish his article before the case went to trial, he hoped that Justice William O. Douglas - who had agreed to write the preface to a symposium issue of the Review - would at least see the draft of his article. His strategy paid off. Although the Supreme Court decision did not follow his thesis, Justice Douglas wrote a dissent in which he held that: “Contemporary public concern for protecting nature’s ecological equilibrium should lead to the conferral of standing upon environmental objects to sue for their own preservation. See Should Trees Have Standing?”2 In 1974, Stone published a book in which he developed his theory further.

1.2 The Concept of Legal Fiction

Christopher Stone’s book is a pillar of modern thinking on the subject. Of course, the argument concerning what is a legal person - or a legal object to which rights are attributed - did not originate in the 1970s. Since medieval times, scholars have considered what rights should be attributed to corpo- rations3 - a debate they centered on the question of legal fictions. A “legal fiction” is presumably defined as a fact created by courts or legislation to help legal ruling.4 Stone poses three conditions for the creation of a new one:

They are, first, that the thing can institute legal actions at its behest, second, that in determining the granting of legal relief, the court must take injury to it into account; and, third, that relief must run to the benefit of it.5

A company meets these criteria. Legal systems have recognized them as a legal fiction for hundreds of years.6 Corporations are, in the words of John Sherman, “artificial person[s] without fear of death, without a soul to save or body to punish;”7 and yet they are at the center of our modern economies. Not only has the law “been able to exploit to its advantage and to maximize for its needs” the fact that corporations are persons; but also, they can file legal actions, suffer from damages and benefit from relief. One can find traces of that recognition in the Rolls of British Parliament in 1444: “they [the Master and Brethren of the Hospital] by that same name mowe be persones able to purchase Londez and Tenementz of all manere persones.” Here, the Hospital was recognized as a legal fiction.

As for the process of establishing legal fictions - once the criteria are known to be met - three methods have been used,8 whether by the courts (in common law) or by the legislature (in civil law). The first is by assertion, where one thing is declared to be true. For instance, one may say that corporations are persons. The second is by assumption - more specifically, by an irrefutable presumption that may morph into a legal fiction. For instance, one may say that corporations are presumed to be persons. The third is by deeming. Here, X is deemed to be Y, which creates a disconnect between the reality before deeming the fact, and after.

1.3 Legal Fiction and Blockchain

If legal fictions are so convenient, why not create a multitude of them? The first objection is the necessity to agree on the desirability of the objective they ought to achieve. When courts use legal fictions to deny minorities their fundamental rights, the objective is achieved, but society does not come out better.9 The second objection relates to the balance of power. Bentham called legal fictions “the stealing of legislative power” when courts create them. The third objection relates to the difficulty of creating a coherent legal system. Companies are legal persons, and although they can be charged with criminal activity, these crimes are committed by physical entities (persons). One must therefore put in place adequate measures to ensure that any illegal activity by a firm can be put to an end (that its perpetrators cease to act). The fourth and final objection concerns the systematization of the law. The creation of legal fictions leads to the elimination of case-by-case analysis, at least partially. For instance, a firm will always be a legal person. That may create difficulties because it entails giving the firm all the fundamental rights given to us, humans.

On the other hand, creating legal fictions significantly improves legal certainty. First, this applies to the entities directly concerned, which as legal fictions may bring actions under their own name and can thus be compensated for any damage they might unjustly suffer. It also creates legal certainty for all those who interact with these legal fictions, as trading partners can indeed bring legal actions against them. It helps when legal fictions rather than individuals benefit from illegal practices and cases where several individuals are responsible for a behavior. In short, although the creation of legal fictions is an exercise that requires precision, it unlocks a range of potential interactions that can greatly benefit society.

I intend to explain that creating a new legal fiction for blockchains is essential to their decentralization. I have argued that decentralization is the capacity of subjects to determine their competence. That requires recognizing their legal existence before transferring such capacity. Doing so will also allow them to introduce proper legal actions and prevent illegal behaviors being turned against them.

2 THE FIRM IN ANTITRUST

Antitrust’s most common legal fiction is the firm. That legal fiction has developed little since the 1930s and Ronald Coase’s work. For that reason, one may wish to understand its premises to get a grasp of modem antitrust law.

2.1 The Theory of the Firm

The economic literature regarding the emergence of firms emphasizes the importance of transaction costs and the ability to reduce them thanks to top-down control. To this day, that theory has provided the bedrock for modem microeconomic analysis.

2.1.1 Highlights of Ronald Coase’s article

In 1937, when he was 21 years old, Ronald Coase published “The Nature of the Firm.”10 It contains no mathematics and is just 20 pages long, but it remains one of the most-cited publications in economic theory today." One can hardly overstate its impact.12

In it, Coase sought to answer the following question: if markets are efficient, why do firms emerge? Coase responded simply and elegantly, stressing that firms make it easier to organize certain exchanges. Coase introduced the concept of transaction costs without naming it - referring to all the expenses the parties must incur to complete a transaction - and explained that firms exist to minimize these costs.13 Indeed, a transaction involves different costs - the costs of finding economic agents on the market, negotiating, drafting a contract and so on. By internalizing these various externalities, firms reduce the cost of economic transactions. Firms were thus seen as an institutional device for the first time.14 Coase opened the firm “black box.”15

He then explained why firms reduce these costs. His explanations came down to the power of command and control.16 Firms are hierarchically organized: orders and directions are given from the top and trickle down the hierarchy. This reduces the scope for costly opportunistic behavior that might otherwise make transaction unprofitable. Put differently, the reduction of these costs is often achieved by collaboration between employees, while market participants outside the firm are compelled to compete.

In Coase’s words, “in place of the complicated market structure with exchange transactions is substituted the entrepreneur-coordinator, who directs production.”17 Reductions of costs follow, as “by forming an organisation and allowing some authority (an ‘entrepreneur’) to direct the resources, certain marketing costs are saved.”18 Coase thus defines the “firm” as “the system of relationships which comes into existence when the direction of resources is dependent on an entrepreneur.”19 On the contrary, this kind of efficiency is not found in the market, where free economic agents compete under emergent orders. One can thus define the boundary between the firm and the market: where control stops, the firm’s perimeter stops.

Coase particularly emphasized the firm’s ability to deal with contingencies during the performance of a contract. While firms manage long-term relationships, the market mainly permits short-term contracts based on the price mechanism.20 Thus, Coase argued, “it seems improbable that a firm would emerge without the existence of uncertainty”21 in the market. This assumption is based on the theory of incomplete contracts, according to which the contracting parties cannot anticipate all the situations that may arise during their contract’s performance.22 The firm helps in creating a way to settle disputes, which as a result reduces all the upfront costs related to the management of potential conflicts. Here again, Coase put the firm’s ability to exercise control at the center of his demonstration. He was awarded the 1991 Nobel Prize in Economics for “his discovery and clarification of the significance of trans- action costs and property rights for the economy’s institutional structure and functioning.”23

2.1.2 Coase’s impact

Coase’s article put transaction costs at the center of modem economics, making them “the ultimate unit of microeconomic analysis.”24 Although Coase complained in 1988 that the concept was “largely absent from current economic theory,”25 it has transformed the perception of the firm from a pro- duction function into a governance structure.26

This transformation of economic thinking heavily influenced Oliver Williamson, among many others.27 He researched the optimal design of firms28 and helped to open the firm “black box” even further, putting the firm’s “control instruments”29 and the “means by which to infuse order”30 at the center of his analysis. Williamson was awarded the Nobel Prize in Economics in 2009.

Alternative theories to those of Coase have also developed. For instance, incentive theory portrays the firm as an incentive system that uses various instruments combining authority, ownership and compensation to ensure that all employees contribute their best to the firm’s interests.31 The theory holds that firms must adopt institutional arrangements that ensure survival by aligning these incentives. They are thus a nexus of written and unwritten contracts between different economic actors in which each contractual relationship is an agency relationship, whose optimal configuration must be discovered. According to the proponents of this theory, there is no difference in nature between firms and the market. Both are said to depend on contractual relationships that do not imply any exercise of authority or control. As I will explain, none of these alternative theories is currently being used in antitrust and competition law.32

2.2 A Pillar of Modern Antitrust

Although Coase’s theory was developed in the 1930s, modem antitrust is still constructed on the basis of this theory and has not adapted to changes in the nature of firms. Why is that? One may find a satisfying explanation in the fact that the nature of economic hierarchies has changed little to this day. Even the apparition of online platforms and aggregators has not changed the structure consisting of minimizing transaction costs thanks to vertical power. In a nutshell, Coase’s theory is here to stay. As a matter of fact, and as we are about to see, all modem antitrust case laws and regulations are based on the above-mentioned article, whether in the United States or Europe. More specifically, Coase’s theory helps point out where control is being exercised and, therefore, where the firm’s boundaries are. Antitrust and competition law applies to all entities defined accordingly.

2.2.1 The firm’s boundaries in antitrust and competition law

The Sherman Act in the United States and the TFEU in Europe are both the subject of extensive case law. The vast majority of the jurisprudence is not concerned with the question of the firm - that is, the person that is the subject of antitrust and competition law. The firm’s structure has transformed very little since the introduction of these two texts; it has become more complex, but has not changed in nature.33 For that reason, litigation generally involves other issues subject to further disagreement. Nevertheless, blockchain’s emergence forces us to reassess the definition of a “firm,” to analyze whether decentralized groups can be captured by antitrust law as currently conceived or if blockchains should be captured through another theory. In the United States, antitrust provisions apply to all “persons”34 affecting trade and commerce by unlawful restraints and monopolies.35 According to Section 7 of the Sherman Act:

the word ‘person,’ or ‘persons,’ wherever used in sections 1 to 7 of this title shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the Territories, the laws of any State, or the laws of any foreign country.36

The text does not further define the term “person”; it simply establishes exemption regimes for which antitrust is not applicable - mainly concerning federal government agencies and instrumentalities.37

The case law is more informative. In *Copperweld*,38 the Supreme Court stressed that although “[n]othing in the literal meaning of [the Sherman Act] excludes coordinated conduct among officers or employees of the same company,”39 there is “general agreement that § 1 is not violated by the internally coordinated conduct of a corporation and one of its unincorporated divisions.” On that basis, the Court held that “there can be little doubt that the operations of a corporate enterprise organized into divisions must be judged as the conduct of a single actor,” therefore exempting these operations from Section 1 of the Sherman Act.

The Supreme Court was dealing with possible intra-group collusion for the first time with this decision.40 One can only guess what would have been its reasoning before Coase’s article (1937). The fact remains that *Copperweld* follows a Coasian logic:41 the firm uses vertical control to save transaction costs; antitrust law must recognize the fact and exempt from Section 1 of the Sherman Act all agreements between two legal entities bound by such a control relationship42 In the words of the Supreme Court:

The intra-enterprise conspiracy doctrine looks to the form of an enterprise’s structure and ignores the reality. Antitrust liability should not depend on whether a corporate subunit is organized as an unincorporated division or a wholly-owned subsidiary. A corporation has complete power to maintain a wholly-owned subsidiary in either form. The economic, legal, or other considerations that lead corporate management to choose one structure over the other are not relevant to whether the enterprise’s conduct seriously threatens competition.

In the end, “courts must examine whether the conduct in question deprives the marketplace of the independent sources of economic control that competition assumes” “when making a single-entity determination.”43 Only when “general corporate actions are guided or determined” by “separate corporate consciousnesses” can two entities be seen as two separate firms in antitrust law.44 One must make no mistake about it: only control makes the firm and defines its scope.45

In Europe, the theory of the firm as defined by Coase is also the basis of modern competition law.46 Article 1 of Protocol 22 to the European Economic Area Agreement defines the “firm” as “any entity carrying out activities of a commercial or economic nature,” but the concept is not properly delimited in the black letter of EU law. However, the case law defines “undertakings” as “every entity engaged in an economic activity, regardless of the legal status of the entity and the way in which it is financed.”47 The legal form of the entity offering the economic activity does not matter.48 In fact, as the CJEU made clear in Shell, “undertakings” are economic units rather than legal units.49 Here again, the concept of undertaking takes Coase’s path-breaking article as a starting point.50

That definition of the “firm” is still incomplete, as it does not define its boundaries. For instance, in Imperial Chemical Industries, the CJEU ruled that the degree to which it carried out “the instructions given” by a company was essential in analyzing the independence of a subsidiary; and that “where a subsidiary does not enjoy real autonomy in determining its course of action in the market,” the prohibitions set out in Article 101 of the TFEU were inapplicable.51 The CJEU further held in Akzo Nobel that “the actual exercise of decisive influence”52 defines firm limits in competition law; and that “it is sufficient for the Commission to prove that the subsidiary is wholly owned by the parent company to presume that the parent exercises a decisive influence over the commercial policy of the subsidiary.”53 In the end, a firm encompasses all the elements over which control is exercised, as in the United States.54 For instance, in Hydrotherm, the CJEU found that a natural person, a limited partnership and another undertaking made up a single economic unit when they were all controlled by the same natural person.55 That logic derives from Coase’s “The Nature of the Firm.”56

2.2.2 The firm as a pillar of antitrust and competition law

The definition of the firm’s boundaries helps in three fundamental steps of antitrust and competition law: (1) determining whether the law should apply; (2) assessing practices; and (3) and assigning liability. First, establishing the firm’s boundaries helps determine the extent to which antitrust and competition law applies. U.S. antitrust law provides several exemptions to different types of entities, which require both the identification of the firm and an understanding of its activities. European competition law applies only to undertakings that carry out an economic activity. Once again, it is then necessary to identify the firm’s boundaries to determine the activities carried out.

Second, establishing the firm’s boundaries is essential when agencies assess the legality of business practices.57 In terms of collusion, U.S. and European courts have recognized that two legal entities that are part of the same eco- nomic unit - that is, the same firm - cannot be held guilty of collusion, as one cannot agree with oneself.58 Antitrust prohibits several forms of cooperation outside the firm, while it always permits cooperation within the firm. The logic is similar in terms of monopolization and abuse of a dominant position. As a company cannot abuse its market power against itself, abuses of power are illegal only when they affect other firms. Above all, defining the boundaries of firms is essential to analyze market power (and thus whether Section 2 of the Sherman Act or Article 102 of the TFEU is applicable to a given case) and the ability to engage in anticompetitive practices. Control indeed confers the firm with the power to implement practices - including the ability to raise prices, which is often central in antitrust cases.

Finally, identifying the boundaries of firms is essential to assign liability.59 Liability for anticompetitive practices rests with the parent company that ultimately controls other entities if such control has been exercised.60 This logic stems from the classic distinction between ownership and control.61

It is safe to assume that antitrust law will capture the activities of blockchain participants at their individual level.62 For example, one could imagine that a miner is considered a company on his own; after all, miners are operating an economic activity. Nevertheless, analyzing whether the entire blockchain layer 1 could be deemed a firm for the purpose of antitrust law is essential if agencies are to understand and apprehend anticompetitive practices that are carried out beyond the simple framework of the individual. For example, suppose a blockchain is implementing practices to exclude another blockchain from the market. In that case, one will want to punish these practices rather than each individual action leading to the entire scheme. I will return to these practices in the coming chapters.

In other words, defining the firm’s boundaries is a necessary step in understanding competitive dynamics, in analyzing practices and eventually, in assigning antitrust liability to the blockchain when, as an entity, it seeks to achieve survival through anticompetitive ways. It is thus essential to carefully consider the elements that are taken into account when defining “firms” under antitrust law. I showed that in the United States, as in Europe, only one element matters: control. This reasoning is problematic when it comes to blockchain.

# 1NC

## Off

### 1NC – Fascism DA

#### Scaling up blockchain leads to an alt-right takeover of government.

Golumbia 16 (David Golumbia, Professor, Writer on Digital Studies, Language, Theory, *The Politics of Bitcoin: Software as Right-Wing Extremism*, University of Minnesota Press, 2016)

Revising Secrets of the Federal Reserve in 1993 and adding the subtitle “The London Connection,” Mullins makes clear that this one family continues to be responsible for orchestrating the U.S. financial system: “The controlling stock in the Federal Reserve Bank of New York, which sets the rate and scale of operations for the entire Federal Reserve System is heavily influenced by banks directly controlled by ‘The London Connection,’ that is, the Rothschild-controlled Bank of England” (203). This same line of thought is found in nearly identical form in the conspiratorial propaganda produced today by the Patriot, militia, and Tea Party movements in the United States (Flanders 2010; Lepore 2010; Skocpol and Williamson 2013), and by prominent conspiratorialists like Alex Jones, Henry Makow, and David Icke. In addition to Mullins, this view is promulgated in the writings of Martin Larson (1975), A. Ralph Epperson (1985), G. Edward Griffin (whose 1998 Creature from Jekyll Island includes an approving blurb from Ron Paul), and Murray Rothbard (2002) himself—as well as writers like Ellen Hodgson Brown (2008), who presents analyses nearly identical to those of Mullins and others without some of their explicitly right-wing trappings; and Anthony Sutton, a wideranging conspiratorialist whose work mixes well-documented history with elaborate speculation, and whose writings on finance and the Federal Reserve (especially Sutton 1995) repeat many of the same “facts” and inferences found in Mullins and others.

Bitcoin enthusiasts repackage material from these writers almost verbatim, regardless of whether they know the origins of that material. Despite the general rightist orientation of much digital culture, central bank conspiracism is relatively new there, gaining a foothold only with the introduction of Bitcoin and the blockchain. In the Bitcoin literature, as in the central bank conspiracy writings, we read that the Fed is a private bank that hides its real purpose; that it steals money from some private citizens and put it in the hands of the “elites” that control the Fed; that the Fed itself is covertly run by a shadowy group of elites, often made up of Jews and members of English banking families such as the Rothschilds; and so on.

Bitcoin literature also advances the more subtle extremist argument that inflation and deflation are caused by monetary policy rather than by more conventional aspects of economies like consumer prices, commodity and asset prices, productivity and other aspects of labor, and so on. It is a cardinal feature of right-wing financial thought to promote idea that inflation and deflation are the result of central bank actions, rather than the far more mainstream view that banks take action to manage inflation or deflation in response to external economic pressures. This view is repeated with remarkable persistence and with a remarkable lack of critical examination in a significant portion of discussions about Bitcoin, regardless of their overt politics.

A third pillar of extremist thought we regularly find in Bitcoin circles is less specific to Bitcoin but more endemic in the digital world among cypherpunks, crypto-anarchists, and other advocates of nebulous digital causes like “internet freedom.” This is the presumption that computer-based expertise trumps that of all other forms of expertise, sometimes because everything in the world is ultimately reducible to computational processes (a view sometimes known as computationalism; see Golumbia 2009). This computer-centric point of view is extremely common throughout digital culture, and it is especially notable in Bitcoin discussions. The implication is that this lack of technical expertise disqualifies the critic from speaking on the topic at all. Of course, no such parallel expertise is granted to fields like economics and finance, despite their own highly technical nature. This selective evaluation of individuals based on a self-nominated set of meaningful and not-meaningful criteria fits uncomfortably well with the tendencies toward producerism, anti-elitism, and anti-intellectualism that critics like Berlet (e.g., 2009, 26) see as endemic in contemporary rightwing movements. Keywords like “elite,” “establishment,” and “academic,” at least at times, signal this rejection of all those forms of noncomputational expertise.

A fourth and final pillar of extremist thought is also found both inside and outside Bitcoin discourse, but appears there with particular force: the idea that government itself is inherently evil, distinct in kind from other forms of power but not in terms of its responsibility to the democratic polity. Of course this view flows somewhat directly from the anarchocapitalist thought of Rothbard and the antigovernment neoliberal doctrines of Reagan, Thatcher, and their supporters, the Koch brothers, the Cato and Heritage Foundations, and many more. It also flows directly from the views of crypto-anarchists and cypherpunks, and to only a slightly lesser extent from the general cyberlibertarian predisposition against internet regulation, and the way that many “privacy advocates” focus so much of their energy on what governments are apparently doing and so little on what corporations are provably doing. At the limit, these perspectives suggest not simply that current governments are corrupt or misguided, but that the project of governance itself is an idea whose time has passed, one to be superseded by markets and market-like mechanisms that offer no resistance at all to concentrations of power, and no formal means beyond market forces to hold those who abuse power accountable to the rest of us. Ironically, in so many ways, and yet befitting the actual political work they do in the world, by painting the world today as if it were an ungoverned “tyranny,” conspiratorial belief systems help to pave the way for just such tyrannies to emerge.

Not all conspiracy theories are the same, despite the use of that term to disqualify many disparate strands of thought that may at times present themselves as alternatives to orthodox or dominant political views (for recent scholarly treatments of the range of “conspiracy theories” and the various meanings of the term see Birchall 2006; Bratich 2008; see also Mulloy 2005, which offers a solid account of the uses of conspiracy theory by right-wing extremist groups in the United States). Views that appear to be conspiratorial at one time may become established or even proven history at others; conversely, established history can turn out at later moments to have been fabricated. It is not the case that merely labeling an idea “conspiracy theory” means it is necessarily untrue. But the conspiracy theories associated with Bitcoin are among the most deeply entrenched, pervasive, politically charged, yet disproven of all the ongoing lines of political discourse in the United States and Europe. Whatever minor kernel of truth they contain (roughly, that very rich and politically powerful people exercise far more influence over the rest of us than we would like to believe) is almost entirely obscured by the projection of a shadowy, absolutely powerful, fundamentally evil racial or religious Other who is actually responsible for many major world historical events. These theories percolate almost exclusively on the extreme political right and serve (to some extent ironically) to mobilize and contain the political energies of those who subscribe to them. It is these theories that dominate not just Bitcoin rhetoric but also the actual functioning of Bitcoin as software and currency: we might say that Bitcoin activates or executes right-wing extremism, putting into practice what had until recently been theory.

There is much more about Bitcoin, its culture, and even its politics than can be accommodated in a short survey of its profound engagement with right-wing thought and practice. Here, my exclusive goal is to trace out this specific line of thought, both because of its urgency and because it has often been misunderstood by some in the media and is continually misrepresented by Bitcoin propagandists. The point is much less that Bitcoin is attractive to those on the right wing, than it is that Bitcoin and the blockchain themselves depend on right-wing assumptions, and help to spread those assumptions as if they could be separated from the context in which they were generated. Absent an awareness of that context, Bitcoin serves, like much right-wing rhetoric, to spread and firmly root a politics part of whose method is to obscure its material and social functions.

#### Extinction

Araie 19 (Farouk Araie - , “World War III fast approaching as fascism and extremism grows.” IOL. 8/20/19, https://www.iol.co.za/capeargus/opinion/world-war-iii-fast-approaching-as-fascism-and-extremism-grows-31027514)

Right-wing fascism, religious extremism and territorial expansionism are the ingredients that will ignite an inferno within the next five years. Albert Einstein once said that after World War III, World War IV would be fought with sticks and stones. Fascism has multiple histories, most connected to failed democracies, more than 80 years ago. It is rearing its deadly tentacles across the entire globe, sending seismic tremors through the corridors of power. Authoritarian regimes are spreading like wildfires, devouring the political landscape in an orgy of naked hate and encompassing a new wave of ethnic cleansing. It was by sheer chance and a stroke of luck that a nuclear war was not fought over the past tense 70 years. The present constellation of events and the suicidal policies of certain powerful nations will certainly trigger a nuclear holocaust. Fascist symbols, rhetoric and salutes are a grim reminder that World War III is fast approaching. The nightmares that shaped the past are poised to wreak havoc on us once again on a global scale. Resurgent right-wing fascism is irrational, closed-minded, violent and racist. There is no doubt that it must be fought at every turn, but in order to do so it must be first be seen for what it is and where it lurks. The geopolitics of hate encompass religion, race and ideology. The globe is being disembowelled for the aquifers of hate. A subtle fear pervades our politics today. Violent, triumphalist majoritarian dominance is on lurid display across the entire global political spectrum. Lynching and genocide threatens to grow into a national pandemic as hate has sadly lynched the conscience of mankind. Right-wing fascism is rapidly spreading across the world. It is in reality, a disease of the mind. It is that plain where internal fears meet the external realities of the world we live in. To the rabid fascist, confusion is a supreme virtue; truth is an enemy met with ridicule, then suppression, then death. Empathy is slain. We are in denial, as all across the world fascism is seeing a terrifying resurgence. The rise of rightwingers in Asia attests to the universality of fascism. A new robust fascist strain has arisen in Europe and South America, bolstered by the atmosphere of political confusion and foreign subterfuge that will eventually escalate out of control. Fascism has become a popular pejorative hurled from many corners of society, but the true danger is that its shadow haunts the precincts of every human heart. Sooner or later, someone in authority will miscalculate, triggering a chain of events that will obliterate humanity.

### 1NC – T Must Be Exemptions

#### ‘Scope’ is the extent of the area dealt with or relevant to the core laws

**Oxford Languages ND**, “scope,” shorturl.at/wCDY3

scope

the extent of the area or subject matter that something deals with or to which it is relevant.

"we widened the scope of our investigation"

#### It’s bounded by exemptions

**Kruse et al. 19** (Layne E. Kruse, Co-Chair; Melissa H. Maxman, Co-Chair; Vittorio Cottafavi, Vice Chair; Stephen M. Medlock, Vice Chair; David Shaw, Vice Chair; Travis Wheeler, Vice Chair; Lisa Peterson, Young Lawyer Representative; all on the Exemptions and Immunities Committee of the ABA Antitrust Section, “Long Range Plan, 2018-19,” American Bar Association. March 2019. https://www.americanbar.org/content/dam/aba/administrative/antitrust\_law/lrps/2019/exemptions-immunities.pdf)

D. Top 3 Accomplishments Since Last Long Range Plan in 2015

(1) Publications. In addition to our Annual ALD Updates, we are set to publish an update to the Noerr-Pennington Handbook, which should be out in 2019. We also published a new version of the State Action Handbook in 2016. The Handbook on the Scope of the Antitrust Laws was published in 2015.

(2) Commentary on Legislative and Regulatory Proposals. The Committee has been very active in supporting Section commentary on proposed legislation, regulations, and other policy issues.

For instance, in March 2018, the E&I Committee assisted former E&I Chair John Roberti in composing his article, “The Role and Relevance of Exemptions and Immunities in U.S. Antitrust Law”, presented to the DOJ Antitrust Division Roundtable on behalf of the ABA Antitrust Section.

In January 2018, in response to a request from the Section Chair, we submitted Section comments along with the Legislative and State AG Committees, addressing the proposed Restoring Board Immunity Act legislation that would impact the post-NC Dental exemptions and immunity climate. Previously, we commented on the Professional Responsibility Act.

(3) Spring Meeting Programs. We have sponsored or co-sponsored a program at every Spring Meeting since our last long range plan. In 2019 we will chair Sham Litigation after FTC v. AbbVie The FTC v. AbbVie decision – calling for the disgorgement of $448 million on the basis of sham patent litigation. In addition, we will co-sponsor in 2019 with the Trade, Sports & Professional Associations Committee, a program on “Antitrust Law's Anomalous Treatment of Sports,” addressing how US courts have shown broad deference to the "rules of the game," including near-immunity status for concepts such as "amateurism."

II. Major Competition/Consumer Protection Policy or Substantive Issues Within Committee’s Jurisdiction Anticipated to Arise Over Next Three Years

A. Issue #1: Will Certain Exemptions Be Eliminated or Expanded?

A goal of the current DOJ Antitrust Division is to streamline antitrust laws, and in particular, take a hard look at exemptions and immunities. This is in the wheelhouse of our Committee’s fundamental policy issue: How much of the economy has opted out of our antitrust system? Is that a problem or are ad hoc exemptions acceptable ways to fine tune the application of the antitrust laws?

We anticipate, therefore, that efforts to enact or to repeal existing statutory exemptions and immunities will continue. In recent years, there have been efforts to repeal the exemptions for railroads and (at least in part) the McCarran-Ferguson insurance exemption. The Section and the Committee has generally supported efforts to repeal statutory exemptions. Given that repeal issues are very political it is unlikely that we will see many exemptions actually repealed.

On the other hand, proposals for new exemptions and immunities will continue to be introduced in Congress. The Committee will improve on a template for use in assisting the Section in drafting comments to Congress on newly proposed exemptions and immunities.

One development that may continue in the health care area are issues over a "COPA" or "Certificate of Public Advantage" at the state level. A COPA is a state statutory mechanism that provides certain collaborations in the health care community with immunity from private or government actions under the antitrust laws by invoking the state action doctrine. The FTC has generally opposed such efforts at the state level, but several states have used them to immunize health care mergers. This is a major development that should be monitored.

Through programs, newsletters, and Connect entries, the Committee intends to educate its members about Congressional and other efforts to repeal, or introduce new, exemptions and immunities, as well as the application of existing statutory exemptions and immunities in the courts. The Committee’s Handbook on the Scope of Antitrust Law, published in 2015, addresses developments in the statutory immunities area. It built on the prior publication, Federal Statutory Exemptions from Antitrust Law Handbook in 2007. Our Scope book will need to be updated within the next three years.

B. Issue #2: Will There Be Legislative Solutions to State Action Issues at State and Federal Levels?

The FTC’s case against the North Carolina Board of Dental Examiners put the "active supervision" prong of the state action test front and center. North Carolina State Board of Dental Examiners v. Federal Trade Commission, 135 S.Ct. 1101 (2015). The Court agreed with the FTC’s position that state occupational licensing boards comprised of market participants must satisfy the active supervision requirement. This spurred additional suits against other types of state boards involving regulated professionals. Moreover, every State had to reassess its boards to determine if there is "active supervision." Courts and state legislatures are addressing those issues. We also expect the proper framing of the clear articulation prong of the state action doctrine will be addressed. The Supreme Court spoke to the clear articulation test in FTC v. Phoebe Putney Health System, Inc., 133 S.Ct. 1003 (2013), narrowing the foreseeability test to cover only situations in which the anticompetitive conduct is the “inherent, logical, or ordinary result of the exercise of authority delegated by the state legislature.” How this test has played out in the lower courts will be of particular interest to the Committee and its membership. The COPA issues, at the state level, as previously mentioned, will impact this area.

The Committee expects to address these issues through updates to Connect, newsletters, Spring Meeting programs, committee programs, its contributions to the Annual Review of Antitrust Law Developments. The State Action Practice Manual addresses these issues, as well as the Committee’s Handbook on the Scope of Antitrust Law.

C. Issue #3: Will Noerr Be Restricted or Expanded?

The Noerr-Pennington doctrine is an exemption issue that is frequently litigated. In particular, the most likely area of further development is in the pharma industry. Alleged misrepresentations to government agencies has caught the attention of some courts. In addition, there may be more development on the pattern exception, which raises the issue of whether each act of petitioning in a pattern must satisfy the objectively and subjectively baseless requirements for sham petitioning. The Committee’s new Handbook on Noerr (forthcoming) and its earlier Handbook on the Scope of Antitrust Law addresses developments in the Noerr law.

III. Specific Long Term Plans to Strengthen Committee

The Committee provides important services to the membership of the Section through publications, drafting ABA Antitrust Section comments to proposed regulation and international competition proposed immunities, and programming. The goals of the Committee include: (1) to provide policy comments on key questions about the scope of the antitrust laws for legislation and policy-making; (2) produce a mix of publications and programming that provides relevant and useful information to our members; (3) to ensure that the Committee remains valuable to our members’ practices; and (4) to make the most productive use of electronic communications to deliver the Committee’s work product.

A. Potential Modifications to Charter: What is the Role of this Committee?

The Committee’s current charter accurately characterizes its purview—that is, addressing the scope of the antitrust laws. That scope, of course, is defined primarily in terms of exemptions and immunities (both statutory and non-statutory). The Committee, however, has dealt with other doctrines, such as preemption and primary jurisdiction. These areas may not necessarily be viewed as traditional exemptions or immunities, but they nonetheless directly affect the application and extent of the antitrust laws. In addition, the Committee expends significant efforts to address international issues, including statutory exclusions from the U.S. antitrust laws, including the FTAIA; the related doctrines of act of state, sovereign immunity, and foreign sovereign compulsion; and industry-specific exemptions and exclusions from non-U.S. antitrust laws, including blocking exemptions.

#### ‘Expand’ must make more expansive – NOT clarify existing principles

**Hatter 90** (Terry J. Hatter, Judge, US District Court, California Central, “In re Eastport Assoc.,” 114 B.R. 686, Lexis)

[\*\*10] Second, Eastport asserts that the presumption against retroactivity does not apply because the amendment was intended only as a clarification of existing law. HN7 Where an amendment to a statute is remedial in nature and merely serves to clarify existing law, no question of retroactivity is involved and the law will be applied to pending cases. City of Redlands v. Sorensen, 176 Cal. App. 3d 202, 211, 221 Cal. Rptr. 728, 732 (1985). The evidence in this case, however, does not support the conclusion that the amendment to section 66452.6(f) was simply a clarification of preexisting law. The Legislative Counsel's Digest specifically states that "the bill would expand the definition of development moratorium." Senate Bill 186, Stats. 1988, ch. 1330, at 3375 (emphasis added). Since the Legislative Counsel is a state official required by law to analyze pending legislation, it is reasonable to presume that the Legislature amended the statute with the intent and meaning expressed in the Counsel's digest. People v. Martinez, 194 Cal. App. 3d 15, 22, 239 Cal. Rptr. 272, 276 (1987). By its ordinary meaning, the term "expand" indicates a change in the law, rather than a restatement of existing [\*\*11] law. In light of the Counsel's comment, Eastport's argument is unpersuasive.

#### The AFF just intensifies the application of antitrust to already covered activities – it does NOT curtail an exemption.

#### Vote neg – eliminating exemptions and immunities provides a limited AND predictable basis for prep, and focuses debates on the balance between antitrust and regulation, ensuring conceptual unity.

### 1NC – Court Clog DA

#### Federal courts fear a clog of trebled private antitrust suits—they manage the burden with procedural ‘floodgates’.

**Stern 3** (BA, JD Candidate at University of Pennsylvania Law School). Toby J. Stern. 2003. “Federal Judges and Fearing the "Floodgates Of Litigation". 6 U. Pa. J. Const. L. 377. <https://scholarship.law.upenn.edu/jcl/vol6/iss2/8/>)

\*\*Clayton Act Section 4 is the basis for private rights of action in antitrust—it establishes damages for "any person injured in his business or property by reason of anything forbidden in the antitrust laws”

Another set of cases in which the floodgates argument recurs are those involving the enforcement of the antitrust laws under Section 4 of the Clayton Act.3 9 Floodgates arguments are particularly applicable to Section 4 cases. That statute mandates treble damages and attorneys' fees to a successful antitrust litigant,40 providing an incentive for 41 someone with a marginal claim to sue.

For example, in Calderone Enterprises Corp. v. United Artists Theatre Circuit, Inc., the Second Circuit Court of Appeals considered "the question whether one who is not a 'target' of an alleged antitrust conspiracy has standing under § 4 of the Clayton Act., 42 In answering the question in the negative, the court argued against opening the floodgates to "every creditor, stockholder, employee, subcontractor, or supplier of goods and services that might be affected."4 Specifically, the court claimed that "the lure of a treble recovery, implemented by the availability of the class suit... would result in an overkill." 44 The dissenting judge, however, held fast to his view of the relevant Supreme Court precedents, claiming that the Court "has constantly recognized that antitrust laws should be given the broadest and most liberal interpretation in order to effectuate Congressional intent."45

A similar situation arose in In re Industrial Gas Antitrust Litigation.4 In that case, the Seventh Circuit held that a fired and blacklisted gas worker was not entitled to bring a private treble damages suit against his employer under Section 4.47 The court echoed the fear expressed in Calderone (and cited the language quoted from Calderone above), claiming that "[u]nless § 4's phrase 'by reason of' is interpreted to require a direct causal link between the antitrust violation and the resulting injury, the courts would be flooded with antitrust litigation.”48

Thus the floodgates argument can appear in many types of cases, but tends to recur in those cases where a litigant seeks to establish a new right or cause of action. 49 At the appellate level, it is as likely to be found in dissenting opinions as it is in those of the majority.

#### The plan causes the federal judiciary to react with anti-plaintiff antitrust hurdles.

**Stone 10** (JD from Northwestern, former law clerk to Justice Antonin Scalia on the United States Supreme Court). Judd E. Stone & Joshua Wright. 2010. “Antitrust Formalism Is Dead! Long Live Antitrust Formalism! Some Implications of American Needle v. NFL” Cato Sup. Ct. Rev, 369–70. Accessed 11/5/21 via Westlaw) \*\**Bell Atlantic Corp. v. Twombly* was a 2007 case that held parallel action alone isn’t illegal under the Sherman Act unless accompanied by evidence of an agreement

But what of Twombly itself? One potential response to Twombly already proposed in multiple circles is simple legislation codifying the previous pleading requirements. This action would presumably lead to a large increase in cases at the margin between, as Twombly put it, merely “conceivable” versus “plausible.”152 These cases would be by necessity among the weakest antitrust suits present, requiring the most extensive discovery in order to vindicate the least obvious consumer harms. Antitrust has seen this pattern play out before, however; it was due to the massive proliferation of private actions that inspired much of the error-cost protections not only ensconced in the consumer harm requirements of Section 2 but narrowing Section 2's scope altogether. To borrow a phrase, the cautionary tale for repealing Twombly is that opening the floodgates to all conceivable antitrust claims is a strategic maneuver that will favor plaintiffs in only the very shortest of temporal horizons--before the antitrust “system” of rules reacts accordingly.

#### Strong private right of action in antitrust protects federal class actions – key to deterrence.

Lande 16—(Venable Professor of Law at the University of Baltimore School of Law, Director of the American Antitrust Institute). Robert Lande. Spring 2016. Antitrust Magazine. “Class Warfare: Why Antitrust Class Actions Are Essential for Compensation and Deterrence.” Volume 30. https://scholarworks.law.ubalt.edu/cgi/viewcontent.cgi?article=2019&context=all\_fac.

Class Actions Are Virtually the Only Way for Most Victims of Federal Antitrust Violations to Receive Compensation

The antitrust statutes provide that violations result in automatic treble damages for the victims.2 The legislative history 3 and case law indicate that compensation of victims is a goal, perhaps the dominant goal, of antitrust law’s damages remedy.4 Class actions play an essential role in ensuring that the treble damages remedy serves its intended function of “protecting consumers from overcharges resulting from price fixing.”5 As the Supreme Court noted, “[C]lass actions . . . may enhance the efficacy of private [antitrust] actions by permitting citizens to combine their limited resources to achieve a more powerful litigation posture.”6 Accordingly, “courts have repeatedly found antitrust claims to be particularly well suited for class actions . . . .”7

Without class actions, cartels and other antitrust violators that inflict widespread economic harm would have little to fear from the treble damages remedy. This is because, as a practical matter, class action cases are virtually the only way for most victims of anticompetitive behavior to receive compensation.8 A 2013 study that Professor Joshua Davis and I conducted documents the benefits of private enforcement by analyzing 60 of the largest recent successful private U.S. antitrust cases (defined as suits resolved since 1990 that recovered at least $50 million in cash for the victims9 ). These actions returned a total of $33.8–$35.8 billion in cash to victims of anticompetitive behavior.10 These figures do not include products, discounts, coupons, or the value of injunctive relief or precedent—only cash.11 Consequently, these totals significantly understate the actual benefits of this litigation to the victims involved. And, of course, this study covered only 60 suits (albeit 60 of the largest private recoveries) out of the many hundreds of private cases filed in the United States during this period.

#### Class actions solve overfishing

Homan et al ’14, law clerk in the Vermont Superior Court. Ding Tingting and Ph.D. in Political Science and Law in Beijing, China (Andrew and Ding Tingting, “MAKING AQUACULTURE ACCOUNTABLE THROUGH THIRD-PARTY CERTIFICATION AND CONSUMER PROTECTION LAW IN THE UNITED STATES AND CHINA”, Vermont Law Review)

The Green Guides have proven to be important beyond the obvious application in FTC enforcement actions. In Koh v. S.C. Johnson & Son, Inc., consumers filed a class action under various California unfair competition and false advertising laws, alleging that S.C. Johnson fraudulently deceived consumers when it sold its Windex products with a "Greenlist" seal of approval. 122 "Greenlist," as it turns out, is not a third- party certifier as reasonable consumers would infer, but rather, a creation of the marketer. 123 The district court accepted the conclusions of the Green Guides when it determined that the claims could survive summary judgment, holding that the seal was likely to deceive reasonable consumers. 124 Ultimately, S.C. Johnson settled the dispute for an undisclosed amount and agreed to change the Greenlist label. 125 The case demonstrates that civil litigants may use the Green Guides as evidence in state consumer protection and unfair competition suits. Additionally, competitors may bring suit in the National Advertising Division (NAD) of the Better Business Bureau. 126 The NAD operates a kind of non-binding arbitration. When litigants fail to comply with the conditions of NAD decisions, it reports the unfair or deceptive practice to the FTC. 127 NAD decisions refer to the Green Guides and apply the "reasonable consumer" standard.128 The Lanham Act allows for a civil cause of action where: (1) Any person who, on or in connection with any goods or services, or any container for goods, uses in commerce any word, term, name, symbol, or device, or any combination thereof, or any false designation of origin, false or misleading description of fact, or false or misleading representation of fact, which- (A) is likely to cause confusion, or to cause mistake, or to deceive as to the affiliation, connection, or association of such person with another person, or as to the origin, sponsorship, or approval of his or her goods, services, or commercial activities by another person, or (B) in commercial advertising or promotion, misrepresents the nature, characteristics, qualities, or geographic origin of his or her or another person's goods, services, or commercial activities, shall be liable in a civil action by any person who believes that he or she is or is likely to be damaged by such act. 129 Because the Green Guides provide substantiated examples of false and misleading environmental claims, plaintiffs in Lanham Act actions may employ the data and conclusions of the Green Guides as evidence against defendants whose green marketing claims match the false claims exemplified in the Guides or whose claims do not comply with the guidelines in some way. In addition to federal consumer protection laws, marketers making green claims or using first or third party seals of approval or certifications must also ensure that they do not violate state consumer protection laws. Because federal consumer protection laws do not preempt state regulations, more than half of the states have a "mini-F.T.C." law. 130 Some states have incorporated the Green Guides into their consumer protection and anti- unfair competition laws, which amplifies the legal power of the Green Guides. 13 1 In California, false environmental claims are unlawful and punishable by fine. 132 In addition to prosecution by the state attorney general, private citizens may also sue violators under a variety of state laws, including common law fraud. 133 Any nationally implemented certification label or seal of approval that makes express or implied claims about the sustainability of farmed seafood would therefore need to comply with state law in addition to the federal standards outlined above. China's civil law system provides for consumer protection law generally but does not offer specific guidance for green marketing claims. The Law of the People's Republic of China on Protection of the Rights and Interests of the Consumers provides that "[c]onsumers shall enjoy the right to obtain true information of the commodities they purchase and use or the services they receive."' 134 Depending on the circumstances, this includes the right to know the origin of production of the commodity. The law further provides that "operators shall provide consumers with authentic information concerning their commodities or services, and may not make any false and misleading propaganda."' 135 Of interest for green product labeling in general and "green" farmed fish specifically is where the operators use advertisements, product descriptions, sample products, or other means to indicate the quality status of the commodities or services. The law requires that the operators guarantee that the actual quality of the commodities or services they provide shall comply with the indicated quality. 136 Until recently, enforcement of these standards rested with government authority, which the law required to take heed of consumers' complaints. 13 7 Under the Consumer Protection Law, actions enforceable by fines and suspended operation include adulterating a commodity, "forging the origin of commodities, forging or counterfeiting the names and addresses of other factories, and forging or counterfeiting the authentication marks of famous- and-excellent-product marks," and "making false and misleading propaganda about their commodities or services."' 138 Unfortunately, the rules under the Consumer Protection Law made it difficult for citizens to seek redress for contaminated products or falsely certified products. Consumer protection law in China took a leap forward when the Standing Committee of the National People's Congress approved amendments to the Law of the People's Republic of China on the Protection of Consumer Rights and Interests in October 2013.139 Consumer organizations under the previous version of the law could assist consumers in resolving disputes and could publicize information about violations of consumers' rights. Under the amended law, the China Consumers' Association, a social organization, may file lawsuits in the people's courts. 140 This change in the law, which went into effect on March 15, 2014, will likely give rise to the first class-action lawsuits under consumer protection law in China.141 Although recently strengthened, China's consumer protection laws do not provide enough traction for civil suits and government enforcement to have a tangible effect on transparent and non-deceptive claims about eco- seafood. Because of the multi-level, decentralized enforcement of consumer protection law in the United States through state and federal regulators as well as potential civil causes of action, consumers may act as quasi- regulators, resulting in economic benefits for producers who voluntarily comply with higher standards and truthfully label their products as such. Unfortunately, for consumer forces to positively affect the conditions on the ground in aquaculture, consumers need better tools and transparency to understand the differences among available third-party standards.

#### Extinction

Rhea Suh 16, Master’s Degree in Education, Administration, Planning, and Social Policy from Harvard University, BA in Environmental Science from Barnard College, Former President of the Natural Resources Defense Council, now Fellow at the Watson Family Foundation, “Sounding the Alarm on Ocean Noise”, NRDC, 5/12/2016, https://www.nrdc.org/experts/rhea-suh/sounding-alarm-ocean-noise

Beneath the surface of our oceans lies a finely balanced, living world of sound, most of which we never hear topside. But to whales, dolphins, and other marine life, sound is survival, the key to how they navigate, find mates, hunt for food, communicate over vast distances, and protect themselves against predators in waters dark and deep. Our oceans, though, have become vast junkyards of industrial noise — often louder than a rock concert — from commercial shipping, military sonar, and seismic blasts that test for oil and gas. The seas have become so loud, in places, that these great animals are drowning in noise that threatens their health, their future, and their very lives. On May 19, the Discovery Channel will premiere an important new NRDC film that documents this shattering underwater peril. Sonic Sea calls on us to turn down the volume before it’s too late. Naval sonar drills leave whales disoriented and impaired. They can go silent and abandon their habitat, and some even become stranded and die in a desperate bid to escape torturous noise. Watermen report entire populations of fish vanishing across broad ocean regions after oil and gas seismic blasting. And in a world where a staggering 60,000 commercial tanker and container ships are plying the seas at any given time, each one as loud as a nearby thunderstorm to area marine life in the area, the onslaught of undersea noise has become relentless, doubling roughly every decade. For animals that live by what they hear, more and more of our oceans are sounding like the factory floor: too loud for conversation at the center of their life. North Atlantic right whales off the coast of Boston regularly lose up to 80 percent of their communications range, their ability to process sound drowned out by commercial shipping. And it’s getting harder to find sanctuary — anywhere. To the future of marine life worldwide, deafening noise is hardly the only threat. It is compounding the stress ocean life faces a growing litany of environmental ills. Climate change is raising ocean temperatures, threatening coral reefs. When we burn coal, gas, and oil, we put carbon pollution in the air. Much of that carbon settles into our seas, raising the acidity of global waters in a process called ocean acidification, impairing the ability of shellfish to grow strong shells. On top of all that, our seas are confronting chronic overfishing, chemical pollution, oil and gas production, and a global tide of plastic waste. By compromising the ability of whales, dolphins, and other marine life to feed, reproduce, and protect themselves, ocean noise is undermining the natural resiliency species need to cope with these other threats. The sea is where life on earth begins. If our oceans die, we won’t survive. And here’s the thing: Ocean noise is a problem we can solve. Like a summer night when the fireworks end, our oceans return to their natural soundscape when we turn down the noise. That’s what NRDC has been working to do for the past two decades, standing at the forefront of the fight against ocean noise worldwide. Last year, we won a court settlement to protect whales, dolphins, and other marine mammals from powerful sonar during routine U.S. Navy tests and exercises off the coasts of Hawaii and Southern California. Naval security and readiness remain sound. We don’t have to harm or kill some of the most majestic creatures on earth to safeguard our seas and shores. We’ve also sued the oil and gas industry over seismic blasting that threatens marine life, winning important improvements in the way such testing is done in places like the Gulf of Mexico. And we helped persuade the United Nations International Maritime Organization to adopt guidelines for reducing low-frequency ocean noise from commercial ships. There’s far more, though, that we must do. Better shipping technology and practices, changes in military exercises and tests, and stronger safeguards against seismic blasting at sea can all go a long way toward reining in the acoustic assault on our oceans. And we need forward-looking action plans from the U.S. Navy, the Interior Department, the Transportation Department, and the National Oceanic and Atmospheric Administration, the federal agencies that produce or manage noise in the sea. To quiet the world’s waters, though, we all need to raise our voices. That’s what Sonic Sea is all about: increasing awareness of this growing threat and building a worldwide community of citizen advocates to help us turn down the volume on undersea noise.

### 1NC – Private PIC

#### The United States Congress should pass new legislation to compel antitrust agencies to prohibit private sector anticompetitive practices by participants in the blockchain nucleus.

#### Counterplan PICs out of private enforcement---private suits are an inextricable part of antitrust liability---public enforcement is sufficient

McCarthy et al., GC & Chief Legal Officer of Womble Bond Dickinson (US) LLP, ‘07

(Eric, Allyson Maltas, Matteo Bay and Javier Ruiz-Calzado, “Litigation culture versus enforcement culture A comparison of US and EU plaintiff recovery actions in antitrust cases,” <https://www.lw.com/upload/pubContent/_pdf/pub1675_1.pdf>)

In comparison, in the European Union, private enforcement actions are rare and play less of a role than public enforcement in the fight against anti-competitive behaviour. Several obstacles hinder actions for damages in member state national courts, including a plaintiff’s limited access to evidence, the unavailability of class actions and the potential that the plaintiff may have to pay the defendants’ costs if the plaintiff loses the case. To address these obstacles and the great diversity of damages actions among the member states, the European Commission recently published a green paper on Damages Actions for Breach of the EC Antitrust Rules.3 The green paper examines those aspects of EU litigation practice that have led to a pronounced underdevelopment of private damages actions in the EU. Since its publication in December 2005, the green paper has sparked significant debate within the international antitrust community about the role of private enforcement of EC Treaty competition law and about damages actions in particular. The general expectation is that private damages actions will emerge (albeit slowly) in the European Union. This article compares the state of plaintiff recovery actions in antitrust cases in the US with that of the EU and explores why the United States is more litigious than the EU. Private antitrust damages actions in the US Rightly or wrongly, the United States has earned the reputation of having a ‘litigation culture’ that permeates its entire legal system.4 If that is true, it certainly earned its stripes this past year in the area of antitrust litigation. Although the number of civil cases filed in the United States dropped by 10 per cent from 2004 to 2005, the number of antitrust civil filings, almost all of which were initiated by private plaintiffs, rose by 8.8 per cent.5 In the first six months of 2006, the number of antitrust class actions doubled over the same period in 2005.6 Some experts speculate that “[h]ard-charging regulators, a more aggressive plaintiffs[’] bar, and the implementation of [CAFA]” may contribute to the increase in antitrust litigation.7 But in all likelihood, the explanation is far more elementary. As discussed in greater detail below, the pot of treble damages available to plaintiffs in the United States, as well as pro-plaintiff discovery and procedural rules, make private damages extremely easy and attractive to pursue. The treble damages remedy In 1914, the US Congress passed the Clayton Act, codified at 15 USC sections 12-27. Section 4 of the Act extends the Sherman Act’s prohibitions on anti-competitive behaviour and, most notably, allows “any person who shall be injured in his business or property by reason of anything forbidden in the antitrust laws” to sue for and “recover threefold the damages by him sustained”.8 Treble damages were designed to deter illegal conduct, deprive antitrust violators of the “fruits of their illegal activities” and provide compensation to victims of wrongdoing.9 The Clayton Act’s treble damages provision is not without its critics.10 Many practitioners and policy makers contend that trebling damages creates too great an incentive for plaintiffs to sue. Additionally, they argue, treble damages actions can result in a windfall to plaintiffs. Furthermore, some believe that large fines and the potential for criminal penalties create just as much of a deterrent against violations, without the need for treble damages.11 Nonetheless, the ability of a US private plaintiff to recover treble damages is so sacred and well protected that earlier this year the First Circuit held in Kristian v Comcast Corp12 that, although Comcast could contract with its subscribers to arbitrate antitrust claims, the arbitration agreements could not bar treble damages because “the award of treble damages under the federal antitrust statutes cannot be waived”.13 Although exceptions to the treble damages provision remain few and far between, congress enacted the Criminal Penalty Enhancement and Reform Act (CPERA) in June 2004. CPERA eliminates the treble damages remedy for corporations that qualify for amnesty under the Department of Justice’s Amnesty Programme.14 Under CPERA, a corporation must report its own anti-competitive behaviour to the DoJ and enter into the Corporate Leniency Programme.15 If a private plaintiff sues the corporation for the same behaviour, the civil court may assess single damages against the participating corporation, but only if the judge in the civil action determines that the corporate defendant is cooperating with the civil claimant by providing a full account of the conduct, furnishing all potentially relevant documents, and securing testimony, depositions and interviews from employees.16 Discovery and evidence Plaintiffs enjoy broad discovery rights in the United States under the Federal Rules of Civil Procedure. These rules provide significant incentives for plaintiffs to file damages suits, even if they have very little factual bases for the underlying claims. At the outset of a case, the parties are obliged to make certain disclosures to one another, including the name of each individual “likely to have discoverable information” and a description by category and location of all documents in the party’s possession or control that it may use to support its claims or defences.17 Thereafter, during the fact-finding or discovery period, plaintiffs may seek a defendant’s business documents through written requests18 as well as answers to questions through written interrogatories.19 Plaintiffs may also ask questions of a defendant’s employees (regardless of seniority), who must sit for depositions and testify under oath.20 Moreover, plaintiffs may seek documents and testimony from non-parties with relative ease.21 Armed with such easy access to a defendant’s or non-party’s documents and employees, plaintiffs with limited evidentiary bases for their lawsuits may be inclined to sue and go on ‘fishing expeditions’ to discover facts to support their case. Contingent fees Plaintiffs that file antitrust damages actions in the United States routinely do so on a contingent fee basis. Under such an arrangement with counsel, the plaintiff client does not pay any fees to his or her attorney unless and until the plaintiff collects damages either by settling with the defendant or prevailing at trial. Typically, plaintiffs’ attorneys demand 33 per cent of the recovery as the fee.22 The result is a win for both client and attorney. The fee arrangements allow plaintiffs with limited funds the freedom to pursue their lawsuits without having to fund the litigation along the way. The plaintiffs’ attorney, on the other hand, is attracted to the prospect of treble damages, and thus a larger fee, and therefore is willing to front the litigation costs in the hopes of earning a sizeable fee at the conclusion of the suit. Class actions Class actions are the procedural device that enable one or more plaintiff members of a proposed class to sue on behalf of all similarly situated members of the same proposed class.23 Courts in the US have recognised that class actions can be appropriate mechanisms for promoting private enforcement of the antitrust laws.24 In this way, large numbers of potential claimants can prosecute their claims in a cost-efficient manner.25 The objective of any class action lawyer is to get the class certified. To do so, the court must find that the proposed class is “so numerous that joinder of all members is impracticable”, that there are “questions of law or fact common to the class”, that the “claims or defenses of the representative parties are typical of the claims or defenses of the class” and that the proposed class representatives “will fairly and adequately protect the interests of the class”.26 In addition, in most antitrust cases, the court must determine that the “questions of law or fact common to the members of the class predominate over any questions affecting only individual members” and that “a class action is superior to other available methods for the fair and efficient adjudication of the controversy.”27 Under rule 23, proposed class members are afforded the opportunity to decline to join or to ‘opt out’ of the class. But if the class is certified, all class members who do not affirmatively opt out are bound by the decision in the case and cannot pursue their claims individually. Class actions remain a popular means among plaintiffs’ lawyers to litigate antitrust conspiracy claims because they are regularly certified. State indirect purchaser actions In Illinois Brick Co v Illinois,28 the US Supreme Court held that, in order to maintain a claim for damages under section 4 of the Clayton Act, a plaintiff must have purchased the product in question directly from the alleged defendant-antitrust violator. The landmark decision thus precludes plaintiffs in a federal court from seeking alleged damages that were ‘passed through’ from the defendant down the chain of distribution in the form of overcharges. In direct response to Illinois Brick, many US state legislatures passed antitrust statutes that permit indirect consumers (ie, below the direct purchaser in the distribution chain) to sue the alleged violator. Today, 29 states permit such suits, or, alternatively, allow the state attorney general to pursue antitrust claims on behalf of indirect consumers.29 In these ‘Illinois Brick repealer’ states, as they are known, defendants face the real prospect of defending against lawsuits that mirror direct purchaser lawsuits pending against them in a federal court. Huge jury verdicts and settlements One natural result of the ease with which plaintiffs can pursue treble damages actions in the United States is huge jury verdicts in private antitrust cases. In Conwood v US Tobacco, the plaintiff manufacturer of moist smokeless tobacco (snuff) sued a competitor, the manufacturer of Copenhagen and Skoal, for unlawful monopolisation in violation of section 2 of the Sherman Act, among other claims.30 The jury awarded plaintiffs approximately US$350 million in damages, which, when trebled, resulted in an award that exceeded US$1 billion. The award is thought to be the largest antitrust jury verdict ever recorded.31 Additionally, the several aspects of US litigation highlighted above are a catalyst to settlement. Even before discovery begins, some defendants, confronted with the promise of invasive and expensive discovery, will choose to settle with plaintiffs in order to spare their employees from intrusive discovery and to save on exorbitant legal fees. Plaintiffs routinely extract large settlements from defendants after gaining access to corporate documents and information that, although not dispositive of any wrongdoing, are damaging or embarrassing enough to justify settlement. Similarly, class actions may contribute to settlement of private damages actions because, if certified, defendants do not want to risk losing at trial and therefore pay treble damages. The same is true for state indirect purchaser actions. Defendants often settle these suits in order to avoid duplicative litigation costs.32 Settlement is also preferable for many defendants in this situation who rightly fear the application of collateral estoppel if they are adjudicated liable in even one state.33 The ultimate risk of large jury verdicts inspire settlements even if the defendants litigate the cases for years and at great expense. In 1998, in In re NASDAQ Market-Makers Antitrust Litigation, MDL Docket No. 1023, plaintiffs settled with 37 defendants for a total of US$1.027 billion.34 And in 2003, on the eve of trial, defendant Visa USA settled with plaintiffs in In re Visa Check/Mastermoney Antitrust Litigation, 297 F Supp 2d 503, 506-508 (EDNY 2003) for approximately US$2 billion. Two days later, defendant MasterCard settled for approximately US$1 billion. The combined US$3.05 billion settlement has been described as “the largest antitrust settlement ever”.35 Private damages actions in the EU In stark contrast to the United States, private damages actions in the EU are few in number and have never played much of an antitrust enforcement role. Although the European Court of Justice (ECJ) in 2001 explicitly recognised a right to damages for breaches of EC competition law,36 plaintiffs have pursued very few damages claims for violations of competition rules. According to a 2004 study (the Ashurst Study), private damages actions based on the violation of either EU or national antitrust rules are in a state of “total underdevelopment” due to various obstacles in bringing such lawsuits.37 To address these obstacles, the EC recently published a green paper, in which the Commission has sparked significant discussion on the present and future role of private enforcement in the EU. This section explores that role. EU antitrust laws and enforcement In the EU, there are two levels of antitrust laws and enforcement. The Commission enforces EU antitrust rules at the EU level, which is limited to public enforcement. At the member state level, however, national antitrust authorities and national courts apply both EU and national antitrust laws. Member states permit private enforcement, including damages actions, through national courts.38 Within this two-tiered system, national antitrust authorities and national courts may apply both EU and national antitrust laws, though substantively there is often little difference between the two. Articles 81 and 82 of the European Community Treaty govern antitrust enforcement. The ECJ long ago decided that these provisions create rights for private parties that national courts must safeguard.39 In Courage v Crehan, the ECJ held that these rights include the right to damages,40 and recently it clarified that such a right includes compensation not only for actual loss, but also for loss of profit plus interest.41 Moreover, with the adoption of Regulation 1/2003,42 the Council of the European Union ‘modernised’ antitrust enforcement by including new procedural rules for the application of articles 81 and 82. In particular, by devoting specific provisions to national courts, the EU legislative branch has recognised the fundamental role that national courts play in the private enforcement of EU antitrust law for the first time since the inception of EU antitrust enforcement in the early 1960s. The green paper These developments, however, have not been sufficient to ensure an effective system of private antitrust enforcement, particularly damages actions, throughout 25 jurisdictions with very different legal traditions and markedly diverse substantive and procedural rules. According to the Ashurst Study, to date there have been only 28 successful private actions for damages for violations of the antitrust laws in the EU.43 More often than not, only single large companies that allege anti-competitive behaviour by dominant competitors have pursued private damages actions. For these well-financed plaintiffs, the damages that they seek are large enough to offset the trouble and costs of private litigation before a national court. In light of the obstacles to private enforcement in the EU, the Commission published its green paper in 2005 to facilitate damages actions, enhance the overall effectiveness of antitrust enforcement and, ultimately, increase compliance with antitrust laws. In response to criticism from those practitioners who fear the adoption of a USstyle system that could lead to ‘excessive litigation’, the Commission has stated that the objective is that of building “an enforcement culture, not a litigation culture”, in which private enforcement would complement public enforcement.44 For each obstacle to damages actions, the green paper proposes several solutions, although the Commission has not yet indicated how it intends to implement any of these solutions (eg, by means of an EU Directive harmonising certain aspects of national law, or thorough ‘soft law’ such as Commission guidelines). Amount of damages Treble damages are not available in the EU. It is also not likely that they will be any time soon; the Commission notes that the US treble damages system can lead to “unmeritorious or vexatious litigation”.45 Instead, compensation is limited to the harm suffered, without the possibility of obtaining punitive or exemplary damages. Plaintiffs may thus usually recover only the loss actually incurred, as well as, in some countries, the loss of profits.46 The Ashurst Study, however, revealed that this system of limited recovery provides disincentives to private litigation.47 To provide balance, the Commission proposes to maintain the rule of single damages, while contemplating the possibility of awarding double damages in cartel actions.48 On this issue, it recognises that the addition of double damages will require the implementation of appropriate measures to avoid jeopardising the effectiveness of leniency programmes (eg, successful immunity applicants would be exposed to single damage recovery only).49

### 1NC – Cap K

#### Blockchain development drives crypto-colonialism – unsustainable development locks in climate change and social unsustainability

Howson 20 (Howson, P., School of Arts and Humanities, Nottingham Trent University; “Climate Crises and Crypto-Colonialism: Conjuring Value on the Blockchain Frontiers of the Global South”, May 13, 2020, https://www.frontiersin.org/articles/10.3389/fbloc.2020.00022/full)

This commentary explores how international development and climate change adaptation and mitigation credentials are being called upon to justify “crypto-colonialism” – neo-colonial processes (Stoneman and Suckling, 1987) whereby blockchain technology is enabling new forms of resource appropriation from the Global South. These appropriations include land, labor, data and other resources needed to facilitate economic growth elsewhere. The term Global South is used here to distinguish between spaces still suffering the scars of colonial expansionism, from those that have historically benefited from these processes (Kapoor, 2004). As with many past development agendas imposing structural economic reform, the contemporary crypto-colonial exercises discussed here are often framed as part of a “will to improve” (Li, 2007) – a quest for betterment enabling the powerful to use development and conservation discourses to legitimize particular claims at the expense of others (van Teijlingen and Hogenboom, 2016). Tsing(2005, p. 57) suggests that through such speculative enterprises, “profit must be imagined before it can be extracted; the possibility of economic performance must be conjured like a spirit to draw an audience of potential investors.” The following section explores how investors are drawn to the sustainable development frontiers – the code/spaces where crypto-colonial conjuring manifests. The paper then discusses three ways blockchain is implicated in colonial processes, exploring: (1) how the technology plays into ongoing narratives of “green grabbing,” enabling the liquidation of resources for green investment, (2) how blockchain impacts persistent North-South trade and investment inequalities, and (3) how a new power asymmetry is enabled by the technology through data colonialism and surveillance capitalism. The paper concludes by discussing how more equitable outcomes might be realized.

Climate Crises, Crypto-Colonialism and the Global South

Despite being distributed, blockchain applications do not occupy an algorithmic place apart. They are always messily embedded in places (Zook and Blankenship, 2018; Lally et al., 2019). Governance frameworks of blockchain applications are heavily entangled with social-spatial relations in multiple ways (Dodd, 2018). The intertwining of code and materiality creates complex manifestations of “code/space” (Kitchin and Dodge, 2011). Within each code/space a unique assemblage of interests gain access to (or are excluded from) sites of crypto-economic production. The geographical character of the blockchain should be understood both in terms of the identification and spatial location of the infrastructure of, for example, private servers and data centers, where the distributed network is thought to materialize, as well as the “bundle of experimental algorithmic techniques acting upon the threshold of perceptibility itself” (Amoore, 2018, p. 12).

The costs and benefits of blockchain-based conservation, community development, and disaster relief, are rarely evenly distributed (Howson, 2020). Blockchain-based interventions in the Global South, though rooted in an obvious will to improve (Li, 2007) still call upon traditions of frontier investment – the belief that being bold and early in underexplored spaces enables the highest rewards (Li, 2014). As Bridge (2001) argues, frontiers are imagined (and constructed) as sites of bountiful emptiness. They are fecund spaces, empty but full. For their proponents, these sites are empty of other entrepreneurial ideas, histories and claims, but full of potential for new and improved use. As Tsing (2005, p. 28) explains, a frontier is “an edge of space and time: a zone of not yet – not yet mapped, not yet regulated. […] The landscape itself appears inert: ready to be dismembered and packaged for export.” Conjuring the plausibility of frontier resources for global crypto-economic exchange requires promoters to overlook the presence of people who remember long histories of recurrent dispossession and neo-colonial imposition.

Transnational market-based approaches to sustainable development, such as appropriations of land for community development, biodiversity conservation, and climate change adaptation and mitigation, are playing an increasingly central role in the global capitalist economy (Büscher and Fletcher, 2018). It should not be surprising when such market logic influences the development of “blockchain-for-good” initiatives. In doing so, blockchain projects enable new manifestations of the now well-established narrative of “disaster capitalism” (Klein, 2007). This thesis contends that neoliberal capitalism both precipitates disasters associated with climate change, while employing these same crises as an opportunity to facilitate the expansion of a neoliberal “green economy”1. Klein (2019) suggests that through the use of Blockchain technology the climate crises is enabling new forms of “crypto-colonialism.” The term crypto-colonialism2 was coined before the invention of blockchain to refer to neo-colonial expansions toward host countries seeking to acquire greater political independence. This was at the expense of greater economic dependence upon the neo-colonial power. The term is used here in a slightly different way, to make sense of how blockchain technology enables new forms of “green grabbing” for global carbon markets, maintains North-South disparities using climate finance instruments, and enables data colonialism through the provision of humanitarian assistance for climate refugees. These projects are all legitimized under a banner of sustainable development in response to calls for urgent action on climate crises.

Green Grabs for Cryptocarbon

Blockchain technology is being leveraged to address the multiple technical faults of global carbon-offsetting mechanisms like Reducing Emissions from Deforestation and Forest Degradation (REDD +). The REDD + mechanism was established by the UN in 2007 to incentivize conservation and make tropical forests more valuable standing than cut down. However, since its inception many REDD + initiatives have become implicated in “green grabbing” (Howson, 2018). Green grabbing can be understood as part of an on-going debate on neo-colonial “land grabbing” more generally (Pearce, 2013), involving the appropriation of land and resources with pro-environmental motives. This form of appropriation includes the transfer of land as property, use rights and control over natural resources that were once publicly or communally owned – or not the subject of ownership – from marginalized groups into the hands of the powerful (Fairhead et al., 2012). Green grabbing is not the same as a simple, agreed transfer of ownership or sale. It is a central characteristic to processes of accumulation and dispossession (Harvey, 2005). It is an emotive term because it is unjust. This form of grabbing often entails the expulsion of existing land claimants in order to release resources for private capital (Fairhead et al., 2012).

#### Blockchain reforestation is a *nightmare* for the planet – it locks in corporate accumulation at the expense of genuine ecological progress. Instead of solving foundational problems with the Net-Zero approach, it doubles down on land grabbing, unsustainable crypto mining, and land theft.

Howson 19 (Howson, P., School of Arts and Humanities, Nottingham Trent University; Oakes, S., CIFOR, Situ Gede, Sindang Barang, Bogor (Barat); Baynham-Herd, Z., School of GeoSciences, University of Edinburgh; & Swords, J., Department of Geography and Environmental Sciences, Northumbria University; (2019). Cryptocarbon: The promises and pitfalls of forest protection on a blockchain. Geoforum, 100, 1–9. doi:10.1016/j.geoforum.2019.02.011)

The weaknesses of REDD+ have become clear in recent years. Technological as well as social and environmental justice concerns, have led some to argue that REDD+ represents another conservation fad, driven primarily by NGOs and their institutional needs to secure donations (Redford et al., 2013; Lund et al., 2017). Others argue that the weaknesses are not fundamental to its operation (McGregor et al., 2014a, 2014b), and that REDD+, although troubled, remains a cornerstone mechanism for protecting the world’s forests (Angelsen et al., 2017). Technical tweaks are all that is required (Duchelle et al., 2018). The rise of blockchain is inspiring techno-ecological innovations, which we argue, are attempting to paper over the cracks of four key interlinked mechanical faults. These include: (1) lack of public interest leading to unsustainable funding, (2) deficient Monitoring, Reporting and Verification (MRV) regimes, (3) inequitable distribution of project costs and benefits, and (4) failure to secure rights for forest dependent and indigenous communities. The remainder of this section will explain how these faults and their respective crypto-fixes are playing out in practice.

2.1. Fault 1: REDD+ project funding is limited and unsustainable

Low demand for carbon credits and low carbon prices in an already volatile carbon market has meant that possible REDD+ funding streams are far too limited to support the hundreds of projects contending for consumer attention (Gizachew et al., 2017). Indeed, the instability and poor reliability of sustainable sources of private finance has proved a major hurdle for REDD+ uptake (Dixon and Challies, 2015). While REDD+ was originally conceived as something that would be funded by a massive global carbon market (McGregor, 2010), this vision no longer reflects reality. The majority of all avoided emissions remain unsold, causing a continued saturation in supply. Only a tiny proportion of over 330 REDD+ initiatives around the world have been able to access payments directly from any carbon market (Evans, 2017).

Some blockchain-based projects are actively addressing REDD+ funding issues, while others are in earlier stages of development. These interventions range from offering REDD+ credits in exchange for popular cryptocurrencies, to enabling automated payment protocols – transforming carbon credits into exchangeable tokens. However, these blockchain-based REDD+ funding platforms are problematic. Projects aimed at enabling transactions of carbon credits using Bitcoin, such as Cool Earth’s Offset-Bitcoin project, produce a significant carbon footprint. Bitcoin’s consensus protocol (known as Proof-of-Work or PoW) necessitates an ever-increasing hash rate — the amount of computing power needed to maintain the network (Huckle and White, 2016). Currently, each Bitcoin transaction has a carbon footprint of 400 kg/ CO2e.3 A single Bitcoin transaction is equivalent to 450,000 VISA transactions (Digiconomist, 2018). Mora et al. (2018) suggest that Bitcoin emissions alone could increase average global temperatures by more than 2 °C, over the next 30 years. Despite the inherent contradiction of offsetting emissions with something so energy intensive, there are clear benefits for REDD+ project implementers to receive funds in cryptocurrencies. The project receives payments without suffering ‘frictional losses’ – the necessity to share funds received with host governments, brokers, NGOs, or other intermediaries. Organisations such as BitGive and BitHope for example, facilitate traceable transactions to projects using widely circulated cryptocurrencies like Bitcoin and Ethereum for this reason (KFNX, 2018) (see Table 1).

Similar repudiation is required when a blockchain is used to transform carbon credits into tradable tokens. The process of conjuring value is unique to each token. Some tokens are similar to currencies, others are more like securities, and others have properties that are entirely new (Conley, 2017). Some REDD+ projects, including Rimba Raya’s Veridium project, are selling tokens speculatively, like shares in a new company, as part of an Initial Coin Offering (ICO). Other projects, such as Poseidon and Ecosphere+, give tokens as an incentive to people offering their computer power to host the platforms’ distributed ledger. As with any commodity, the value of a cryptographic token is not natural or permanent (Appadurai, 1995). Bitcoins are theoretically valuable as representations of the computer processing ‘work’ that went into their production, as well as their theoretical scarcity, and their utility as a medium of exchange (Li and Wang, 2017). Ether, Ethereum’s ‘smart-contract’ 4 token is valued as the currency used to purchase the services of a particular application (Evans, 2017). In contrast, the value of a cryptocarbon token is derivative, literally derived from the value of the underlying avoided emissions, and other REDD+ co-benefits. However, as Büscher (2010) argues, the problem with producing ‘derivative nature’ in this way, is that forests, people and livelihoods are arranged as ‘underlying assets’ for the ‘real’ source of value of neoliberal conservation. Despite offering an immutable and ‘trustworthy’ (with regards to maintaining consensus between contracting parties), efficient and accessible means of carbon commodity exchange, cryptocarbon tokens are not capable of representing the materiality of ‘saved carbon’. These underlying ‘assets’ are a fetishised abstraction of ‘nature’ in both image and value (Nel, 2015). Blockchain cannot fix that.

2.2. Fault 2: REDD+ projects fail to accurately monitor, report and verify forest carbon attestations

Due to the dynamic nature of forests, REDD+ projects cannot attest to permanent removals of atmospheric carbon. Milne et al. (2019) problematize the overly simplified codification systems used to quantify REDD+ project attestations that are elusive, ethereal and non-permanent in nature. As explained by Angelsen et al. (2012), issues with representing dynamic forest eco-systems stem from the methods used to predict and model future conjectural deforestation patterns, the quality of data for constructing reliable historical deforestation rates, and the use of non-permanent carbon stock sampling plots. Despite some gains in satellite technology, numerous methodological problems involved in quantifying the emissions saved through REDD+ projects continue (Green, 2018). This includes problems identifying and agreeing baselines or reference levels.

Blockchain-based applications aim to improve the reliability of carbon sequestration monitoring. For example, FlowerTokens5 are an experimental project centred on the verification and representation of specific plants, to create a combined crypto-collectible physical asset.6 FlowerTokens are part of a series of projects oriented around the production of ‘hybrid ecosystems’ – a mixture of crypto-collectibles and verified, physical, constantly updated securities. During the development phase of the project’s implementation, users can buy, trade, and speculate on tokenised Freesias (familie Iridaceae) within an online marketplace. The token is a representation of an individual flower, with each token linked to data generated by a ‘camera oracle’. 7 The state of the individual tokens are automatically updated according to the different phases of the corresponding plant’s growth and decline (Terra0, 2018).

Although unquestionably creative, many cryptocarbon experiments are not new, but instead offer cryptographic re-runs and modular replacements for previous experiments in REDD+. Blockchain experimenters, Gainforest,8 have developed an application to verify threatened patches of forests and attestations of ‘caretaker’ action through ‘Proof-of-Care’ protocols. However, instead of identifying threatened forests based on convenience – a common criticism of many REDD+ schemes to date (Lin et al., 2014) – Gainforest uses algorithms to predict areas-at-risk in order to prioritise sites for intervention. Using the Gainforest platform, donors can pledge any amount, which is distributed to forest caretakers. Donors can also see where and when their support impacts conservation efforts in real-time using smart-contract distribution systems.

Some blockchain projects have abandoned the unfeasible task of forecasting future deforestation patterns, instead focussing on the remediation of already degraded land, and incentivising a ‘Change-ofState’. Regen Network9 proposes to use a series of ‘Ecological State Protocols’ to monitor on-the-ground conditions and generate more reliable attestations about the material health of any predefined geographical area. According to Regen, the core set of protocols and remote sensing tools have been co-produced by working groups of scientists, ecologists, farmers, and community members, and will be open source (Regen Network, 2018) (see Fig. 1).

Regen and Gainforest propose fully automated carbon offset initiatives that utilise self-executing code governed by smart-contracts. To help prevent fraudulent behaviour, monitoring, reporting and verification of all carbon storage attestations are decentralised and remotely operated. Remote sensing tools include RaDAR and LiDAR, but also depend on ‘Proof-of-Location’ (PoL) devices, sometimes known by the ominous term, Sentinels.

Sentinels linked to blockchain-based incentive distribution infrastructures depend on the Internet of Things (IoT), networks of smartphones and other devices embedded with electronics, software, sensors, actuators, and connectivity. Companies, like XYO Network10 and FOAM,11 have built open protocols to enable devices to connect, triangulate and exchange data for forest conservation projects. According to FOAM, their protocols are designed to empower users to build consensus-driven maps that can be trusted for every application. The goal of the PoL solution is to provide the framework and infrastructure to support a decentralised, privacy-preserving, highly accurate, censorship resistant alternative to GPS (FOAM, 2018).

Many REDD+ interventions, ostensibly designed to promote reforestation have, in some cases, accelerated biodiversity loss by providing perverse incentives for unsustainable management and conversion of natural forests to monocultured landscapes (Barr and Sayer, 2012). Deep learning Artificial Intelligence (AI) technology, or Artificial Neural Networks, are being ‘trained’ to know the difference. For example, according to Boyda et al. (2017), the D-Wave AI platform is 90% accurate at recognising a range of tree species from aerial photographs. This demonstrates how computers can be programmed to look at and analyse images. iNaturalist12 is launching a deep-learning-based app that automatically identifies plants and animals by species. The application identifies and learns patterns from photos uploaded by users of their website that have been verified by their community of experts and amateur ‘citizen scientists’. However, these intelligent monitoring algorithms are encoded with human prejudice. As O’Neil (2016) explains, algorithms are simply opinions framed as math, dependent upon a historical data-set and an ‘objective function’ - an idea of what constitutes success. There is therefore no objective algorithm, because the interests that build an algorithm, define success. The interests of capital are coalescing with blockchain algorithms, ‘big data’, and AI in the monitoring, reporting and verification of the environment. This will inevitably lead to an expansion of capitalist interests, at the expense of sound environmental management.

2.3. Fault 3: REDD+ project benefits are inequitably distributed

Regen and Gainforest do not clearly specify how they intend to identify and verify appropriate ‘caretakers’ to participate in their incentivisation programmes. For many REDD+ schemes, in the absence of formal tenure and ‘carbon rights’ regimes, participation has often been mediated through social relationships, technical knowledge and access to local markets and capital (Karsenty et al., 2014; Howson, 2017). Many projects have proved highly exclusive with benefit-sharing frameworks disproportionately excluding women and other already marginalised groups (Cavanagh and Benjaminsen, 2014; Nel, 2015; Howson, 2018). Projects have also proved expensive with project funding generally only covering the cost of project inception. Land concessions and associated licensing fees often swallow up the lion’s share of available funds. Enrici and Hubacek (2018) report such fees in Indonesia to range from US$0.6 million to US$1.4 million. Third party intermediaries including officials, auditors, verifiers, consultants and scientific experts, who ensure REDD+ baseline levels are believable, are also expensive and absorb much of the residual capital (Gupta et al., 2012).

In many contexts where conventional, non-blockchain-based REDD + projects have been implemented, payments have never made their way to the forest dependent communities, who pay the highest cost and take on the highest levels of risk (Howson and Kindon, 2015; Nel, 2015; Enrici and Hubacek, 2018). Payments have typically been made in-kind as community development assistance (Milne and Niesten, 2009). Fintech solutions for REDD+ benefit sharing regimes, in the form of mobile money platforms, are being proposed to enable small-holders and other rural actors to access economic benefits. Thompson (2017) points out that several countries including Cambodia, China, Tanzania, and the Philippines demonstrate both high REDD+ uptake, and high ‘emoney’ penetration. Using existing mobile technology infrastructure in these rural locations lowers transaction costs, enables higher frequency payments, and could provide new socioeconomic benefits to those with the capacity to participate.

Thomason et al. (2018) suggest that leveraging blockchain and distributing payments using digital ‘crypto-wallets’ might go further, offering opportunities to access some of the financial benefits of protecting forests for the most vulnerable. The authors provide several case-study examples of how this works in practice, in Papua New Guinea, Swaziland, Somalia, Armenia, and Samoa. Through the orchestration of Decentralised Autonomous Organisations (DAO),13 information from remote monitoring sensors use verification protocols and automatically dictate the allocation of resources among a group of rural individuals (DuPont, 2017). However, issues around digital exclusion have, so far, been largely ignored. As Warren (2007) points out, there is a danger that in rural areas, non-users of communication technology will become disenfranchised by such developments, and these include some of the most disadvantaged and vulnerable sections of rural society. Our own research in the forests of Central Kalimantan also highlights the damaging social and environmental effects of privileging those with REDD+ access capabilities while ignoring those without (McGregor et al., 2014a, 2014b; Howson, 2018).

There are also unresolved issues surrounding the conditionality and programmability of forest protection incentive tokens. Blockchain is changing the way aid agencies provide assistance, including tokenised cash transfers, as well as using biometrics to register and track beneficiary assistance through iris scans and fingerprinting (Sandvik and Raymond, 2017). Cryptographic tokens such as AidCoins14 for example, are fully programable to ensure donations are spent ‘correctly’. Oxfam Australia are also exploring the potential for similar tokens to enable programmable payments to individuals and organisations during disaster events in the Pacific (OxChain, 2018). Cryptocarbon token transactions, and, potentially, the economic life of individuals living in remote rural locations, could be monitored, managed, and even switched-off remotely, to ensure transactions occur as intended by the project implementers.

2.4. Fault 4: REDD+ projects fail to secure the rights of forest dependent and indigenous communities

REDD+ projects have often failed to generate improvements in well-being for participating stakeholders (Sunderlin et al., 2017). Projects have undermined indigenous rights (Krause, 2013), and perpetuated securitisation and violence by government actors (Cavanagh and Benjaminsen, 2014). Carbon projects often promote adversarial relationships within and between indigenous groups, encouraged through a market-based REDD+ that relies on well-defined property rights. Even in cases where indigenous land tenure has been secure and risk of dispossession minimal; such market-based undertakings have presented a tendency toward exclusionary management practices (Sullivan, 2009). Yet, for most carbon offset projects, a regulatory framework of safeguards operates in order to manage potential social and economic risks (Jagger et al., 2012). These risks include involuntary displacement of forest dependent and indigenous peoples from their land, as well as other rights violations. REDD+ projects that operate best-practice safeguards, often fail to pay attention to the specificity of socio-cultural, historical, and political contexts, which aggravates already complex land access and tenure regimes in the Global South (Barletti and Larson, 2017). This lack of clear and exclusive tenure rights in places, continues to be identified as a key failing of many market-based approaches to forest conservation (Larson et al., 2013).

In much of the Global South, uncertainty around land holding is common, as are disputes over titles and accusations of pervasive state corruption (Kshetri, 2017). Blockchain-based applications have been developed to enable land titling systems that are more efficient, transparent and theoretically immune to corrupt practices. For example, multiple states in India have switched to blockchain technology to record land deals (Oprunenco and Akmeemana, 2018). According to Bal (2017), due to a lack of coordination between various registering agencies handling land records in India, the information registered is not standardised. This leads to ambiguity in terms of the nature of rights being transferred by the transaction and the boundaries of the land being transacted. Records are not updated promptly and entries rarely reflect the true nature of ownership of a particular parcel of land. In 2015, India was facing a backlog of 124,325 cases for property registration. The governments of Honduras, Georgia and Rwanda have faced similar challenges, also spurring the development of blockchainbased land-titling solutions (Mwanza and Wilkins, 2018).

The Terra0 blockchain project takes advantage of the way these blockchain-based land registries fail to differentiate between individual, corporate, or even non-human entities as specified owners of land (Gloerich et al., 2018). Their artistic intervention furnishes forests with agency to own and protect themselves. Conceptions of ownership and agency are commonly associated with intentionality of human actors, who exert control through their decision-making, strategies and behaviour. However, recent work around carbon’s socio-natural configurations, consider the agency of carbon more in terms of the sets of relations that produce particular outcomes and enable the ability of these configurations to shape the world (McGregor et al., 2019). With blockchain applications, such as autonomous policy decision making tools (see Kiggins, 2018) agency extends beyond the human, as it no longer requires conscious decision-making. Instead, agency derives from material relations between things, or what Bennett (2010) refers to as ‘thing-power’. By exploiting autonomous land registries, the Terra0 project offers carbon its thing-power, expressed on humanterms. Terra0’s white paper states:

Terra0 is a self-owned forest; an ongoing art project that strives to set up a prototype of a self-utilising piece of land. Terra0 creates a scenario whereby a forest is able to sell licences to log trees through automated processes, smart-contracts and blockchain technology. In doing so, this forest accumulates capital. A shift from valorisation through third parties, to a self-utilisation, [which] makes it possible for the forest to procure its real exchange value, and eventually buy (thus own) itself. The augmented forest, as owner of itself, is in the position to buy more ground and therefore to expand.

These human terms are based on private property relations. Terra0, and projects like it, constitute an opportunity to subvert ‘natural resource’ chattelism. But they may also constitute cooptation of new materialisms, ideas and discourses to mask ‘green growth’ strategies of accumulation. In the following section we consider the implications of all this automation for REDD+ decision making frameworks.

1. Governing cryptocarbon

Automated cryptocarbon platforms can remove the necessity to trust third parties, and in doing so render traditional forms of REDD+ governance obsolete. For conventional REDD+ projects, the most obvious source of governing authority is the various private voluntary carbon standards, which verify emissions reductions and certify project compliance with social and ecological safeguards (Dixon and Challies, 2015). Though verified REDD+ offsets retain traceability to originating projects, mistrust in the state and non-state entities that trace these commodities has been highlighted as the missing building block for the programme’s success (Iley and Elvers, 2017). For carbon offsets to be trusted, Chapron (2017 p403) argues that algorithms should replace the humans that repeatedly fail to be trustworthy. For environmental markets, he argues, “[t]he time is ripe for ‘cryptogovernance’, in which trust, law and enforcement are outsourced to computer code.” The postpolitical challenges of implementing ‘SusTech’ – technology that blends cryptography and sustainability – emerge here as entirely technical; a matter of hardware efficiency, developing and distributing technical dictionaries, and replacing legal protections with smart contracts written in computer code. The rest of this section will consider the flaws to these arguments in relation to automated trust protocols for REDD+ governance, specifically around managing access to project benefits.

With many REDD+ projects to date, there have been gaps between proposed intentions and reality (Howson, 2017). Especially with regards to access to benefits, including financial compensation payments. Some projects have highlighted the conditional nature of their commitments explicitly. For example, the Clinton Climate Initiative envisioned their Sungai Lamandau project as a community-forestry empowerment project with a potential REDD+ ‘bonus’ (Howson and Kindon, 2015). This potential bonus would take the form of a direct financial payment to members of local community groups, payable upon the sale of the project’s carbon credits, should a buyer ever materialise. Proposals behind the EarthToken15 cryptocarbon initiative, built on Ethereum smart contracts, have proved more misleading (Sullivan, 2018). The initiative originally stated their intent towards incentivising forest communities living in and around Zimbabwe’s Kariba REDD+ project site, via their native token. EarthToken16 states that, “People just like you can invest in a sustainable future and share in the success of this enormous opportunity” (see Fig. 2). However, no transfer of tokens has been, or could ever be, made within the current global governance regime of crypto-commodity markets.

The broken promise relates to EarthToken’s conditions specifically excluding investors from ‘high-risk’ jurisdictions, as defined by the US Department of the Treasury’s Financial Action Task Force and Office of Foreign Assets Control, which includes Zimbabwe (Lang, 2018; Sullivan, 2018). Other cryptocarbon projects have tended to promote their promises through whitepaper proposal documents, giving a detailed summary of the implementers’ respective use case. However, these claims tend to be aspirational. For example, XYO network’s whitepaper proposes the launch of two ‘low-earth-orbit satellite sentinels’ by 2019. Veridium proposes a less ambitious roadmap. Their Verde token will be tied to an established REDD+ project, and their management and advisory panel includes well-known names, such as Infinite Earth co-founder, Todd Lemons and US broadcaster, CNBC’s Fast Money host, Brian Kelly. However, despite the efforts of blockchain project implementers to appear legitimate, according to Benedetti and Kostovetsky (2018), most blockchain ventures fail to achieve their stated objectives. 66 percent of blockchain projects that raise funds through public ICOs, fail to form functioning projects.

Participation in autonomous cryptocarbon governance frameworks is defined by property relations, and a belief that parties always act to further their private self-interest (Chapron, 2017). Members must buy shares in the project, in the form of tokens, while the platform maintains a system of incentive payments. Smart contracts running on Ethereum, for example, pay a sum of Ether to the network node that executes that contract. Yet, these incentive structures are unlikely to encourage any new form of mutuality beyond quid pro quo forms of market exchange. They maintain social disconnections and mistrust ‘away from keyboard’. As the founder of the Ethereum Network, Vitalik Buterin explains, organisations run on smart contracts are just like any other human organisation. “In general, a human organisation can be defined as a combination of two things: a set of property, and a protocol for a set of individuals, which may or may not be divided into certain classes with different conditions for entering” (in Greenfield, 2017 p161). Promoting a human-non-human conviviality is not the objective for such a governance framework. The cryptocarbon fix is encoded with market-based principles. A blockchain-based solution for climate change will always maintain the coupling between the non-human and market environmentalism. Both REDD+ and cryprocarbon projects require unfathomably complex forest ecosystems to be simplified into discrete processes and objects in order to define, standardise, and universally agree on their carbon content and value of the associated service provision (Boyd, 2009). Such monetary valuation remains ultimately about advancing capitalist forms of governance, which not only leads to an oversimplification of ecological complexity, but further embeds neoliberal ideologies in global solutions for environmental crisis (Matulis, 2015).

#### IOT and blockchain tech are key to global financialization

Alvarez-Pereira 19 (Carlos Alvarez-Pereira, Founder and President of Innaxis Foundation & Research Institute, “Anticipations of Digital Sustainability: Self-Delusions, Disappointments and Expectations”, Anticipation, Agency and Complexity pp 99-120, 2019, doi:10.1007/978-3-030-03623-2\_7)

Second, ICTs have been key for two processes wich have run in parallel and are fully intertwined, i.e. the globalization and financialization of the economy. This is a perfect example of how the outcomes of technology depend on its coupling with political decisions and societal trends, in this case with the policies of deregulation of finance and international trade heralded by the USA since the 1980s. In this context, financial markets have been transformed by electronic trading, making access to them much more open, but also conducive to the dominance of automation and its extreme variant of High-Frequency Trading (HFT), with software agents executing algorithms to move in and out of ultra-short-term positions at high volumes and high speeds to capture an infinitesimal profit on every trade. So, volumes of financial trading exceed now by many orders of magnitude the physical trading of goods and services, leading to a more prominent role of finance at the same time that it is more and more disconnected from physical reality. It is extremely cheap to represent money as bytes on hard drives and to trade it on the cyberspace, so the virtuality of finance has been reinforced, as show the tripling in the global ratio of financial assets to GDP in the last 30 years and the explosion of a debt-driven economic model, structurally more inclined to speculation, volatility and systemic risk. Examples of this abound at all geographical scales.

#### Financialization, agriculture crisis, extraction from the global south make global collapse inevitable. We are impact turning the rapid acquisition of tech like blockchain and IOT!

Tilzey 18 (Mark, Senior Research Fellow in Governance of Food and Farming Systems, Centre for Agroecology, Water and Resilience at Coventry University, *Political Ecology, Food regimes, and Food Sovereignty*: *Crisis, Resistance, and Resilience*, “The Neoliberal Food regime in crisis” (Chapter 7), 197-225, https://doi.org/10.1007/978-3-319-64556-8\_3)

Until the turn of the new millennium, neoliberalism appeared to be carrying all before it, without serious contradiction for this regime of accumulation. The collapse of state communism and the opening up of China and other centres of super-cheap labour as manufacturing zones for Northern transnational corporations enabled the attack on labour in the imperium to be mitigated by the import of ‘cheaps’ from the global South. As we have seen, this served a crucial legitimation function as well as maintaining satisfactory consumption levels in the global North. Environmental contradictions of productivist agriculture, of manufacturing, and of energy production in the imperium could also be mitigated through shifting these activities to the periphery. As the first decade of the new millennium progressed, however, a variety of contradictions, in terms of capital accumulation, in terms of the supply of basic needs to the global majority (perhaps most notably food), and in terms of the biophysical fabric of the planet and resource supply (all the while representing contradictions of capital for the subaltern classes and extra-human nature), began to ‘come home to roost’ as mounting contradictions for capital, and for neoliberalism in particular.

From the perspective of the ‘classes of labour’, the contradictions of neoliberalism are those of wage stagnation, increasing job insecurity, and increasing indebtedness (global North), and increasing poverty and hunger, lack of access to land and other basic necessities (food, water, shelter, healthcare) (global South). From the perspective of ‘ecology’, the contradictions are those of increased extraction of non-renewable resources, depletion of renewable resources, loss of biodiversity, and global climate change due to capital’s profligate consumption of fossil fuels. In short, from the biophysical perspective, this represents the generalized overconsumption of commodities to feed capital’s ‘treadmill of production’. From the perspective of capital, however, the contradictions for neoliberalism comprise, firstly, an under-consumption (over-accumulation) of commodities arising from competitive pressure to lower wages globally— capital, in other words, cannot sell the commodities that it needs to in order to survive by means of the treadmill of production. We can see clearly, therefore, that the aims of ecological sustainability and the aims of capitalist reproduction are diametrically opposed. Perversely, however, under-consumption leads to a further competitive downward spiral of labour shedding through automation, wage stagnation, and the search for ever-cheaper labour sources in order to lower prices so that market share can be retained. Meanwhile consumption, located largely in the global North, is sustained only by increasingly risky credit-lending and by never-ending product innovation and premature obsolescence. These dynamics can be explained only by reference to the ‘political’, Level 4, in our model, since they are essentially questions of class struggle in the authoritative domain.

But while capital needs to produce and sell more and more commodities to infinity, this unavoidable impulse constitutes a looming and potentially fatal second contradiction for capital in terms of the necessarily finite supply of energy and raw materials required for their manufacture. With the major means of keeping the cost of commodities down, and available in abundance—fossil fuel—having now passed the point of peak supply, the future prospect is one of dwindling stocks, and secularly increasing cost, of these crucial energy sources. Since renewable energy, despite the claims of ‘green capitalists’, cannot generate the cheap, abundant, and continuously expanding supply of energy required to feed capital’s insatiable appetite, the demise of fossil fuel would appear to constitute an insuperable obstacle to capital’s reproduction, unless some equivalent substitute can be found. These are ‘ecological’ or Level 3 dynamics where the ‘political’ dynamics of capital are enabled or constrained by biophysical affordances. At the same time, environmental contradictions for capital as reflexive political response, usually at the level of the state, in terms of regulatory climate change mitigation, generates constraints on capital through tendential restrictions on fossil-fuel consumption and greenhouse gas emissions. This leads, in turn, to the search for, and implementation of, fossil-fuel ‘substitutes’ in the form of, inter alia, the ‘bio-economy’. Since the ‘bio-economy’ requires land, in contrast to the ‘subterranean forest’ of fossil fuel, this inevitably leads to conflicts with food production, particularly in the global South, generating further reflexive political resistance by subaltern classes. These dynamics comprise a dialectic between Level 3 and Level 4.

The issue of land therefore assumes an importance in the current conjuncture that it appeared to have lost during the era of apparently limitless fossil-fuel production and consumption. Thus, as neoliberalism’s expansionary dynamic encounters the looming constraint represented by the exhaustion of the ‘subterranean forest’ of fossil fuel, so land, as in the pre-industrial era, again becomes the principal focus of contention as the basis for either the production of renewable energy, or for the production of food. And the contention is also focused on questions of ‘energy for whom?’ and ‘food for whom?’ Should energy and food be directed towards profligate consumption by the global minority in the North, or towards basic need satisfaction by the global majority in the South? In land, therefore, the different strands of the ‘political’ and ‘ecological’ contradictions of neoliberalism coalesce, culminating in strained social relations and struggles over land, between social classes within the global South, and between the global South and North. This is reflected in the revival of issues long eclipsed during the heyday of neoliberalism (and still largely eclipsed in the global North for the reasons earlier explained), such as land inequality, redistributive land reform, the organization of agriculture, its role in the social division of labour, and its relationship to non-agricultural sectors.

Contradictions for Neoliberalism in General

As we have seen, the crisis of the Keynesian regime of accumulation comprised a supply-side (under-accumulation) crisis, stimulating the turn to neoliberalism. The latter has, in turn, generated the current underconsumption (over-accumulation), or demand side crisis. These are ‘political’ or ‘internal’ contradictions, although enabled concurrently by ‘ecological’ or ‘external’ conditions of production. ‘Internal’ supply-side crisis tends to stimulate technological innovation and the exploitation of new and cheaper conditions of production to exert downward pressure on prices in order to sustain and enhance the rate of profit—hence the impulse towards globalization from the 1970s. The present conjuncture is characterized by the juxtaposition of demand-side crisis, due to the power of capital over labour (Level 4), with a supply-side crisis in the conditions of production, defined by increases in the cost of conditions of production, most particularly oil (Level 3), and the ramifications of political attempts to curb greenhouse gas emissions (together with knockon effects for fossil-fuel-based agriculture and consequent rise in the cost of food) (Level 3 and 4). The demand-side crisis is exacerbated by the supply-side crisis in the conditions of production, representing structural contradictions, compounded by the conjunctural tendency of monopoly finance capital to profit from speculation in newly de-regulated futures commodities such as food (Ghosh 2010; Isakson 2014). The result is a paradoxical situation in which financial surplus continues to increase even as the under-consumption crisis deepens, and the conditions of production exhibit a secular, if uneven, rise in cost.

The current plethora of commodities on the market is the product of global competition to produce masses of products on the basis of low wages and ever-lower costs in the biophysical conditions of production (the ‘cheaps’ of labour power in capitalist production and the ‘zone of appropriation’ that lies behind this). There is a frantic race to introduce new commodities in order to sustain sales, such that supply has become divorced from demand, resulting in major imbalances between the two. The outcome is a frenzied search for consumers that encounters the insurmountable constraint of limits to absorption. This comprises the perennial dilemma for capitalism of seeking reductions in wage costs whilst simultaneously desiring expanded consumption. It also comprises the characteristic capitalist paradox of poverty, or lack of ability to pay, in the midst of abundance. The rise in global trade above production reinforces global competition, while productivity growth in excess of wage increases hinders the realization of the value of goods through sales. The short-term imbalances caused by over-accumulated capital, over-produced commodities, and asymmetrically exchanged goods between South and North are inscribed in the contradictions that culminated in the financial crisis of 2007/8. These imbalances take the form of two fundamental contradictions for neoliberalism in the sphere of demand and in the rate of profit. This means that these contradictions of neoliberalism take place in two spheres, namely, the realization of the value of commodities, and the valorization of capital.

With respect to the crisis of realization, there are, as noted, severe imbalances between production and consumption. By reducing salaries and increasing unemployment and poverty, neoliberalism has eroded the purchasing power of the ‘classes of labour’ (of primary significance in the global North). This has created impediments to the realization of the value of commodities and has led, therefore, to a re-emergence of difficulties in realizing the surplus value that capitalists extract from their labour force. While the Fordist model included, as we have seen, a link between wage and productivity increases, the neoliberal model, by contrast, is premised on the prioritization of competition to reduce wage costs, thereby creating a widening gap between increases in production and purchasing power. The impacts of this have been most severe in the global South, as we have seen, where the labour force plays an insignificant role in global consumption but is vital in reducing costs of production. In addition to the removal of people, wholly or partially, from the land, the superexploitation of workers employed in capitalist production in the periphery is one of the main reasons for the food crisis that erupted almost simultaneously with the financial crisis. As we have seen, superexploitation is compounded by extractivism, founded on ‘accumulation by dispossession’. ‘Neoliberal capitalism has amputated the basic sources of subsistence for one-sixth of the global population’ (Katz 2015, 283).

Significantly, however, these effects have been mitigated in the global North by a number of compensatory mechanisms which have been of benefit even for the ‘working classes’. However, the latter’s ability to purchase even luxury items, in addition to essentials, produced in the global South, is now linked not to improvements in income, but rather to debt. In other words, the realization crisis of neoliberalism has been kept within certain bounds through recourse to credit-lending, that is, to debt. This countervailing factor allowed purchasing power to be maintained despite wage stagnation, the creation of a ‘precariat’, and the spread of unemployment. Workers drew on credit relief, with this credit sustaining consumption levels until debt liabilities reached such a level that default became inevitable. Financial crisis, as we have seen, was the consequence. Clearly these structural proclivities have not been removed, so it seems only a matter of time before another financial crisis descends on the global North. (The financial crisis did not impact as severely on the global South simply because its workers are too poor for larger banks to consider lending to.)

It should be evident, then, that consumption is based on a highly polarized distributive structure at the global level based on the imperium as main consumer, and the periphery as main producer. Thus, 80 per cent of the planet’s population engages in just 14 per cent of private consumption (Katz 2015). In other words, 20 per cent of the global population (overwhelmingly in the global North) consumes 76 per cent of commodities produced. This casts doubt on assertions by alter-globalists such as Hardt and Negri that Marxian class analysis based on the labour theory of value is dead, and that the ‘pain’ of neoliberalism is distributed equally among the ‘multitude’, whether North or South.

With respect to the crisis of valorization, it is the case, as Marx foresaw, that the dynamic of accumulation increases the organic composition of capital, which, in turn, tends to reduce the rate of profit based on the surplus value extracted from the labour force. There are three indications that there has been an increase in the organic composition of capital under neoliberalism. Firstly, there were very significant increases in investment in Asian economies, particularly, most notably China, from the 1980s, which became the new ‘workshops of the world’. High rates of exploitation, particularly of semi-proletarian migrants from rural areas, made the average level of investment in China, particularly, extremely high in relative terms (see case study below). Secondly, despite increased rates of labour exploitation, there has been a uniform process of capitalization (the use of machinery in preference to labour) across all regions and sectors, North and South, associated with the activity of transnational capital. These capitals have sought to increase productivity, even in combination with super-cheap labour, by means of intense computerization of the production process. This has brought about a reduction in the surplus value created by living labour. Increasingly, there is little difference in productivity between labour in the global South and in the global North, but, despite this, wage differentials between the two remain huge. This is the key to super-exploitation in production in the South and the confinement of consumption to the global North. This phenomenon is known as ‘labour arbitrage’ (Smith 2016). Thirdly, the loss of jobs generated by capitalization has generated structural unemployment.

These three processes—high foreign investment by transnational capital, the information revolution, and structural unemployment—have increased the organic composition of capital, resulting in a relative deterioration of the rate of profit. As in the case of the realization imbalances, declining valorization of capital has generated countervailing tendencies. The prevailing countervailing tendency is that identified as number two earlier—driving wages down below the reproductive cost of labour power through an increased rate of exploitation. This is the principle mechanism identified by Smith (2016) in his unification of Lenin’s theory of imperialism with Marx’s labour theory of value. Herein lies the essence of neoliberal imperialism in its authoritative dimension.

Hitherto, these countervailing tendencies of a ‘political’ or ‘internal’ kind in the ‘zone of exploitation’ have been complemented by another, ‘ecological’ or ‘external’, tendency in the ‘zone of appropriation’—that is, a secular decline in the cost of raw materials. But the first decade of the new millennium began to witness a reversal of this countervailing tendency as the cost of the conditions of production exhibited an upward, if uneven, trend. Thus, neoliberalism’s ‘internal’ over-production crisis is compounded by an ‘external’ under-production crisis in the supply of the cheap and abundant energy and raw materials required to sustain the ever-enlarging scale of capital’s production and productivity.

Contradictions for the Neoliberal Food Regime

These relationships between ‘internal’ and ‘external’ contradictions of neoliberalism are exemplified particularly well by the food crisis of 2007/8. The ultimate, or structural, causes of the food crisis may be attributed to the basic accumulation dynamic of the class alliance of disarticulated capital described in the previous chapter, predicated, in the global South, upon a deepening process of primitive accumulation, engendering semi-proletarianization or proletarianization, and the superexploitation of labour. Alternatively, extractivism, through accumulation by dispossession, renders the expropriated work force surplus to requirements from capital’s perspective. Neoliberalizing agriculture has, through its symbiotic relationship with the disarticulated alliance, favoured and reinforced strongly skewed patterns of land distribution and production in much of the global South, particularly in Latin America and Asia, whereby agri-industrial producers, as a small minority, occupy much of the land and produce the bulk of export crops through the socio-naturally alienating techniques of market productivism (Kay 2006; Tilzey 2006; Weis 2007). As an outcome of such skewed land tenure structures, however, the majority of the rural population occupies insufficient land to meet its own food needs (the semi-proletarians), or has no access to land at all (the proletarians). Structurally, such populations therefore occupy a spectrum of class positions. These range from semi-proletarian, producing as much as they can on their small plots, usually for themselves and any surplus for the home market, and selling their labour on the large estates, or in the urban centres (see de Janvry 1981), to fully proletarian. Such ‘classes of labour’ comprise the growing numbers who now depend on the sale of their labour power for their own daily reproduction (Bernstein 2009). Such lack of adequate access to land, a direct consequence of class structures both supporting and supported by neoliberalism, therefore generates market dependence and vulnerability to price volatility.

Following the era of developmentalism, the neoliberal food regime has been characterized by the prising open of Southern markets through the bilateral class interests of neoliberalism, and further exacerbated by reductions in, or elimination of, support for domestic agricultural production, and other entitlement structures, by structural adjustment policies. Structural adjustment policies created new opportunities for the South to become increasingly export-oriented (Petras and Veltmayer 2001), favouring the agro-export fractions of capital in supplying cheap food and facilitating downward pressure on global labour from the 1980s. This has entailed the marginalization of other, sub-hegemonic, capitalist class fractions in favour of the agri-food oligarchy. Bilateral neoliberalization has thus enabled reconstruction of a global food regime that bears certain similarities to the Imperial food regime of the late nineteenth century, to the extent that cheap food is again siphoned off from the periphery to the consumption hubs of the global North (Araghi 2009b).

The consequence for growing numbers of rural producers in the global South has been increased poverty and an enforced process of semiproletarianization, or permanent rural–urban migration and consequent proletarianization. The consequence has been chronic levels of unemployment and under-employment throughout the burgeoning cities of the global South, together with their rural hinterlands (Davis 2006), leading to severe vulnerability and exposure to global market volatility, increasingly manipulated by the power of financialized transnational capital. The corollary is the displacement of local farming systems, the loss of associated biodiversity, and the general degradation of ecosystems and the biophysical resource base. As Araghi has noted, the [neoliberal] enclosure food regime, as the agrarian programme of a reenergized, re-globalizing capital, represents a reversal of the suspension of global value relations [of the state developmentalist era], with drastic consequences for the masses of agrarian direct producers who become redundant on a daily basis, and who are thrown out of collapsing national divisions of labour into the vortex of globalization as masses of surplus labour in motion. (2009b, 135).

This neoliberal ‘enclosure’ food regime, comprising the symbiosis of transnationalized fractions of Northern agri-food capital with extroverted class fractions of the South, has entailed a systematic emasculation of the developmentalist state in much of the periphery. This has involved a concomitant dismantling of government credit and protection for nationally oriented agriculture, together with progressive abandonment of public structures to ensure appropriate domestic food distribution and availability of strategic food staple reserves (Moyo and Yeros 2005). Heavily indebted states, now confronted by increasingly volatile international markets in food commodities and dominated by re-energized agroexport fractions of capital, are unable, or unwilling, to counteract such volatility since they are themselves, due to imperialist rent, privatization and contraction of the tax base, constrained by internal and external fiscal deficits (Ghosh 2010). The consequence is that many states in the global South are today characterized by a triple crisis of increasing semiproletarianization or proletarianization, increased international price volatility for food staples, and decreased capacity, or willingness, to address the consequences of such enhanced vulnerability.

The foregoing affords an ultimate explanation for the structural and immanent vulnerability of the majority of rural (and urban) poor to globalized market ‘forces’, and therefore to food crisis, through their sundering, wholly or partially, from the means of production, and through the consequent generation of market dependence. This constitutes an ‘internal’ (Level 4) contradiction of capital, although one that is inherently conjoined to the exploitation of ‘external’ socio-natural affordances in the generation of ecological surplus as a second structural, ‘external’ contradiction. This second contradiction arises both from the direct impacts of, and indirect and reflexive responses to, the ever-increasing metabolic rift between accumulation and the environmental conditions of production (Araghi 2009a). In this way, the increase in oil prices, and their consequences for global warming, led the ‘automobile-oil complex’, for example, to initiate investment of large sums of capital in the production of agro-fuels, especially in the production of sugar cane and maize for ethanol, and soybean, peanut, rapeseed, and oil palm for vegetable oil. This resulted in ‘an unmitigated attack by financial capital and transnational companies on Southern tropical agriculture’ (Stedile 2015, 37). This structural contradiction in the contraction of ‘ecological surplus’ through secular increase in the cost of fossil energy, combined with more conjunctural and reflexive responses by capital, to generate the causes of the food crisis in 2007/8. These Level 3 to Level 4 dynamics may be summarized as follows: (1) anthropogenic climate-change-induced declines in agricultural output, arising from the impacts of capital’s treadmill of production; (2) oil price rises, impacting upon agro-chemically based agriculture and leading to food price rises, as a result of impending peak oil, compounded by neoliberalism’s reluctance to invest in extractive infrastructure; (3) the diversion of land for the production of agro-fuels as a response to climate change and energy insecurity, again leading to food price rises as the area under food grains declines and, in the global South, peasant production is displaced by productivist, or extractivist, agro-fuel plantations.

Another proximate, or conjunctural, cause of food crisis derived from one of the more specific impacts of global financialization as an internal contradiction—the deregulation of commodity futures markets (Ghosh 2010). The resultant trend towards greater market volatility in agri-food and fuel commodities was compounded by a further ramification of the financial crisis in the global North. Northern finance capital sought a more ‘secure’ home in peripheral economies through investment in fixed assets such as land, minerals, agricultural raw materials, water, agricultural production in addition to the control of renewable energy sources such as hydroelectric power and ethanol plants (Stedile 2015). This ‘internal’ contradiction has served further to reinforce agri-food productivism, or extractivism, in the global South, to marginalize subaltern classes, and to create immanent and actual conditions for food crisis.

This analysis suggests, then, that both the ultimate, structural, and proximate, conjunctural, causes of food crisis arise from the dynamics of the neoliberalizing agri-food system within a disarticulating coreperiphery structure, and are linked intimately to the wider crisis of underconsumption in world accumulation. Thus, the newly disarticulating structure of transnationalized accumulation has facilitated downward pressure on labour costs and conditions of production, leading to underconsumption crisis and enhanced accumulation by neoliberal class fractions as financial surplus. This is the key ‘internal’ contradiction, as the generation of a huge reserve army of labour through primitive accumulation, and accumulation by dispossession, has kept wages low, leading to realization crisis. This is a crisis now increasingly both of and for capital, marking, at a minimum, a signal, and possibly also a developmental, crisis for neoliberalism. But while the cost of labour power has stayed down due to primitive accumulation and super-exploitation, counteracting increases in the cost of wage foods, selective and strategic conditions of production costs have risen progressively, basically through approaching/attained peak oil but also reflexive responses to global warming (agrofuels), manifest in steadily increasing energy and food prices. Thus, the first crisis is one of under-consumption through low wages; the second is through increasing costs in the conditions of production, representing an unusual and significant juxtaposition of demand-side crisis with supplyside crisis in the conditions of production.

#### The alt embraces an socialist developmental path in response to the coming crisis. The IoT generates the *false hope* of dematerialization that allows capital to resecure itself.

Tilzey 18 (Mark, Senior Research Fellow in Governance of Food and Farming Systems, Centre for Agroecology, Water and Resilience at Coventry University, *Political Ecology, Food regimes, and Food Sovereignty*: *Crisis, Resistance, and Resilience*, “Crisis and Resistance: Reform or Revolution?” (Chapter 8), 197-225, https://doi.org/10.1007/978-3-319-64556-8\_3)

The contradictions detailed in the previous chapter suggest that neoliberalism, although still hegemonic in the North, and dominant in the South, is increasingly crisis prone and subject, therefore, to a variety of resistances. Some of these are ‘systemic’ or sub-hegemonic (reformist), reflecting the interest of states, in conjunction with more nationally focused fractions of capital, in re-asserting national sovereignty, whilst others are ‘anti-systemic’ or counter-hegemonic (revolutionary) and seek a post- developmental path in which food sovereignty, agro-ecology, and social equity are of central importance. Still others may be described as ‘alter- hegemonic’, lying somewhere between these two positions, and advocating above all localism and ‘ecologization’. We are therefore passing through a crucial period, socio-politically and ecologically, in which a number of alternative politico-ecological discourses and systems, some systemic and others anti-systemic, are being defined and contested. As I argue in this chapter, more interventionist forms of capitalism (neo- productivism in the global North, neo-developmentalism in the global South) appear likely in the shorter-term, and have indeed emerged already in Europe, and in Latin America, particularly. But while these models may address some issues to do with social inequality and demand- side crisis, they cannot overcome capital’s linear, entropic, and imperialistic dynamic (Biel 2012; Exner et al. 2013).1 In other words, they remain locked within capitalism as reformism, and, while attempting to address some aspects of contradiction, ‘political’ or ‘ecological’, they simply reproduce the overall contradictory nature of capitalism’s social-property relations. In moving, tendentially, from neoliberalism to a more interventionist form of capitalism, akin to Polanyi’s ‘double movement’, the system is encountering, and attempting to resolve, a developmental crisis. But as the resulting modes of reformism fail, as they undoubtedly will, to resolve the continuing contradictory trajectory of capitalism, so an epochal crisis will loom, precipitated by a ‘political’ under-consumption crisis, an ‘ecological’ over-production crisis, and anticipated by the reflexive political resistances of the subaltern classes.

\*\*\* Note 1\*\*\*

1. This argument differs profoundly from that developed by writers such as Rifkin (2014). He uses a non-Marxian argument to argue, as Marx did, that competitive pressure forces capital to innovate and reduce labour costs through adoption of labour substituting technology which, ceteris paribus, raises the organic composition of capital and progressively reduces profits. Rifkin suggests that the ‘zero marginal cost’ (extreme cheapness of commodities) prefigures a new ‘commons’ based on the abundance of such ‘commodities’. There are a number of flaws in his argument: (1) while the argument about ‘zero marginal cost’ is correct as an ‘internal’ tendency (as Marx argued) it ignores the reactions by capital provoked by this trend, most obviously the rise of neoliberalism and its logic of sustaining profit by moving to cheap labour locations—globalization is basically a response to this tendency; (2) ironically, while Rifkin’s argument is supposedly based on ecological arguments—entropy law—in actuality the proposed Internet of Things (IoT) is based precisely on the externalization of the real costs associated with the ‘knowledge economy’. In other words, the IoT is not actually de-materialized at all—it is an energy and materials intensive mode of production. The majority of those ‘hidden’ environmental costs are externalized onto the global South, where the bulk of the materials for IoT are produced. So, the abundance he refers to is in fact an unsustainable abundance based on the illusion of de-materialization; (3) so while Rifkin’s argument is basically about an ‘internal’ process of capital —the rise in the organic composition of capital—ironically it ignores capital’s ‘external’ dynamic as being premised on ecological affordances/ constraints—ironic because ecology is supposed to be at the forefront of his analysis. But it is, in fact, evacuated —unlike the argument developed in this paper. A truly sustainable society would need to be established at a much lower level of consumption than the one he envisages, in accordance with the real entropic constraints of the planet.

## Adv 1

### 1NC – Crypto Causes Warming

#### Cant’ solve climate. Everyone knows how to solve it. We just aren’t because we don’t have political will.

#### Crypto causes warming, wreck democracy, and triggers a massive speculative bubble that pops inevitably

Diehl 21 (Stephen Diehl, I’m a software engineer in London, England, “The Political Case for a Blanket Cryptocurrency Ban”, March 30, 2021, https://www.stephendiehl.com/blog.html)

Bitcoin is the textbook speculative mania for our time. Contrary to its namesake, it is not a currency, it’s a pseudo-asset built around the dubious notion of “speculation for speculation’s sake”. The cryptocurrency market abandons the pretense of trading for price discovery or capital formation and instead entices masses of dumb money investors to pour their savings into what is effectively a unregulated speculative momentum investment untethered to any real economic activity. Cryptocurrency is a greater fools game of shuffling numbers around with cryptography under the delusion that this alchemy of entropy can generate progress and wealth—while in fact it does neither.

If this entire scheme was simply a small group of wealthy individuals playing silly financial games with each other, it would not rise to the level of public policy concern, after all Wall Street trades crazier things everyday before lunch. But the retail enticement of this asset class must become an object of political scrutiny when it becomes predatory investment fraught with systemic risk and when the full global externalities of its existence are considered.

The largest elephant in the room is the environmental damage done by bitcoin mining. As every major news outlet worldwide has covered, bitcoin is an incredibly dirty business that incentivizes and rewards increasing energy waste as part of the design of the technology. While many technologies consume energy, there is no other technology whose core concept is designed around ever-increasing energy waste. The carbon footprint is simultaneously both a failure of the technology and a moral disaster for those that continue to promote it despite its clearly realized ecological consequences. On top of this, in the last year we’ve seen a tobacco-industry level of lobbying and disinformation campaign to try greenwash the carbon footprint of this destructive industry against the interests of the public.

Global climate change won’t be slowed or stopped by a single silver bullet. It will take an aggregate reduction across many industries, many of which are already underway under existing laws and treaties. Crypto is simply the largest and easiest carbon emissions nail sticking out begging for the hammer. It is burning the equivalent of a top 30 nation state all for the sake of insane wealth redistribution to a tiny group of colluding insiders. This is not something humanity can afford anymore and cannot be reconciled with a world of increasing income inequality where our children bear the outsized costs of our climate choices.

The second concern is that of the predatory nature of cryptocurrency investments. Despite conflicting stories pushed by its advocates, cryptocurrency is treated as a speculative investment by the overwhelming majority of participants. Put simply everyone is expecting a return on their investment based on appreciation in value, and for most people it does not present as a investment based on fundamental value but simply as a new financial betting game. As many economists have pointed out, an investment scheme of this form cannot have the property that many investors believe it does. Investing in cryptocurrencies is a negative-sum game, that from a macro perspective simply redistributes wealth from later investors to early investors and the expected return of an average investor is negative, most people are guaranteed to lose money.

The predatory nature of cryptocurrency investment schemes is structurally not that dissimilar from the predatory lending bubble we saw preceding the financial crisis. The United States is a deeply economically unequal society and the proliferation of get-rich-quick schemes taps into a deep weakness in the American mindset. An important whitepaper by Georgios A. Panos & Tatja Karkkainen analyzes the risk perception of cryptocurrencies based on demographics and comes to the conclusion that “a large part of the cryptocurrency market comprises unsophisticated investors with lower financial literacy skills. These investors are likely to overestimate the reward prospects in cryptocurrencies and underestimate the risk involved in related investment.”

Cryptocurrencies disproportionately victimize vulnerable people and those in marginalized communities without access to traditional investments or financial advisory. The overwhelming risk is to naive investors who have been induced to put their savings into volatile cryptocurrency assets by spurious promises of fantastic price increases without the education to assess these claims. The darker perspective is that cryptocurrency may be taking a demographic who would otherwise have had gambling problems and legitimates their addiction by wrapping it up in a veneer of technical legitimacy. Cryptocurrency is not a vehicle for financial inclusion, it is a vehicle for capital destruction and extracting money from the desperate and clueless.

The thesis this administration campaigned on is the obvious truth that the working class needs to be able generate wealth by being given access to opportunity and investment in productive American companies, not in shady offshore crypto schemes that extract wealth from the public. Having a long-term and forward-looking stake in our economy is how generational wealth and prosperity is created, not through speculative gambling.

Across the private sector we see vast economic distortions on the set of new companies that can even be built. Our private sector is dumping billions into marketplaces for the nouveau riche to buy flash-in-the-pan GIFs as ephemeral Veblen goods, and for a whole generation of entrepreneurs to build thinly-veiled Ponzi schemes whose entire business is model revolves around investors taking a rake on gambling action while hiding behind the veneer of “innovation”. What did Silicon Valley’s ICO bubble create? Absolutely nothing. There is not a single profitable company that came out of the excess of $20 billion poured in. Startups have a high failure rate, but a 100% failure rate is unheard of. In America we ran the crypto experiment. And it failed miserably.

All this while our closest allies in Japan, Taiwan, Brazil, and United Kingdom have payment and infrastructure that is decades ahead of America. The fintech revolution happened, it just happened abroad while Americans were hypnotised by libertarian fantasies of selling magic beans to each other. This US obsession with failed promises of the blockchain panacea has had an enormous opportunity cost for the economy and a perverse influence on new venture formation and on renovating domestic infrastructure. The US needs drastic public and private investment in real time gross settlement systems, such as FedNow, and the move towards real time digital payments systems. The fact that the US populace still transacts with paper checks makes us the laughing stock of much of the rest of the world. We can build 5nm semiconductor fabrication processes but can’t build the same dumb FTP-based clearing systems the rest of the world already has. Calcification of existing infrastructure and aging banking infrastructure is form a societal debt that we must repay in order to compete in the 21st century.

Just as the 19th century saw the rise of nation-state sponsored privateering on the high seas, so to are we seeing the rise of a cyber privateering attacks across the public and private sector all across NATO. Cryptocurrency is, by design, the single greatest enabling factor in the rise of exponential explosion in ransomware extortion attacks. A network which is designed to evade sanctions and capital controls will be primarily be used for crime, and the ability to send value beyond the reach of law enforcement, and sight-unseen to anonymous hackers is a game changer for the criminal element. This kind of attack is rapidly becoming a menace to local governments and companies and unless something is done to discourage these attacks then the States is fighting an asymmetric cyber war it cannot win. We’re not just waiting for our cyber Pearl Harbour event, with cryptocurrency we’re enticing it.

In social media era, everyday our adversaries are running very effective military-inspired psyops campaigns to sow division and polarization within the body politic. As many other journalists have pointed out, the information system that drives the election at the heart of our democracies has become decentralized and disentangled from the institutions of the past. Notions of journalistic integrity and funding disclosure are no longer the norm for today’s new media and we’ve yet to grapple with the implications of this for campaign financing. Many people predict we are already seeing or will soon see the effects of so-called Dark Political Action Committees, political campaign pools that take contributions indiscriminately (in cryptocurrency) and distribute funds to influence and shape advertisements and outreach all with no oversight or controls. The mechanisms by which foreign actors can use cryptocurrency to manipulate public financing of elections is completely uncharted territory, it is however clear that most individuals holding cryptoasset are unlikely to fund Democrat seats.

#### Pro-bitcoin takes are shrouded in undisclosed conflicts of interest – reject fraudulent sources

Golumbia 20 (David, Professor, Writer on Digital Studies, Language, Theory, “Cryptocurrency Is Garbage. So Is Blockchain.”, Jun 27, 2020, https://davidgolumbia.medium.com/cryptocurrency-is-garbage-so-is-blockchain-3e80078e77fe)

6. Cryptocurrency discussion, including cryptocurrency “journalism” and even to some extent academic writing, is permeated by people with a vested interest in cryptocurrency

Nearly all “journalism” outfits devoted specifically to cryptocurrency are funded and run by people who profit off of cryptocurrency price moves. This is not parallel in any way to the ordinary interests anyone has in their own opinions or the “prevailing system” or whatever. Bitcoin “journalists” are frequently being paid by Bitcoin operators to promote cryptocurrency, in exactly the way that, say, Wall Street financial journalists are prohibited from doing. Financial Times journalists are required to be independent and it shows. Many if not all of the major crypto news outlets are either owned by cryptocurrency firms or serve as press release services for them, often without much if any disclosure of conflicts of interest that are not allowed in most reputable financial and even technology publications. This certainly does not mean everything in these publications is dishonest — I’ve quoted more than a few of them here — but it is reason to treat their pieces, especially their pro-cryptocurrency pieces, with skepticism.

CoinDesk, the best-known cryptocurrency news site, is owned by Digital Currency Group, a cryptocurrency venture capital firm (“CoinDesk,” Wikipedia)

Even some of the crypto publications with some reputation for editorial independence are directly funded by the industry: Decrypt (for which Amy Castor writes) is funded by ConsenSys, a crypto incubator; the now-defunct Breaker Mag was funded by SingularDTV, a ConsenSys venture

Bitcoin Magazine was co-founded by Ethereum creator Vitalik Buterin and describes itself as “owned by BTC Media LLC, which is the media and publishing subsidiary of BTC Inc,” a crypto incubator

Technology company IOHK creates a “Blockchain Technology Lab” at the University of Edinburgh (2017) and a “research and authentication center” as part of the University of Wyoming’s Blockchain Research and Development Lab (2020)

Elaine Ramirez, “Is It Ethical for Journalists to Own Cryptocurrency?” (Medium, Jan 17, 2020)

Corin Faife, “We Asked Crypto News Outlets If They’d Take Money to Cover a Project. More Than Half Said Yes” (Breaker Mag, Oct 25, 2018)

Jemima Kelly, “Universities of Britain: Cozying Up to Crypto Is a Bad Look” (Financial Times, July 10, 2018)

Jemima Kelly, “Hey Crypto Bros! Journalism ≠ Advertising” (Financial Times, May 1, 2018)

### 1NC – Cyber D

#### No cyber impact

**Lewis 20** (James Andrew Lewis is a senior vice president and director of the Technology Policy Program at the Center for Strategic and International Studies in Washington, D.C. <KEN> "Dismissing Cyber Catastrophe," Center for Strategic and International Studies. August 2020. <https://www.csis.org/analysis/dismissing-cyber-catastrophe>)

A catastrophic cyberattack was first predicted in the mid-1990s. Since then, predictions of a catastrophe have appeared regularly and have entered the popular consciousness. As a trope, a cyber catastrophe captures our imagination, but as analysis, it remains entirely imaginary and is of dubious value as a basis for policymaking. There has never been a catastrophic cyberattack.

To qualify as a catastrophe, an event must produce damaging mass effect, including casualties and destruction. The fires that swept across California last summer were a catastrophe. Covid-19 has been a catastrophe, especially in countries with inadequate responses. With man-made actions, however, a catastrophe is harder to produce than it may seem, and for cyberattacks a catastrophe requires organizational and technical skills most actors still do not possess. It requires planning, reconnaissance to find vulnerabilities, and then acquiring or building attack tools—things that require resources and experience. To achieve mass effect, either a few central targets (like an electrical grid) need to be hit or multiple targets would have to be hit simultaneously (as is the case with urban water systems), something that is itself an operational challenge.

It is easier to imagine a catastrophe than to produce it. The 2003 East Coast blackout is the archetype for an attack on the U.S. electrical grid. No one died in this blackout, and services were restored in a few days. As electric production is digitized, vulnerability increases, but many electrical companies have made cybersecurity a priority. Similarly, at water treatment plants, the chemicals used to purify water are controlled in ways that make mass releases difficult. In any case, it would take a massive amount of chemicals to poison large rivers or lakes, more than most companies keep on hand, and any release would quickly be diluted.

More importantly, there are powerful strategic constraints on those who have the ability to launch catastrophe attacks. We have more than two decades of experience with the use of cyber techniques and operations for coercive and criminal purposes and have a clear understanding of motives, capabilities, and intentions. We can be guided by the methods of the Strategic Bombing Survey, which used interviews and observation (rather than hypotheses) to determine effect. These methods apply equally to cyberattacks. The conclusions we can draw from this are:

Nonstate actors and most states lack the capability to launch attacks that cause physical damage at any level, much less a catastrophe. There have been regular predictions every year for over a decade that nonstate actors will acquire these high-end cyber capabilities in two or three years in what has become a cycle of repetition. The monetary return is negligible, which dissuades the skilled cybercriminals (mostly Russian speaking) who might have the necessary skills. One mystery is why these groups have not been used as mercenaries, and this may reflect either a degree of control by the Russian state (if it has forbidden mercenary acts) or a degree of caution by criminals.

There is enough uncertainty among potential attackers about the United States’ ability to attribute that they are unwilling to risk massive retaliation in response to a catastrophic attack. (They are perfectly willing to take the risk of attribution for espionage and coercive cyber actions.)

No one has ever died from a cyberattack, and only a handful of these attacks have produced physical damage. A cyberattack is not a nuclear weapon, and it is intellectually lazy to equate them to nuclear weapons. Using a tactical nuclear weapon against an urban center would produce several hundred thousand casualties, while a strategic nuclear exchange would cause tens of millions of casualties and immense physical destruction. These are catastrophes that some hack cannot duplicate. The shadow of nuclear war distorts discussion of cyber warfare.

State use of cyber operations is consistent with their broad national strategies and interests. Their primary emphasis is on espionage and political coercion. The United States has opponents and is in conflict with them, but they have no interest in launching a catastrophic cyberattack since it would certainly produce an equally catastrophic retaliation. Their goal is to stay below the “use-of-force” threshold and undertake damaging cyber actions against the United States, not start a war.

This has implications for the discussion of inadvertent escalation, something that has also never occurred. The concern over escalation deserves a longer discussion, as there are both technological and strategic constraints that shape and limit risk in cyber operations, and the absence of inadvertent escalation suggests a high degree of control for cyber capabilities by advanced states. Attackers, particularly among the United States’ major opponents for whom cyber is just one of the tools for confrontation, seek to avoid actions that could trigger escalation.

The United States has two opponents (China and Russia) who are capable of damaging cyberattacks. Russia has demonstrated its attack skills on the Ukrainian power grid, but neither Russia nor China would be well served by a similar attack on the United States. Iran is improving and may reach the point where it could use cyberattacks to cause major damage, but it would only do so when it has decided to engage in a major armed conflict with the United States. Iran might attack targets outside the United States and its allies with less risk and continues to experiment with cyberattacks against Israeli critical infrastructure. North Korea has not yet developed this kind of capability.

One major failing of catastrophe scenarios is that they discount the robustness and resilience of modern economies. These economies present multiple targets and configurations; they are harder to damage through cyberattack than they look, given the growing (albeit incomplete) attention to cybersecurity; and experience shows that people compensate for damage and quickly repair or rebuild. This was one of the counterintuitive lessons of the Strategic Bombing Survey. Pre-war planning assumed that civilian morale and production would crumple under aerial bombardment. In fact, the opposite occurred. Resistance hardened and production was restored.1

### 1NC – Smart Contracts Fail

#### The legal system cannot possibly keep up – smart contracts will cause a fraud explosion!

Sklaroff 17 (Jeremy M Sklaroff, Senior Editor, Volume 166, University of Pennsylvania Law Review. J.D. Candidate, 2018, University of Pennsylvania Law School; M.B.A. Candidate, 2018, The Wharton School; , “SMART CONTRACTS AND THE COST OF INFLEXIBILITY”, University of Pennsylvania Law Review, Vol. 166, 2017, https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=9605&context=penn\_law\_review)

The impacts go beyond transaction costs. Fraudulent and unconscionable contract terms, traditionally policed by courts, would likely proliferate as “code-savvy parties” take advantage of the “code-naive.”180 Decentralized blockchain adjudicators would be unable to efficiently create doctrine around such fact-intensive questions. And though some proponents have envisioned smart contracts with special intervention functions for traditional courts, they presume that traditional judges will interpret smart contracts using traditional contract doctrine.181 Code fails to contain the interpretive richness conveyed by semantic language, and so intervening courts would be forced to essentially rebuild entire agreements from scratch. This is likely intolerable to both code-savvy and code-naive parties to a smart contract.

These tradeoffs suggest that technology cannot replace what is fundamentally a human activity. Smart contracting certainly proposes exciting new changes to the way transactions might take place, and presents a meaningful step forward from the days of EDI. But a full-scale smart contracting revolution would introduce costs far more extreme and intractable than the ones it seeks to solve. Proponents who argue for a complete replacement of semantic contracts underestimate the power of fluid human behavior and judgment in the contracting process. The flexibility of semantic contracts is a feature, not a bug.

### 1NC – Blockchain Fails

#### Blockchain wont actually solve the problems they isolate, its just marketing

Golumbia 20 (David, Professor, Writer on Digital Studies, Language, Theory, “Cryptocurrency Is Garbage. So Is Blockchain.”, Jun 27, 2020, https://davidgolumbia.medium.com/cryptocurrency-is-garbage-so-is-blockchain-3e80078e77fe)

4. It is “early in the day” for blockchain technology and so we need to wait before we judge whether blockchain will produce interesting results

An excuse sometimes floated for the prior fact, this is a claim made since the earliest days of Bitcoin (and to some extent blockchain). It is wild that anyone takes it seriously. The digital world is saturated with new technologies that stand or fail based on their near-immediate uptake by users. The blockchain story is odd in this way because plenty of people (or machines) run blockchain technology but there are no examples of these technologies doing any of the things their promoters claim for them. Blockchain technology has existed for nearly a decade. Contrast it with similar technologies, by which I mean technologies that can, in some or many circumstances, perform the same functions claimed for blockchain. Imagine if someone said that a service like Facebook or Twitter, let alone a fundamental technology like SQL or HTML, was “still too young to be judged” 10, 5, or even 2 years after it was introduced. Other technologies — technologies that also really do things, just not the things that anybody wants, or not better than other technologies — fade away all the time when they don’t meet user needs. People rarely if ever claim that we need to wait longer to see how great they will be, let alone persist in making claims about ground-breaking and revolutionary digital technology that can demonstrate no such accomplishments.

## Adv 2

### 1NC – Spyware Scenario

#### Zero chance the US can lead on spyware – all of their evidence is about Pegasus – the US owns the tech *and* its made by our closest ally, Israel!

Bergman 22 (Ronen Bergman, Staff writer for The New York Times Magazine and Mark Mazzetti, Washington investigative correspondent, “The Battle for the World’s Most Powerful Cyberweapon”, Jan. 28, 2022,

The F.B.I. had bought a version of Pegasus, NSO’s premier spying tool. For nearly a decade, the Israeli firm had been selling its surveillance software on a subscription basis to law-enforcement and intelligence agencies around the world, promising that it could do what no one else — not a private company, not even a state intelligence service — could do: consistently and reliably crack the encrypted communications of any iPhone or Android smartphone.

Since NSO had introduced Pegasus to the global market in 2011, it had helped Mexican authorities capture Joaquín Guzmán Loera, the drug lord known as El Chapo. European investigators have quietly used Pegasus to thwart terrorist plots, fight organized crime and, in one case, take down a global child-abuse ring, identifying dozens of suspects in more than 40 countries. In a broader sense, NSO’s products seemed to solve one of the biggest problems facing law-enforcement and intelligence agencies in the 21st century: that criminals and terrorists had better technology for encrypting their communications than investigators had to decrypt them. The criminal world had gone dark even as it was increasingly going global.

But by the time the company’s engineers walked through the door of the New Jersey facility in 2019, the many abuses of Pegasus had also been well documented. Mexico deployed the software not just against gangsters but also against journalists and political dissidents. The United Arab Emirates used the software to hack the phone of a civil rights activist whom the government threw in jail. Saudi Arabia used it against women’s rights activists and, according to a lawsuit filed by a Saudi dissident, to spy on communications with Jamal Khashoggi, a columnist for The Washington Post, whom Saudi operatives killed and dismembered in Istanbul in 2018.

None of this prevented new customers from approaching NSO, including the United States. The details of the F.B.I.’s purchase and testing of Pegasus have never before been made public. Additionally, the same year that Khashoggi was killed, the Central Intelligence Agency arranged and paid for the government of Djibouti to acquire Pegasus to assist the American ally in combating terrorism, despite longstanding concerns about human rights abuses there, including the persecution of journalists and the torture of government opponents. The D.E.A., the Secret Service and the U.S. military’s Africa Command had all held discussions with NSO. The F.B.I. was now taking the next step.

### 1NC – India Scenario

#### Their 1AC ev says Modi is causing backsliding

Mauktik Kulkarni 21, Trained in Engineering at the University of Pune, Biophysics at the University of Illinois at Urbana-Champaign, and Neuroscience at Johns Hopkins University, Author at The Fair Observer, Writer for National Public Radio, All India Radio, BBC Marathi, National Geographic, LiveMint, Times of India, and The Hindu, “Why Americans Should be Alarmed by the Pegasus Spyware Controversy in India”, Scroll, 8/2/2021, https://scroll.in/article/1001373/why-americans-should-be-alarmed-by-the-pegasus-spyware-controversy-in-india

Under a collaboration called the Pegasus Project, 17 media organisations from around the world have recently released startling information about the way several governments have allegedly used spyware made by Israeli firm NSO to snoop on perceived adversaries.

Pegasus spyware, classified as a weapon to be used against criminals and terrorists, was allegedly used in India to spy on opposition politicians, bureaucrats and journalists, among others. While the Indian government has denied the charges, all the evidence points to the executive branch running amok.

The unravelling of Indian democracy offers important lessons for the United States, especially with recent revelations regarding former President Donald Trump’s final days in office and the reluctance of his Republican Party in the legislature to hold him accountable.

The destruction of Indian democratic institutions under Narendra Modi since he came to power in 2014 is well documented. If these new allegations are left unaddressed, which is the most likely outcome, their chilling effect on society will ensure India’s swift decline into a sham democracy like Russia.

If true, the implications of such surveillance are not limited to political, bureaucratic, journalistic, or judicial opponents of the current government. They will affect the economic climate, open-minded academic inquiry, and spirited debates among students and civil society, which are all essential for a thriving democracy.

#### Vikram says India is backsliding now because of Modi authoritariasm

Akshai Vikram 21, Doctoral Candidate in Security Studies at the University of Central Florida, Roger L. Hale Fellow at the Ploughshares Fund, M.A from Johns Hopkins University SAIS and B.A. from Johns Hopkins Baltimore, “Indian Democracy Is on The Ropes. The US Must Act”, Defense One, 6/12/2021, https://www.defenseone.com/ideas/2021/06/indian-democracy-ropes-us-must-act/174679/

Even as the U.K. hosted President Biden on a visit to “rally the world’s democracies,” Britain’s reopening is under threat from a new strain of the COVID-19 virus. This new variant, which originated in India, is directly related to Narendra Modi government’s disappointing and less-than-democratic handling of the pandemic. The new coronavirus strain is just one example of the threat that awaits U.S. interests if India, the world’s largest democracy, should complete its slide into authoritarianism. Thankfully, the U.S. still has a number of options to combat, if not prevent, democratic backsliding in India.

Democratic or not, India’s relevance is assured. Its size alone guarantees this. India’s largest state, Uttar Pradesh, boasts a population of over 200 million people, larger than any individual country in Africa, Europe, or Latin America. This hard fact has led Republicans and Democrats to agree on India’s importance, with both sides emphasizing its potential role as a regional counterweight to China. The Trump administration’s National Defense Strategy stressed the benefits of a “free and open Indo-Pacific region” and promised to “strengthen our alliances and partnerships in the Indo-Pacific…to preserve the free and open international system.” The Biden administration made similar pronouncements in its Interim National Security Guidance, saying it will “reinvigorate and modernize our alliances and partnerships,” partially to “hold countries like China to account.” The Biden administration specifically promised to “deepen our partnership with India” as part of this effort.

This strategic logic presumes the United States will be dealing with a democratic India that prefers a “free and open international system,” rather than an authoritarian India that domestically more closely resembles “countries like China” than it does a full-functioning democracy.

But the pace of Indian democratic backsliding has noticeably quickened. It was an ominous warning when Narendra Modi, who was banned from the United States for turning a blind eye to a virtual pogrom against Muslims while chief minister of Gujarat, was elected Prime Minister in 2014. After seven years in power, Modi and his Hindu nationalist Bharatiya Janata Party, or BJP, have further eroded Indian democracy, leading the nonprofit Freedom House to rank India as “partly free” for the first time in 30 years.

Modi’s authoritarian actions have ranged from the pseudo-scientific and laughable to the egomaniacal and lethal. Most notoriously, the BJP sought in 2019 to openly discriminate against Muslim immigrants. The law passed, and when it drew mass protests across the country, the BJP met them with authoritarian force. Later in the year, India stifled the Internet in Kashmir.

India’s democratic backsliding has also hurt its lackluster COVID-19 response. Modi’s BJP has propagated a number of inane myths about the disease, especially quack cures. Party leaders from Modi on down have set bad examples, appearing at large rallies, without masks, and turning the Hindu Kumbh-Mela festival into a superspreader event because “the faith in God will overcome the fear of Covid-19.”

The Modi government has also moved to stifle dissent, especially investigative journalism on its pandemic response. In April, the chief minister of Uttar Pradesh threatened to seize the property of people propagating “rumors” of oxygen shortages. And just last month, when information on the Indian variant was desperately needed, a top Indian virologist on a government panel to investigate the variant suspiciously resigned, after he had been quoted in the New York Times criticizing the government. All this suggests that continued democracy in India is no sure thing.

A fully authoritarian India could take a number of forms, with disparate effects on its relationship with the United States. Shared concerns about China could lead the U.S.-India relationship to mirror the path of American relations with Vietnam, where the two countries have managed to work constructively despite their tempestuous past and Vietnam’s one-party rule.

Perhaps more likely, India under Modi could present a challenge not dissimilar to that of the Philippines under Duterte, a country too strategically important for the U.S. to ignore in its efforts to counter Chinese influence in the region, but one whose authoritarian streak routinely impedes greater cooperation.

Most detrimentally for the United States, India could even one day seek to follow the path of Russia, prioritizing allegiance to right-wing authoritarian ethno-nationalism rather than its historical and geographic disputes with China. This worst case scenario is not as far-fetched as it once might have seemed: in the last few months alone, Russia and India have taken eerily similar steps to stifle Twitter in response to domestic critics.

No matter how authoritarian the government in New Delhi becomes, the United States will need to engage with it constructively on certain issues, especially transnational threats like climate change and nuclear weapons. Fortunately, the Biden administration has already demonstrated its capability to do just that by cooperating constructively with Russia on nuclear arms control and with both China and Russia on climate change, while at the same time confronting both countries on other issues as necessary.

However, there is no scenario where further democratic backsliding in India would make life easier for the United States. At the very least, an increasingly authoritarian Indian would jeopardize the push for cooperation among ‘like-minded’ democracies, especially when it comes to countering China.

International partnerships, like the recent project of coordinated vaccine production from the emerging ‘Quad’ countries—India, Australia, the U.S., and Japan—could conceivably continue even if India moves further from the democratic camp. Even so, they would surely be less resilient if based solely on common interests rather than common values. Efforts by the European Union to increase ties to India would also likely be undermined.

### 1NC – FTC Turns

#### Ftc gets gutted becaues of the aff

**Vaheesan 18** (Sandeep Vaheesan – legal director at the Open Markets Institute. He previously served as a regulations counsel at the Consumer Financial Protection Bureau. <KEN> “Resurrecting “A Comprehensive Charter of Economic Liberty”: the Latent Power of the Federal Trade Commission,” *University of Pennsylvania Journal of Business Law*. Vol. 19, Issue 3. <https://scholarship.law.upenn.edu/jbl/vol19/iss3/4/>)

Among those sympathetic to an expansive Section 5, some are likely to express reservations about its political feasibility. History certainly lends support to this concern. Congress has been hostile to an activist FTC in the past and could be expected to move to rein in any activism. In the 1970s, the FTC zealously pursued its antitrust and consumer protection missions.251 This period of aggressive enforcement and rulemaking triggered a powerful backlash from corporate America.252 The Washington Post condemned the Commission as the “National Nanny” in a stinging editorial.253 This period of zeal ended poorly for the FTC. Congress asserted new power over the agency and imposed additional procedural conditions on the use of its consumer protection authority.254

This fear of a political backlash from business and Congress may be the strongest line of criticism of an expansive Section 5. Corporations pour money into Congressional campaigns to ensure that their interests are represented and advanced. Although the FTC has been averse to policy activism or innovation for decades, the House has tried to limit the FTC’s authority to challenge mergers under Section 5, in the name of creating harmony between the FTC and the DOJ.255

The recent experience of another federal agency is instructive. Congressional Republicans, with the support of some Democrats, have been trying to hobble the Consumer Financial Protection Bureau (“CFPB”).256 The CFPB is seen as aggressively pursuing its statutory mission, bringing a wide range of enforcement actions and writing a number of rules to regulate consumer finance markets.257 In light of its vigor, the opposition from Congress does not come as a surprise. Even under more favorable political circumstances, an FTC that seeks to breathe life into Section 5 is certain to invite comparable Congressional opposition.

The probable reaction from many ideologically or financially captured members of Congress should not be underestimated, let alone ignored. Corporate interests and their Congressional allies would seek to curtail any Section 5 expansions. The FTC is a creation of Congress and so must answer to Congress. Congress can undertake a range of actions to limit the FTC’s day-to-day ability to function and its statutory power. At an extreme, Congress could repeal the FTC Act and shut down the FTC entirely. The risks to the FTC’s future would include various existential threats and should not be brushed aside. Undertaking a reinterpretation of Section 5 without an awareness of political dynamics on Capitol Hill would be a grave mistake.

#### Plan crushes resources.

Lauren Feiner 1/19/22. News Associate @ CNBC. “FTC Chair Lina Khan says agency won’t back down in the face of intimidation from Big Tech.” https://www.cnbc.com/2022/01/19/ftc-chair-lina-khan-says-agency-wont-back-down-in-the-face-of-intimidation.html

As it stands, Khan said the agency does have to choose its workload wisely, which often involves trade-offs about what it can pursue. Given those constraints, the question of which enforcement actions could have a deterrent effect becomes an important one, she said.

“We have to make very difficult choices about which billion-dollar deals we’re going to ensure we’re closely investigating, but there are very real trade-offs in terms of what that work is going to come at the expense of,” she said.

“What are instances in which certain types of actions could have a market-wide impact?” Khan said, giving an example of a question the agency might consider. “If we are able to obtain a particular settlement or consent decree or get a good outcome in court, what are instances in which that could really change the dynamic in the entire market rather than just, you know, here or there?”

# 2AC

## Solvency

### Finishing

#### Finishing Schrepel.

U.S. antitrust law provides several exemptions to different types of entities, which require both the identification of the firm and an understanding of its activities. European competition law applies only to undertakings that carry out an economic activity. Once again, it is then necessary to identify the firm’s boundaries to determine the activities carried out.

Second, establishing the firm’s boundaries is essential when agencies assess the legality of business practices.57 In terms of collusion, U.S. and European courts have recognized that two legal entities that are part of the same eco- nomic unit - that is, the same firm - cannot be held guilty of collusion, as one cannot agree with oneself.58 Antitrust prohibits several forms of cooperation outside the firm, while it always permits cooperation within the firm. The logic is similar in terms of monopolization and abuse of a dominant position. As a company cannot abuse its market power against itself, abuses of power are illegal only when they affect other firms. Above all, defining the boundaries of firms is essential to analyze market power (and thus whether Section 2 of the Sherman Act or Article 102 of the TFEU is applicable to a given case) and the ability to engage in anticompetitive practices. Control indeed confers the firm with the power to implement practices - including the ability to raise prices, which is often central in antitrust cases.

Finally, identifying the boundaries of firms is essential to assign liability.59 Liability for anticompetitive practices rests with the parent company that ultimately controls other entities if such control has been exercised.60 This logic stems from the classic distinction between ownership and control.61

It is safe to assume that antitrust law will capture the activities of blockchain participants at their individual level.62 For example, one could imagine that a miner is considered a company on his own; after all, miners are operating an economic activity. Nevertheless, analyzing whether the entire blockchain layer 1 could be deemed a firm for the purpose of antitrust law is essential if agencies are to understand and apprehend anticompetitive practices that are carried out beyond the simple framework of the individual. For example, suppose a blockchain is implementing practices to exclude another blockchain from the market. In that case, one will want to punish these practices rather than each individual action leading to the entire scheme. I will return to these practices in the coming chapters.

In other words, defining the firm’s boundaries is a necessary step in understanding competitive dynamics, in analyzing practices and eventually, in assigning antitrust liability to the blockchain when, as an entity, it seeks to achieve survival through anticompetitive ways. It is thus essential to carefully consider the elements that are taken into account when defining “firms” under antitrust law. I showed that in the United States, as in Europe, only one element matters: control. This reasoning is problematic when it comes to blockchain.

## Blockchain ADV

### AT: Cryptocurrency Turn

#### Distributed ledgers are key to reach Net Zero emissions.

Daniel Knight 21, Digital Marketing Team at SICCAR, “Can Blockchain Save the Planet? The Role of Distributed Ledger Technology on the Road to Net Zero”, Digital Leaders, 9/29/2021, https://digileaders.com/can-blockchain-save-the-planet-the-role-of-distributed-ledger-technology-on-the-road-to-net-zero/

The latest IPCC report into climate change is yet another reiteration of the urgency of humanity’s dire need to reduce greenhouse gases emissions and invest in sustainable technologies, processes, and infrastructures.

Technologies such as reforesting, rewilding, and direct air capture have showed promise. Governments around the world have also set the target of nations achieving Net Zero, where no more harmful emissions are produced than the amount reabsorbed (most likely through a combination of natural processes such as photosynthesis, and man-made solutions such as carbon capture devices).

Blockchain technology does not have the best reputation when it comes to the environment. Cryptocurrency, the most well-known application of blockchain, has caused a boom in highly energy-intensive activities such as bitcoin mining and producing NFTs. However, blockchain is a technology with many other potential uses and could be a useful tool in achieving Net Zero.

The challenges of achieving Net Zero

To have a shot at achieving Net Zero, let alone the ideal “carbon-negative”, we cannot rely solely on technologies—emissions must also be reduced as quickly and as much as possible. This means that public and private organisations of all sizes must review every single process and appliance used to carry out operations and replace them with sustainable ones.

This includes not only internal processes, but those of any suppliers or partner organisations. Every aspect of an organisation’s effect on the environment must be audited. Accessing the vast amount of data that this entails is not only practically difficult, but also risks violating data protection regulations.

Even with technologies and infrastructure that would solve these particular challenges, achieving Net Zero is a difficult task. Without these technologies, however, it may be an impossible one.

How do blockchain technology and DLT work?

Although the terms are often used interchangeably, blockchain technology is just one type of DLT—or Distributed Ledger Technology. DLT describes technologies that store data in decentralised ledgers, with access managed by administrators and/or programmed authorisation rules. Blockchain, and its continually verified encrypted data blocks, is a type of DLT, as is the newer DAG (Directed Acrylic Graphs).

The environmental uses of DLT

The applications of DLT for secure and reliable data sharing are established, with the technology enabling decentralised yet secure data storage. This could minimise the security and logistical challenges of sharing emissions data between organisations, with immutable data accessible for every step of a supply chain and by any organisation that needs it.

With data stored using DLT platforms, transparency could be increased, organisations empowered to make informed decisions on their suppliers and partners, and unscrupulous actors prevented from falsifying data. For example, wealthier nations could be prevented from excluding overseas emissions (such as those from agriculture or manufacturing outsourced to poorer countries) from their national recorded emissions.

Carbon offsetting, one of the procedures that has been explored to help organisations reach Net Zero, has been plagued by practical issues. “Double-counting”—when multiple people or organisations claim ownership of an offset, causing it to be re-used without more carbon-reducing measures being taken—is a particular problem.

Double-counting could become much more difficult with data stored using DLT. Tokens could be created to represent carbon offsets and tracked reliably in a tamper-proof ledger. In fact, a decentralised ledger of carbon credits has been trialled by the Partnership on Transparency in the Paris Agreement.

It is not just accountability and transparency that DLT could provide. Reliable ledgers could enable more efficient and sustainable resource management in energy and water systems. Especially when combined with smart sensors, waste could be curbed and energy use tracked and monitored in real-time across large-scale infrastructures. The potential implications for disaster relief are also significant, with decentralised shared information enabling faster and more targeted responses.

DLT and the future

No technology is likely to reverse climate change alone. As well as tracking emissions, they must be hugely reduced.

DLT is one of numerous tools at our disposal. However, we must have the collective will and organisation to use it the right way. Even decentralised technologies require human input, and those granted access must be trained, knowledgeable, and willing to put the planet above any other short-term interests.

The international collaboration required to save the planet will take immense effort. This is no easy task, but technologies like DLT could make this collaboration more informed, practical, and focused.

#### Cryptocurrency will reach a wide rollout---that builds resiliency to survive inevitable existential filters

Alex McShane 21, Writer and Head of Video for Bitcoin Magazine, BA from the University of Iowa, Degree from the University College Dublin, Degree from Kirkwood Community College, “Bitcoin and Existential Risk”, Bitcoin Magazine, 9/5/2021, https://bitcoinmagazine.com/culture/bitcoin-and-existential-risk-alex-mcshane

TL;DR - An existential risk is the possibility of an event or series of events that could drastically curtail humanity’s potential. A hypothetical global catastrophe could be anthropogenic or non-anthropogenic and internal or external in nature. The adoption of Bitcoin will better position us to address these risks as a society.

EXTERNAL NON-ANTHROPOGENIC

A catastrophic collision with an astronomical object, such as an asteroid impact would be an external non-anthropogenic risk. This has already occurred here several times. During the Permian Triassic period (ending 250 million years ago) an astronomical impact killed 90 percent of the species on Earth. It took tens of millions of years for life on Earth to repopulate and Earth’s intelligence potential to recover.

One interesting external non-anthropogenic risk is Earth’s reflected light, which could be measured by an external intelligence who then come to extinguish us. (The topic of our own signal bringing about this death by misadventure is discussed further below.)

What does this have to do with Bitcoin?

Generally, hard money facilitates greater innovation and technological process. At this point one might argue that if we do not migrate to some degree from Earth as a species, and are subsequently wiped out by an astronomical object impact or a super-volcanic event, the risk becomes anthropogenic in nature. We are a centralized species on a grand scale, and at this point one could say we have through consensus chosen to remain vulnerable to a single vector of attack by staying here.

Bitcoin is not only the hardest money known to man, it is the most responsible from this standpoint. Bitcoin as it currently operates is currency that can provide a monetary framework on which humans can achieve greater capital growth, collaboration, resource allocation, and therefore technological progress. Because the terminal supply of Bitcoin is capped, we can store value in it indefinitely as a society.

66 Million years ago the Cretaceous-Paleogene Extinction Event extinguished the life and intelligence potential of the non-avian dinosaurs. This series of events was external, and broadly non-anthropogenic in the sense that no form of life on Earth at the time contributed to its own demise, but more specifically, at the time of those astronomical impacts the first humans hadn’t split from chimpanzee lineages. This split is thought to have occurred between between 4 and 8 million years ago.

An important distinction between astronomical impacts or super-volcanic events of the past and such events if they were to happen today is that one could argue that our intelligence potential is now mature enough to tackle certain of the external existential risks. Today, the risk posed by an asteroid impact or something similar would still be external in its origin, but at what point does the burden of responsibility to migrate off of the planet fall upon our population? We can surely solve for some external existential risks, and in any case, no one is going to do it for us. You could say that failing to collectively pursue a solution when technically we could have would recategorize a civilization-extinguishing asteroid impact as an external but anthropogenic risk.

At what point do innovation dampening authoritarian states and their mandated broken money cause society to stall at a local optimum? Surely the government has already caused this. It’s only a matter of time before another object strikes the Earth with devastating consequence. I would argue it is irresponsible to continue life here with government money. Government money is an existential risk. Bitcoin is not only a solution, it is a societal responsibility.

INTERNAL ANTHROPOGENIC

Nuclear war is one example of an internal anthropogenic risk. That is, should nuclear war arise, it would be both self destructive, and relatively self contained on a cosmic scale. It follows that biological warfare is an internal anthropogenic risk, the reality of which we as a species can surely understand now. If I were to hazard a guess I would say virtual emergencies and cyber pandemics are next. These self constructed catastrophes are the government’s misguided attempts at proof of work. This is a topic for another time. Do not surrender your ability to think and speak freely.

The second law of thermodynamics can summed thus, processes that involve the transfer or conversion of heat energy are irreversible. The law indicates we have not observed a spontaneous transfer of energy from cold to hot. Another way to think of this is that there is no such thing as cold, only lesser degrees of hot. Nothing cannot transfer. So broadly, within a closed system, the second law of thermodynamics would indicate that all differences tend to level out.

So what has this got to do with Bitcoin?

Well firstly, all hardware is subject to entropy. The distributed nature of the blockchain increases the probability that it will survive centralized entropy. At Bitcoin’s inception, imagine a failure because Satoshi’s computer randomly crashed. Distributed networks are inherently hedged against this particular centralized form of existential risk.

The second law of thermodynamics also suggests that on a grander scale, relatively isolated (centralized) systems will degenerate more and more into disordered states. Proof of work, and network growth are two ways Bitcoin fights against falling into disrepair.

Bitcoin uses proof of work to stave off entropy. The system cannot stay dormant. It must continue to use proof of work to advance the state of the chain, and to fight entropy to secure the monetary value all of the users have stored in the network. The U.S. dollar, as many have pointed out, relies on proof of war, or distributed political energies to maintain dominance. Its methodology can be described as haphazard at best.

INTERNAL NON-ANTHROPOGENIC

One internal non-anthropogenic risk is that of a super-volcanic eruption, provided it wasn’t humans who brought about the eruption. Just like with external non-anthropogenic risks, Bitcoin alone cannot prevent them, but it can help humans prepare for them such that we may survive these relatively small intelligence filters the universe throws our way.

Bitcoin allows for fundamental capital accumulation and human innovation, and promotes collaboration to such a degree that we will find an increased collective problem solving power as humans the further Bitcoin adoption spreads. It is worth mentioning that Bitcoin also maintains and appreciates wealth to such a degree that often those of us to chose to live our lives on a Bitcoin standard will experience relatively greater freedoms, and vastly greater amounts of free time than our peers who chose to continue their lives on a fiat standard, and are perpetually working to outpace their chronic debt. Many Bitcoiners will likely forego that newfound free time to work and continue to provide value to others in whatever area interests them, because Bitcoin incentivizes the collaborative accumulation of capital but also the responsible reallocation of it.

EXTERNAL ANTHROPOGENIC

An external anthropogenic risk has the least probability of occurring. This is a problem of reach. Imagine human intelligence being sent into the cosmos and signaling or generally causing an external intelligence or astronomical object to come back to extinguish us. This is a most improbable extinction by misadventure.

The probability that we send messages of consequence into the cosmos that in turn cause some other far-flung intelligence, with knowledge enough to reach us, to come and bring about our own destruction is next to zero, but it isn’t zero.

I would posit that the probability increases every day that Bitcoin survives, with each person that chooses to hold Bitcoin over fiat, because on a fiat standard we are again, stuck at a local optimum at best, and each day the global monetary system devolves further into chaos. The fiat world may continue to be habitable chaos, but our technological progress and our greatest capacity for innovation cannot be achieved on a fiat standard.

A Bitcoin standard is not only our current best bet, it is the only monetary vehicle that will take us from here, or enable us to build technology that can effectively communicate with places in the universe where other intelligence has emerged. The other reason this fatal miscommunication is unlikely to occur is that once through a Bitcoin standard we have manage to build a society that can effectively reach and communicate at greater depths of the cosmos we will at that time have already become a multi-planetary, if not transitory, if not multi-solar system species. The topic of Bitcoin in space and planetary interoperability will be discussed in a later essay.

The most distant human made object from the earth is the Voyager 1, which is over 13 billion miles away. (For perspective, Apha Centuri, the nearest star system to Earth, is 25 trillion miles away.) Human radio signals have announced our presence and our intelligence to the cosmos since around 1900. The first human radio signals have all ready traveled 114 light years, that is 681,920,540,000,000 miles. Although the reach of our radio signals is very great, the probability of us being heard and subsequently extinguished is negligible. External anthropogenic risks are the least of our concerns at the moment.

As Bitcoin adoption grows, it serves to promote advances in artificial intelligence and nanotechnology. External anthropogenic risks will become more relevant to human intelligence at a much later time. External non-anthropogenic risks are similarly out of our hands for the time being. That is, at the moment there is nothing we can do to prevent the Sun from becoming a red giant star and subsuming the Earth.

But we do already have the monetary technology upon which to engineer solutions to some of these problems. We have the potential as humans to prevent internal global catastrophes, both those set on by us and not. Survival and longevity is arguably our greatest task as a species. Adopting Bitcoin, and protecting this network is proceeding with diligence and a long eye toward the future in all of our political and scientific affairs. The existential risks of living are great, though it is human nature for our ambitions to out pace our current abilities. The only evidence of life is change. To change is to exit fiat currency, it is to use Bitcoin instead.

## FTC ADV

## OFF

### T Scope Exemptions---2AC

#### We meet! Blockchain is immune from antitrust under judicially-crafted exemptions. The scope of law is limited under Sherman to ‘the firm’, defined in *Copperweld* as vertical control. That excludes blockchain, which is entirely horizontal---that’s Schrepel.

[1AC SCHREPEL – FOR REFERENCE]

2.2.1 The firm’s boundaries in antitrust and competition law

The Sherman Act in the United States and the TFEU in Europe are both the subject of extensive case law. The vast majority of the jurisprudence is not concerned with the question of the firm - that is, the person that is the subject of antitrust and competition law. The firm’s structure has transformed very little since the introduction of these two texts; it has become more complex, but has not changed in nature.33 For that reason, litigation generally involves other issues subject to further disagreement. Nevertheless, blockchain’s emergence forces us to reassess the definition of a “firm,” to analyze whether decentralized groups can be captured by antitrust law as currently conceived or if blockchains should be captured through another theory. In the United States, antitrust provisions apply to all “persons”34 affecting trade and commerce by unlawful restraints and monopolies.35 According to Section 7 of the Sherman Act:

the word ‘person,’ or ‘persons,’ wherever used in sections 1 to 7 of this title shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the Territories, the laws of any State, or the laws of any foreign country.36

The text does not further define the term “person”; it simply establishes exemption regimes for which antitrust is not applicable - mainly concerning federal government agencies and instrumentalities.37

The case law is more informative. In *Copperweld*,38 the Supreme Court stressed that although “[n]othing in the literal meaning of [the Sherman Act] excludes coordinated conduct among officers or employees of the same company,”39 there is “general agreement that § 1 is not violated by the internally coordinated conduct of a corporation and one of its unincorporated divisions.” On that basis, the Court held that “there can be little doubt that the operations of a corporate enterprise organized into divisions must be judged as the conduct of a single actor,” therefore exempting these operations from Section 1 of the Sherman Act.

The Supreme Court was dealing with possible intra-group collusion for the first time with this decision.40 One can only guess what would have been its reasoning before Coase’s article (1937). The fact remains that *Copperweld* follows a Coasian logic:41 the firm uses vertical control to save transaction costs; antitrust law must recognize the fact and exempt from Section 1 of the Sherman Act all agreements between two legal entities bound by such a control relationship42 In the words of the Supreme Court:

The intra-enterprise conspiracy doctrine looks to the form of an enterprise’s structure and ignores the reality. Antitrust liability should not depend on whether a corporate subunit is organized as an unincorporated division or a wholly-owned subsidiary. A corporation has complete power to maintain a wholly-owned subsidiary in either form. The economic, legal, or other considerations that lead corporate management to choose one structure over the other are not relevant to whether the enterprise’s conduct seriously threatens competition.

#### Blockchain is exempted---antitrust is not applicable

Dr. Thibault Schrepel 21, PhD in Antitrust Law from Université Paris-Saclay, LLM in International Law and Legal Studies from the Brooklyn Law School, Associate Professor of Law at VU Amsterdam University, Faculty Affiliate and Creator and Director of the Computational Antitrust Project at the Stanford University CodeX Center, Blockchain + Antitrust: The Decentralization Formula, p. 107-108

4 CHAPTER SUMMARY AND BEYOND

I have explained that legal fictions achieve specific objectives by granting rights to subjects and entities. Their creation is a strenuous exercise, and for this reason courts and legislatures are reluctant to design new ones. Antitrust law, for instance, has been based on the same legal fiction as was theorized the 1930s. Ronald Coase’s early work defines the “firm” as a zone in which vertical control is exercised to reduce transaction costs.

Over the last several decades, the theory of the firm as developed by Coase has become a crucial part of antitrust analysis. It is used to define entities to which antitrust laws apply and to characterize and assess anticompetitive practices. The creation of an “inside” and “outside” the firm thus guides both collusion and monopolization cases.

But one cannot transpose the theory of the firm to blockchain layer 1, as it does not feature the same vertical control. The absence of vertical control averts antitrust law, meaning that most of the behavior within that layer cannot be sanctioned. This is problematic for blockchain communities, as applying antitrust could benefit them by eliminating illegal practices. It is thus necessary to create a new legal fiction around that layer - Chapter 7 makes a proposal along those lines.

#### ‘Expanding the scope’ increases the general range to which antitrust applies. Their distinction is totally arbitrary.

Christopher L. Sagers 21, James A. Thomas Distinguished Professor, Cleveland State University. Law & Faculty Director, Cleveland-Marshall Solo Practice Incubator, "Sagers Email," JDi Debate, December 2021, https://jdidebate.blogspot.com/. brackets inserted for readability.

Jordan Di <jordandi505@gmail.com>

Fri, Dec 3, 11:17 AM

to C.SAGERS

Hi Jordan!

It's very nice hearing from you, and I'm sorry I'm just getting back to you. Your question was stimulating for me to think about, and I'm glad you've had a chance to review and think about that old book I edited.

So, I wound up writing a really long answer that I am afraid will be counter-productive. It seems very possible that you are asking a much simpler question than I thought, and I just misunderstood it. I'm sorry if that's the case, but the following is what I've got to share.

It turns out I've heard about this competition and its reliance on that book, but only because another participant also asked me for clarification. I wasn't involved in setting up the competition or designing the resolution, and questions from participants were the first that I heard anything about it. I also should say that I've never participated in debate and don't know anything about it, so I don't know how useful the following feedback will be.

But I will confess that I don't think the resolution was a very good idea, at least not as it is written.

A. What I Really Think

To me, the problem is that this idea of the "scope" of antitrust has no established legal meaning and very little practical significance. It isn't used in actual practice and it would have no real, legal significance in any actual antitrust case. It was a convenient shorthand that I came up with for organizing the materials in that book, and it also had one theoretical value to me, but that's it. Most antitrust lawyers I've worked with understand it what I meant by it, but it doesn't have any precise meaning or doctrinal significance. I don't think the term was even really used before that book. I almost literally made it up.

So, it sounds like participants in this competition are getting hung up on whether particular exclusions from antitrust liability are issues of "scope" or issues of something else, but I don't believe there is any good reason to worry about it. It almost literally doesn't matter, except maybe in the one theoretical sense that I mentioned. (I'll say something about that in a second.) For example, you mentioned the "investment" exception from the Clayton Act, and you ask whether it should be thought of as a "limit" on the "scope" of antitrust. But I find myself asking . . . so what? What difference would it make if that is a matter of "scope" or it is something else?

Moreover, what even is a "scope" issue? If antitrust is held not to apply in a given case, is it because that conduct was beyond the "scope" of antitrust, or was it because, even though antitrust applied to the challenged conduct, the conduct just wasn't illegal? For example, say that a manufacturer enters into an exclusive distribution agreement for 6 months with a distributor, prohibiting the distributor from carrying the products of a competitor. Contracts like that are so plainly not illegal--because it is for such a short period of time--that some lawyers say they are "per se legal." So, are 6-month exclusive distribution contracts outside the scope of antitrust, or are they subject to antitrust but legal? We could ask the same question about investment purchases under the Clayton Act. They are automatically legal so far as [Section 7] s. 7 is concerned. But does antitrust not apply at all, or does antitrust apply and just hold those purchases legal?

(I can answer these questions for myself, because I have a working definition of my own of what "scope" means. In my mind, the manufacturer and its sales are subject to antitrust, because it is exchanging a thing of value for money, but not all of its conduct is illegal. Likewise, I think of purchases of stock as always being subject to the Clayton Act, but sometimes legal under it. But my working definition in itself has no legal or policy significance, really.)

Like I said, I did have one theoretical purpose for thinking about antitrust "scope" as one, unified doctrine, and encouraging other lawyers to think of all the various doctrines that govern antitrust applicability as one doctrine, that should be made theoretically coherent. But the purpose I had in mind was different than what participants in the competition seem to be thinking about.

I thought that thinking of a "scope" of antitrust could force judges and lawyers to think more coherently or holistically about the several different doctrines that can be used in particular cases to exclude conduct from antitrust applicability. It would make them think about the fact that the different doctrines often clash with one another theoretically--they generate different results on similar facts for no good reason. As one example, the McCarran-Ferguson Act mostly exempts insurance from federal antitrust so long as a given insurance company's conduct is subject to some state legal requirements in a given case. Courts typically don't require active state oversight of the company in order for MFA immunity to apply. The question is just whether there is some regulation. But in non-insurance cases, the mere fact that a defendant is subject to some state law is definitely not enough to exempt it from antitrust. Usually, in those cases, the so-called "state action immunity" requires that a state statute explicitly authorizes the challenged conduct and​ a state actor actively oversees it. So very similar cases could come out with opposite results for no better reason than that one case involves insurance and the other does not.

But a problem, as you might see from this example, is that thinking through the differences in different scope doctrines gets extremely​ complex. Just that one example requires you both to really understand the McCarran-Ferguson Act and its caselaw and​ the law of state action immunity, and​ have a reasonable understanding of substantive antitrust in general, before you can even reasonably think about whether and how the doctrines should be revised for greater coherence. Because I think most practicing antitrust lawyers would find that a challenge, I can't imagine how non-lawyer undergraduate debate competitors are supposed to do it.

OKAY, so, all of that said, I would like to add one other sense in which it does actually kind of matter in real cases whether a legal rule goes to the applicability of antitrust or merely goes to the legality of the underlying conduct. As I'm sure you know, lawsuits can be dismissed before they go to trial. If a defendant moves to dismiss and persuades a court that antitrust doesn't even apply to the defendant's conduct, then the case can be dismissed at a very early stage in the litigation. If the court believes that antitrust applies to the defendant's conduct, but there is some substantial reason to believe that the conduct doesn't violate antitrust, then getting pre-trial dismissal will probably take longer and be more difficult. Real-world parties care about this kind of thing a lot​, because getting early dismissal is much cheaper for defendants and leaves plaintiffs with much less hope of securing any sort of settlement. But I can't believe that procedural niceties like that are actually of interest in your competition.

So, with my apologies, I think it would have been a lot better if the organizers of the competition wrote the resolution in a way that is much more specific. It should have asked something like, "should federal antitrust prohibit XYZ conduct by online commerce platforms" or something like that. Just asking whether the "scope" should change is hardly asking any question at all, because the word has so little clear meaning or significance.

B. What Is Probably More Useful

All of that was probably not hugely useful to you, since it's my background navel-gazing.

I hope the following might be more practical advice, though again I was never involved in debate, so you'll have to be the judge of whether it's useful or not.

If I were to talk about the resolution you quoted, I would begin by saying what I mean by the "scope" of antitrust. To me, it means the general range of conduct to which the Sherman, Clayton, and FTC Acts apply, which roughly means exchanges of things of value within the domestic United States and imports. That is very broad, but then I would point out that that scope is and always has been riddled with specific exceptions. And then I would say that I do (or do not) favor reining in those exceptions. That is, I wouldn't argue about "scope" in some abstract sense, and instead would say that we should read all of the existing exemptions as narrowly as possible. You wouldn't necessarily have to argue about individual exemptions, although discussing particular examples might be helpful. Anyway, to argue that I favor narrowing the existing exemptions, I would point out that when antitrust applies to particular conduct, it effectively requires that conduct to be regulated by the ordinary market forces of capitalism. It requires leaving that conduct to the whims of supply and demand, without interference from private agreements, exclusionary conduct, or anticompetitive consolidations. I would argue that that is generally a good thing--markets do a pretty good job of allocating resources, and ordinarily work better than either government or private intrusions. If you were going to make that kind of argument, you would say that we should generally narrow and limit all those dozens of statutory and caselaw rules that say that antitrust should not apply to particular cases. We should make it really hard, in all cases, for defendants to argue that their conduct should be exempt from antitrust. (Btw, that is nominally what the courts say. Though they now honor it only in the breach, the courts still constantly repeat rote platitudes that markets are great, Congress wants markets to regulate conduct without the interference of private parties, and for those reasons that all exemptions and immunities are narrowly applied.)

If I were required to argue that I disfavor it, I would say that in fact the forces of supply and demand are often ill-suited to regulate particular kinds of conduct. I don't personally believe that, but it's an easy enough argument to make. You say that markets are clumsy, that they have negative and unanticipated consequences in all kinds of ways, and so we have to apply antitrust carefully. You would argue that we should make it relatively easy for a defendant to say that in a particular case it should enjoy protection under some statutory exemption or the statute action immunity or the labor exemption or whatever, because imposing antitrust and the full force of unbridled price competition often harms other values that we care about.

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So, I have a bad feeling that this is too long, too beside the point, and to confusing, and I'm afraid I may have done more harm than good. I hope that some of it was helpful to you, and if I can be of any more help, I will try.

Best of luck to you, and thanks for reaching out.

Chris

### Private Enforcement PIC---2AC

#### Private litigation is crucial to overall deterrence

AAI 21, American Antitrust Institute, Washington, D.C.-based non-profit education, research, and advocacy organization, citing research conducted by Professor John Davis at the University of San Francisco School of Law, “The Critical Role of Private Antitrust Enforcement in the United States,” American Antitrust Institute, 8/4/21, <https://www.antitrustinstitute.org/wp-content/uploads/2021/08/Huntington-Report-FINAL-1.pdf>

I. Introduction

With all of the attention currently focused on public enforcement and legislative reform of the antitrust laws, less attention is being paid to private enforcement.1 But Congress considered private antitrust enforcement indispensable for promoting competition. The judiciary has so recognized time and time again. In California v. American Stores Co., for example, the Supreme Court proclaimed, “Private enforcement of the [Clayton] Act was in no sense an afterthought; it was an integral part of the congressional plan for protecting competition.”2

Private enforcement is not a substitute for vigorous public enforcement. Both are necessary to foster competition. But private enforcement plays an important part, one that becomes more significant when public enforcement recedes.3 And, unlike public enforcers, private enforcers can obtain significant damages on behalf of the victims of antitrust violations.4 This serves as a crucial source of deterrence for illegal anticompetitive conduct and the primary means of compensating victims for harms suffered at the hands of cartelists and dominant firms.5 The importance of the antitrust class action, a major private enforcement device, is clear. The recently released 2020 Antitrust Annual Report: Class Action Filings in Federal Court (“2020 Report”)6 by Huntington National Bank and the University of San Francisco School of Law (“USF Law”) reflects that the cumulative total settlement amount recovered for victims in antitrust class actions from 2009-2020 was over $27 billion.7

Antitrust class actions recover damages from companies engaged in harmful, illegal conduct, such as price fixing and attempted monopolization, in markets for important and essential products and services. The most active defendants during the period, for example, included companies providing financial services, pharmaceuticals, automobile parts, and electronics parts. 8 In light of the vital role played by private antitrust enforcement, and the antitrust class action in particular, continued empirical analysis of trends in activity is essential. This analysis aids in understanding and evaluating proposals for reforming the antitrust laws in the U.S. and such proposals’ impact on private enforcement, the public-private partnership, and ultimately on competition and consumers.

II. Overview of the Commentary

The American Antitrust Institute (AAI)9 and Professor Joshua P. Davis at USF Law10 evaluated the 2020 Report with the goal of identifying its major implications for private enforcement in the U.S. The 2020 Report builds and expands on the 2019 Antitrust Annual Report: Class Action Filings in Federal Court (“2019 Report”)11, which assessed private enforcement activity from 2009-2019. Like the 2019 Report, the 2020 Report relies largely on data for private U.S. antitrust class actions available through Lex Machina, as well as supplemental data analysis.12 The 2020 Report extends the dataset to the eleven-year period covering 2009-2020, thus allowing for a deeper analysis of private enforcement trends and their implications. The analysis provided in this Commentary highlights the importance of private antitrust enforcement in the U.S. system and the particularly important role played by the antitrust class action.

III. Observations and Implications for Private Enforcement

The 2020 Report provides further evidence of a divergence between public and private enforcement trends. As public enforcement has waned, private filings have waxed, undermining the notion that class actions simply ride the coattails of public enforcement. On the contrary, the data suggest that as lax public enforcement fosters higher market concentration and invites bad behavior, private filings may compensate for underenforcement in an effort to address the resulting antitrust violations.

Looking beyond the number of enforcement actions filed and focusing on the results of the actions, the rich data reveal more nuance to this narrative. Despite increased private actions in the face of decreased public enforcement, the amount of money recovered from violators by both public and private enforcers has diminished. For public enforcers, this diminution is to be expected, as fewer cases have been brought. For private enforcers, though, the explanation likely lies with other trends, most notably the increasing headwinds faced by private enforcers due to heightened pleading and class certification standards. If these explanations are correct, the clear implication is that for private enforcement to fulfill its increasingly vital role as a complement and a backstop to public enforcement, these trends must be reversed.

A theme we noted in the 2019 Report, and that continues to feature in the 2020 Report, is the tremendous variability in the data on some measures related to settlement size. Aggregate settlement amounts over the period vary widely from year to year. By disaggregating the settlements by size, however, we are able to observe that settlements at different levels trend somewhat independently. Very large settlements, which are few in number, drive most of the variability in the aggregate data. But trends and anomalies in very small settlements cannot be entirely discounted, as they are the force behind one of the highest recovery years in the period, 2018.

Finally, building on analysis from our 2019 commentary, we take a deeper dive on attorneys’ fees and how they correspond to settlement amounts. Our findings reinforce the tentative conclusion from last year’s analysis that the so-called “megafund doctrine”—a dramatic decrease in attorneys fee percentages on settlements above a threshold of about $100 million—does not operate in federal antitrust cases in a significant way. Rather, decreases in the fee award percentage in antitrust cases are not discrete and drastic, but rather gradual, much like marginal tax rates in the United States. In what follows, we discuss each of the above observations in more detail and provide analysis of their implications for private enforcement, many of which suggest fertile areas for additional study.

A. The Relationship of Private to Public Enforcement: Riding on Coattails or Stepping into the Breach?

A long-running antitrust policy debate centers on the value that private enforcement adds to the antitrust enterprise as a whole. Critics of private actions maintain that private plaintiffs often follow an easy trail blazed by government enforcers, and that private enforcement therefore does not supplement worthwhile public actions as much as it should. Proponents of private actions have sought to debunk this claim with empirical evidence suggesting that many large and successful private antitrust cases often precede, or else expand the scope of relief sought in, any overlapping government actions.13

#### Private enforcement is key AND practices are under-deterred now.

Robert H. Lande 8, Venable Professor of Law at the University of Baltimore School of Law and a Director of the American Antitrust Institute; Joshua P. Davis, Professor of Law and Director, Center for Law and Ethics at the University of San Francisco School of Law and a member of the Advisory Board of the American Antitrust Institute, “Benefits From Private Antitrust Enforcement: An Analysis of Forty Cases,” 42 U.S.F. L. Rev. 879, p. 904-908, Lexis

In fact, there are many reasons to believe that these private antitrust actions complement government enforcement of the antitrust [\*906] laws in important ways. Indeed, private enforcement may be every bit as essential as public enforcement. As a practical matter, the government cannot be expected to do all or even most of the necessary enforcement for various reasons including: budgetary constraints; 107 undue fear of losing cases; 108 lack of awareness of industry conditions; 109 overly suspicious views about complaints by "losers" that they were in fact victims of anticompetitive behavior; 110 higher turnover among government attorneys; 111 and the unfortunate, but undeniable, reality that government enforcement (or non-enforcement) decisions are, at times, politically motivated. 112 One would expect a [\*907] vigorous private antitrust regime, then, to confer significant benefits over and above those conferred by a system reliant solely upon government enforcement.

Moreover, under the current legal system it is striking that not only is the conduct that results in criminal antitrust violations greatly under-deterred, but there is simply no good way for the government, by itself, to optimally deter most conduct that is illegal but does not give rise to criminal penalties.

The anticompetitive conduct that does give rise to criminal antitrust violations currently occurs far too frequently and is almost certainly significantly underdeterred n113--even factoring in the effects of the present system of private litigation. A fortiori this conduct would be even more underdeterred if private litigation were eliminated or substantially curtailed.

The effects of any significant curtailment or repeal of private rights of action on conduct that does not result in criminal violations might, however, be even more inimical to the public interest. As a remedy for this conduct divestiture, as a practical matter, almost never occurs, and while an injunction can stop future anticompetitive behavior, it puts violators in a no-lose situation (unless there also is the prospect of private litigation). Even if defendants lose their case and have to stop the practices in question, an injunction alone would permit them to keep the fruits of their past anticompetitive behavior. Optimal deterrence under the current regime is not possible without the prospects of private litigation.

Indeed, private litigation actually does a better job than the government in advancing the primary goal of the government's enforcement program: deterring illegal corporate behavior. The forty cases analyzed in this study, by themselves, provide greater deterrence against anticompetitive behavior than all the DOJ imposed criminal fines and prison sentences since 1990. 114 This is remarkable considering [\*908] that these forty cases were only a portion of all private cases initiated during this period.

### Court Clog DA---2AC

#### Private action is increasing---BUT, the plan reduces the incentive.

Diana L. Moss 21, President, American Antitrust Institute; Joshua P. Davis, Professor, University of San Francisco School of Law. Director, Center for Law and Ethics, University of San Francisco School of Law. Dean's Scholar, University of San Francisco School of Law; Randy Stutz, Vice President of Legal Advocacy, American Antitrust Institute; Laura Alexander, Vice President of Policy, American Antitrust Institute, "Antitrust Experts Review New Data On Private U.S. Antitrust Enforcement, Identify Trends That Must Be Reversed For Private Enforcement To Fulfill Its Increasingly Vital Role," American Antitrust Institute, 08/04/2021, https://www.antitrustinstitute.org/work-product/antitrust-experts-review-new-data-on-private-u-s-antitrust-enforcement-identify-trends-that-must-be-reversed-for-private-enforcement-to-fulfill-its-increasingly-vital-role/.

The American Antitrust Institute and Professor Joshua P. Davis at USF Law have released a Commentary on the 2020 Antitrust Annual Report: Class Action Filings in Federal Court (2020 Report). The goal of the Commentary, The Critical Role of Private Antitrust Enforcement in the United States, is to identify major implications for private enforcement in the U.S. Like the 2018 and 2019 Reports, the 2020 Report relies largely on data for private U.S. antitrust class actions available through Lex Machina, as well as supplemental data analysis. The 2020 Report extends the dataset to the eleven-year period covering 2009-2020, thus allowing for a deeper analysis of private enforcement trends and their implications. The analysis provided in the AAI-USF Commentary highlights the importance of private antitrust enforcement in the U.S. system and the particularly important role played by the antitrust class action.

The Commentary explains that the 2020 Report provides further evidence of a divergence between public and private enforcement trends. As public enforcement has waned, private filings have waxed, undermining the notion that class actions simply ride the coattails of public enforcement. On the contrary, the data suggest that as lax public enforcement fosters higher market concentration and invites bad behavior, private filings may compensate for under enforcement in an effort to address the resulting antitrust violations.

#### Courts reject progressive antitrust.

John Newman 19, Professor of Law at the University of Miami School of Law and Former Attorney with the U.S. Department of Justice Antitrust Division, JD from the University of Iowa College of Law, BA from the Iowa State University of Science & Technology, “What Democratic Contenders Are Missing in the Race to Revive Antitrust”, The Atlantic, 4/1/2019, https://www.theatlantic.com/ideas/archive/2019/04/what-2020-democratic-candidates-miss-about-antitrust/586135/

But the federal courts represent a massive stumbling block for any progressive antitrust movement. Reformers have identified two paths forward; both lead eventually to the court system. The first is relatively moderate: appoint regulators who will actually enforce the laws already on the books. Warren’s plan rests in part on this straightforward idea. The second, more audacious path requires congressional action to amend and strengthen our current laws. Warren’s call for a new ban on technology companies’ buying and selling via their own platforms falls into this category. Klobuchar has also proposed new antitrust legislation that would make it easier to block harmful mergers and acquisitions.

But no matter its content, enforcing a law requires persuading a judge. When it comes to U.S. antitrust laws, federal judges—not Congress, and not regulatory agencies—are the ultimate arbiters. The Department of Justice Antitrust Division, one of our two public enforcement agencies, files all its cases in federal courts. And although the Federal Trade Commission (the other) can decide cases internally, the inevitable appeals eventually end up in court as well.

No matter how strongly worded a law may be, ideologically driven judges can usually find a way around enforcing it. The cyclical history of U.S. antitrust law is proof that judges wield nearly limitless institutional power in this area.

Soon after Congress passed the Sherman Act in 1890, a conservative Supreme Court began to chip away at its effectiveness. Congress reacted in 1914 with the Clayton Act, which sought to ban anticompetitive mergers. In 1936, at the height of the New Deal era, Congress passed the Robinson-Patman Act, which prohibits price discrimination (charging different prices to different buyers for the same product). These laws were actively enforced for decades.

But starting in the late 1970s, conservative judges began to erode the Clayton Act. Today, megamergers among competitors such as Bayer and Monsanto barely raise eyebrows. So-called vertical mergers, which combine suppliers and their customers, are now all but immune from antitrust enforcement—see the DOJ’s failed challenge to AT&T and Time Warner’s recent tie-up.

Under the business-friendly Roberts Court, the Robinson-Patman Act has similarly been eviscerated. By the 2000s, the ideas of the conservative Chicago School had become mainstream in antitrust circles. Robinson-Patman, a law intended to protect small businesses, was an easy target for Chicago School critics narrowly focused on efficiency and low consumer prices. Their attacks found a receptive audience in the federal judiciary. Among insiders, Robinson-Patman is now known as “zombie law.” It remains on the books, but regulators no longer bother trying to enforce it.

#### Courts have sufficent hurdles already.

Meredith M. Render 20, Professor of Law at the University of Alabama School of Law, JD from the Georgetown University Law Center, BA from Boston College, “Fiduciary Injury and Citizen Enforcement of the Emoluments Clause”, Notre Dame Law Review, 95 Notre Dame L. Rev. 953, January 2020, Lexis

First, as previously discussed, there is reason to be skeptical about the efficacy of the CAP rule in terms of reducing the overall number of cases in the federal courts. 315 Moreover, in addition to the fact that the CAP rule likely does little to reduce the overall number of opportunities for federal courts to judge the behavior of coordinate branches, there is reason to [\*1007] believe that the opening-the-floodgates worry itself is overblown. 316 Not only is the floodgates argument in support of the CAP rule lacking in empirical support, 317 but it may also be lacking in a clear, germane, and substantive content when used by various members of the Court. 318F or example, Professor Marin Levy has observed that "recent cases show the justices vacillating between providing assurances that their decision will not result in a deluge of new claims, and accusing each other of being driven by an improper desire to stave off such a deluge." 319 The floodgate alarm has been used in diverse and internally inconsistent contexts without the mooring benefit of evidentiary support, such that it has taken on more the character of epithet than of a serious constitutional obstacle. 320Justice Ginsburg, writing in dissent, has succinctly summarized this development, stating: "The 'floodgates' argument the Court today embraces has been rehearsed and rejected before." 321

The fact that the floodgate rationale is frequently used to support both sides of a contested determination by the Court suggests that it may lack a stable normative content. 322 The floodgate rationale is, at heart, a prediction about how future litigants will behave if the Court adopts a new rule. Yet the ordinary norms of prediction with their attendant empirical safeguards seem not to obtain. 323 Those invoking the floodgate alarm have not felt [\*1008] obliged to supply evidence of past instances in which the federal courts were in fact "flooded" as the result of similar rule changes, and that the Federal Rules of Civil Procedure were inadequate to address the "flood." 324 Given that members of the Court have so frequently predicted a litigatory deluge as a consequence of a rule change, it would seem a simple matter to confirm that a deluge has, in fact, occurred. 325 However, evidence of past flooding has yet to emerge within the floodgate discourse. 326

It is possible that the reason that the floodgate worry has not been documented may be because it has yet to come to pass. There is ample reason to believe that the Federal Rules of Civil Procedure are generally commensurate to the task of qualitatively stemming the tide of litigation. 327 The Federal Rules of Civil Procedure are designed to weed out duplicative, harassing, frivolous, and meritless cases. 328While no standing rule - including the CAP rule - prevents nonmeritorious cases from being filed in federal court, such cases are generally resolved on a Rule 12(b)(1) motion to dismiss. 329The Rule 12(b)(1) motion to dismiss is also the first opportunity during which a defendant can challenge standing. 330There is no strategic advantage to [\*1009] defendants - in terms of the expenditure of resources - to having a case dismissed for want of standing as compared to any other grounds for dismissal under Rule 12(b)(1). 331Likewise, doctrines and mechanisms designed to conserve both judicial and defendant resources, such as claim preclusion, issue preclusion, abstention, joinder, and case consolidation, all operate to prevent horizonal lawsuits alleging the same nexus of operative facts from going forward simultaneously in multiple district courts - a point that is especially important in the emoluments context where presumably any citizen suit would allege the same operative facts. 332

#### Response is delegation AND resource boosts, NOT restrictions.

Marin K. Levy 13, Associate Professor of Law at the Duke University School of Law, JD from Yale Law School, “Judging the Flood of Litigation”, University of Chicago Law Review, 80 U. Chi. L. Rev. 1007, Lexis

To be sure, judicial workload is a critical concern. As noted earlier, the lower courts have faced rising caseloads over the last several decades 285 - a fact the justices have emphasized. 286 Today, both federal district and appellate judges must contend with hundreds of filings per year, 287 meaning that their ability to give attention to individual cases is greatly reduced. Employing the tools at hand, district judges have come to rely more heavily on the aid of magistrate judges, 288 and appellate judges have come to rely on the assistance of staff attorneys and other case-management tools to cope with their workload. 289 Still, judges and scholars alike have called for an expansion of the bench 290 and limiting the flow of cases 291 to alleviate the strain on the federal courts. Thus, when the justices express their desire to avoid inviting new claims into federal courts, the underlying concern is not a trivial one. 292 The critical question, though, is [\*1066] whether considerations of judicial workload can stand as an independent factor in shaping the Court's interpretation of substantive law.

The courts fail at antitrust---results in a patchwork.

Rohit Chopra 20, Commissioner of the Federal Trade Commission, and Lina M. Khan, Academic Fellow at Columbia Law School, Counsel to the Subcommittee on Antitrust, Commercial, and Administrative Law, US House Committee on the Judiciary and Former Legal Fellow at the Federal Trade Commission, “The Case for "Unfair Methods of Competition" Rulemaking”, University of Chicago Law Review, 87 U. Chi. L. Rev. 357, March 2020, Lexis

I. THE STATUS QUO: AMBIGUOUS, BURDENSOME, AND UNDEMOCRATIC?

Antitrust law today is developed exclusively through adjudication. In theory, this case-by-case approach facilitates nuanced and fact-specific analysis of liability and well-tailored remedies. But in practice, the reliance on case-by-case adjudication yields a system of enforcement that generates ambiguity, unduly drains resources from enforcers, and deprives individuals and firms of any real opportunity to democratically participate in the process.

One reason that antitrust adjudication suffers from these shortcomings is that courts analyze most forms of conduct under the "rule of reason" standard. The "rule of reason" involves a broad and open-ended inquiry into the overall competitive effects of particular conduct and asks judges to weigh the circumstances to decide whether the practice at issue violates the antitrust laws. Balancing short-term losses against future predicted gains calls for "speculative, possibly labyrinthine, and unnecessary" analysis and appears to exceed the abilities of even the most capable institutional actors. 1 Generalist judges struggle to identify anticompetitive behavior 2 and to apply complex economic criteria in consistent ways. 3 Indeed, judges themselves have criticized antitrust standards for being highly difficult to administer. 4 And if a standard isn't administrable, it won't yield predictable results. The dearth of clear standards and rules in antitrust means that market actors face uncertainty and cannot internalize legal norms [\*360] into their business decisions. 5Moreover, ambiguity deprives market participants and the public of notice about what the law is, thereby undermining due process--a fundamental principle in our legal system. 6

Decades ago, former Commissioner Philip Elman observed that case-by-case adjudication "may simply be too slow and cumbersome to produce specific and clear standards adequate to the needs of businessmen, the private bar, and the government agencies." 7Relying solely on case-by-case adjudication means that businesses and the public must attempt to extract legal rules from a patchwork of individual court opinions. Because antitrust plaintiffs bring cases in dozens of different courts with hundreds of different generalist judges and juries, simply understanding what the law is can involve piecing together disparate rulings founded on unique sets of facts. All too often, the resulting picture is unclear. This ambiguity is compounded when the Supreme Court assigns to lower courts the task of fleshing out how to structure and apply a standard, potentially delaying clarity and certainty for years or even decades. 8

### Capitalism K---2AC

#### It’s strategic duplicity that implodes capitalism from within. Direct rejection fails.

Dr. Brian Massumi 18, Professor in the Department of Communication Sciences at the University of Montréal, Ph.D. in French Literature from Yale University, and Dr. Erin Manning, Professor of Philosophy and Cinema at Concordia University, Ph.D. in Political Philosophy from University of Hawaii, “A Cryptoeconomy of Affect”, The New Inquiry, 5/14/2018, https://thenewinquiry.com/a-cryptoeconomy-of-affect/

It would be very naive of us to think you could just walk out of capitalism. We’re not that naive. Neoliberalism is our natural environment. We therefore operate with what we call strategic duplicity. This involves recognizing what works in the systems we work against. Which means: We don’t just oppose them head on. We work with them, strategically, while nurturing an alien logic that moves in very different directions. One of the things we know that the university does well is that it attracts really interesting people. The university can facilitate meetings that can change lives. But systemically, it fails. And the systemic failure is getting more and more acute. And so what we imagine is that the Institute, assisted by the 3E Process Seed Bank, will create a new space that might overlap with some of the things the university does well, without being a part of it (or being subsumed by its logic).

MASSUMI.— Going back to the question of value, we want to create an economy around the platform that does not follow any of the usual economic principles. There will be no individual ownership or shares. There will be no units of account, no currency or tokens used internally. The model of activity will not be transactional. Individual interest will not be used as an incentivizer. What there will be is a complex space of relation for people to create intensities of experience together, in emergent excess over what they could have created working separately, or in traditional teams. It’s meant to be self-organizing, with no separate administrative structure or hierarchy, and even no formal decision-making rules. It’s anarchistic in that sense, but through mobilizing a surplus of organizing potential, rather than lacking organization. You could also call it communistic, in the sense that there is no individual value holding. Everything is common.

MANNING.— Undercommon.

MASSUMI.— Yes, undercommonly. The undercommons is Fred Moten and Stefano Harney’s word for emergent collectivity, which is one of our inspirations. We want to foster emergence and process, but at the same time find ways of making it sustainable. That means that the strategic duplicity has to extend to the economy as we currently know it. We have to be parasitical to the capitalist economy, while operating according to a logic that is totally alien to it.

What we’re thinking of is making the collaborative process moving through the platform function according to the radically anti-capitalist principles we were just talking about, centering on the collective production of surplus values of life, and separating that from the dominant economy by a membrane. A membrane creates a separation, but at the same time allows for movements across. It has a certain porosity. The idea is that we would find ways, associated with the affect-o-meter we were describing earlier, to register qualitative shifts in the creative process as it moves over its formative thresholds, and moves back and forth between online operations and offline events. What would be registered is the affective intensity of the production of surplus value of life, its ebbs and flows. The membrane would consist in a translation of those qualitative flows into a numerical expression, which would feed into a cryptocurrency. Basically, we’d be mining crypto with collaborative creative energies—monetizing emergent collectivity. The currency would be “backed” by the confidence we could build in our ability to keep the creative process going and spin it off into other projects, as evidenced by the activities of the Three Ecologies Institute as an experiment in alter-education.

On the side of the membrane facing the monetary economy, we would be producing a recognizable, quantifiable movement of value. But the membrane would shelter the creative process going on inside the platform from being colonized by that logic. We’d try to have the best of both worlds. It would be essential that the currency not be just a speculative vehicle that joins the crowd of coins. Our economic space would have to inhabit an ecology of other economic spaces experimenting with adapting blockchain and post-blockchain autonomous organization to cooperative endeavors. The key, once again, is finding workable solutions to the problem of how to use qualitative analysis to register movements of creative intensity—how to coax numbers into an alliance with qualities of experience. There is a new concept being developed by Nora Bateson that she calls “warm data” that has a similar goal, in relation to basic science, that we’d like to hook into.

MARC.— You want to use blockchain to create a parasitic economy that reappropriates speculative finance to generate profit from collaborative events. You are working within the immaterial level that the movement to occupy public spaces only gestured at, and uses the collaborative spirit common to any movement. Do you consider yourself to be “occupying” the abstract?

MANNING.— If we’re “occupying an abstraction,” we’re doing it in a way that is extraterritorial. All of this is a thought experiment that we want to help sow, but needs to be continued by others, and with others. It will be interesting if it manages to produce process seeds that get away from us and end up going beyond anything that we could have imagined. I’m not sure what Brian would say, but my feeling is that if we’re occupying anything, it’s the imagination. The postcapitalist imagination.

MASSUMI.— Another way of saying it is that we are talking about creating what’s often been called a temporary autonomous zone, but recognizing that we’re all complicit with capital, and not pretending we can just step outside that and go our merry way. If you do that, you only end up carrying unexamined presuppositions with you, and everything breaks down. We want to work from and with that complicity, using strategic duplicity. That doesn’t mean being deceptive. It means working in two registers at once.

We want to create a temporary autonomous zone (TAZ), following anarcho-communist logic, while at the same time being able to articulate it to the existing neoliberal economy, because like it or not, those are the conditions under which we live, and its grip is so tentacular, reaching not only all around us but inside of us, that you have to work hard and with great technique to start loosening the grip. You have to find ways of inhabiting the present, while setting off sparks of futurity that prefigure a postcapitalist world to come. So it’s an occupation in the sense that it’s a cohabitation. The TAZ isn’t a world apart. It’s a pore in the world as it is, in which something else can grow. It’s a relational space that you can enter without the conceit that you’re leaving the existing world. It starts by supplementing, rather than purporting to replace right away. Hopefully that supplementation grows and takes more and more of our cohabitation in, to the point that it can rival the dominant economy.

### AT: Crypto-Colonialism Link

#### Blockchain empowers indigenous communities AND foments a transition from exploitative economics---it can be scaled up without crypto-colonialism---their author!

Peter Howson 21, Professor in the Department of Social Sciences at Northumbria University, “Distributed Degrowth Technology: Challenges for Blockchain Beyond the Green Economy”, Ecological Economics, Volume 184, June 2021, ScienceDirect

5. Scaling-up degrowth without crypto-colonialism

Solutions to growth-induced environmental crises rooted in positivism, reinforce a colonial perspective (Nirmal and Rocheleau, 2019). Favouring a pluralism of values, a growing coalition of degrowth scholar-activists are aiming to transform degrowth into a scaled-up international field, bridging networks of social and environmental justice movements (Liegey and Nelson, 2020). To avoid a colonial approach to the bridging process, a primary concern must be to avoid one branch of ideas being imposed on vulnerable groups, especially technological ideas, like blockchain. Escobar (2018: 65) argues that to positively design tools for degrowth requires the deconstruction of the colonial divide – “the us-versus-them divide that was introduced with the conquest of America, slavery, and colonialism and is alive and well today with modernizing globalization and development”. For degrowth technology to be decolonising, it should not exhibit a propensity for deployment towards neocolonial projects, and it must be useful for reparative justice. If distributed technologies limit freedoms of vulnerable groups and leave intact the legacies of colonial dispossession, whether they were ‘co-produced’ or not, then their design is not decolonising.

Howson (2020a) explores how environmental crises are used to justify ‘crypto-colonialism’, where blockchain technology is used to extract economic benefits from peoples suffering scars of colonialism in the Global South. These benefits include land, labour, data and other resources needed to facilitate capital interests elsewhere. One of the starkest manifestations of this blockchain-based neocolonialism is observed in the exclusive crypto-enclaves of Puerto Rico. As Crandall (2019) explains, degrowth visions from Puerto Rico’s women-led and grassroots groups, to exercise collective sovereignty over their land, energy and resources, conflicts with the growth-oriented visions conjured up by crypto-enthusiasts (primarily men in fintech and venture capital from the United States) looking to establish their own cryptoutopia.

Blockchain applications can connect diverse groups, but often involve attaching automated conditions to interactions, inevitably leading to power asymmetries, whilst limiting the freedom of some users (Howson, 2020d). The Indonesia-based blockchain project, SEEDS,5 aims to provide fledgling communities, often relocating from the Global North, with tools for constructing local economies, including UBI schemes, whilst incentivising community-based ecologically regenerative tasks, like tree planting. As well as being potentially colonising, SEEDS maintains a hierarchical multi-level structure and an associated governance framework which is likely to promote homogeneity, rather than diversity of interests.

In some cases, blockchain initiatives are being used to promote indigenous customary land claims. But indigenous, does not always equate with degrowth. Some initiatives like the Honduran blockchain land registry, designed with indigenous communities in mind, has been criticised for leaning heavily towards the growth-orientated business interests of their developers (Eder, 2019). The Canadian non-profit organisation, Blockchain for Reconciliation, aims to ensure blockchain project promotions account for local interests and are sympathetic to local struggles for reparative justice and reconciliation from colonialism. The project advocates on behalf of Treaty Four Cree and Saulteaux First Nation communities. The blockchain-agnostic group6 asserts that there is no better place for ‘trustless’ systems than between indigenous peoples and the Canadian government. The group describe themselves as ‘a filter layer’ encouraging distributed application developers to start working with indigenous communities in a spirit of collaboration, not colonisation.

Other indigenous blockchain projects, such as IDGO aims to create tourism and blockchain-based community economies for local indigenous peoples. Indigenous ID cards are verified by indigenous community nodes globally to strengthen local autonomy and ethnic identity. Tourists can buy digital passport permits, the revenue from which is returned to indigenous communities to pay for environmental protection, education, and cultural continuity (Ringuette, 2020). These projects may help empower some communities in the short term. They may encourage meaningfully engaged visitation. But such projects also support the conventional growth economy if they entertain alienated workers looking for eco-touristic voyeurism (Higgins-Desbiolles et al., 2019). In localised degrowth economies, the need for such escapism is less likely (Howson, 2020c), but the need for building international alliances between marginalised communities will remain. Dislocated communities, including indigenous perspectives, will continue to benefit from cultural exchange, even within a sustainable degrowth society.

Despite these mixed results, critical degrowth scholars should not be too keen to wholly reject blockchain. This technology foments political and economic change by circumventing growth-orientated interests, rather than fighting them (Russo, 2020). Continuing this fight maintains a crisis of imagination, blinkering the degrowth movement from seeing alternative post-capitalist futures (Thwaites, 2020). A distributed network of global infrastructure supporting more direct, deliberative, and democratic forms of governance, owned by a network of networked communities, could help transcend that crisis.

6. Conclusions

Centralised digital technology is destroying human freedoms and the environment (Bihouix, 2020). With new blockchain platforms for surveillance capitalism, green growth tools for environmental management are becoming increasingly more automated (Howson et al., 2019). Despite these concerns, some scholars understand blockchain as a potentially useful tool for transitioning towards a post-capitalist society (Huckle and White, 2016; Raworth, 2017; Büscher and Fletcher, 2020). Others argue that explorations around distributed technology point to a red herring, diverting attention away from degrowth’s target adversaries (patriarchy, racism, environmental destruction, and class conflict).

This commentary has offered a critical exploration of blockchain solutions to start discussions concerning how (or if) these technologies could be useful in facilitating sustainable degrowth economies. The exploration has focused on three key challenges for the technology. If blockchain is ever to prove useful for degrowth it would need to: 1) help build (re)distributive economies, 2) regenerate the environment without commodifying it, and 3) help facilitate international alliances without imposing a particular set of values. There are many other litmus tests besides those explored here that require research. What is certain is that these technologies on their own will not transcend political struggles ‘away from keyboard’. They might, however, make those struggles more effective, enabling a transition away from market capitalism locally and/or at scale.

### AT: Reforestation Link

#### It’s comparatively better than fiat currency AND will drive global sustainability

Brian Armstrong 21, Master’s Degree in Computer Science from Rice University, et al., “7 Biggest Bitcoin Myths”, Coinbase, https://www.coinbase.com/learn/crypto-basics/7-biggest-bitcoin-myths

Myth #7: Bitcoin is bad for the environment

Bitcoin mining is an energy-intensive process. But determining the environmental impact is hard. For one thing, all aspects of the digital economy require energy. Consider the entire global banking system, and all of the energy required to process bank transactions and power office buildings, ATMs, local branches, and much more.

The real story:

* Recent research by New York-based fund Ark Investment Management concludes that “Bitcoin is much more efficient than traditional banking and gold mining on a global scale.”
* A significant portion of Bitcoin mining is powered by renewable-energy sources (including wind, hydro, and solar). The actual number ranges from 20 percent to more than 70 percent, according to Cambridge Bitcoin Electricity Consumption Index.
* The Cambridge researchers concluded: “Bitcoin’s environmental footprint currently remains marginal at best.”
* An argument can even be made that the economic incentives inherent to Bitcoin mining are helping drive sustainable energy innovation, as miners constantly seek to increase profits by lowering their electricity costs — in a world where renewable energy is fast becoming the cheapest option.

#### The environmental impact is miniscule

Adam Rothstein 14, Contributing Editor at The State, and Previously Contributed to Rhizome, The New Inquiry, The Atlantic Tech, The Magazine, and Longshot Magazine, Insurgent Archivist and Writes About Politics, Media, Art, and Technology, “Bitcoin and the Speculative Anarchist”, Rhizome, 2/18/2014, https://rhizome.org/editorial/2014/feb/18/bitcoin-and-speculative-anarchist/

Does any of this mean that any participation in cryptocurrencies is inherently unethical? I don't think that is clear. No workers are having their labor stolen from them. No one is being physically harmed with ill-gotten altcoin gain (that we know of). There is no categorical exploitation within cryptocurrencies, certainly not compared to fiat currencies. Eight billion USD is a lot of value, but only relatively. That's greater than the GDP of Benin, but less than 1/100 the GDP of Indonesia. It is only a few years' work to a Silicon Valley angel investor or a drug cartel, and a minute fraction of the student loan industry. But aren't cryptocurrencies bad for the environment by using tons electricity? Sure, they use electricity. But it is not nearly as bad as everyone thinks it is. (I estimate that Bitcoin uses 2x more electricity than every iPad in the world, but ¼ the electricity of all the flat screen TVs sold in the first quarter of 2012.) And compared to the ecological disaster than is American's consumption of chicken wings, I feel that vegetarianism is probably a stronger political decision than directing an inordinate amount of attention to the environmental costs of running your GPU overnight.

#### Energy is offset by renewables and recycling

Leigh Cuen 21, Reporter for TechCrunch, Vice, Business Insider, CoinDesk, Newsweek, Teen Vogue, Al Jazeera English, and The Jerusalem Post, “Is Bitcoin Mining Bad for the planet? The truth is Really About Capitalism”, Inverse, 3/13/2021, https://www.inverse.com/innovation/is-cryptocurrency-bad-for-the-environment

One of the most misunderstood criticisms of bitcoin is the incorrect claim that cryptocurrency mining is so bad for the environment that owning bitcoin comes with unethical, “dirty baggage.” Despite difficulty increases as the $1.4 billion bitcoin mining industry spreads, most critiques of mining’s energy consumption are actually identifying the flaws in capitalism, not Bitcoin’s challenging design.

Computer systems do require electricity and mass production is often harmful to the environment. This includes tools like Facebook, iPhones, and Bitcoin. When it comes to energy consumption, ARK Investment Management estimates that Bitcoin consumes “less than 10 percent and 40 percent of traditional banking and gold mining, respectively.”

Cryptocurrency mining, by its very nature, requires a lot of electricity and sophisticated computers. In a paper published this week in the journal Joule, data scientist ALEX DE VRIES — correctly — argues bitcoin mining is likely to exceed an annual consumption of 101 terawatt-hours (TWh) of electricity as the price fluctuates.

Cryptocurrency mining is purposefully designed to become harder over time, building up to a fixed supply of 21 million bitcoin. The harder it gets to mine, the more electricity the process consumes.

As de Vries explains in his paper: “As of January 11, 2021, it is estimated that all miners combined make over 150 quintillion attempts every second of the day to produce a valid new block. Moreover, the Bitcoin protocol self-adjusts the difficulty of meeting these requirements to ensure that, on average, only one block is created every 10 min.”

At the current pace of mining, the industry will reach 21 million bitcoin in 2140. If Bitcoin follows the rules of capitalism, as the supply starts to run dry, the demand for coin increases — but with more people mining, and mining ever more difficult, so too will the energy demand rise.

“Any laptop or computer is theoretically capable of participating in cryptocurrency mining, and any location that has access to internet and electricity might be used to host these devices,” de Vries writes.

There are a couple of ways crypto miners — both on the small and the large scale — can offset their energy demands.

According to a Seetee research report by Aker ASA, the $6 billion Norweigan company is establishing mining facilities powered by wind, solar, and hydro electricity. “Bit­coin is, in our eyes, a load-bal­anc­ing eco­nom­ic bat­tery,” the company says, “and bat­ter­ies are es­sen­tial to the en­er­gy tran­si­tion re­quired to reach the tar­gets of the Paris Agreement.”

Likewise, Blockstream CEO ADAM BACK, whose company has run mining facilities since 2016, said in an interview that Blockstream’s miners use a mix of energy sources, including hydropower.

“We’re also currently investigating the viability of developing a new solar-powered facility with one of our institutional clients,” Back said. “Thanks to our Blockstream Satellite service — which broadcasts the Bitcoin blockchain to most of the world — we can go where other miners can't. This allows us to better access stranded energy resources that are not only typically more green, but also provide competitive energy prices for our clients.”

Some recreational cryptocurrency miners experiment with green energy themselves — although this depends on where a miner lives and the available energy sources for their area. Such is the case with the anonymous co-founder of Deep in the Mines LLC. This miner goes by @BreakTheirRules on Twitter and tells Inverse they built a mining rig near a wind farm in Minnesota in 2017. In addition to Bitcoin, Deep in the Mines also uses the rig to mine other cryptocurrencies, like Litecoin.

“We’ve got about 2000 miners running now between four of us,” BreakTheirRules says in a direct message. “We had looked into relocating to several states and where we ended up kind of just worked out cause the power company had a bunch of excess energy they were going to have to waste.”

The investment firm CoinShares estimated in 2019 that up to 73 percent of Bitcoin miners use at least some renewable energy as part of their power supply, including the industrial Chinese miners, for example, who use hydropower from massive dams to fuel their efforts. And beyond clean energy, miners can also use recycled computers and other reused hardware to reduce their current footprint.

It remains to be seen which cryptocurrency companies will opt for renewable energy sources as demand for bitcoin ramps up, but whenever there is lucrative demand, suppliers like cryptocurrency miners will find a way.

### AT: Impact

#### Profit-centric innovation solves their impacts---BUT, limits are wrong.

---T = dirty technology.

---A = affluence.

Stijn Bruers 21, PhD, Researcher, Physics & Philosophy, KU Leuven, "The Case Against Degrowth," Stijn Bruers – Word Press, 12/29/2021, https://stijnbruers.wordpress.com/2021/12/29/the-case-against-degrowth/.

Economic degrowth is not necessary, because it targets the wrong enemy. GDP is not the enemy; environmental impact is the enemy. Environmental scientists are able to determine upper bounds on environmental impacts such as pollution. For example, climatologists have determined the carbon budget: how much greenhouse gases can still be emitted that keep the atmospheric temperature increase below 1,5°C. But GDP is measured in dollars, a totally different quantity than kg CO2. Hence, none of the economic degrowthers are able to say what is the upper bound or true limit on affluence. There are no scientific studies that estimate the maximum level of GDP that is still permissible.

In the very end, it all comes down to computation (information processing). Everything we value, such as the feelings of well-being created by our computing brains or the biological diversity created by ecosystem processes, is based on computation. The true limits to growth, are the limits of computation, and these are extremely far away. GDP can still grow by an extremely huge amount before hitting these limits.

Economic degrowth is not an effective strategy to reduce environmental impact. First, from a global social justice perspective, economic degrowth should apply only to the high-income countries. Poorer countries should be allowed to grow in order to reduce poverty. However, most (more than 50%) of the global environmental impact (for example global greenhouse gas emissions) occurs in non-high-income countries with high levels of poverty, where degrowth is not appropriate. Suppose degrowth results in a reduction of 50% of the average GDP per capita in the high-income countries. This will reduce the total impact with less than 25%. Such a small reduction in greenhouse gas emissions is not sufficient to meet climate targets and keep the temperature increase below 1,5°C. Hence, reducing affluence has only a small potential. In general, reducing the total impact all the way to zero by only reducing affluence requires a 100% reduction of affluence, which is not feasible.

Economic degrowth is not so politically feasible, as it requires a lot of international cooperation between high-income countries. Reducing GDP is an objective of economic degrowth, but that does not immediately translate into a concrete policy. To study the effectiveness and feasibility of economic degrowth, we have to look at specific policy proposals made by degrowthers.

The most obvious degrowth policy proposal that targets economic growth and affluence, is the implementation of an income ceiling or maximum income level (e.g. a 100% income tax rate above a certain threshold). Degrowthers argue that the relationship between what is measured (income or GDP per capita) and what matters (e.g. well-being, life satisfaction, flourishing), is non-linear and concave. That means increasing the income or wealth of a poor person strongly increases that person’s well-being, but increasing the income of a rich person does not much increase that person’s well-being. If a population becomes very rich, increasing GDP is no longer an effective means to increase the well-being of those people. Hence, setting a maximum income level where the relationship between income and well-being breaks down, should be feasible. But degrowthers neglect the also non-linear and concave relationship between environmental impact (e.g. ecological footprint per capita, greenhouse gas emissions per capita) and GDP per capita. Richer people have a higher propensity to save, which means a smaller fraction of their income goes to consumption. Richer people also make use of more clean technologies that are more expensive. Hence, someone with twice as much income, has less than twice as much environmental impact. This non-linear relationship between GDP and environmental impact means that choosing a high maximum income level does not reduce the total environmental impact that much.

In general, choosing the maximum income level is difficult. If the maximum income level is high, it still allows for a lot of growth, as many people can increase their incomes. If on the other hand the maximum income level is low, it becomes politically unfeasible, as many people will consider that income level as poverty.

A more problematic aspect of a maximum income, is that it can decrease innovation and technological progress, because it reduces the incentive to earn more money by taking risks and invest in innovation. The same goes for another degrowth proposal: a maximum size on (for-profit) companies. This regulation would imply that companies cannot grow and take advantage of their increasing returns to scale. This reduces efficiency. Many small companies are often not able to produce the same things as efficiently as a fewer number of larger companies.

Another degrowth policy proposal that intends to target affluence, is a reduction of working hours. Income and affluence can be reduced by reducing hourly wages, but this faces political resistance, or reducing working hours. However, in free market capitalist societies, we already see a reduction in working hours per worker. Due to increasing productivity and income levels, which corresponds with economic growth, people increasingly value leisure time and prefer to work fewer hours. As a consequence, further government interventions to regulate working hours, for example by setting a maximum that people are allowed to work, would be less effective. And such regulations are too economically disruptive. For example, some highly productive people are willing to work more hours and employers are willing to pay them for those extra hours, but they would be prevented from doing so. This is an infringement on liberty.

Finally, economic degrowth can be harmful. A policy to reduce economic growth risks having negative economic side-effects, for both richer and poorer countries. The rich countries that degrow could face for example increased unemployment and increased government debt (due to lower tax revenues). There are at present no economies that show a decrease in their GDP while at the same time not increasing unemployment or government debt. There is no clear consensus among economists how to safely degrow as a country. Degrowth can be considered as a risky experiment to figure out how to avoid unwanted economic problems while reducing GDP. Also poorer countries can be harmed if richer countries degrow, because of reduced international trade and decreasing export levels towards degrowing richer countries.

Reducing resource consumption: the resource degrowth objective

A third strategy to reduce environmental impact, is to reduce the resource consumption intensity C. This can be very cost-effective, as it saves energy and resource costs, but it has limited feasibility. Just like the previous two factors, reducing the impact all the way to zero by reducing consumption intensity to zero, is not feasible. This unfeasibility is not because of political reasons, but because of physical limits (in particular the second law of thermodynamics).

Due to its cost-effectiveness, we already see a decrease in the global average energy intensity (kWh energy used per dollar GDP) with 1% per year over the past two decades.

Instead of focusing on the factors A and C separately, the degrowth movement focuses on the product AxC. What is needed according to resource degrowth, is neither merely a reduction in economic activity as measured in GDP, nor merely a reduction in consumption intensity, but a reduction in resource throughput, as measured in GDP times consumption intensity.

As with economic degrowth, resource degrowth is not necessary, not effective, not politically feasible and potentially harmful.

The major criticism against resource degrowth policies, is its lack of necessity. First, the real limits to growth are still far away. Consider energy scarcity. The amount of solar energy that hits the earth is almost 10.000 times more than the energy used by all humans. Add the solar energy that can be captured in space (e.g. on the moon), all geothermal energy that can be captured, and nuclear energy from both fission and fusion, and it becomes clear that there is an abundance of energy. Limits on materials (e.g. metals and minerals) are less stringent, because given enough energy, materials can be recycled or mined at hard-to-reach places (e.g. the ocean floor, the moon, asteroids,…). The physical limits of resource use are not yet reached, so why would we need a self-declared, political limit on resource use that is much lower than the physical limit that sets the true boundary?

Second, even if we hit the limits, planned policies are not required. Private property rights on resources (energy, land, minerals) are feasible. These rights are already in place or easily implementable. With such property rights, there is no market failure, which means that free markets solve the scarcity problem through the price mechanism. In other words; markets will automatically indicate whether resource growth and GDP growth are no longer possible. In particular, if the prices of resources increase so fast that resource use or GDP no longer grow, then the market indicates that the limit to growth is reached. As the market will not let the economy grow any further, extra government interventions to stop the growth are superfluous.

But at this moment, there are no indications that we are near the limit. For example, energy expenditure accounts for less than 10% of GDP in high-income countries. That means that the energy prices need to increase really a lot before they impact economic growth. But the prices of resources do not increase so fast that growth becomes impossible. In fact, the prices of most resources (adjusted for inflation) are not even increasing. There is more evidence for a general decreasing trend of resource prices the past decades. This is the opposite of what one would expect if we reached the limits to growth.

Next to their lack of necessity, the resource degrowth policy proposals are not so effective. The two most relevant proposals are an advertisement ban and a resource taxation.

Suppression of advertisements from the public space might be effective, as it could decrease overconsumption. However, this effectiveness is very limited. First, there is some economic evidence that advertisement does not increase consumption that much. Second, an advertisement ban could decrease the prices of products, which results in higher consumption levels. Commercial advertisement is economically inefficient, because it is a zero-sum game: if one company advertises, the competing companies have to spend advertisement budgets to promote their products. In the end, the competing companies are pulling on a rope in opposite directions. The rope is not moving that much and the rope pullers waste energy. Similarly, the competing companies waste costs on advertisement. An advertisement ban would save the companies these costs, which means they can lower their prices.

Degrowthers argue that technological innovations that increase resource efficiency and decrease resource use are not so effective, due to possible rebound effects. For example, households save energy costs when they use more energy efficient appliances. That means they have more money left for extra consumption of other things. Their use of energy efficient appliances also decreases energy demand, which means the price of energy decreases, which means other people will buy (and waste) more energy. These concerns for rebound effects are legitimate. But degrowthers underestimate or neglect similar rebound effects of their policy proposals, such as an advertisement ban.

A second resource degrowth policy proposal is a resource taxation. We have to make a distinction between a resource tax and a pollution tax. When there are negative externalities, such as pollution, a taxation is very effective (although its effectiveness is mitigated due to a lower political feasibility, as it requires international cooperation). A pollution tax internalizes the external costs of pollution into the price of the product. However, when there are property rights on resources, there are no such negative externalities. Furthermore, the supply of resources is inelastic (independent of the price). Consider a tax on land use. As the land is already there (i.e. it is not being produced), a land tax does not decrease land use (unless the tax would be really high, which is politically unfeasible). In general, a resource taxation does not decrease resource use and hence is not effective to reduce the environmental impact.

But a resource tax remains important, though, because it increases fairness through redistribution. A resource tax allows to redistribute the unearned income (resource rent) from owning resources. A resource tax-and-dividend system, where resource tax revenues are distributed to all citizens as a universal dividend, is both fair and efficient. A resource tax is efficient, because resources are created by nature and not by the resource owners. The resource owners will not be disincentivized by the tax: they will not produce less resources when resources are taxed, because the resources are not produced by the owners. And a resource dividend makes the system fair: as no-one produced the resources, the value of the resources belongs equally to everyone. A dividend is a method to equally distribute the value (resource rent) of the resources among citizens.

Improving technology; the ecomodernist objective

In contrast with the degrowth movement, the ecomodernist and effective environmentalist movements primarily focus on the fourth factor in the ImPACT-equation. This T-factor represents technology. A high T-factor means a lot of dirty technology is being used in the economy. Ecomodernists and effective environmentalists campaign for increased government funding in clean technology research and development.

There are several reasons why ecomodernists and effective environmentalists focus on reducing the T-factor by increasing government spending on clean tech innovation.

A first reason is that of all factors in the ImPACT-equation, T is the only factor that can feasibly (according to the laws of physics, without much political resistance) be reduced all the way to (almost) zero, such that the environmental impact becomes (almost) zero. For example, there are clean energy technologies, such as nuclear energy and renewable energy, that have (almost) zero greenhouse gas emissions per energy unit.

Due to technological innovation (research and development of clean technology that has a low environmental impact), we already see a decoupling of climate impact and economic growth in most high-income countries. The consumption-based per capita CO2-emissions in almost all high-income countries (e.g. EU, US,…) dropped by about 25% the past 15 years (since 2005), whereas their levels of GDP per capita kept increasing. Degrowthers are skeptical about such decoupling, and argue that such decoupling is not fast enough to meet climate targets and avoid 1,5°C global warming. But at least we have evidence that decoupling due to technological innovation is possible. In contrast, degrowthers believe in the feasibility of another kind of decoupling, between economic wealth and human well-being or life satisfaction. But there are no countries that show an increase in well-being (e.g. an increase in living standards or flourishing) and a decrease in GDP or resource use. There is strong evidence that GDP is positively correlated with measures of well-being. Degrowthers should be more skeptical about the decoupling of well-being and GDP, than about the decoupling of GDP and environmental impact.

A second reason for the effectiveness of reducing the T-factor, is the interdependence between the factors A and T. In particular, with appropriate policy, the T-factor can be made a decreasing function of A. And this function could even be steeper than 1/A. That means an increase in A could reduce the total environmental impact, because the factor T decreases stronger than the increase in A. Suppose the affluence A increases with 10% (which can be reasonably expected after 5 years of growth at the average growth rate of the past two centuries). If only 1% of that increase in GDP is used for funding of clean technology innovation, which should be politically feasible, the global budget for clean technology R&D more than doubles (currently less than 0,1% of global GDP goes to clean tech R&D). A doubling of R&D could roughly correspond with having the clean technologies on the market twice as fast. If a clean technology has zero CO2 emissions per kWh energy or dollar GDP, it doesn’t matter if the economy grows with 10%, because zero times 10% is zero. Reducing GDP, on the other hand, is dangerous, because there will be less money available for funding of clean tech R&D and for paying for the new clean tech infrastructure.

Third, technological innovations have positive returns to scale. Technology has large spillovers: once invented, the whole world population can adopt the clean technology without extra R&D costs. The innovation is a public good. The provision of public goods is a market failure, because markets are not sufficient providers of public goods. Therefore, it is important that governments invest in this public good by increased funding of clean tech R&D.

Fourth: technological innovation is politically feasible. It does not require international cooperation. It does not face much societal resistance.

Degrowthers argue that clean tech innovation introduces rebound effects that make this policy less effective. For example more clean tech could decrease the price of dirty technology and hence increase the use of dirty technology. However, a rebound effect is mitigated if a pollution tax (or a tax on dirty technologies) is introduced, and if the R&D focuses on clean technologies that are sufficiently substitutable (instead of complementary) with dirty technologies. If clean tech is a good substitute, it can automatically outcompete dirty technologies from the market. Compare it with the transition from horse carriages to motorized cars. The cars outcompeted the horse carriages from the market, even without a horse carriage tax or other government policies to regulate horse carriage use. Horse carriages were considered a big environmental problem in 19th century cities, because of the horse manure and horse cadavers on the streets. And these carriages created other negative externalities, such as the noise of the horse hooves and accidents by unexpected movements of horses. But economic or resource degrowth policies were not necessary to solve these problems. Technological innovation, in particular the invention of the car, solved it.

#### 1. It solves climate mitigation.

Eduard Soler et al. 21, Senior Research Fellow, CIDOB. PhD, International Relations, Universitat Autònoma de Barcelona; Hannah Abdullah, Senior Research Fellow, Global Cities Programme, CIDOB; Inés Arco, Visiting Fellow, CIDOB; Anna Ayuso Pozo, Associate Professor, Public International Law, Universitat Autònoma de Barcelona, "The World In 2022: Ten Issues That Will Shape the International Agenda," Barcelona Centre for International Affairs, December 2021, https://www.cidob.org/en/publications/publication\_series/notes\_internacionals/265/the\_world\_in\_2022\_ten\_issues\_that\_will\_shape\_the\_international\_agenda.

Are we better prepared for a new way of doing things? Time will tell if the reassessment of the priorities of public administrations and societies that occurred in the pandemic has lasting effect. The measures imposed to tackle the health emergency accelerated processes of economic and social transformation. Readjustments may occur when it comes to teleworking, but the change of habits that has taken place in mobility, consumption and information processing and the intensive process of learning digital tools will be difficult to reverse. Another of the legacies of the health crisis has been the focus on science. Ostensibly contradictory phenomena have emerged. Science’s social prestige has grown (the latest global State of Science Index (SOSI) suggests that 79% of people believe that science will improve life in the next five years), but so have the dynamics of politicisation and contestation mentioned above.

If this trend continues it may have a densifying effect, with more collaboration projects between research teams, alliances forming between public administrations, scientists and the private sector, and a closer relationship between the public and science. Meanwhile, science budgets will be notably larger: the Next Generation EU funds allocate 37% and 20% to financing the green and digital transitions, respectively, while the US stimulus plans will spend $250 billion on innovation.

On the other hand, this will exacerbate the concentration of scientific production in just a few countries. Global investment in artificial intelligence (AI) and quantum computing is led by the United States, China and a small group of developed countries, as well as India in certain fields. When it comes to new patents China is the undisputed leader and a wider shift towards Asia is underway. This scientific asymmetry adds a new dimension of inequality to a world advancing at multiple speeds, even in innovation.

Alongside health, the environment is the second major field where efforts are being concentrated. In 2022, pressure will rise on scientific communities, businesses and public administrations to find innovative solutions to the climate crisis. This includes research into advanced technologies to reduce emissions associated with energy use, such as carbon capture and storage, small modular nuclear reactors and options for decarbonising energy-intensive industries. Another challenge is the search for technical solutions to anticipate and prevent the worst impacts of natural disasters and increase resilience.

#### 2. It caps numerous existential risks.

Philip Trammell 21, PhD, Economics, Oxford University. Researcher, Global Priorities Institute, Oxford University, "Existential Risk and Exogenous Growth," ResearchGate, 01/17/2021, pg. 12-13.

Aschenbrenner (2020) explores the possible relationship between economic growth and existential risk, using an endogenous growth model in which sustained output growth requires sustained population growth, and an existental risk model in which the production of consumption goods increases existential risk and the production of “safety goods” lowers it. He finds that, as society grows richer, it should allocate ever more of its resources from consumption to existential risk mitigation efforts. Furthermore, he finds that this policy can render (at least anthropogenic) existential catastrophe permanently avoidable under circumstances in which it would be inevitable under a “rule of thumb” policy in which a fixed proportion of output is spent on risk reduction. Finally, he finds that if there is a sufficiently large “scale effect” of existential risk, existential catastrophe is unavoidable: lowering the hazard rate steeply enough to render the probability of long-run survival positive would require a consumption sacrifice so large that life would no longer be worth living, and which would therefore in itself constitute a kind of existential catastrophe.

Here, we have seen that the last of these findings, but not the rest, disappears when we use the same risk model but move to a simple exogenous growth model. The intuition for this divergence is straightforward. Fixing consmption at some positive-utility level, exponential exogenous productivity growth allows for an exponential increase in risk-mitigation efforts, which delivers a positive probability of survival. Exponential population growth with fixed consumption per capita, on the other hand, creates exponential increases in output only at the expense of corresponding exponential increases in the risky production of consumption goods.

Since we are unlikely to sustain population growth in coming centuries, but may nonetheless sustain productivity growth, the above is good news for those concerned with humanity’s long-term survival. It also illustrates the potential importance of growth theory from a longtermist perspective, even if we believe with Bostrom (2003) that existential risk is the primary determinant of the expected value of the future. Our beliefs about the feasibility of containing existential risk may be sensitive to our beliefs about the mechanisms driving economic growth.

### AT: ALT

#### 1. It can’t overcome institutional barriers AND backlash turns the K.

David A. Spencer 20, Professor, Economics, University of Leeds, "Economics and ‘Bad’ Management: The Limits to Performativity," Cambridge Journal of Economics, Vol. 44, Issue 1, 2020, pg. 15-18.

Proponents of the performativity idea suggest that revision in the theories taught in business schools could help to bring about positive changes in management within real-world organisations. On the one hand, they claim that by not teaching currently dominant mainstream economic theories, ‘bad’ management can be combatted. On the other hand, they argue that by teaching other (‘good’) management theories conditions can be created that promote ‘good’ management.

While the status of ‘good’ theories is not always fully explained, there is the idea that these theories will contribute to social good, at the same time as promoting the goal of efficiency. Positive contribution comes here through sound explanation not just through the ‘preaching’ of a particular set of policies and politics (Ghoshal, 2005: 86). For writers such as Pfeffer and Ghoshal, there is support for a more ethically grounded management theory that can support higher firm performance while protecting and enhancing the health and well-being of workers. Here ‘high-commitment’ management is seen to have some merit and is endorsed ahead of cost-reducing alternatives linked to the shareholder value model (see Pfeffer, 2007). More generally, there is a plea for greater ‘pluralism’ in management theory and for more discussion of alternative types of management practice that go beyond the shareholder value model (Ghoshal, 2005: 88).

Performativity, in general, suggests that business school academics need to be more self-reflective and consider the potential for the theories they teach and profess to become selffulfilling prophecies. They should be careful what they write and what they say because their writings and utterances could change reality for good as well as ill. In the realm of teaching, in particular, self-reflection means professing and promoting theories that seek changes in management practice that transcend the goal of shareholder value maximisation. More directly, it means teaching theories to would-be or actual managers that are not moneycentred, but rather which aim for a balance between efficiency and equity (Pfeffer, 2016).

From a different standpoint, some proponents of ‘critical management studies’ (CMS) have argued for a form of ‘critical’ or ‘progressive’ performativity (see Fournier and Grey (2000) for a summary of CMS). These writers argue that management researchers ought to get closer to managers and promote ideas that can effect changes in the practice of the latter. Spicer et al. (2009: 538), for example, recommend ‘active and subversive intervention into managerial discourses and practices’. Wickert and Schaefer (2015: 3), in a similar vein, see the need ‘to ‘activate’ the language that managers use’ [in ways that] ‘support managers to ‘talk into existence’ new (counterbalancing) behaviours and practices’. In both instances, there is a stress on modifying the language used by managers in a manner that can bring about positive change in their practice. Here the performative power of language is accepted and used to argue for action designed to reform management. CMS, in short, is urged to embrace performativity as a way to create a better world in and beyond present-day organisations.

The notion of performativity as a driver of management reform, however, faces problems. Most clearly, it ignores the fact that critical management theories may be professed in business schools without any influence at all on actual management practice. Managers may be exposed to these theories and may even accept them but if they continue to work under conditions that preclude their realisation, their behaviour will remain unchanged by them. It is to invest too much power in the potential influence of critical management theories to think that they alone could help to bring about ‘good’ management.

Consider the example of a middle-manager being exposed to a critical management theory – for example, one found in the subjects of HRM and business ethics – that promotes the idea of shared ownership and challenges the shareholder value model. This theory may be highly convincing in its arguments and may also be backed by strong supporting evidence (e.g. on the well-being and health benefits of more democratic forms of management). It may win over the manager in ways that make her want to implement it. More subtly, it may lead her to think and act differently, in ways that create the potential for the theory to become performative. But consider then the scope for the manager to make changes in her work life. She will face the pressing constraint of shareholders who demand conformity to profit maximisation. She will run the risk of demotion and even the loss of her job if she pursues an alternative course of action. Resistance to the shareholder value model would not just breach a corporate norm but also lead to opprobrium and direct sanction. Here even though the manager may be convinced by a different course of action and want to revise existing management practice, she will be unable to change things as she wishes. Instead, circumstances will lead her to maximise shareholder value, despite her belief in its regressive implications.

Fleming and Banerjee (2016: 265-67), as mentioned above, discuss reasons why performativity is likely to fail in practice. They show how management scholars will often be required to make compromises in getting close to managers and how any critical agenda will be diluted by such engagement. Middle-managers are easier to access than CEOs and senior managers, yet the latter are the ones with the power and influence to change management. CMS scholars, in this case, may be faced with engaging with managers who lack the ability to change anything significant. Further, CEOs and senior managers may turn critical agendas into mechanisms for promoting their own goals – corporate social responsibility, for example, has become another tool for promoting firm performance with little positive effect on climate change or worker well-being (see Fleming and Jones, 2013). Finally, if promoting alternative theories to managers causes a backlash from shareholders in the form of stricter management control, the effect on lower-level managers and workers may be worse terms and conditions. Hence, in this case, the impact of performativity may be more, not less, ‘bad’ management.

The point to add here is that the reasons for the failure of performativity are not just contingent but structural. They reflect on the way that capitalism sets limits on management and how change in management requires reform beyond the level of theory. The problem of performativity, in short, stems from a failure to see the need for broader structural change and a future where organisations are run differently and in non-capitalist ways.

#### 2. Socialist blockchain disproves solvency---Venezuela proves it.

Paul Mason 16, Visiting Professor at the University of Wolverhampton, BA in Politics from the University of Sheffield, Postgraduate Degree from the Second Viennese School at the University of Sheffield, PostCapitalism: A Guide to Our Future, Kindle Edition, p. 6-17

What started in 2008 as an economic crisis morphed into a social crisis, leading to mass unrest; and now, as revolutions turn into civil wars, creating military tension between nuclear superpowers, it has become a crisis of the global order.

There are, on the face of it, only two ways it can end. In the first scenario, the global elite clings on, imposing the cost of crisis on to workers, pensioners and the poor over the next ten or twenty years. The global order – as enforced by the IMF, World Bank and World Trade Organisation – survives, but in a weakened form. The cost of saving globalization is borne by the ordinary people of the developed world. But growth stagnates.

In the second scenario, the consensus breaks. Parties of the hard right and left come to power as ordinary people refuse to pay the price of austerity. Instead, states then try to impose the costs of the crisis on each other. Globalization falls apart, the global institutions become powerless and in the process the conflicts that have burned these past twenty years – drug wars, post-Soviet nationalism, jihadism, uncontrolled migration and resistance to it – light a fire at the centre of the system. In this scenario, lip-service to international law evaporates; torture, censorship, arbitrary detention and mass surveillance become the regular tools of statecraft. This is a variant of what happened in the 1930s and there is no guarantee it cannot happen again.

In both scenarios, the serious impacts of climate change, demographic ageing and population growth kick in around the year 2050. If we can’t create a sustainable global order and restore economic dynamism, the decades after 2050 will be chaos.

So I want to propose an alternative: first, we save globalization by ditching neoliberalism; then we save the planet – and rescue ourselves from turmoil and inequality – by moving beyond capitalism itself.

Ditching neoliberalism is the easy part. There’s a growing consensus among protest movements, radical economists and radical political parties in Europe as protest movements, radical economists and radical political parties in Europe as to how you do it: suppress high finance, reverse austerity, invest in green energy and promote high-waged work.

But then what?

As the Greek experience demonstrates, any government that defies austerity will instantly clash with the global institutions that protect the 1 per cent. After the radical left party Syriza won the election in January 2015, the European Central Bank, whose job was to promote the stability of Greek banks, pulled the plug on those banks, triggering a €20 billion run on deposits. That forced the left-wing government to choose between bankruptcy and submission. You will find no minutes, no voting records, no explanation for what the ECB did. It was left to the right-wing German newspaper Stern to explain: they had ‘smashed’ Greece.3 It was done, symbolically, to reinforce the central message of neoliberalism that there is no alternative; that all routes away from capitalism end in the kind of disaster that befell the Soviet Union; and that a revolt against capitalism is a revolt against a natural and timeless order.

The current crisis not only spells the end of the neoliberal model, it is a symptom of the longer-term mismatch between market systems and an economy based on information. The aim of this book is to explain why replacing capitalism is no longer a utopian dream, how the basic forms of a postcapitalist economy can be found within the current system, and how they could be expanded rapidly.

Neoliberalism is the doctrine of uncontrolled markets: it says that the best route to prosperity is individuals pursuing their own self-interest, and the market is the only way to express that self-interest. It says the state should be small (except for its riot squad and secret police); that financial speculation is good; that inequality is good; that the natural state of humankind is to be a bunch of ruthless individuals, competing with each other.

Its prestige rests on tangible achievements: in the past twenty-five years, neoliberalism has triggered the biggest surge in development the world has ever seen, and it unleashed an exponential improvement in core information technologies. But in the process, it has revived inequality to a state close to that of 100 years ago and has now triggered a survival-level event.

The civil war in Ukraine, which brought Russian special forces to the banks of the Dniestr; the triumph of ISIS in Syria and Iraq; the rise of fascist parties in the Dniestr; the triumph of ISIS in Syria and Iraq; the rise of fascist parties in Europe; the paralysis of NATO as its populations withhold consent for military intervention – these are not problems separate from the economic crisis. They are signs that the neoliberal order has failed.

Over the past two decades, millions of people have resisted neoliberalism but in general the resistance failed. Beyond all the tactical mistakes, and the repression, the reason is simple: free-market capitalism is a clear and powerful idea, while the forces opposing it looked like they were defending something old, worse and incoherent.

Among the 1 per cent, neoliberalism has the power of a religion: the more you practise it, the better you feel – and the richer you become. Even among the poor, once the system was in full swing, to act in any other way but according to neoliberal strictures became irrational: you borrow, you duck and dive around the edges of the tax system, you stick to the pointless rules imposed at work.

And for decades the opponents of capitalism have revelled in their own incoherence. From the anti-globalization movement of the 1990s through to Occupy and beyond, the movement for social justice has rejected the idea of a coherent programme in favour of ‘One No, Many Yes-es’. The incoherence is logical, if you think the only alternative is what the twentieth century left called ‘socialism’. Why fight for a big change if it’s only a regression – towards state control and economic nationalism, to economies that work only if everyone behaves the same way or submits to a brutal hierarchy? In turn, the absence of a clear alternative explains why most protest movements never win: in their hearts they don’t want to. There’s even a term for it in the protest movement: ‘refusal to win’.4

To replace neoliberalism we need something just as powerful and effective; not just a bright idea about how the world could work but a new, holistic model that can run itself and tangibly deliver a better outcome. It has to be based on micro-mechanisms, not diktats or policies; it has to work spontaneously. In this book, I make the case that there is a clear alternative, that it can be global, and that it can deliver a future substantially better than the one capitalism will be offering by the mid-twenty-first century.

It’s called postcapitalism.

Capitalism is more than just an economic structure or a set of laws and institutions. It is the whole system – social, economic, demographic, cultural, ideological – needed to make a developed society function through markets and private ownership. That includes companies, markets and states. But it also includes criminal gangs, secret power networks, miracle preachers in a Lagos slum, rogue analysts on Wall Street. Capitalism is the Primark factory that collapsed in Bangladesh and it is the rioting teenage girls at the opening of the Primark store in London, overexcited at the prospect of bargain clothes.

By studying capitalism as a whole system, we can identify a number of its fundamental features. Capitalism is an organism: it has a lifecycle – a beginning, a middle and an end. It is a complex system, operating beyond the control of individuals, governments and even superpowers. It creates outcomes that are often contrary to people’s intentions, even when they are acting rationally. Capitalism is also a learning organism: it adapts constantly, and not just in small increments. At major turning points, it morphs and mutates in response to danger, creating patterns and structures barely recognizable to the generation that came before. And its most basic survival instinct is to drive technological change. If we consider not just info-tech but food production, birth control or global health, the past twenty-five years have probably seen the greatest upsurge in human capability ever. But the technologies we’ve created are not compatible with capitalism – not in its present form and maybe not in any form. Once capitalism can no longer adapt to technological change, postcapitalism becomes necessary. When behaviours and organizations adapted to exploiting technological change appear spontaneously, postcapitalism becomes possible.

That, in short, is the argument of this book: that capitalism is a complex, adaptive system which has reached the limits of its capacity to adapt.

This, of course, stands miles apart from mainstream economics. In the boom years, economists started to believe the system that had emerged after 1989 was permanent – the perfect expression of human rationality, with all its problems solvable by politicians and central bankers tweaking control dials marked ‘fiscal and monetary policy’.

When they considered the possibility that the new technology and the old forms of society were mismatched, economists assumed society would simply remould itself around technology. Their optimism was justified because such adaptations have happened in the past. But today the adaptation process is adaptations have happened in the past. But today the adaptation process is stalled.

Information is different from every previous technology. As I will show, its spontaneous tendency is to dissolve markets, destroy ownership and break down the relationship between work and wages. And that is the deep background to the crisis we are living through.

If I am right we have to admit that for most of the past century the left has misunderstood what the end of capitalism would look like. The old left’s aim was the forced destruction of market mechanisms. The force would be applied by the working class, either at the ballot box or on the barricades. The lever would be the state. The opportunity would come through frequent episodes of economic collapse. Instead, over the past twenty-five years, it is the left’s project that has collapsed. The market destroyed the plan; individualism replaced collectivism and solidarity; the massively expanded workforce of the world looks like a ‘proletariat’, but no longer thinks or behaves purely as one.

If you lived through all this, and hated capitalism, it was traumatic. But in the process, technology has created a new route out, which the remnants of the old left – and all other forces influenced by it – have either to embrace or die.

Capitalism, it turns out, will not be abolished by forced-march techniques. It will be abolished by creating something more dynamic that exists, at first, almost unseen within the old system, but which breaks through, reshaping the economy around new values, behaviours and norms. As with feudalism 500 years ago, capitalism’s demise will be accelerated by external shocks and shaped by the emergence of a new kind of human being. And it has started.

Postcapitalism is possible because of three impacts of the new technology in the past twenty-five years.

First, information technology has reduced the need for work, blurred the edges between work and free time and loosened the relationship between work and wages.

Second, information goods are corroding the market’s ability to form prices correctly. That is because markets are based on scarcity while information is abundant. The system’s defence mechanism is to form monopolies on a scale not seen in the past 200 years – yet these cannot last.

Third, we’re seeing the spontaneous rise of collaborative production: goods, services and organizations are appearing that no longer respond to the dictates of services and organizations are appearing that no longer respond to the dictates of the market and the managerial hierarchy. The biggest information product in the world – Wikipedia – is made by 27,000 volunteers, for free, abolishing the encyclopaedia business and depriving the advertising industry of an estimated $3 billion a year in revenue.

Almost unnoticed, in the niches and hollows of the market system, whole swathes of economic life are beginning to move to a different rhythm. Parallel currencies, time banks, cooperatives and self-managed spaces have proliferated, barely noticed by the economics profession, and often as a direct result of the shattering of old structures after the 2008 crisis.

New forms of ownership, new forms of lending, new legal contracts: a whole business subculture has emerged over the past ten years, which the media has dubbed the ‘sharing economy’. Buzzterms such as the ‘commons’ and ‘peer- production’ are thrown around, but few have bothered to ask what this means for capitalism itself.

I believe it offers an escape route – but only if these micro-level projects are nurtured, promoted and protected by a massive change in what governments do. This must in turn be driven by a change in our thinking about technology, ownership and work itself. When we create the elements of the new system we should be able to say to ourselves and others: this is no longer my survival mechanism, my bolt-hole from the neoliberal world, this is a new way of living in the process of formation.

In the old socialist project, the state takes over the market, runs it in favour of the poor instead of the rich, then moves key areas of production out of the market and into a planned economy. The one time it was tried, in Russia after 1917, it didn’t work. Whether it could have worked is a good question, but a dead one.

Today the terrain of capitalism has changed: it is global, fragmentary, geared to small-scale choices, temporary work and multiple skill-sets. Consumption has become a form of self-expression – and millions of people have a stake in the finance system that they did not have before.

With the new terrain, the old path is lost. But a different path has opened up. Collaborative production, using network technology to produce goods and services that work only when they are free, or shared, defines the route beyond the market system. It will need the state to create the framework, and the postcapitalist sector might coexist with the market sector for decades. But it is postcapitalist sector might coexist with the market sector for decades. But it is happening.

Networks restore ‘granularity’ to the postcapitalist project; that is, they can be the basis of a non-market system that replicates itself, which does not need to be created afresh every morning on the computer screen of a commissar.

#### 3. Societies can’t and won’t shift fast enough---centuries of history prove.

Rogelio Luque-Lora 21, MSci in History and Philosophy of Science from the University of Cambridge, M.A. in Natural Sciences from the University of Cambridge, “Engaging imaginaries, rejecting utopias: The case for technological progress and political realism to sustain material wellbeing,” Political Geography, Vol. 86, 02-21-2021, https://doi.org/10.1016/j.polgeo.2021.102358

Gómez-Baggethun is right to suspect that the modern myth of progress has theological origins. In fact, it is largely a product of the Christian conception of human history as an inherently meaningful story that has salvation as its end point. Without the belief that there is a teleological coherence to the history of humanity, and that salvation (whether the Christian version of the Kingdom of God on Earth, or the humanist faith in an emancipated and harmonious future) is an earthly event that lies ahead of the present, the idea of progress is groundless. In cultures that are not historically steeped in Western monotheism, the belief that humanity is inexorably marching toward a better state of affairs is largely absent (Gray, 2007, pp. 29–39). Where Gómez-Baggethun's reading of progress misses the mark is in limiting its scope to technology. The central tenet of modern belief in progress is that ethics and politics advance in line with the growth of knowledge, so that as scientific and technological understandings accrue, so too do humans increasingly learn to arrange their societies in rational and ethical ways (Gray, 2002).

Contrary to Gómez-Baggethun's assertions, technological progress is a fact. Throughout their history, humans have increasingly learnt to manipulate the environment around them to serve their interests. The reason for this is that scientific knowledge grows cumulatively: past discoveries are not necessarily lost with the advent of new knowledge, but rather can be built upon or thrown into question by these new understandings. In contrast, any historical ‘gains’ in politics and ethics (placed between inverted commas to reflect that such evaluations will depend on the particular values of each generation) are easily undone by regime and cultural changes. It is progress in ethics and politics, not in technology, that is a myth.

Viewed in this light, Gómez-Baggethun's assertion that utopias are concrete and plausible if they are scientifically informed, while saying nothing about how assumed radical social change may come about, begs the question of why scientific plausibility is given categorical priority over social and political feasibility. Gómez-Baggethun's analysis fits within a broader tradition; the belief that humans can radically remake the world at will commonly presents itself as having the authority of science (Gray, 2007, p. 20). An historically and politically informed view may well reveal degrowth to be utopian, in the true sense of being a projection into the future of an unrealisable society (Gray, 2007, pp. 20–29).

There are no historical examples of humans showing the intelligence or will to voluntarily restructure their societies in the measure that would be required for a global shift to degrowth, let alone at the speed required to avert the climatic changes and ecological collapses predicted for this century. Further complicating things for advocates of degrowth, no contemporary democratic state has been able to survive without sustaining economic growth over the medium and long terms (Gray, 1992, p. 83). Recently, Gray (2019) has written,

The trouble is that Green proposals involve a drop in material living standards for large numbers of people, and any such fall will be unsustainable in political terms. Macron's tax on petrol fuelled the rise of the gilets jaunes in France, while the principal beneficiary of Hilary Clinton's election pledge to shut down the coal industry has been Donald Trump. When Green policies impose heavy costs on the poor and the working majority – as they often do – the result is a popular blowback.

Gómez-Baggethun's mistake here is to think that degrowth is feasible simply because it is desirable. In political terms, the evidence suggests that it is unfeasible. To resist these facts and to consider degrowth to be the only realistic imaginary reflects a pseudo-religious faith in humans' willingness and ability to convert to an ecological worldview and to radically adjust their institutions accordingly.

#### 4. Organizing failure and bureaucracy make the alt unsustainable---but, blockchain unlocks it

Tom Cassauwers 20, Writer for Ozy, Freelance Journalist from Belgium, Currently Writes About Startups, Technology, Social Movements and Latin America, “Who Really Loves Blockchain? Socialists”, Ozy, 12/6/2020, https://www.ozy.com/the-new-and-the-next/who-really-loves-blockchain-socialists/397843/

WHY YOU SHOULD CARE

Cryptocurrencies have traditionally been driven by libertarians. Now socialists are embracing blockchain as a weapon against capitalist states.

Cryptocurrencies and blockchain have traditionally been the preserve of the libertarian right.

A growing number of socialists see blockchain as the weapon their political movement needs, from helping fund protest movements to avoiding sanctions and increasing government accountability.

To many millennials, Adrian’s sharp turn to the left is recognizable.

After graduating from college, he had student debt and a job he describes as shitty, in addition to working as an Uber driver. “I went deeper into left-wing theory during this period,” says Adrian (because Adrian doesn’t want his radical politics to interfere with his life, he asked that we not use his real name). “But I was also searching for ways to make rent. Which made me have a closer look at stocks and eventually cryptocurrencies.”

As Adrian got hooked on blockchain, a whole new world opened up. “It was a wormhole from there,” he says. “I realized we could automate away the capitalists.”

It’s an idea that a small but growing set of left-wingers are exploring. Cryptocurrencies like Bitcoin, blockchain and the underlying technology have traditionally been the preserve of the libertarian right. Many of the field’s leading figures are libertarians, and some of their economic beliefs are foundational for the community.

Socialists, though, are increasingly embracing the potential of blockchain to assist their political plans. This year Cryptocommunism, a book by French philosopher Mark Alizart, was translated into English. Yanis Varoufakis, the former finance minister of Greece and a left-wing icon, has repeatedly mused about the uses of Bitcoin for the left. The socialist government of Venezuelan President Nicolás Maduro started a botched cryptocurrency experiment in 2018 to evade U.S. sanctions. Adrian himself hosts a podcast about cryptocurrencies and has founded a Reddit community called r/CryptoLeftists.

“Leftists often see blockchain as a libertarian toy that’s only good for buying drugs, which I think is wrong,” says Matthew McKeever, executive associate editor of the academic journal Inquiry and a research assistant at the University of Hong Kong. McKeever doesn’t consider himself a socialist, but he has written about the relation between socialism and blockchain. “The technology has elements that deserve attention from the left,” he says.

WITH BLOCKCHAIN, YOU DON’T NEED TO DEPEND ON A CENTRALIZED AUTHORITY.

Broadly speaking, blockchain could serve socialists in two ways. The narrow option is to use blockchain technologies to better organize. A cryptocurrency might be used to allow money transfers to persecuted activists, similar to how Wikileaks received donations in bitcoin after its accounts were blocked for leaking classified information. Nigerian activists have used cryptocurrencies to raise funds for their recent protests against police brutality, after traditional banking channels were shut off. “For socialists, it could be good to organize without taking a detour through large capitalist companies, whose interests are anti-aligned with yours,” says McKeever.

But beyond that, blockchain might also be useful to build a socialist economy. Adrian mentions a hypothetical case in which the government might be able to distribute housing through blockchain and cryptocurrencies.

Capitalism, says Adrian, allows individuals to accumulate infinite amounts of capital, and in turn buy up houses as investments. To transition this to a system based on need, a token, or coin, which gives every citizen the right to a house, could be used. The community would then decide which categories of people are eligible for which houses. A single person, for example, might get a different token, and in turn access to a different selection of houses, than a couple with three children. In this way, blockchain would allow socialists to distribute goods and services without a market. “We need to distribute housing based on need, instead of through the market,” Adrian says.

The Venezuelan experiment with the petro, a cryptocurrency backed up by oil, is the odd one out. The attempt had more to do with evading U.S. sanctions than moving to socialism.

But even beyond Venezuela, traditional libertarians don’t agree with the cryptosocialists’ views. “Cryptocurrency technology is fundamentally libertarian,” says Diego Zuluaga, associate director of financial regulation studies at the libertarian think tank Cato Institute.

For him, libertarianism doesn’t just mean free markets. He argues that cryptocurrencies preserve the ability of individuals to do with their money as they please, instead of centralizing that power. And for Zuluaga, the plans of leftists like Adrian run counter to that fundamental libertarian belief about cryprocurrencies. “Most socialists like hierarchies,” he says. “They just want to replace private sector hierarchies with public sector ones.”

“They don’t know what they’re talking about,” responds Adrian, noting how capitalist economies are still highly centralized. Cryptosocialists argue that turning to blockchain could eliminate bureaucrats from the equation. “With blockchain, you don’t need to depend on a centralized authority,” Adrian says, returning to his housing example. “The alternative is for a socialist government to organize the housing supply, which creates technocratic dependencies.”

Blockchain would also be open source, allowing citizens to review the software underlying government decisions. In a sense, it would help avoid an age-old problem for socialism: that its utopian sentiments tend to get bogged down in stale bureaucracies. To back this up, Adrian references socialist philosopher Friedrich Engels: “He said that we need to transition the state from a government of people, to the administration of things.” Perhaps blockchain is the revolution that socialism needs.

### Extra

#### The overall environment is resilient---‘existential’ threats are false

Ronald Bailey 20, Science Correspondent at Reason, Member of the Society of Environmental Journalists and the American Society for Bioethics and Humanities, “The Global Environmental Apocalypse Has Been Canceled”, Reason Magazine, 8/1/2020, <https://reason.com/2020/08/01/the-global-environmental-apocalypse-has-been-canceled/> [grammar edit]

According to these activists and politicians, humanity is beset on all sides by catastrophes that could kill off civilization, and maybe even our species. Are they right?

Absolutely not, answers the longtime environmental activist Michael Shellenberger in an engaging new book, Apocalypse Never: Why Environmental Alarmism Hurts Us All. "Much of what people are being told about the environment, including the climate, is wrong, and we desperately need to get it right," he writes. "I decided to write Apocalypse Never after getting fed up with the exaggeration, alarmism, and extremism that are the enemy of positive, humanistic, and rational environmentalism." While fully acknowledging that significant global environmental problems exist, Shellenberger argues that they do not constitute inexorable existential threats. Economic growth and technological progress, he says, can ameliorate them.

Shellenberger's analysis relies on largely uncontroversial mainstream science, including reports from the Intergovernmental Panel on Climate Change (IPCC) and the Food and Agriculture Organization. And as a longstanding activist, Shellenberger is in a good position to parse the motives behind the purveyors of doom.

Shellenberger's activism is the real deal. To raise a donation to the Rainforest Action Network, he charged his friends $5 to attend his 16th birthday party. At 17 he went to Nicaragua to experience the Sandinista revolution. In the 1990s he worked with the Landless Workers' Movement in Brazil.

In 2003, Shellenberger and allies launched the New Apollo Project to jumpstart a no-carbon energy revolution over the next 10 years. In 2008, Time named him "A Hero of the Environment." He co-founded the ecomodernist Breakthrough Institute, which advocates the use of advanced technologies such as nuclear power and agricultural biotechnology to decouple the economy from the ecology, allowing both humanity and the natural world to flourish. More recently, he founded Environmental Progress, which campaigns for, among other things, the deployment of clean modern nuclear power. He is an invited expert reviewer of the Intergovernmental Panel on Climate Change's next assessment report.

Ohio Passes Controversial Conscience Clause for Doctors

So what does he say about climate change? "On behalf of environmentalists everywhere, I would like to formally apologize for the climate scare we created over the last 30 years," he wrote in an essay to promote his new book. "Climate change is happening. It's just not the end of the world. It's not even our most serious environmental problem." Needless to say, there are environmentalists everywhere who do not believe they have anything to apologize for. A group of six researchers assembled by the widely respected Climate Feedback fact-checking consortium rated his article as having low scientific credibility.

Shellenberger doesn't devote much of Apocalypse Never to the science behind man-made climate change. He basically accepts the consensus that it's a significant problem and instead focuses on various claims about the harms it is supposedly already causing. In that promotional essay, he argues that (1) human[s] being are not causing a "sixth mass extinction," (2) the Amazon rainforests are not the "lungs of the world," (3) climate change is not making natural disasters worse, and (4) fires have declined 25 percent around the world since 2003.

Shellenberger isn't denying the reality of man-made climate change. He's arguing that humanity is already adapting to the ways climate change has been making weather patterns evolve, and that we will continue to adapt successfully in the future. His book is ultimately a sustained argument that poverty is world's most important environmental problem, and that rising prosperity and increasing technological prowess will ameliorate or reverse most deleterious environmental trends.

#### Blockchain creates sustainability AND solves their impact

Michael Macaulay 21, Full-Stack Ethereum Developer, Software Engineer at LiveArt.io, BA in Digital Communication from Carson Newman University, “The Socialist Case for Cryptocurrency”, Medium, 9/2/2021, https://medium.com/geekculture/the-socialist-case-for-cryptocurrency-f162b8c1508

Socialists propose different paths forward to fix the many problems we face. However, they tend to ignore Cryptocurrency as an option.

Cryptocurrency hardly fixes every problem in the modern world. Far from it. But it can address many grievances that socialists have in the modern west.

Socialism is a loaded term. So let’s define it before we get into it. Just so we’re on the same page.

Socialism is the political idea of social ownership of the means of production. The means of production being businesses and property.

Basically, the people who work the businesses should also be the owners.

Socialism often gets confused with communism. Communism advocates for state ownership of the means of production.

When people criticize socialism for “not working,” they are really criticizing communism. Many socialist policies in Scandinavia, Europe, and even the US to an extent have produced good outcomes.

For example, Universal public education and the 40 hour work week are socialist policies.

Hopefully we’re on the same page now. And we can explore how cryptocurrency can promote socialist ideals without state intervention.

Universal Access to Finance

Access to basic financial services is a must. If you don’t have a bank account, you can’t start a business or safely save your own money.

There are billions of people across the world who don’t have any chance in the free market because they don’t have access to financial services.

As socialists would point out, because it’s not profitable to provide those services.

Cryptocurrency is easy to access as long as you have an Internet connection.

In theory, you could be homeless living in Sub-Saharan Africa. And if you have a laptop, you can create an Ethereum wallet and start earning cryptocurrency.

And if you luck out, you could end up becoming very wealthy in the process.

The important distinction is that cryptocurrency provides you the opportunity in the first place. The bank won’t even let you try.

Metamask is never going to do a background check on you. They don’t care if you are living in extreme poverty.

Anti-Inflation

Inflation is the big problem with a government backed currency. They can’t stop printing it. this is how most people get their start in cryptocurrency to begin with.

Inflation disproportionately hurts the lower classes. Their survival is dependent on their wages. And inflation slowly makes those wages worth less and less.

You can’t artificially create more Bitcoin or Ethereum.

Your crypto might be vulnerable to price fluctuations, but that can play in your favor. A smart trader can buy low and sell high. But inflation will always hurt you.

Inflation hurts rich people too. Don’t get me wrong. Which is why most of the new printed money goes directly into their businesses.

Rigged free market

It’s no secret that most of the printed money goes directly into businesses. Drives up stock prices. Makes the business owners wealthier.

They claim it’s to “stimulate the economy.” But most people have figured out that it only stimulates their economy. Not ours.

This allows big business to maintain monopolistic control of the free market. Which makes competing with them all the more difficult.

A lobbyist has a better ROI than innovation.

Cryptocurrency is unique because it isn’t vulnerable to that kind of regulation. The code that powers bitcoin can’t be turned off. Or edited by the government.

Anti-monopoly

Look, at the end of the day, cryptocurrency is open source software. That means it’s very hard to monopolize it.

Microsoft has a monopoly with Windows because the code that makes it run is closed source. You’re not allowed to look at it.

If a cryptocurrency project had some kind of flaw, but was otherwise a great project, it can easily be fixed.

Developers can create their own version of the code, fix the problem, and release it as a new, separate project.

So, let’s say there’s a cryptocurrency project that lets you trade rare crypto coins. But, the creator forces you to pay a 50% fee.

That would suck. Other developers would be able to fork the code. Remove the fee. And let everyone use it.

Cryptocurrency Connect Workers to the Business

The traditional economy looks something like this. A wealthy person starts a brick and mortar business. Hires locals to come in and work it. He pays the employees a set wage and the business owner collects any of the upside.

The Internet disrupted this to an extent. Sites like YouTube, Fiverr, Uber, etc.

Now, the workers simply use these websites as a platform to find work. Whether they’re content creators or freelancers.

But there are a few big problems. The most important being the platform itself. It has complete control over these workers.

They can arbitrarily delete your account without warning, and take a large percentage of any money you make.

For example, YouTube takes a whopping 45% of all your revenue.

That’s where cryptocurrency and blockchains come in.

As Vitalik Buterin put it, “Whereas most technologies tend to automate workers on the periphery doing menial tasks,” Buterin says, “blockchains automate away the center. Instead of putting the taxi driver out of a job, blockchain puts Uber out of a job and lets the taxi drivers work with the customer directly.”

The platform itself will be autonomous code. Code that cannot be edited or manipulated.

The best example right now is Uniswap. It’s a decentralized cryptocurrency exchange.

There is no central authority controlling everything. There are only traders and liquidity providers. That’s it. No middlemen. No rule makers. No bullshit.

As tech continues to get better, this will be the norm for large platforms.

Every single giant tech company that controls a massive platform of workers and creators will be replaced by a Decentralized cryptocurrency competitor.

This is going to be a revolution for workers. They’ll be able to build up their skills. Sell those skills on the decentralized web. Get paid in crypto. And that’s it.

And what’s even more exciting is that every platform will use a native token. Uniswap issues Uniswap tokens that act as governance tokens.

Who gets those tokens? The users! The people who make the platform run to begin with.

This is going to do more to democratize the workplace than any other socialist policy in history.

Final Thoughts

Cryptocurrency is popular with the political right. You can’t ignore the anti-government freedom crowd.

But cryptocurrency addresses loads of socialist ideals. And what’s better — it will be decentralized socialism. No governments or unions required.

Cryptocurrency is building a utopian future. Constructed with code and powered by computers. Where workers will own their own product without a profiteering middleman reaching into their pockets.

The future crypto-powered world is going to be a utopia for everyone. Workers included.

### Fascism DA---2AC

#### Refusing antitrust means it’s controlled by capitalists and worse---socialism demands strong regulation

Francis Erdman 21, Society for Humanistic Judaism, IT worker in Massachusetts, “Blockchain for the People? A Progressive Perspective on the Technology”, People’s World, 7/19/2021, https://www.peoplesworld.org/article/blockchain-for-the-people-a-progressive-perspective-on-the-technology/

There are many myths and misunderstandings about blockchain, the technology that underpins cryptocurrencies such as Bitcoin. This largely because many (not all) people who work in that space come at it either from a global capitalist mindset and/or some flavor of libertarian/anarchist mindset. They are seeking to politicize something which is after all just a technology, a tool, that can be used towards one set of ends or another. They want to monopolize this tool all for themselves.

Without getting into too many technical details, blockchain at heart is just the most recent iteration of an old methodology started by bankers in 1400s Italy, who found it was more secure and more resistant to bookkeeping errors to keep at least two sets of ledger books, copies of one another, in order to avoid typos and intentional altering of data by bad actors. So blockchain is just that, essentially, except not just two copies of ledger books, but potentially millions of copies, distributed across computers through the internet all over the world.

And that is really about it—blockchain is just the latest way to avoid fraud and accidental data entry errors by keeping duplicate records. The political aspects of blockchain technology are basically “baggage” brought into it by people with their own agendas, and have nothing to do with the technology itself, which, again, is basically just a computerized form of keeping duplicate records in order to enhance security in recordkeeping.

There are many legitimate uses for this technology. Companies can use it to keep track of inventory and supply chains to reduce costs and avoid errors and waste. Blockchain can also be used to create very ambitious multi-player online games because, as even the casual gamer knows, it is often easy for a bad actor to exploit a vulnerability in a game to win prizes, points, etc. for themselves at the expense of the other players (a situation that was parodied in the South Park episode, “Make Love Not Warcraft”). Blockchain makes cheating in a multi-player online role playing game difficult or impossible to do, basically, because it can make so many copies of the “inventory,” so to speak, of the virtual assets of each player such that no player can find an exploit which would alter this virtual “inventory” of in-game assets to their advantage.

Even states can use blockchain to their advantage as well. Russia, for instance, has a plan in the works to issue a digital version of the ruble underpinned by blockchain technology, with the goal of making fraud and counterfeiting virtually impossible.

So there are many perfectly legitimate uses of this technology which have nothing to do with private individuals or corporations issuing their own wholly unregulated “currencies,” a scheme which hearkens back to the “robber baron” days of the 1800s where there were no regulations on companies issuing stocks or “company currencies” and so fraud ran rampant, mostly at the expense of working people, even worse in some ways than it is today.

Today’s trend of social media “influencers,” such as Kim Kardashian, issuing their own “pump and dump” cryptocurrencies—they “talk up” the price of an asset, only to sell it at the top, leaving everyone else, namely, their followers on social media, holding the bag—is sadly, I think, the end, logical result of the Reagan-Thatcher deregulation era that began in the 1980s. When government abdicates its responsibility to protect people from the excesses of predatory capitalists, it is no surprise that today everywhere one looks on social media there is yet another fraudulent digital “currency” being shilled by some social media “personality” or other. Of course, certainly not all social media influencers are unethical, but as is often the case, sometimes it is the unethical ones who seem to get the most attention.

Widely-used public, open-source blockchains, such as Bitcoin or Ethereum, can be viewed essentially as public commodities, subject to sensible regulation just like any other commodity to protect the public from fraud. Ethereum can be used as a platform to build other applications (such as the above-mentioned example of games), and Bitcoin can be seen as a sort of “store of value” type commodity not too different from precious metals. USDC is a “stable coin” built on Ethereum technology whose value is pegged to the U.S. dollar. I can see a (properly regulated) version of USDC becoming a sort of “digital dollar” similar to the above-mentioned “digital ruble” that Russia is planning.

These things are not good or bad in and of themselves; it is a question of how they are used. Properly regulated, blockchain can be used to the benefit of society, but improperly used, it will only serve to benefit the scam artists and profiteers who can monopolize control of it.

A key component of the concept of socialism is the notion of centralization of the means of production. Technology in general—including computers, the internet, and blockchain—are all types of means of production, that is, they are all tools that help to create economic output. Blockchain is not so unique a situation; it is simply another tool that can be used for the benefit of all, or for the benefit of the few at the expense of everyone else.

There are also environmental concerns which are a little technical to get into, but basically, there are better and worse ways to go about securing blockchain networks. The wrong way is a family of algorithms called “proof of work,” which is very electricity-intensive and thus can contribute to ecological destruction and climate change. A less electricity-intensive family of algorithms that can alternately be used to secure blockchain networks is called “proof of stake,” which from an ecological perspective is preferable but it too has issues regarding fairness in terms of what actors are allowed a “stake” in the network, which is a little beyond the scope of this discussion. There are other alternative methods out there under research as well, so a future challenge of blockchain technology is to find ecologically responsible and economically equitable operating procedures and algorithms which can be used for securing the blockchain networks.

Used properly, blockchain can be a useful mechanism to eliminate fraud in general, be it financial fraud such as counterfeiting, inventory-related fraud in corporations (embezzlement, “cooking the books”, etc.), and even fraud in online gaming, and it can be used to create many applications that can enhance human life. Used improperly, blockchain can be a disaster for the environment and unleash financial malfeasance which harms working people at levels not seen since before President Franklin D. Roosevelt’s banking regulations were put into place to stop some of the extremes of capitalism that led to the Great Depression.

We are at a critical juncture at this time as to which way things will go with this technology. Socialists and progressives generally should advocate for strong oversight and regulation of blockchain technology to ensure it is used to benefit all of us, and not just a handful of unscrupulous financiers and social media influencers.

#### The question is whether blockchain is better regulated or left free from government influence---only an active supervisory role can make it accountable and open.

Dr. Robert Herian 18, Senior Lecturer in Law at the Open University Law School, The Open University, and Co-Founder of the Law, Information, Future, Technology (LIFT) Research Group and Equity and Trusts Research Network (ETRN), “Taking Blockchain Seriously”, Law and Critique, Volume 29, Springer Link

Conclusion

It is clear that ignoring the hype surrounding blockchain is unwise given its rapid proliferation. Echoing trends in technologies that have come before it, blockchain represents an ‘increasingly influential yet subtle force in our lives’ (Brenner 2007, p. 185). Regulators and governments especially need to get a grip on blockchain in order to ensure democratic accountability in the blockchain ecosystem and beyond; to ask whether the technology and the regulatory goals attached to it are ‘proportionate and limited to what is necessary to protect a specific public interest in a democratic society’ (Wright et al. 2006, p. 156). Blockchain is a product of the shifts and tensions in political and socio-economic thought and practice since the financial crisis of 2008. As a discourse or text blockchain recounts a broad matrix of socio-economic and political issues in a constant state of flux. Moreover it is revealing something very important about the evolution of the subject caught in the force-field of neoliberal economic reason both at the macro level of contemporary free-market capitalism, and more intimately. Blockchain further highlights for example: the subject’s encounter with the (im)materialism of digital objects; big data and the digital unconscious; as well as the ability of technologies to produce and distort meaning, as well as (re)constitute being and memory. These issues are technologically informed social, political, as well as psychological, concerns that deserve serious analysis. The consequences of change in communities and the lives of individuals who already lack influence over the technologies, networks, platforms and data that presently shape, control and yet provide meaning, is key to the unravelling story of blockchain. For better or worse, understanding a future with blockchain is imperative. From a critical perspective it may not be *all* about blockchain (Tapscott and Tapscott 2016), but it is certainly the case that *blockchain can no longer be ignored*.

#### IoT stops transnational organized crime

Yury Fedotov 16, Executive Director of the UN Office on Drugs and Crime, 08/18/2016, "The Future Of Fighting Transnational Crime May Lie In The Internet Of Things" New Vision, <http://www.newvision.co.ug/new_vision/news/1432987/future-fighting-transnational-crime-lie-internet>

Naturalist John Muir once said, “when we try to pick out anything by itself, we find it hitched to everything else in the Universe”. As the Executive Director of the UN Office on Drugs and Crime (UNODC), I see Muir’s sentence as offering a deep insight into how transnational crimes are “hitched” together. Transnational crimes are closely connected. Illicit drugs are smuggled by groups who may also traffic in guns, contraband, wildlife and people, with corruption as the enabler of all these activities. A devastated woman coerced to work in the sex trade may have been trafficked or smuggled long distances before being held captive. And there are many other examples. Take almost any transnational crime and it is not practiced in isolation; instead, it forms part of a portfolio of criminality driven by greed. Perhaps the closest analogy is a large, spreading root system with a single giant taproot—profit. After all, nothing is ever undertaken by criminals, if it is not profitable. Equally importantly, we have to recognize that criminals are creative and adaptive. Illicit drugs offer a worrying example. In recent years, we have seen smuggling via so-called mules on passenger flights, in cargo holds, fast boats and even submarines. Each time, the criminals are challenged by law enforcement their modus operandi adapts in terms of route, of transport, of personnel. If we accept the underlying premise of interconnectedness and sophisticated adaptation, then we must also keep changing the way we tackle crime. But in moving forward, we need to take ideas from the developments around us. One such concept is the Internet of Things. Put simply, this idea envisages the networking of all devices, systems and services, including buildings, cars, and other products, to the Internet. If you are stuck on the train, as an example, and likely to be late for an important meeting, your mobile phone can send emails ahead to those attending. The thinking behind these improvements is that the communication of information can lead to radical and beneficial adjustments saving time and badly needed resources. Such connectivity can aid law enforcement by allowing immediate transfers of information about criminals and their behavior, but the Internet of Things also contains the seeds for how we can link activities to confront crime. What needs to be done in the future is to bring together every aspect of the global effort to disrupt transnational organized crime. This means intelligent connectivity linking organizations, regions, and actions into a single harmonious system devoted to countering every aspect of transnational organized crime. Increased connectivity would lead to greater sharing of information, joint operations and mutual legal assistance based on the UN Convention against Transnational Organized Crime. All of this to be undertaken in real time. Organizations such as INTERPOL, EUROPOL, and a host of other organizations including at the local level, are already carrying out tremendous work to ensure that the criminals do not evade justice. Despite this, there is a need to go even further. The UN Office on Drugs and Crime is playing its part. Our “Networking the Networks” initiative is connecting organizations, including INTERPOL, World Customs Organization, regional police organizations and law enforcement centers, the OSCE and others. By doing so, we are promoting the exchange of information and intelligence, and supporting multilateral operations against the criminal networks. We recently launched the Global Programme on Building Effective Networks Against Transnational Organized Crime to build on this work and it is proving a considerable success. UNODC is also taking this approach further by ensuring its new generation of regional programmes have connectivity at their heart and are bound to the sustainable development agenda adopted last year. Next week, I will be in Nairobi to launch the new East African Regional Programme, which recognizes that transnational crimes are not separate endeavors, but a swirling mass of entwined activities, countries and groups. Operating over the next four years, the programme will enhance the rule of law and human security across the Eastern Africa region, through activities tailored to combat existing challenges and address emerging threats. Eastern Africa is a place where many criminal activities meet. People are trafficked, heroin is transited, and Ivory smuggled to various overseas markets. Many of these markets are bound together and they allow criminals to exploit some fragile states in the region with criminal networks overlapping with terrorist cells, pirate groups and drug trafficking organizations. Our work against these activities needs to reflect this. My vision for the future of global law enforcement involves connected activities where information sharing and operations occur at every level: local, regional and global to prevent the criminals from escaping arrest. To paraphrase the novelist Herman Melville we are all connected by a thousand threads and our actions return to us as effects. We need to tie these threads together, if we are to have any chance of turning our decisive actions into deliverable effects against the criminals. The Internet of things offers many insights; we need to start learning to adapt quickly.

#### Extinction

Dr. Michael Miklaucic 13, Adjunct Professor of U.S. Foreign Policy at American University, and of Conflict and Development at George Mason University, Director of Research, Information and Publications at the Center for Complex Operations (CCO) at National Defense University, Jacqueline Brewer, 07/05/2013, “Convergence: Illicit Networks and National Security in the Age of Globalization,” Government Printing Office, Google Books

Public-Private Partnerships to Combat Illicit Trade and Illegal Economy  
The illegal economy poses an existential threat when it begins to create criminalized markets and captured states, which launches a downward, entropic spiral toward greater insecurity and instability. In countries that have been corrupted by criminal networks, market- and state-building become less attainable, economic growth is stunted, efforts toward development and poverty eradication are stifled, and foreign direct investment is deterred.

The United States is supporting the OECD, the World Economic Forum (WEF), and other international partners to provide knowledge-based platforms for international public and private stakeholders to raise awareness of the threat posed by illicit trade and illegal economy to economic growth, development, and global security, and to share experience on practical approaches to the control of illicit activities as well as of the negative externalities of the illicit economy. Engaging the public and private sectors through innovative public-private partner-ships will be particularly important for securing the integrity of the global supply chains and for ensuring long-term sustainable licit commerce and productive markets.

The steep rise in mobility of goods, people, capital, and information that has accompanied globalization is largely comprised of lawful and beneficial exchanges, but an increasing share is illicit. Criminal entrepreneurs and illicit networks sometimes use or exploit legitimate businesses and legitimate global supply chains to carry out financial frauds, industrial espio-nage, money laundering, and other illicit activities. Hundreds of billions of dollars of revenue from these activities flow through the global economy every year, distorting local economies, diminishing legitimate business revenues, deteriorating social conditions, and fueling conflicts.

# 2NC

## K

### 2nc – overview/impact

#### The aff is blockchain hysteria and *every* tech hysteria comes during a crisis point in capitalism. The aff is a corporate propaganda project designed to scale the blockchain and IOT *only* to the benefit of tech firms, consultants, and their investors! The benefits are *never* socialized and they always underestimate the social degradation their businesses cause!

#### Capitalism is collapsing the social fabric all around us – driving conflict, land degradation, climate change, and financial collapse which we all agree are existential threats. The alt presents the only serious *scholarly* approach to these problems, the aff is purely wishful thinking written by and for corporate interests!

#### You have a choice between socialist knowledge production and politics and the corporate version – they already picked their side!

#### 3 Impacts. First, Agriculture – capitalism severed the source of subsistence for one sixth of the global population – global productive capacity is toast due to soil erosion and tech-driven chemical intensification – the system is destined for a global food crisis which would trigger every aff impact.

FDI 12 – Future Directions International (“International Conflict Triggers and Potential Conflict Points Resulting from Food and Water Insecurity Global Food and Water Crises Research Programme”, May 25, <http://www.futuredirections.org.au/files/Workshop_Report_-_Intl_Conflict_Triggers_-_May_25.pdf>)

There is a growing appreciation that the conflicts in the next century will most likely be fought over a lack of resources. Yet, in a sense, this is not new. Researchers point to the French and Russian revolutions as conflicts induced by a lack of food. More recently, Germany’s World War Two efforts are said to have been inspired, at least in part, by its perceived need to gain access to more food. Yet the general sense among those that attended FDI’s recent workshops, was that the scale of the problem in the future could be significantly greater as a result of population pressures, changing weather, urbanisation, migration, loss of arable land and other farm inputs, and increased affluence in the developing world. In his book, Small Farmers Secure Food, Lindsay Falvey, a participant in FDI’s March 2012 workshop on the issue of food and conflict, clearly expresses the problem and why countries across the globe are starting to take note. . He writes (p.36), “…if people are hungry, especially in cities, the state is not stable – riots, violence, breakdown of law and order and migration result.” “Hunger feeds anarchy.” This view is also shared by Julian Cribb, who in his book, The Coming Famine, writes that if “large regions of the world run short of food, land or water in the decades that lie ahead, then wholesale, bloody wars are liable to follow.” He continues: “An increasingly credible scenario for World War 3 is not so much a confrontation of super powers and their allies, as a festering, self-perpetuating chain of resource conflicts.” He also says: “The wars of the 21st Century are less likely to be global conflicts with sharply defined sides and huge armies, than a scrappy mass of failed states, rebellions, civil strife, insurgencies, terrorism and genocides, sparked by bloody competition over dwindling resources.” As another workshop participant put it, people do not go to war to kill; they go to war over resources, either to protect or to gain the resources for themselves. Another observed that hunger results in passivity not conflict. Conflict is over resources, not because people are going hungry. A study by the International Peace Research Institute indicates that where food security is an issue, it is more likely to result in some form of conflict. Darfur, Rwanda, Eritrea and the Balkans experienced such wars. Governments, especially in developed countries, are increasingly aware of this phenomenon. The UK Ministry of Defence, the CIA, the US Center for Strategic and International Studies [CSIS] and the Oslo Peace Research Institute, all identify famine as a potential trigger for conflicts and possibly even nuclear war.

#### Second, Financialization – it wrecks every aff internal link – ICT’s cause speculative bubbles and prevent solving any large-scale problems

\*Alvarez-Pereira 19 (Carlos Alvarez-Pereira, Founder and President of Innaxis Foundation & Research Institute, “Anticipations of Digital Sustainability: Self-Delusions, Disappointments and Expectations”, Anticipation, Agency and Complexity pp 99-120, 2019, doi:10.1007/978-3-030-03623-2\_7)

In previous sections we discussed the many dark sides of digitization. But maybe the darkest is what could be called the “innovation paradox”: in a world with a very high degree of ICT-enabled financialization, the worst enemy of true innovation is precisely its great exposure to short-term financial expectations. Further progress in innovation is now subject to an endless stream of speculative bubbles (Pérez 2002). Actually, the perception of accelerated innovation is high because its working economic model requires it to be widely publicized. The dogmatic perspective of techno-utopianism has to be widely assumed in order to ensure that vast public and private resources are invested fast in its spasmodic development. The logic is shorttermist, to cash in now on future and fully uncertain realizations of innovative ideas, which inflates an already huge amount of fictitious capital and prevents that enough investments are made at the right pace over enough time to reap the benefits for the common good. The evolution of ICTs is a consequence of the way they were born, their historical contingencies and the lock-ins they have produced, but especially of their current dynamics, which are complex enough to feed their strong momentum, but not enough to contribute in a proper way to the challenges that humanity is facing. Their current framing actually inhibits the possibility of addressing the challenges of “world problematique” in the appropriate time and space scales.

#### Third, Societal Resilience - You should have an overwhelming bias against market-led tech disruptions - Comprehensive historical studies in Peer-reviewed journals prove *technological acceleration* causes mass inequality and societal collapse

Mirza 19 (M. Usman Mirza, Environmental Economics and Natural Resources Group, Sub-department of Economics, Wageningen University, Netherlands; Andries Richter, Environmental Economics and Natural Resources Group, Sub-department of Economics, Wageningen University, Netherlands; Egbert H. van Nes Environmental Sciences, Wageningen University, Netherlands; Marten Scheffer Environmental Sciences, Wageningen University, Netherlands; “Technology driven inequality leads to poverty and resource depletion”, Ecological Economics, Volume 160, June 2019, Pages 215-226, https://doi.org/10.1016/j.ecolecon.2019.02.015)

Our results present key mechanisms which may explain the emergence of local inequality in a society. A positive feedback between wealth and technology will allow moderate levels of inequality to emerge in a growing society. Furthermore, if the initial distribution of technology and productivity are heterogeneous, as in a capitalistic society, this can potentially lead to a rapid rise in inequality. With a heavy-tailed distribution of improved technology in society, fast rise in inequality is observed where a small elite group achieves accelerated wealth accumulation due to the convolution of better technology, capital income and resource control. Left unabated, this fast rise in inequality will have catastrophic effects such as overharvesting of resources and throwing those dependent on the resource off the resource and into poverty.

Main results from the paper can be summarized as follows: First, in growing societies, inequality rises in our model society due to an inherent positive wealth-technology feedback. Second, capitalistic development may result in a much faster rise in inequality and poverty depending on the distribution of productivity gains in society. Third, for uniformly distributed capital productivity gains, results show a slow innocuous rise in inequality. Pressure on resource use goes up, but stays within sustainable levels. Fourth, for heavy-tailed distributed capital productivity gains, results show (i) rapid rise in inequality triggering a collapse in wealth and resource dynamics at the societal level, and (ii) sharp rise in poverty while resource stocks fall below sustainable levels. Finally, if the ecological system is prone to collapse, we see that the positive feedback between wealth accumulation and resource extraction results in social-ecological collapse with resource extinction.

From a policy perceptive, the key message here is that a growth based agenda may not only fuel inequality, but also resource depletion. While it is a public policy choice, how to rank objectives in importance, our results are a cautionary note on an agenda that is purely driven by economic growth, i.e. wealth accumulation, without any consideration for equity. We show that ensuring equality in access to key resources is not only essential for social justice, but also for improving ecological resilience and reduction in poverty. We also show that there is not necessarily a trade-off between inequality and total welfare, as inequality may fuel overexploitation which erodes the foundation of society's wealth, making everyone worse off in case of a collapse.

### 2nc – fw

#### Interpretation - the threshold for links should be demonstrating methodological incompatibility. The debate is a comparison between their corporate approach and an *anticapitalist alternative.*

#### We meet – the alt justifies *abandoning* blockchain instead of creating a better blockchain market.

#### Knowledge Production DA - Their interp brackets out consideration of vital epistemological/scholarly aspects of the 1ac and makes unethical research practices a no-cost option. That turns education claims by giving them an easy out of any debate about their actual ev set. The source, qualification, and conflicts of interest should be central to any policy debate – it is illogical for them to spike out of the debate about whether its ok to present their authorship as neutral even though they are literally trying to sell you something. “But the PLAN” is an illogical response to our indicts of their scholarship!

#### Framework comes before the alt debate. Methods for advocacy construction *spill up*, but individual affs *don’t*. *Even if the plan is desirable*, on a broader level, their political-economic vision embraces technologies that cannot incorporate the socialist reforms necessary to stop cycles of *instability* and *ecological collapse*!

#### Its try or die to tune debate into networks of global anti-capitalist movements instead of its usual technocratic naval-gazing or corporate regurgitation.

#### Our interp is predictable – scholars have this debate all the time, especially in the context of crypto – they should be able to defend the corporate sources they are reading.

### 2nc – perm

#### No perms – if any aff advantage is counter-productive for the alt, the perm should be disregarded. Affs should be forced to defend the entire research project that forms their advantages. Any other standard makes their project inconsistent, isn’t supported by evidence, and ignores the core disagreement in the literature about blockchain tech.

### 2nc – at: at good link turn (massumi)

#### They are not the radical leftist blockchain, they are the corporate one that filters resources to private gains which is a booster to neoliberalism. We may start to sound like a broken record on this, but this weird leftist pivot in the 2ac is not representative of the 1ac or the plan’s effects! Filter all of these weird link turns through the link debate.

### --- 2nc – crypto-colonialism link

#### Crypto-Colonialism Link – scaling blockchain enables the financial extortion of the global south through carbon markets and offsets schemes. Crypto-Offsets monetize unsustainable reforestation and land use changes to facilitate financial accumulation in the global north. This streamlines land-grabbing which devastates agrarian smallholders and communal ownership schemes. The impact is agriculture and social sustainability. Land deprivation is a key driver of the global food crisis which will *end society* – that’s tilzey.

#### Crypto-colonialism link turns development – crypto-development exacerbates the north/south divide in investment, triggering capital flight, privatization of resources to facilitate western corporate interests, and under-investment in social welfare. Land Grabbing and neo-colonial development cause constant war in peripheral states – that outweighs!

Saito 10 (Natsu, Professor of Law, Georgia State University College of Law, “Decolonization, Development, and Denial”, Fla. A & M U. L. Rev. 1, <https://readingroom.law.gsu.edu/cgi/viewcontent.cgi?article=1429&amp;context=faculty_pub>)

In strictly economic terms, the development paradigm has failed to facilitate the improvements in material conditions of life foreseen in conjunction with the end of centuries of colonial rule. The liberatory potential of decolonization-the restructuring of formerly colonized societies in ways that would allow peoples to govern themselves and to provide for their communities in a manner both sustainable and culturally consonant-has not been realized.199 If the ongoing immiseration of so many peoples, the spread of armed conflict, and environmental devastation are to be avoided, we must think outside the box of the contemporary world order. In turn, this requires reconsideration of some of the most basic premises upon which it has been built. This section returns to the notion of self-determination because it is central to the decolonization project. It then addresses the ideological premises of the doctrine of development, premises which coincide with those of colonization. Finally, it considers some possibilities for fundamental change embodied in worldviews that move beyond the current model in which statehood and development are equated with decolonization.

A. Revisiting Self-Determination

The decolonization process of the twentieth century was closely supervised by the colonial powers themselves, and implemented entirely within the framework of international relations they had developed. In other words, both the analysis of the injustices of colonialism and the means by which they were to be redressed were determined by those who perpetrated the wrongs. By maintaining control over the mechanisms for the collective imposition of sanctions and the use of force, precluding substantive transformation of international law without their consent, and consolidating significant power within economic institutions, the dominant powers ensured not only that the legacy of colonialism would remain unredressed but also that colonial relations would be reproduced in various new forms. 201

The most obvious of these forms was, perhaps, the perpetuation of territorial boundaries arbitrarily imposed upon the colonies. Makau Mutua observes that the "'Scramble for Africa,' . . . driven by the need for raw materials and markets for European capitalism, is responsible for the imposition of the modern state on Africa," 202 and that because "the European powers treated Africa as terra nullius or no-man's land,"203 the boundaries they drew on their maps had no relationship to the cultural, political, or economic realities of the peoples whom they were quite well aware inhabited the lands at issue. The result, of course, was a system in which preexisting nations and communities were both divided between separate colonies and forcibly merged with other peoples. 204 Conditioning the right of decolonization on the adoption of colonially imposed state structures and boundaries was therefore not the granting, or recognition, of a right to self-determination but a process of "legitimiz [ing] the denial of sovereignty to precolonial, independent African states and communities."

As noted by intellectual historian Edward Said, imperialism: is an act of geographical violence through which virtually every space in the world is explored, charted, and finally brought under control. For the native, the history of his or her colonial servitude is inaugurated by the loss to an outsider of the local place, whose concrete geographical identity must thereafter be searched for and somehow restored. From what? Not just from foreigners, but also from a whole other agenda whose purposes and processes are controlled elsewhere. 206 Because history, culture, language and geography were ignored in the delineation of these territories, legal scholar Tayyab Mahmud explains that "[t]he resulting postcolonial 'contrived state' is often a mockery of the right of self-determination because territory rather than a distinct people become the primary frame of reference of the right."2 017 This process "ensured that internal colonialism became the rule rather than the exception." 208

Said characterized this process as a "dynamic of dependence" 209 resulting from the reality that "the cultural horizons of nationalism are fatally limited by the common history of colonizer and colonized assumed by the nationalist movement itself."210 For the peoples of newly independent states, the price paid for a "self-determination" limited to nominal political independence was the loss of self-definition: "From 1949 onwards, often without realizing it, more than two billion inhabitants of the planet found themselves changing their name, being 'officially' regarded as they appeared in the eyes of others, called upon to deepen their Westernization by repudiating their own values." 211 Quite predictably, the resulting states "have more often than not failed to develop into cohesive political units having legitimacy, and have been plagued by separatist movements, civil wars, and secessions." 212

The extent to which this reality has undermined any hope of actual peace or security for the world's peoples in the postwar years was illustrated by cultural geographer Bernard Neitschmann, who emphasized the importance of distinguishing states, as political constructs, from nations, which he defined in terms of peoples with common history, culture, language, and geographic ties. 213 Neitschmann reported that, as of 1993, there were ninety-seven wars between states and the nations over which they were attempting to exercise political control compared to one "state versus state" war and six "nation versus nation" wars. 214 He also estimated that between 1945 and 1993 over 80 percent of all deaths attributable to genocide resulted from state-directed genocides against the peoples of nations.215 With governments unable to ensure basic security, many of these countries have been caught in a downward spiral of disintegrating social networks, dysfunctional distribution systems for food and other basic necessities, the rise of predatory crime and private security forces, heightened levels of "ethnic" violence, and a resulting rise in displaced persons and refugees. 216

### 2nc – at: scaling link turn (howson)

#### Even if crypto can be scaled up without harming indigenous communities, they *actively prevent* this from happening! We are conceding that they help scale up net-zero offset tech which does massive harm to indigenous communities and the environment!

#### The only reason settlers would sign on to smart contracts that result in land transfers back to indigenous people is if corporate power and interest in extraction in dumping are removed. They cement those exact corporate interests both materially through profits off the tech and by reading their propaganda for 9 minutes.

#### The conclusion of Howson is ambiguous at best! It goes back and forth between sentences; they just highlighted the favorable ones – prefer our cutting of Howson!

#### Their Howson concludes neg *right after* their card ends. whoops – says the alt has to come first

Peter Howson 21, Professor in the Department of Social Sciences at Northumbria University, “Distributed Degrowth Technology: Challenges for Blockchain Beyond the Green Economy”, Ecological Economics, Volume 184, June 2021, ScienceDirect

6. Conclusions

Centralised digital technology is destroying human freedoms and the environment (Bihouix, 2020). With new blockchain platforms for surveillance capitalism, green growth tools for environmental management are becoming increasingly more automated (Howson et al., 2019). Despite these concerns, some scholars understand blockchain as a potentially useful tool for transitioning towards a post-capitalist society (Huckle and White, 2016; Raworth, 2017; Büscher and Fletcher, 2020). Others argue that explorations around distributed technology point to a red herring, diverting attention away from degrowth’s target adversaries (patriarchy, racism, environmental destruction, and class conflict).

This commentary has offered a critical exploration of blockchain solutions to start discussions concerning how (or if) these technologies could be useful in facilitating sustainable degrowth economies. The exploration has focused on three key challenges for the technology. If blockchain is ever to prove useful for degrowth it would need to: 1) help build (re)distributive economies, 2) regenerate the environment without commodifying it, and 3) help facilitate international alliances without imposing a particular set of values. There are many other litmus tests besides those explored here that require research. What is certain is that these technologies on their own will not transcend political struggles ‘away from keyboard’. They might, however, make those struggles more effective, enabling a transition away from market capitalism locally and/or at scale.

\*UK Card Ends\*

For sustainable degrowth, trust must be built before a blockchain. The technology potentially opens doors to new possibilities by transcending neoliberal crises of imagination (Thwaites, 2020). But degrowth scholars must be mindful that blockchain projects exist because their users often do not trust their institutions or even each other (Golumbia, 2016). Using ‘trustless’ systems to enable the exchange of things between users who are indifferent towards building strong trusting communities will ultimately lead to unsustainable and socially divisive outcomes. The goal of degrowth projects, therefore, should not be to use blockchain for degrowth, but to be open to technologies like blockchain if a transition to degrowth requires them.

### --- 2nc – financialization link

#### Financialization link – IOT and Blockchain turns all assets into tradeable liquid assets like NFT’s with no regard for the network effects of high volumes of speculative asset trading. We already know how bad the market got in Housing, just wait until we unleash it in trading of Carbon, Trees, Pharmaceuticals, and Land itself! The market is impossible to regulate already. Expanding the volume of financial assets encourage risky activity and exploitation of poor countries through bad loan terms. The aff pumps the gas on an already buckling financial industry and accelerates exploitation at the heart of the US banking system.

#### AT BEST they increase *trust* in individual transactions which may solve fraud, but our DA is about legitimate, legal financial instruments, not just shadow banking! Their evidence even endorses a “light-touch” approach to crypto-securities regs.

#### The problem with financial expansion is that it is *unmoored from production* which creates forced macroeconomy corrections that wreck growth – flips all sustainability and development offense

**Foster et al 21** (John Bellamy Foster, editor of Monthly Review and a professor of sociology at the University of Oregon, R. Jamil Jonna, associate editor for communications and production at Monthly Review, and Brett Clark, associate editor of Monthly Review and professor of sociology at the University of Utah, “The Contagion of Capital.” The Monthly Review, 1/1/21, <https://monthlyreview.org/2021/01/01/the-contagion-of-capital/>, Accessed 1/12/21, JCP – JMoore)

The Boundary Line and the Contagion of Capital

The crisis of the U.S. system and of late capitalism as a whole is one of overaccumulation. Economic surplus is generated beyond what can profitably be absorbed in a mature, monopolistic system. This dynamic is associated with high levels of idle capacity, the atrophy of net investment, continuing slow growth (secular stagnation), enhanced military spending, and financial hyperexpansion. The inability of private investment (and capitalist consumption) to absorb all of the surplus actually and potentially available, coupled with government deficit spending, leads to growing amounts of free cash in the hands of corporations. The result is the rise of a system of asset speculation that partially stimulates the economy due to the wealth effect (increases in capitalist consumption fed by a part of the increased returns on wealth), but which is unable to overcome the underlying tendency toward stagnation.[57](https://monthlyreview.org/2021/01/01/the-contagion-of-capital/#en57)

Hence, monopoly-finance capital of today is a deeply irrational system, in which money is seen as begetting more money without the mediation of production, or what Marx characterized as M-M’ (Money-Money + Δm or surplus value).[58](https://monthlyreview.org/2021/01/01/the-contagion-of-capital/#en58) “The viability of today’s money manager capitalism,” as the heterodox economist Hyman Minsky called it,

depends upon not having a serious depression: the continued absence of a serious depression fosters experimentation with portfolio managing techniques that increases the likelihood of system threatening crises, that is, increases the likelihood of depressions. There is a basic contradiction in money manager capitalism which makes continued success ever more dependent upon an apt structure of supportive government interventions. Money manager capitalism rests upon the power of government to prevent a sharp decline in aggregate business profits.… We can expect future crises to be met with some form of ad hoc intervention which will in part reflect an unwillingness by policy makers to appreciate that once again capitalism has changed.[59](https://monthlyreview.org/2021/01/01/the-contagion-of-capital/#en59)

#### \*extra – Digital economies lock in the over-accumulation crisis

Staab 17 (Philipp Staab, professor of “Sociology of the Future of Work” at the ECDF and Humboldt-Universität zu Berlin, “The consumption dilemma of digital capitalism”, Transfer: European Review of Labour and Research, 23(3), 281–294, 2017, doi:10.1177/1024258917702830)

Since the end of the Fordist era, highly developed OECD economies have faced a systemic weakness of private demand that has failed to keep pace with productivity gains. The expansion of public and, later, private debt, globalisation and financialisation were strategies for coping with the consumption problem of the post-Fordist production model. Globalisation and financialisation also supported the rise of the ICT sector and the spread and diffusion of digital technology in all parts of the economy. Powerful corporations have emerged during the rise of digital capitalism. Their business models target the weakness of private demand through rationalisation strategies in the consumption domain. They include the rationalisation of distribution systems and individualised advertising targeting and systematically integrating prosumers into production models. However, these attempts to solve the consumption problem have failed, as consumption rationalisation has in many cases either substituted paid labour with prosumer work or created downward pressure on wages by cannibalising other production models or rationalising labour processes. Furthermore, leading digital economy companies are now implementing new robotics technologies, automating work in several employment-intensive branches. The logic inherent to the business models of leading digital economy companies will presumably aggravate rather than solve the consumption problem. Digital capitalism thus not only fails to achieve its own implicit goals but would also seem to exacerbate the very problem it aims to solve.

### 2nc – sustainability

#### Filter sustainability through the link debate – they lock in market logic and the most corporate-friendly version of their tech!

#### Contradictions in capitalism are irresolvable and make global collapse inevitable. 2 reasons

#### *Financialization* – the speculative economy build up to sustain production will be *undermined* by stagnating wages, lack of land access, resource depletion, and climate disruption. Consumption crisis in *importing* countries is resolved by debt and forced restructuring which causes structural vulnerabilities to market shocks among every developing economy. Theres no chance their tech warrants survive the accelerated financial boom-bust cycle!

#### *Agriculture* – restructuring create structural unemployment and mass land diversion to increase output which skyrockets soil erosion, biodiversity loss, and decks profits in the short run. Their tech evidence supercharges this because tech only exacerbates land displacement and private accumulation in food sectors abroad which displaces billions of peasant farmers.

#### Rural displacement causes extinction

Tilzey 18 (Mark, Senior Research Fellow in Governance of Food and Farming Systems, Centre for Agroecology, Water and Resilience at Coventry University, *Political Ecology, Food regimes, and Food Sovereignty*: *Crisis, Resistance, and Resilience*, 2018)

As a consequence, we may ask, perhaps rhetorically, whether the ‘modernization’ of agriculture in the South by capitalist means is possible or desirable? In an ‘optimistic’ (and therefore probably unrealistic) reformist scenario, we might hypothesize a strategy for the development of agriculture that attempts systematically to reproduce in the South the course of modern family agriculture in the North. We should recall, however, that the ‘efficiency’ of the agricultural family business typical of North America and Western Europe is due to its high capitalization, the product in turn of its predication on cheap fossil energy and agro-chemical inputs. Energetically, then, it is grossly inefficient, since fossil fuels and agro- chemical inputs have been substituted for human labour, animal traction, and organic manures. Ecologically it is inefficient (and unsustainable) because it relies on the perpetual simplification of agro-ecosystems (the suppression of all species other than the monocrop) to conform to the demands of mechanization and profit maximization. The only criterion on which this agriculture is ‘efficient’ is the ratio of human labour input to production output (productivity), the sole criterion of interest to capital since it is the sole source of profit. Mechanization and its energetic ‘inefficiencies’ also permit, of course, the generation and support of large non-agricultural populations, separated from their original means of production, on which capitalism depends. But the demise of energy and resource cheaps portends the commensurate demise of highly capitalized agriculture and the simultaneous feasibility of sustaining large non- agricultural populations and complex divisions of labour. Both highly capitalized agriculture and associated complex divisions of labour have been premised on the systematic discounting, through productivism, of ecological and energetic ‘costs’, the ‘unpaid debts’ of which are now being ‘called in’ in the form of climate change, soil exhaustion, water pollution and depletion, biodiversity loss and ecosystem collapse, to say nothing of the social unsustainability and cultural deracination that accompanies the stripping of the countryside of its agrarian population.

Nonetheless, were such a ‘farmer road’ to capitalist agriculture politically feasible, this strategy might entail the establishment of some 50 million farms across the global South, each awarded access to land through expropriation of the middle and lower peasantry. This would comprise the best land, of course, and were these farms to secure access to capital markets for capitalization, they could potentially supply the essentials that creditworthy urban consumers currently obtain from peasant agriculture. What, however, would become of the billions of ‘non- competitive’ peasant producers under this scenario? Were the ‘logic of the market’ permitted to take its course, these peasants would be further marginalized or eliminated, swelling the already overflowing ranks of the global Southern ‘labour reserve’, most of whom, despite precarity, currently contrive to feed themselves and provision their peers. No industrial development, even in the far-fetched hypothesis of high growth rates for three quarters of humanity, has the capacity to absorb even a third of this massive labour reserve. But, as we have seen, such a scenario represents, politically, an heroic assumption given the extremely selective process of industrialization, and industrialization ‘without jobs’, that is increasingly characteristic of contemporary capitalism. Chronic commodity oversupply and under-consumption render this ‘farmer road’ plus labour- absorbing industrialization scenario thoroughly utopian, politically. And ecologically and energetically it is equally utopian, even ignoring the far greater ecological fragility and irresilience of soils, water resources, and biodiversity in the global South by comparison to the more provident temperate environments of the North. We must conclude, therefore, that capitalism, whether Keynesian/Polanyian or neoliberal, cannot resolve the peasant question politically or ecologically. Indeed, the only prospects it can offer are a planet of slums, inhabited by a ‘surplus’ population of billions, and a world rendered increasingly uninhabitable ecologically for humans and non-humans alike.

We have reached the point, therefore, where to open up a new field for the expansion of capital, entailing the ‘modernization of agricultural production’, would entail the destruction of entire societies and ecosystems, an ‘achievement’ sustainable only so long as cheap fossil fuels persisted. According to our ‘optimistic’, reformist scenario, this might entail the creation of 50 million new, ‘efficient’ producers (200 with their families) on the one hand, and some 3 billion excluded people on the other. Capitalism has thus entered the early phases of an epochal crisis whereby the logic of the system is not only incapable of ensuring the simple survival of humanity (even if this were ever the case), but is also actively destroying the means of that long-term survival through ‘political’ marginalization and ‘ecological’ despoliation.

### CCS

#### CCS causes conflict – land use from any method is unsustainable – triggers resource and social dislocation internal links

Kreuter 21 (Judith Kreuter, Research Fellow at the Chair for International Relations at Technische Universität Darmstadt, Germany, and associated PhD candidate at the German Research Foundation Priority Programme "Climate Engineering"; Markus Lederer, Professor of Political Science with a focus on International Relations at the Technical University Darmstadt in Germany; “The geopolitics of negative emissions technologies: learning lessons from REDD+ and renewable energy for afforestation, BECCS, and direct air capture”, 25 September 2021, Global Sustainability 4, e26, 1–14. https://doi.org/ 10.1017/sus.2021.24) \*BECCS = Bioenergy CCS, DACCS = Direct Air Capture CCS

We find that, first, afforestation and BECCS would have a classic geopolitical impact due to their requirements of territory for biomass growth which is known, already, from REDD+. This would lead to national and international conflict potential over who should provide the territory required to counter past CO2 emissions – which, in turn, were created while benefitting the industry and economy of some states and not others. In a similar vein, both DACCS and BECCS – like wind energy – present conflict potential ranging from the local to the global scale over who should bear the burden of setting up facilities. In the case of DACCS and BECCS, additionally, the focus can be expected to be more strongly on safety issues due to the need to store CO2 sustainably. Second, the material requirements of afforestation and BECCS – most prominently in fertilizers and water supply – might present local or regional conflict potential over the use of these resources when it comes to conflicts of aims between CO2 drawdown and, for example, food production. Third, the discursive construction of space and identity which would take place in the wake of large-scale deployment might lead to very interesting new conflict patterns in its own right. A first indication in this direction is the potential for conflicting discursive representations of abstract concepts of DACCS (and possibly BECCS) on the one hand and of concrete facilities in the vicinity on the other, a conflict which has also been apparent in the discussion on wind energy installations. Fourth, BECCS and RE share the potential to turn geopolitics on its head – at least to some degree. Both could loosen the connection between energy generation and geographic location – without, of course, severing it completely.

To sum up, afforestation and BECCS pose challenges due to their high land use and material requirements and subsequent conflicts over what to use these resources for and who will benefit from its use. It is, however, unclear, at this point, which actors would be motivated to pursue large-scale afforestation or BECCS. This might change if sequestered carbon gains a relevant price tag and thus market actors gain an interest in setting up the instrument – a story well known from REDD+ that also in the end will only have a large-scale impact as a ‘results-based payment’ scheme (Turnhout et al., 2016). The latter, however, would further undermine the attempt to gain any co-benefits leading to a tradeoff that has neither been solved in the international negotiations nor on the ground. This would most likely also occur in the case of NETs. Furthermore, DACCS requires large amounts of energy and might thus be placed in conjunction with RE. This could foster existing land-use conflicts posed by RE installations, possibly providing them with a global dimension when it comes to selecting suitable carbon storage spaces which are distributed unevenly around the globe. Other energy generation approaches are conceivable, such as nuclear, but this, in turn, poses its own set of requirements of suitable locations for production and disposal, an issue that is certainly also highly conflictual.

Specifically, DACCS shares the burden of RE approaches such as wind energy generation that the general and abstract notion of its use is considered benign, but the concrete deployment in the vicinity meets with local resistance. Furthermore, increasing carbon pricing, emerging national or international negative emissions policies, and/or policy entrepreneurship from interested parties – such as private companies whose business model is based on carbon sequestration – could lead to the development of socio-technical systems of BECCS or DACCS. This, in turn, might affect the geopolitical relevance of specific territories but also lead to specific identity constructions. For instance, remote locations with carbon storage and RE generation potential (for DACCS) or fertile lands with carbon storage potential (for BECCS) would increase in importance materially but also as spaces for green deals etc. could eventually materialize. This would cause a shift in the balance of the current geopolitical constellation the consequences of which cannot, so far, be known.

In a nutshell, land use, resource conflicts on local and global scales, and the discourses surrounding them are common staple in international relations and they concern territory as well as space. Several of the conflict potentials opened by NETs are known from RE or REDD+ and it can be expected that the social construction of the space for NETs, which, so far, takes place only in very limited, mainly academic circles (Buck, 2013; Matzner & Barben, 2018), will follow similar lines as the discourses on RE, REDD+, and other environmental and even other global issues and be straddled with several of the same challenges as current mitigation strategies. The geopolitics of NETs might have just begun.

### 2nc – alt

#### The alternative invests in the Socialist Mass politics necessary to move away from Market-Led technology revolutions.

#### Capitalism is in an epochal crisis that demands a radical challenge. Success requires abandoning reformist attitudes and focusing ONLY on socializing production, democratizing resources, and creating economic justice that repatriates land and resources to the dispossessed classes.

#### To the extent that the blockchain and IOT can create socialized production and public control of resources, they can only do so AFTER the alternative cleanses society of the corporate interests that produced all the aff’s scholarship. Otherwise, its implimentation will always serve the interests of accumulation which are inherently exploitative and unsustainable.

#### Even without a mass movement to solve sustainability, the reforestation and financialization, DA’s are unique turns to the aff - we all agree that they are key to uptake of the tech globally, no take backs!

#### Err negative – the alternative faces the same barriers to implimentation as the affirmative. *Centuries* of propaganda paid for by corporate interests made the status quo seem like common sense. You should hedge against this bias and take a leap towards ethical scholarship production and democratization of the economy!

### 2nc – at: tech link turn (mason)

#### This mason card is what happens when you talk about anticapitalism without mentioning Marx! We don’t need blockchain to invent new social bonds. Socialist societies that exist today were formed through struggle and exist around shared notions of human progress and collective wellbeing.

#### If there is one thing socialist states do well, its create strong lasting social investment in the state – look to China, Vietnam, and Cuba – they survived constant siege for at least 60 years. War communism is very resilient!

#### Socialism *does* have a positive vision – it is created by the conditions of capitalism, not just refusal of capitalism – it embraces the way capitalism empowers workers to take over the productive capacity of society to socialize the gains of that production.

#### The conditions now are *not different* from those where socialist states were formed throughout history! The alt has centuries of historical precedence!

# 1NR

## Kicks

### Private PIC

#### Not going for it.

#### Group all the theory args – reason to reject the argument, not the team.

#### Condo –

#### the neg gets *infinite condo* against new affs.

#### key to *clash and neg ground* – the neg can’t predict how a new aff will interact with neg generics until after the 2AC, so we need to be able to kick out of spiked neg ground to truth test the aff.

#### *Infinite pre-round prep* against an opponent with *zero pre-round prep* solves their offense.

#### *Truth-testing* --- their interp artificially shields the aff from competition by limiting out innovative research--- don’t prop up bad affs that’ll lose in the marketplace of ideas.

#### *diminishing marginal returns checks* --- we can only test the agent, process, and action of the plan. The neg won’t waste time with multiple counterplans that test the same element. Three aff key warrants answer all counterplans.

#### CX reasonability from T.

### Court Clog

#### Concede courts won’t implement restrictions. Can’t possibly be uniqueness for a turn because a private right of action exists now.

### Fascism DA

#### Not going for it, but I will answer the “we’re left-wing” blockchain argument.

Golumbia 16 (David Golumbia, Professor, Writer on Digital Studies, Language, Theory, *The Politics of Bitcoin: Software as Right-Wing Extremism*, University of Minnesota Press, 2016)

There are many things worth saying about Bitcoin. This short book is concerned not with providing a thorough description of the technology, a detailed history of its uses, an account of the scandals and triumphs associated with it, or profiles of the various personalities involved in its creation and subsequent use (for which good introductory resources include Lanchester 2016; Murray 2013; Pagliery 2014; Payne 2013; Popper 2015; Robinson 2014; Scott 2016). Its goal is more limited: to show how much of the economic and political thought on which Bitcoin is based emerges directly from ideas that travel the gamut from the sometimes-extreme Chicago School economics of Milton Friedman to the explicit extremism of Federal Reserve conspiracy theorists. While it is beyond doubt that many who “believe” in Bitcoin think they do not subscribe to these theories, it frequently turns out that they rely on assumptions and concepts that do emerge from the far right. As they are currently configured, Bitcoin and the blockchain technology on which it rests satisfy needs that make sense only in the context of right-wing politics; those of us who do not share those politics must, therefore, view Bitcoin and the blockchain with both skepticism and a clear eye for the political terms and concepts invoked in the discourse surrounding them.

I am sometimes asked to account for Bitcoin enthusiasm among those with explicitly left-wing politics. My response is to ask two questions analytically prior to this one: first, to ask for accounts of where and how it happened that a technology developed specifically to magnify the powers favored by the political right has mutated so as not to serve those powers but the forces they oppose; and second, to ask for accounts on economic and political-economic grounds that proceed from left-wing thought (whether Marxian or Keynesian) to the need for and utility of Bitcoin. Almost uniformly, responses to these queries repeat some of the rightist tropes about central banking and governmental tyranny I describe here, and those that do not (e.g., Bauwens 2014) emerge very skeptical about Bitcoin. Perhaps Bitcoin and the blockchain can serve politics other than the ones from which they were birthed and which they continue to embody; my goal here is to document those politics and to show what any non-rightist politics of Bitcoin needs to overcome.

## FTC Adv

### 1NR – Pegasus I/L

#### Zero risk of their – that thumper spills over to deck US cred broadly – the technology was developed by an Israeli firm and PURCHASED BY THE FBI to be distributed in the US and to our other allies – even the strongest FTC in the world can’t stop the FBI from spreading the tech around that they want to contain!

#### FTC Fails – at best they enforce existing anti-spyware rules, but they cant prevent exports of tech which has been going on for decades and swamps the aff’s internal link.

#### We are the cause of the spyware problem across the Mideast and South Asia – the Pegasus program was even used on Khosoggi. The FTC cannot overcome that. This thumper wrecks press freedoms internal link and broader spyware containment – we have zero cred beyond limited law enforcement.

#### Thumper decks coop – nobody will work with us to stop the tech we gave them obviously. Europe has the tech too, so no cred for them either!

#### All of their evidence for the india relies on Pegusus for the internal link – Kulkarni evidence inserted!

Mauktik Kulkarni 21, Trained in Engineering at the University of Pune, Biophysics at the University of Illinois at Urbana-Champaign, and Neuroscience at Johns Hopkins University, Author at The Fair Observer, Writer for National Public Radio, All India Radio, BBC Marathi, National Geographic, LiveMint, Times of India, and The Hindu, “Why Americans Should be Alarmed by the Pegasus Spyware Controversy in India”, Scroll, 8/2/2021, https://scroll.in/article/1001373/why-americans-should-be-alarmed-by-the-pegasus-spyware-controversy-in-india

Under a collaboration called the Pegasus Project, 17 media organisations from around the world have recently released startling information about the way several governments have allegedly used spyware made by Israeli firm NSO to snoop on perceived adversaries.

#### The US Exports all of the tech which theres no way the FTC can stop – thumps the link

Morgus 19 (Robert Morgus and Justin Sherman, Washington Post, “How U.S. surveillance technology is propping up authoritarian regimes”, January 17, 2019, https://www.washingtonpost.com/outlook/2019/01/17/how-us-surveillance-technology-is-propping-up-authoritarian-regimes/)

But when U.S. companies sell surveillance technology to the likes of Saudi Arabia, they are sending more than surveillance kits; they are also sending conflicting signals. On one hand, the United States cares deeply about protecting a global and open Internet. This was made clear in the 2018 U.S. National Cyber Strategy and the United States’ recent proposal to the U.N. General Assembly, co-signed by countries including Australia, Canada, France, Germany and Britain. On the other hand, American companies are selling surveillance technology that undermines this mission — contributing to the broader spread of digital authoritarianism that the United States claims to fight. (This also implicates allies such as Britain, whose companies have also sold surveillance technology to oppressive regimes.)

We won’t be able to allay this situation until the United States updates its approach to exporting surveillance technology. Of course, this must be done carefully. But digital authoritarianism is spreading, and U.S. companies need to stop helping it.

Indian democracy is non-unique – even without the best tech, Modi will just arrest journalists and cement his rule – zero chance they solve – that’s all of their 1AC evidence!

## Crypto Adv

### 2NC – Turn

#### Crypto is an unsustainable financial racket that is doomed inevitably. Saturating and inflating the market through “scaling” and “decentralization” only amplifies the long-term impact of its fundamental instability and volatility. Crypto assets and blockchain tech are a fad that lure people into an unregulated securities market based on insane emissions, network security vulnerabilities, and industry propaganda.

\*Go thru impacts then read the epis indict\* - impacts are not included here bc its likely that they already read some of those impact for u, just read the i/l sections for turns case analysis!

#### Financial crises go nuclear

**Qian 18** (Qian Liu – PhD in economics from Uppsala University. <KEN> “From Economic Crisis to World War III,” *Project Syndicate*. November 2018. <https://www.project-syndicate.org/commentary/economic-crisis-military-conflict-or-structural-reform-by-qian-liu-2018-11>)

The response to the 2008 economic crisis has relied far too much on monetary stimulus, in the form of quantitative easing and near-zero (or even negative) interest rates, and included far too little structural reform. This means that the next crisis could come soon – and pave the way for a large-scale military conflict.

BEIJING – The next economic crisis is closer than you think. But what you should really worry about is what comes after: in the current social, political, and technological landscape, a prolonged economic crisis, combined with rising income inequality, could well escalate into a major global military conflict.

The 2008-09 global financial crisis almost bankrupted governments and caused systemic collapse. Policymakers managed to pull the global economy back from the brink, using massive monetary stimulus, including quantitative easing and near-zero (or even negative) interest rates.

But monetary stimulus is like an adrenaline shot to jump-start an arrested heart; it can revive the patient, but it does nothing to cure the disease. Treating a sick economy requires structural reforms, which can cover everything from financial and labor markets to tax systems, fertility patterns, and education policies.1

Policymakers have utterly failed to pursue such reforms, despite promising to do so. Instead, they have remained preoccupied with politics. From Italy to Germany, forming and sustaining governments now seems to take more time than actual governing. And Greece, for example, has relied on money from international creditors to keep its head (barely) above water, rather than genuinely reforming its pension system or improving its business environment.

The lack of structural reform has meant that the unprecedented excess liquidity that central banks injected into their economies was not allocated to its most efficient uses. Instead, it raised global asset prices to levels even higher than those prevailing before 2008.

In the United States, housing prices are now 8% higher than they were at the peak of the property bubble in 2006, according to the property website Zillow. The price-to-earnings (CAPE) ratio, which measures whether stock-market prices are within a reasonable range, is now higher than it was both in 2008 and at the start of the Great Depression in 1929.

As monetary tightening reveals the vulnerabilities in the real economy, the collapse of asset-price bubbles will trigger another economic crisis – one that could be even more severe than the last, because we have built up a tolerance to our strongest macroeconomic medications. A decade of regular adrenaline shots, in the form of ultra-low interest rates and unconventional monetary policies, has severely depleted their power to stabilize and stimulate the economy.

If history is any guide, the consequences of this mistake could extend far beyond the economy. According to Harvard’s Benjamin Friedman, prolonged periods of economic distress have been characterized also by public antipathy toward minority groups or foreign countries – attitudes that can help to fuel unrest, terrorism, or even war.

### 2NC – Turns Warming

#### Blockchains are massive emitters – they already emit as much as a major European country. Scaling will only amplify the costs. We cannot afford to keep crypto going and meet the 2 degree target!

#### Lean neg – their evidence uncritically accepts greenwashing claims paid for by tech companies. The greening of Ethereum is not taking place as promised!

#### AT IOT scenario – no political will! Macnhin, GOP, conservative courts. we don’t need a card becaues they don’t have one!

#### Their ev is from Bitcoin magazine and a Bitcoin consultant. Get outta here.

#### You should distrust the entire literature base – you cannot escape the industry propaganda. The anti-bitcoin base is WAYY more credible

Golumbia 20 (David, Professor, Writer on Digital Studies, Language, Theory, “Cryptocurrency Is Garbage. So Is Blockchain.”, Jun 27, 2020, https://davidgolumbia.medium.com/cryptocurrency-is-garbage-so-is-blockchain-3e80078e77fe)

9. There are no thorough, detailed, robust defenses of the major claims made for blockchain and cryptocurrencies.

No matter how deeply you read in the pro-blockchain literature, you will ultimately find people taking at face value claims made by some of those with vested interests in the stuff — including many of the claims listed in the Falsehoods section above. Claims that “Bitcoin is money,” for example, almost exclusively rely on question-begging, semantic, and/or outright conspiracy-theoretical claims. Critiques of the proposition, like other parts of cryptocurrency dogma, on the other hand, rely on a vast array of scholarly and professional literature.

#### The “we’re blockchain, not bitcoin” is silly.

Tente 21 (tente is a independent theorist working on the intersection of technology, politics and the social, degreee in computer science and philosophy, “The Third Web”, http://tante.cc/The%20Third%20Web\_v1.1.pdf)

Ever heard of the climate? I gotta bring this one up. Currently Ethereum, the blockchain most people use for Web3 stuff uses about the amount of electricity that the Netherlands use because of its Proof of Work consensus algorithm. This is indefensible. This “world computer” that can do less than a 5 year old cheap smartphone creates CO2 pollution like a medium sized state. Even if we were in danger to lose the best writing on this planet to censorship (we are not) and even if only a blockchain could save the writing from deletion (it’s not) it wouldn’t be easy to argue that that amount of destruction of the environment would be worth it. There is the claim that especially Bitcoin mostly uses renewable energy (it does not). But even if it did: Should we spend that medium sized country’s worth of energy on a casino for nerds or should we use it to power hospitals, transportation or heating houses? Now I know Ethereum will switch to a more sustainable consensus algorithm in a few months. It has been switching in a few months for years now. Let’s not even talk about all the e-waste that cryptocurrency mining does. The blockchain and Web3 crowd talks big about human rights. But the right to a habitable planet with breathable air and no floods or droughts drowning and starving the poorest people on the planet is also a human right that is fundamentally opposed to using blockchains.

#### DAC is useless without renewables

Erans 22 (Marıa Erans, Department of Energy, Chemical, and Mechanical Technology, ESCET, Universidad Rey Juan Carlos; Eloy S. Sanz-Perez, Department of Energy, Chemical, and Mechanical Technology, ESCET, Universidad Rey Juan Carlos; Dawid P. Hanak, Energy and Power Theme, School of Water, Energy and Environment, Cranfield University, Bedford, Bedfordshire; Zeynep Clulow, Energy Policy Research Group, Judge Business School, University of Cambridge; David M. Reiner, Energy Policy Research Group, Judge Business School, University of Cambridge; Greg A. Mutch, Materials, Concepts and Reaction Engineering (MatCoRE) Research Group, School of Engineering, Newcastle University; “Direct air capture: process technology, technoeconomic and socio-political challenges”, 7th February 2022, Energy & Environmental Science, DOI: 10.1039/d1ee03523a)

A limited amount of reliable data is presented in the literature on both techno-economic and life-cycle environmental performance of DAC (Section 4). To date, only a handful of comprehensive technology assessments have been published to accurately establish the economic and environmental viability of DAC. In the most optimistic scenarios, the long-term cost of CO2 removal was shown to vary between 40–80 h per tCO2 for low-temperature DAC and 45–90 h per tCO2 for hightemperature DAC. It needs to be stressed that there is a large discrepancy in the reported economic viability of DAC, and the cost of CDR up to 400–800 h per tCO2 that has been reported. Such discrepancies result from a lack of standardised assessment methods and reliable benchmarks for DAC. From the lifecycle emissions perspective, DAC was shown to achieve lifecycle carbon efficiencies of 85–95% when driven by low-carbon energy sources. However, if DAC is driven by electricity from grids relying on fossil fuels, the life-cycle efficiencies can be as low as 9–17%. This means that for each 1 kg of CO2 removed from the air, 0.83–0.91 kg of CO2 is released into the atmosphere from the combustion of fossil fuels, negating the true potential of DAC. Importantly, although the LCAs presented in the literature follow the standardised assessment procedures, different approaches to life-cycle inventory analysis and data sources were used. Consequently, past TEAs and LCAs rely on different sets of assumptions, making reliable benchmarking of reported results difficult, if not impossible. It is, therefore, important to derive a set of standardised guidelines and benchmarks that would enable a reliable comparison of DAC.

### 2NC – Cyber

#### Crypto wrecks cybersecurity – we have a way stronger internal link – the rise of ransomware is *entirely* caused by blockchain-based coins. Theft, scams, and hacking is just as easy on blockchains.

#### Their evidence fundamentally misunderstands what a blockchain is – the added security benefits from multiple authentication nodes is already present in critical systems! Fooling the system by emulating a credible node is just as easy as before except that self-executing contracts mean fraudulent behavior *cannot be undone* which is way more compromising for critical infrastructure!

Tente 21 (tente is a independent theorist working on the intersection of technology, politics and the social, degreee in computer science and philosophy, “The Third Web”, http://tante.cc/The%20Third%20Web\_v1.1.pdf)

Web3 is a security disaster Credit card data gets stolen and if yours is that’s very annoying. You have to get a new card and call the credit card company that a bunch of transactions were fraudulent. It’s a hassle. But there are systems in place to protect you. They are not perfect but they work reasonably well. With a blockchain based system all these protections go away because there is no “undo”. If you have your life’s savings in Bitcoin and someone gains access to your key, those coins are gone and you are shit out of luck. Given how easy it is to accidentally click on a wrong button, have people clicking on a phishing mail or just have people get their computer infected with a virus that risk is completely indefensible. If one virus can wipe out all your assets with no way to correct that mistake, that's not a world we should ever want. We need more protections for people, not fewer.

#### Blockchains are super vulnerable – new and qualified evidence

Gurdgiev 21 (Constantin Gurdgiev, College of Professional StudiesMonfort College of Business, University of Northern Colorado; Adam Fleming, Trinity College Dublin; Informational Efficiency and Cybersecurity: Systemic Threats to Blockchain Applications. In: Walker T., McGaughey J., Goubran S., Wagdy N. (eds) Innovations in Social Finance. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-72535-8\_16)  
Abstract

Crypto-assets and blockchain technologies hold the promise of providing more secure systems for managing public and private data, enhancing public trust in data collection, and increasing the efficiency of social impact finance transactions. However, to date, blockchain technologies have struggled to deliver on these promises. Specifically, cybersecurity threats to blockchain technologies are accelerating and becoming more impactful over time. This generates growing risk toward the use of the blockchain technologies in social impact finance services provision. Our analysis data on cybersecurity breaches involving cryptocurrencies trading platforms from 2014 through 2019 shows that cryptocurrencies markets have, to date, failed to develop the informational efficiencies necessary to sustain these technologies’ deployment in impact finance. Faced with increasing cybersecurity threats, permission-less blockchain systems appear to be more vulnerable to shocks than they were in the past. Cyber breaches in the cryptocurrency markets create major risk contagion pathways, which are dramatically increasing volatility of the directly attacked currencies and other major cryptocurrencies. They also present an increased risk of system-wide attacks that threaten not only the accounting and transactional accuracy and efficiency of the crypto-based FinTech solutions, but also the data stored using public blockchain protocols. These findings lead us to conclude that, due to the absence of dramatic improvements in the regulation of cryptocurrencies and exchanges, public blockchains based on traded crypto-assets are not suitable for large-scale deployment in social impact finance applications.

#### Oracle problem makes real decentralization impossible

Diehl 21 (Stephen Diehl, I’m a software engineer in London, England, “The Handwavy Technobabble Nothingburger” November 24, 2021, https://www.stephendiehl.com/blog/nothing-burger.html)

In database terminology smart contracts are stored procedures that run one of the various incarnations of distributed databases these technologies are built on. In theory they act somewhat like self-automated vending machines but for more complex user interactions. In practice they act more like self-automated bug bounties which typically explode violently when certain exploits are issued against the coded logic, and at which point they spill all of the coins locked up in the contract. These disasters happen about two or three times a week now because coding at that level of correctness required in a Javascript-like language with loose and ill-defined semantics is near impossible. When a contract does finally meet its end, the only recourse is begging or threats to return the stolen tokens. However it’s unclear that “stolen” is the right word because the contract was simply behaving exactly as instructed and therein lies the core reason why “code is law” is an absolutely rubbish idea.

The second absurdity at the heart of smart contracts is their dependence on external data sources to function, the so-called “Oracle problem” is an intractable issue whereby these blockchain stored procedures must depend on data external to a blockchain in order to allegedly perform some business function. If a contract is modeling some sort of derivative contract then it depends on the price of the underlying asset, which it will have to pull from a price feed from Bloomberg. To check if the counterparty to the derivative has posted collateral it will have to pull out to query the balance of an account at a high street bank for one of the counterparties. To check if the counterparties are allowed to trade with each other they have to check whether either of them is on a sanctions list. So then by the time you’ve folded Bloomberg, Barclays and Uncle Sam into the trust boundary of your smart contract there’s very little point to saying this process is decentralized anymore, and begs the question why even construct this Rube Goldberg machine when it could be better done as a simple program running on a centralized server. It would be far more sensible and efficient to just build a web app that uses Stripe for payments. That is unless your business model fundamentally depends on selling unregistered securities or breaking the law.

#### The threshold for network security is through the roof – bad news for ledger-based code

Gerard 17 (David Gerard, crypto journalist, works as a Unix system administrator, *Attack of the 50 Foot Blockchain*, 2017)

Smart contracts make no sense as software engineering. You need a perfect bug-free program – but humans are really bad at coding without error. Programming to this extreme quality level is done by organisations like NASA for spacecraft, and it’s hideously slow and expensive. (Everyday businesses would find a floor full of lawyers both cheaper and more effective.)

A much-touted advantage of smart contracts is that the code is public, so anyone can check and verify it before engaging with it. The problem is that it is extremely difficult to tell precisely what a program might possibly do without actually running it.339 Even if you do see any obvious (or exploitable) bugs, nobody can fix them once the contract’s been deployed – your bugs are immutable.

Then there’s the question of what’s an error and what’s deliberate. In the wider world of security programming, we have the Underhanded C Contest, a competition to write deceptive programs that look like they just have a bug: “you must write C code that is as readable, clear, innocent and straightforward as possible, and yet it must fail to perform at its apparent function. To be more specific, it should perform some specific underhanded task that will not be detected by examining the source code.”340 The Ethereum community is also running one for Solidity, to encourage security awareness.341 If you think people have trouble with loopholes and traps in conventional contracts …

Smart contracts rely on the program being perfect and not having any bugs. But they also rely on the language (e.g., Solidity in Ethereum) being perfect and not having any bugs. And the platform the language runs on (e.g., the Ethereum Virtual Machine) being perfect and not having any bugs. You can deploy fully-audited code that you’ve mathematically proven is correct – and then a bug in a lower layer means you have a security hole anyway. And this has already happened.342

#### Blockchain attacks are just as easy – permission blockchains like for nuclear security would recentralize things and undermine benefits!

Gerard 17 (David Gerard , crypto journalist, works as a Unix system administrator, *Attack of the 50 Foot Blockchain*, 2017)

If you want to work with people you trust less than those you trust now, you will need to be absolutely clear on how your blockchain is secured against attackers, both internal and external.

What is your threat model? What attacks from the outside world do you need to protect against? What attacks from your fellows on your blockchain do you need to protect against? What do your security-conscious IT staff think of all this?

Attacks may include:376

The usual human problems in cryptographic key management. Ordinary employees just trying to do their jobs are really bad at security thinking. What can someone do as “you” if your company’s keys leak, or if someone clicks the wrong link in a phishing email? If you have enough hashpower on a Proof of Work chain, from 25% up you can conduct an attack on the system, as described in the Bitcoin mining chapter. In Bitcoin, this attacks the transaction ledger; in a business blockchain, the integrity of the information. On an invitation-only permissioned blockchain, you don’t have to control a large chunk of the hash power – you just need to compromise a single member. The miner gets to choose which transactions they write to the next block. What could they write, or decline to write, to the chain that would be adverse to you? What if some other members of your chain decide they don’t like you?

Blockchain promises that it will let people who don’t trust each other work together. The trouble is that it does this only approximately, with startling inefficiency, and in a way that naturally recentralises to one or a few winners, as happened with Bitcoin. The usual proposal to avoid this is to just start with central authority, at which point you probably shouldn’t be using a blockchain.

### 2NC – Cyber Defense

#### No cyber impact --- no one has the capability to cause physical damage against robust US cyber defenses, fear of retal discourages attacks and encourages de-escalation if they do, and attackers know attacks wouldn’t do anything. That’s Lewis.

#### Even if they happen, no escalation:

#### 1 --- attribution failure

Krepinivich 12 (Andrew, President of the Center for Strategic and Budgetary Assessments — a conservative budget thinktank, Ph.D. in International Studies from Harvard University, 2012, “Cyber Warfare a ‘Nuclear Option’?,” *Center for Strategic and Budgetary Assessments,* August 24th, Accessible Online at <http://csbaonline.org/publications/2012/08/cyber-warfare-a-nuclear-option/>)

As the discussion of attack attribution earlier in this report suggests, for at least the near term the source of a nuclear attack is far more likely to be identified than the source of a cyber attack. The difficulty in determining attribution of a cyber attack is a significant and perhaps enduring character of cyber warfare. This is due in part to the potential large number of actors that can execute cyber attacks, and to the relative ease by which cyber attackers can mask the origins of an attack. To date even substantial efforts to determine attribution of a sophisticated attack have not produced a “smoking gun” level of evidence, and have taken con- siderable time and resources to pursue. 237 This suggests that in the case of a cyber attack whose purpose is to inflict catastrophic destruction, the victim may have difficulty determining its source. To the extent this is the case, the victim will also want to avoid being deceived into engaging in a catalytic war by retaliating against the apparent source of an attack that was actually conducted by a third party. Moreover, cyber weapons could also be employed to trigger a catalytic nuclear war in other ways; for example, by feeding false information into a state’s early warning system to spoof operators into believing their country is under attack when in fact it is not. It seems unlikely that nuclear weapons could be employed to trigger a catalytic cyber war, at least given the current state of nuclear proliferation.

#### 2 --- doesn’t meet the nuclear threshold

**Tucker 18** (Patrick Tucker – Technology editor for Defense One, published in Slate, The Sun, MIT Technology Review, Wilson Quarterly, The American Legion Magazine, BBC News Magazine. “No, the US Won’t Respond to A Cyber Attack with Nukes.” Defense One. February 2018. <http://www.defenseone.com/technology/2018/02/no-us-wont-respond-cyber-attack-nukes/145700/>)

There’s a reason for that. While cyber attacks on physical infrastructure can be very dangerous, they are unlikely to kill enough people to provoke a U.S. nuclear response.

An National Academies of Science and Engineering analysis of the vulnerability of U.S. infrastructure makes that point. A major cyber attack could cut off electrical power, resulting in “people dying from heat or cold exposure, etc.,” said Granger Morgan, co-director of the Carnegie Mellon Electricity Industry Center and one of the chairs of the report. “A large outage of long duration could cover many states and last for weeks or longer. Whether and how many casualties there could be would depend on things like what the weather was during the outage.”

It’s a huge problem but not an event resulting in tens of thousands of immediate deaths.

Contrast that with a nuclear attack on a city like Moscow, even one using a device of 6 kilotons, much smaller than the ones the United States used against Japanese targets in World War II. The immediate result: there would be 40,000 deaths, according to the online nuclear simulation tool NukeMap.

Russia has demonstrated a willingness to take down power services with cyber attacks, as they did in Ukraine on Christmas Eve 2015. But these attacks were brief and occured in the context of actual fighting.

In other words, the worst cyber physical attack that top experts believe credible likely does not meet the threshold that the Defense Department has set out for deploying a nuclear weapon.

### 2NC – Disarm Scenario

#### No arms control scenario. Blockchain can’t generate trust becaues of smart contract failure. Parties won’t trust decentralized networks because of widespread potential for fraud. That’s DOUBLY true for verifying ARMS control agreements. That’s 1NC Skaroff scenario.

#### human judgement is inevitable – cannot solve trust to motivate disarm. You can lie just as easily to the blockchain as to another verification system.

Gerard 17 (David Gerard , crypto journalist, works as a Unix system administrator, *Attack of the 50 Foot Blockchain*, 2017)

Unless you just want to shuffle tokens inside your smart contract platform, at some point you’re going to need to interact with the outside world. Your contract has to know if a shipment has not just been delivered but is what you ordered, or if a given piece of work has been done to a satisfactory standard. This will frequently involve unavoidable trust in human judgement.

And remember: garbage in means garbage out. You may set up incentives against false data – but what about accidental errors, or disputed data, or unavailable data? Or, as Matt Levine from Bloomberg points out: “My immutable unforgeable cryptographically secure blockchain record proving that I have 10,000 pounds of aluminum in a warehouse is not much use to a bank if I then smuggle the aluminum out of the warehouse through the back door.”335

#### Smart contracts are a procedural, legal, and technical nightmare – doesn’t really improve anything over traditional contracting, but does force us to invent a new legal system from the ground up!

Sklaroff 17 (Jeremy M Sklaroff, Senior Editor, Volume 166, University of Pennsylvania Law Review. J.D. Candidate, 2018, University of Pennsylvania Law School; M.B.A. Candidate, 2018, The Wharton School; , “SMART CONTRACTS AND THE COST OF INFLEXIBILITY”, University of Pennsylvania Law Review, Vol. 166, 2017, https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=9605&context=penn\_law\_review)

However, the decentralized nature of these systems ensures that they will be essentially useless in managing the high costs of smart contracting. By shifting dispute resolution to an online system that relies on an everchanging, unpredictable, unaccountable, and opaque group of decisionmakers, decentralized adjudication cannot generate contract “public goods” like performance standards, which emerge through the stable application of interpretation rules by courts. For example, OpenBazaar’s system allows users to select their own moderators just like they would select a product to purchase on the site, based on each moderator’s fees and her ratings from previous users. But each moderator is free to decide her cases based on whatever substantive principles she prefers, which may or may not be evident from her listing.176 Likewise, Buterin’s proposal requires that judges are “randomly selected” and then incentivized to adjudicate honestly “by the threat of a larger ‘supreme court’ contradicting them,” resulting in forfeiture of their adjudication fee.177

In these decentralized resolution systems, parties cannot know how to craft their arguments to maximize success or minimize risk. They cannot cite precedent to incorporate previous decisions, and may not even know what those previous decisions were. They cannot deploy performance standards because there’s no way to restrict the range of review used by randomlyselected courts, which may or may not respect the wording of a particular merger clause or a preamble that restricts relevant commercial practice to a specific industry. As a result, decentralized adjudication will grow more resource-intensive over time as parties attempt, and inevitably fail, to define every contingency ex ante with the exacting rigor of computer code. In short, without the tools created for traditional contracts by traditional courts, parties will have to argue every dispute from scratch, and without any idea about how such disputes will be analyzed.178

#### Smart contracts fail to solve trust, human judgement is always needed for contracts

Gerard 17 (David Gerard , crypto journalist, works as a Unix system administrator, *Attack of the 50 Foot Blockchain*, 2017)

Unless you just want to shuffle tokens inside your smart contract platform, at some point you’re going to need to interact with the outside world. Your contract has to know if a shipment has not just been delivered but is what you ordered, or if a given piece of work has been done to a satisfactory standard. This will frequently involve unavoidable trust in human judgement.

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# 1AR

## Cap K

### O/V---AT: Impact---T/L

### O/V---AT: Agriculture Impact

#### No food wars.

Jonas Vestby 18, Doctoral Researcher at the Peace Research Institute Oslo, Ida Rudolfsen, doctoral researcher at the Department of Peace and Conflict Research at Uppsala University and PRIO, and Halvard Buhaug, Research Professor at the Peace Research Institute Oslo (PRIO); Professor of Political Science at the Norwegian University of Science and Technology (NTNU); and Associate Editor of the Journal of Peace Research and Political Geography, “Does hunger cause conflict?”, 5/18/18, https://blogs.prio.org/ClimateAndConflict/2018/05/does-hunger-cause-conflict/]

It is perhaps surprising, then, that there is little scholarly merit in the notion that a short-term reduction in access to food increases the probability that conflict will break out. This is because to start or participate in violent conflict requires people to have both the means and the will. Most people on the brink of starvation are not in the position to resort to violence, whether against the government or other social groups. In fact, the urban middle classes tend to be the most likely to protest against rises in food prices, since they often have the best opportunities, the most energy, and the best skills to coordinate and participate in protests.

Accordingly, there is a widespread misapprehension that social unrest in periods of high food prices relates primarily to food shortages. In reality, the sources of discontent are considerably more complex – linked to political structures, land ownership, corruption, the desire for democratic reforms and general economic problems – where the price of food is seen in the context of general increases in the cost of living. Research has shown that while the international media have a tendency to seek simple resource-related explanations – such as drought or famine – for conflicts in the Global South, debates in the local media are permeated by more complex political relationships.

<<IF TIME>>

#### Growth is key to food security

Timmer 04 – Peter Timmer, Center for Global Development, “Food Security And Economic Growth: An Asian Perspective” Heinz W. Arndt Memorial Lecture, Canberra, November 22, 2004

There is a different way to pose the question, however. Rather than asking how to cope with hunger and famine, the question might be how to escape from their threat altogether. As Fogel (1991) has emphasised, this is a modern question that is only partly answered by the institutional and technological innovations that are at the heart of modern economic growth (Kuznets 1966). Without these innovations, the modern escape from hunger to food security would not have been possible. But the record of economic growth for the developing countries since the 1950s shows that, even in countries with relatively low levels of per capita income, government interventions to enhance food security can lift the threat of hunger and famine. The countries most successful at this task are in East and Southeast Asia, although the experience in South Asia has been instructive as well (Timmer 2000). This article has a main premise: an early escape from hunger—achieving food security at the societal level—is not just the result of oneway causation from economic growth generated by private decisions in response to market forces. Improved food security stems directly from a set of government policies that integrates the food economy into a development strategy that seeks rapid economic growth with improved income distribution (Timmer, Falcon and Pearson 1983). With such policies, economic growth and food security are mutually reinforcing. Countries in East and Southeast Asia offer evidence that poor countries using this strategy can escape from hunger in two decades or less — that is, in the space of a single generation.

### O/V---AT: Speculative Bubbles Impact

### O/V---AT: Societal Resilience Impact

### Framework---1AR

### AT: Cryptocolonialism Link---1AR

### AT: Financialization Link---1AR

#### The environmental impact is miniscule

Adam Rothstein 14, Contributing Editor at The State, and Previously Contributed to Rhizome, The New Inquiry, The Atlantic Tech, The Magazine, and Longshot Magazine, Insurgent Archivist and Writes About Politics, Media, Art, and Technology, “Bitcoin and the Speculative Anarchist”, Rhizome, 2/18/2014, https://rhizome.org/editorial/2014/feb/18/bitcoin-and-speculative-anarchist/

Does any of this mean that any participation in cryptocurrencies is inherently unethical? I don't think that is clear. No workers are having their labor stolen from them. No one is being physically harmed with ill-gotten altcoin gain (that we know of). There is no categorical exploitation within cryptocurrencies, certainly not compared to fiat currencies. Eight billion USD is a lot of value, but only relatively. That's greater than the GDP of Benin, but less than 1/100 the GDP of Indonesia. It is only a few years' work to a Silicon Valley angel investor or a drug cartel, and a minute fraction of the student loan industry. But aren't cryptocurrencies bad for the environment by using tons electricity? Sure, they use electricity. But it is not nearly as bad as everyone thinks it is. (I estimate that Bitcoin uses 2x more electricity than every iPad in the world, but ¼ the electricity of all the flat screen TVs sold in the first quarter of 2012.) And compared to the ecological disaster than is American's consumption of chicken wings, I feel that vegetarianism is probably a stronger political decision than directing an inordinate amount of attention to the environmental costs of running your GPU overnight.

### Sustainability---1AR

#### Best study confirms it.

Hideo Noda & Shigeru Kano 21, Tokyo University of Science; The Shoko Chukin Bank, "Environmental Economic Modeling of Sustainable Growth and Consumption in a Zero-Emission Society," Journal of Cleaner Production, Vol. 299, 05/25/2021, pg. 1-2.

Manufacturing activities that pollute the soil, atmosphere, and water have adversely affected the environment. The abatement of pollution is therefore essential to maintaining environmental standards in the future. The purpose of this paper is to examine what kind of economic conditions should be satisfied if an economy adopts a rule stating that pollution must be cleaned up when it is produced, and whether the zero net emission of pollution flow (in the sense of a zero residual amount of pollution created minus pollution abated) is compatible with the continued growth of gross domestic product (GDP) and consumption when the economy experiences cyclical fluctuations.

A detailed understanding of the economic implications of cyclical fluctuations is crucial because actual economies inevitably undergo cycles of expansion and recession. In this respect, on the basis of the laboratory equipment model of Rivera-Batiz and Romer (1991), Matsuyama (1999) constructed a useful model that generates endogenous fluctuations. Notably, under specific conditions, an economy can perpetually oscillate between a capital-accumulation-based (no-innovation) growth phase and innovation-led growth phase. The former phase is called the Solow regime, after the work of Solow (1956), while the latter phase is called the Romer regime, after the work of Romer (1990) and Rivera-Batiz and Romer (1991).

However, Matsuyama (1999) did not pay attention to environmental aspects in a society. We therefore extend the model of Matsuyama (1999) by considering pollution abatement from the perspective of the kindergarten rule model of Brock and Taylor (2005). We thereby expect to obtain meaningful findings by analyzing endogenous fluctuations with pollution abatement, which has not been tackled in earlier studies. The term “kindergarten rule” originates from the title of a book written by Fulghum (1990) and implies that messes be cleaned up as they are created. Brock and Taylor (2005) referred to the proportion of pollution abatement expenditure in GDP for achieving zero net emissions of pollution (i.e., completely eliminating the amount of pollution created minus pollution abated) as the kindergarten rule level of abatement (or just the kindergarten rule).

Ono (2003) extended Matsuyama’s (1999) model to analyze endogenous fluctuations by accounting for environmental variables. Specifically, Ono (2003) incorporated the production structure of Matsuyama (1999) into the framework of the overlapping generations model on the basis of the work of John and Pecchenino (1994) and examined environmental taxation that maximizes the environmental quality and economic growth rate. It is found that there is a critical level of tax, and the economy achieves higher growth rates of GDP and environmental quality by raising (or reducing) tax if the initial tax is below (or above) the critical level. That is to say, the purpose of the present study differs from that of the study of Ono (2003). We analyze the feasibility of the positive growth of GDP with zero net emission that reflects the kindergarten rule of pollution abatement, while Ono (2003) focused on taxation for improving environmental quality and promoting economic growth. Recent efforts toward a zero-emission society, which are an important topic of the Paris Agreement that came into force on November 4, 2016, have received worldwide attention (see, for example, Pauli, 1997; Baumgartner and Zielowski, 2007; Tokimatsu et al., 2014). The present study is therefore of social importance and relevant. Additionally, we consider that the notion of environmental quality is vague and hence difficult to capture empirically. In contrast, the zero net emission of pollution has clear meaning.

Related studies of environment-growth models with endogenous fluctuations include those conducted by Zhang (1999), Chen and Li (2011), and Palivos and Varvarigos (2017). Zhang (1999), for example, examined the possibility of nonlinear dynamics in the model of John and Pecchenino (1994) and showed that cyclically or chaotically fluctuating equilibria are more likely to exist when people’s concerns are more towards greener preferences and the maintenance efficiency relative to degradation is not sufficiently high. Chen and Li (2011) introduced the habit formation of environmental quality and consumption tax to the model of John and Pecchenino (1994). The habit formation of environmental quality in the model of Chen and Li (2011) means that people get used to the environment while they grow up and will compare environmental quality in their old age with that when they were young. As a result, Chen and Li (2011) showed that cyclical fluctuations and entropic chaos may exist if households have a preference towards environmental quality and the maintenance efficiency is sufficiently low relative to degradation and the tax rate. The economy moves from complex to simple dynamics as the tax rate increases. Using an overlapping generations model where life expectancy is positively affected by the provision of public health services and by the environmental quality, Palivos and Varvarigos (2017) showed that, despite the presence of an aggregate learning-by-doing externality, the economy cannot sustain a positive growth rate in the long run if resources are not devoted to environmental preservation. Moreover, an active policy of environmental preservation is not only an important complementary engine of long-run growth but also a powerful tool of stabilization.

Zhang (1999), Chen and Li (2011), and Palivos and Varvarigos (2017), however, did not consider the role of innovation in economic growth. When we consider issues related to recent economic growth, it is noteworthy that the economic activities of industries in developed countries and some developing countries have increasingly become knowledge intensive. The economies of these countries are often termed knowledge-based economies. An important feature of such an economy is that it emphasizes innovation, including the creation of new products and production processes through industrial research and development (R&D), and the innovation is accompanied by accumulated knowledge that drives sustained growth. Accordingly, any study on the actual economic problems of a knowledge-based economy needs to construct a model that endogenously incorporates R&D and innovation. From such a perspective, the above-mentioned earlier studies are inadequate in terms of understanding the relationship between contemporary economic growth and environmental problems.

Our model leads to the theoretical possibility that the zero net emission of pollution flow is compatible with sustainable growth and consumption. In this regard, however, the economy requires GDP above a certain level. Moreover, to simultaneously achieve a zero net emission of pollution and sustained economic growth, the economy requires variability of the kindergarten rule level of abatement. In other words, the kindergarten rule level of abatement must not be fixed at a specific value. The present study makes two main contributions. First, we shed light on the relationship between the zero net emission of pollution and economic growth, which is not well understood, and address theoretically an important subject interesting environmental scientists, economists, and policy makers: whether both a zero net emission of pollution and sustained growth of GDP (consumption) are achievable when economies implement a zero net emission policy. In terms of the association with Sustainable Development Goals (SDGs), which were adopted by the United Nations General Assembly in September 2015 and have received international attention, our considerations are conducive to providing a theoretical basis for a part of SDG 8 (“Decent Work and Economic Growth”). Second, we present a dynamic macro-environmental modeling approach based on an extension to Matsuyama’s (1999) model with the idea of the kindergarten rule of Brock and Taylor (2005). To the best of our knowledge, there have been few studies on the environmental economic modeling of endogenous growth with cyclical fluctuations in a zero-emission society. That is to say, our dynamic macroenvironmental modeling approach can be interpreted as a methodological contribution in the research field of economic growth and the environment.

### Sustainability---AT: Financialization

#### No impact---it’s too broad to explain structural issues AND inflates its own import---particularity is key.

Brett Christophers 15, Assistant Professor, Social & Economic Geography, University of Uppsala, "The Limits to Financialization," Dialogues in Human Geography, Vol. 5, No. 2, 2015, pg. 184-185.

In response to, and in the face of, this mushrooming financialization literature, the present article constitutes, essentially, a call for caution. With scholars from various disciplinary constituencies having enthusiastically invoked the concept in attempting to understand contemporary capitalism and its specificities, and with a critical mass of increasingly breathless and boosterish scholarship on the phenomenon having crystallized, now is the time, the article submits, to pause, breathe in, and carefully (re)evaluate. Are we—not just geographers but other scholarly communities to have invested in financialization—comfortable with our collective, if contested, theorization of the concept? Is it working for us as we want and need it to? Should we simply plow ahead with mobilization and elaboration of the concept broadly along the lines we have been tracing to date?

Having reviewed the state of the field, the article argues that caution is not just advisable but necessary. It makes this case by invoking a multiply constituted idea of limits. Financialization, it suggests, is limited, both conceptually and empirically. As such, in continuing to use the concept—as surely for the foreseeable future we, as a constellation of scholarly communities, will—it is essential to recognize such limits and to think through their implications for the ways we use the concept and for the work that we expect it to do for us. The limits are sufficiently substantive, and their implications sufficiently material, to warrant a tempering of enthusiasm, if not a turn away from the concept altogether. More specifically, we need to be much more wary of relying on the concept and of mobilizing it for the purposes of both categorization and explanation.

The article proceeds in five sections, which respectively correspond to and delineate the five connected types of limits that attach to financialization. The first such limits are analytic. For a concept to be analytically valuable, it should be possible for scholars to invoke it in such a way that it brings recognizability and clarity to the particular topic of analysis; the critical properties or dynamics of the empirical object of investigation are foregrounded, if not comprehensively accounted for, simply by the use of a term whose reproducible coherence offers ready-made analytical expedience and insight. For a variety of reasons, however, not least unchecked and promiscuous conceptual reiteration, the idea of financialization has by now largely lost any coherence that it previously enjoyed: increasingly standing only for a vague notion of ‘the (increased) contemporary importance of finance’, its enrolment today risks raising more questions than it answers

Does this then mean that the concept is valueless and that it has facilitated no scholarly progress? Absolutely not. But, the article goes on to argue, there are crucial limits to its positive contributions, not least—as discussed in the ‘Theoretic limits’ section—of a theoretic nature. Here the argument is that there are very real limits to the depth and range of genuinely new conceptual insights generated by the positing and theorization of financialization. The central concern in this regard, to be clear, is not so much with the sophistication, rigor, or novelty of theorizations of financialization per se, although as we shall see there are legitimate questions to be asked here, too. Rather, our main concern is with the limits to the power of financialization and its conceptualization to meaningfully advance our theoretical understanding of capitalism’s cultural and political economies more generally.

The third section discusses limits of a very different type. One of, if not the most important contribution of the financialization discourse and ‘movement’ has been of a strategic nature. It has served to make finance a more acceptable, indeed more obligatory, object of study for a range of scholarly communities for whom it historically represented something of an unmentionable and unknowable other. In the process, it has also helped bringing those communities into productive conversation with one another. In other words, it—financialization—has served vital strategic purposes. Yet there are limits to this strategic function, which the third section of the article identifies and reflects critically upon. If financialization’s great contribution has been to alert new constituencies to the significance, broadly defined, of finance, at what point can we say that this contribution is more or less complete?

The latter question of finance’s significance— economic, political, and cultural—is considered explicitly in the article’s fourth section. It argues that notwithstanding the self-evident and demonstrable importance of finance to contemporary social life on all manner of axes, its significance nonetheless risks being overstated, and arguably already has been in influential financialization accounts. The scale of finance’s significance is one aspect of such potential overstatement, and the historical novelty thereof is another. In attempting to understand and account for the possibility of such overstatement, meanwhile, the article invokes, once more, the central trope of limits: a susceptibility to exaggerate finance’s contemporary significance is embedded, it submits, in the limited nature of the optics brought to bear upon contemporary ‘financialized’ phenomena.

To recognize that exaggeration of financialization’s reality as a historical–geographical set of phenomena is conceivable is to recognize, at the same time, that there are material limits—fifth, and finally—to the various processes referred to with that term. In other words, financialization-as- ‘thing(s)’ is no less limited—or, better, no less required to confront limits to its conditions of possibility and its scope for intensification or extension— than financialization-as-concept. But these limits, the article’s last substantive section argues, have ordinarily not been recognized and critically reflected upon, and nor, therefore, have their implications for the discourse of financialization actively been considered. Recognizing and robustly conceptualizing these empiric limits, it is therefore argued, is in fact an indispensable component of the simultaneous process of working through financialization’s analytic and theoretic limits.

### Sustainability---AT: Agriculture

#### Industrial ag is preserving---no chance of short-term disaster.

James Wong 19, Botanist and Science Writer, Trained at the Royal Botanic Gardens, “The Idea That There Are Only 100 Harvests Left Is Just A Fantasy”, The New Scientist, 5/8/2019, https://www.newscientist.com/article/mg24232291-100-the-idea-that-there-are-only-100-harvests-left-is-just-a-fantasy/

When it comes to science reporting, there are some headlines that are so frequently repeated, so intuitively plausible, so closely aligned to our cultural beliefs, that they can seem like incontrovertible truths.

The general public, and indeed many scientists, may fervently believe that these claims reflect the overwhelming scientific consensus. However, sometimes when you dig a little beyond the surface, the evidence underpinning even the most ubiquitous headlines can seem surprisingly shaky.

Perhaps the best example of such an assertion is that of an impending agricultural Armageddon, caused by decades of irresponsible farming practices that have degraded soils across the planet (or so the press narrative goes).

A quick scan of the headlines reveals that despite the confidence with which these forecasts are proclaimed, the actual timescale to D-Day varies rather widely from story to story. While some report that we have 100 years until the end of our soil’s ability to support farming, citing a University of Sheffield study, others claim that this is a mere 60 years away, referencing a speech at the UN’s Food and Agriculture Organization.

Recently, the UK government’s environment secretary even stated that the UK is as little as 30 years away from an “eradication of soil fertility” because we “drench it in chemicals”. If this is indeed a likely end-game scenario, we should probably determine which of these estimates is most plausible as a matter of urgency: 30, 60 or 100 years. So let’s take a closer look at this claim.

Despite dozens of headlines quoting these predictions, surprisingly only one peer-reviewed paper from a scientific journal is ever cited as evidence to back them up. This 2014 study from the University of Sheffield compared the soil quality of a range of sites in the English city, including agricultural, garden and allotment soils.

Now, before we question whether the results of this single, small study can be extrapolated to represent all of England, let alone the whole UK or even the whole world, let us take a look at their findings: basically, some urban soils in Sheffield are higher in carbon and nitrogen than some nearby agricultural ones. OK, but where is the 100-year statistic? It turns out that nowhere in the study was there any calculation, prediction or even passing reference to the claim. None whatsoever. Perhaps not so much shaky evidence to support this assertion as much as non-existent.

“I asked leading soil scientists if they had ever come across such a prediction in published research. Not a single one had”

Maybe this is the result of a typo and the work is in another research paper? After an 8-hour trawl through the academic journals failed to pull up a single study that even attempted to make this calculation, I contacted six leading soil scientists across the world to ask if they had ever come across such a prediction in either the published literature or their work. Not a single one had.

In fact, the words they used to describe this claim were “bold”, “too Malthusian”, “hardly useful”, “almost insulting” and “I have used this in my soil science lectures to show the students to be wary of headlines!”. Ouch.

Does that mean there aren’t real threats to some agricultural soils around the world? Absolutely not. Indeed, all the scientists I spoke to went to great lengths to point these out, where they exist.

However, they also highlighted how incredibly complex the calculations needed to make such predictions would be, based on myriad factors, only some of which can be predicted with any reliability, with generalisations almost impossible. The boring reality is that while soils in some parts of the world might be in decline, others are not.

Furthermore, while agriculture may be one of the factors driving erosion and nutrient depletion, many modern farming practices such as no-till and synthetic fertiliser applications may actually be helping alleviate (rather than drive) this. In fact, according to many objective measures, modern, evidence-based farming techniques are more sustainable than those of an idealised past. Quite a different picture to that painted by the headlines.

Despite the thirst for simple truths in a complicated world, the researchers I contacted agreed that setting such a figure for an agricultural “end-point” would be nigh on impossible, which may explain why no published studies appear to have been able to do so. But this hasn’t stopped the newspapers. Welcome to 2019!

#### No impact.

Peter Kareiva 18 and Valerie Carranza, Institute of the Environment and Sustainability, University of California, Los Angeles, “Existential Risk Due To Ecosystem Collapse: Nature Strikes Back,” Futures, 1/5/2018, ScienceDirect

The interesting question is whether any of the planetary thresholds other than CO2 could also portend existential risks. Here the answer is not clear. One boundary often mentioned as a concern for the fate of global civilization is biodiversity (Ehrlich & Ehrlich, 2012), with the proposed safety threshold being a loss of greater than 0.001% per year (Rockström et al., 2009). There is little evidence that this particular 0.001% annual loss is a threshold—and it is hard to imagine any data that would allow one to identify where the threshold was (Brook, Ellis, Perring, Mackay, & Blomqvist, 2013; Lenton & Williams, 2013). A better question is whether one can imagine any scenario by which the loss of too many species leads to the collapse of societies and environmental disasters, even though one cannot know the absolute number of extinctions that would be required to create this dystopia. While there are data that relate local reductions in species richness to altered ecosystem function, these results do not point to substantial existential risks. The data are small-scale experiments in which plant productivity, or nutrient retention is reduced as species numbers decline locally (Vellend, 2017), or are local observations of increased variability in fisheries yield when stock diversity is lost (Schindler et al., 2010). Those are not existential risks. To make the link even more tenuous, there is little evidence that biodiversity is even declining at local scales (Vellend et al., 2013, 2017). Total planetary biodiversity may be in decline, but local and regional biodiversity is often staying the same because species from elsewhere replace local losses, albeit homogenizing the world in the process. Although the majority of conservation scientists are likely to flinch at this conclusion, there is growing skepticism regarding the strength of evidence linking trends in biodiversity loss to an existential risk for humans (Maier, 2012; Vellend, 2014). Obviously if all biodiversity disappeared civilization would end—but no one is forecasting the loss of all species. It seems plausible that the loss of 90% of the world’s species could also be apocalyptic, but not one is predicting that degree of biodiversity loss either. Tragic, but plausible is the possibility of our planet suffering a loss of as many as half of its species. If global biodiversity were halved, but at the same time locally the number of species stayed relatively stable, what would be the mechanism for an end-of-civilization or even end of human prosperity scenario? Extinctions and biodiversity loss are ethical and spiritual losses, but perhaps not an existential risk.

### Growth Good---1AR

#### AE is coming AND achieves absolute decoupling.

---AE = alternative energy.

Klaas Lenaerts et al. 21, Research Assistant, Bruegel; Simone Tagliapietra, Senior Fellow, Bruegel; Guntram B. Wolff, Director, Bruegel, "Can Climate Change Be Tackled Without Ditching Economic Growth?" Bruegel, Working Paper No. 10, 2021, pg. 11-13.

A decline in energy demand/real GDP can be driven by improvements in energy efficiency from using better technologies for production, transport, isolation etc; by behavioural change towards less energy-intensive consumption (eg increased use of public transport, a larger sharing economy and more re-use of durable goods); and by a changing economic structure towards a more ‘immaterial’ service-oriented economy. A decline in CO2/energy demand is mostly driven by the shift from fossil fuels to renewable energy sources. Changing behaviour also plays a role (choosing to travel by rail rather than by air for example).

So far, energy demand/real GDP has declined more since 1995 than CO2/energy demand. Perhaps this is somewhat surprising as in the long run it seems more likely that energy would be almost completely decarbonised than that the global economy would be completely ‘de-energised’: goods still need to be produced somewhere and transport, heating and lighting will remain necessary. In practise, both factors will have to decline simultaneously to sufficiently reduce gross CO2 emissions. This is also visible in Tables 1A and 1B, which show that if energy demand/real GDP continues to decline at its current rate, a very steep drop in CO2/energy demand will be necessary for both the world and the EU. If energy demand/real GDP is also addressed more strongly, the ‘burden’ can be spread over both factors of the Kaya identity (see for example the different rates depending on which reference period is used for energy demand/real GDP).

The data presented here suggest that an absolute decoupling of CO2 and GDP is possible, but that it is currently still too slow to reach net zero. Note that while the required decoupling rate is higher for the EU than for the world, the EU is closer to its goal: while the overall decoupling rate must increase around five-fold for the whole world, the EU itself only needs less than a three-fold acceleration.

The historical decoupling rate against which to compare also increases if one takes a more recent reference period, as is visible in the table. Speeding-up will still take tremendous effort: if the energy intensity of GDP decreases at the same speed as in the last few decades, even the EU would need to speed up its decarbonisation of energy by a factor of around 11 to reach its required decoupling rate.

The drastic decline in prices of renewable energy technologies suggests that such an accelerated decarbonisation of energy may be feasible. Figure 3 shows that over the last decade, the cost of generating electricity with solar panels has decreased by 85 percent, while the cost of doing so with wind turbines has decreased by 68 percent. The costs of energy from solar and wind have become lower than fossil fuel alternatives even without subsidies. Firms and governments all over the world would therefore have economic incentives to make the necessary investments to save money and at the same time reduce their emissions.

Investment decisions are of course not based solely on market prices but also on government policies and strategies. Money is still being invested in fossil fuels, but volumes are declining. Meanwhile global investments in renewable energy generation have been on the rise uninterruptedly since 2017, even during the pandemic in 2020. Moreover, it takes time before lower costs are translated into larger investments, and other key investments must be made before renewable energy can be used at a massive scale, notably in energy storage capacity and more reliable distribution and transmission. As investments in battery storage are surging while costs are declining and investments in grids are set to recover in 2021, we can expect that the upward trend in renewable energy investment will continue for the foreseeable future (IEA, 2021d).

[Figure omitted]

Already in the earlier literature rejecting degrowth pessimism, the central role of technology was highlighted. Stiglitz (1974) and Kamien and Schwartz (1978) did not yet address GHG emissions, but rather whether continued consumption growth is possible in a world with exhaustible resources. They found that technology-driven efficiency gains allow the limits set by nature to be pushed forward so that continued expansion is possible. Later papers, including Weitzman (1999), Acemoglu et al (2012) and Aghion et al (2016), discussed endogenous and directed technical change with more optimistic outlooks.

#### Anthropogenic risks are numerous, existential, AND compounding.

Nathan A. Sears 20, PhD, Political Science, University of Toronto. Former Professor, International Relations, Universidad de Las Américas, "Existential Security: Towards a Security Framework for the Survival of Humanity," Global Policy, Vol. 11, Issue 2, April 2020, pg. 256.

The ‘anthropogenic’ and ‘existential’ criteria highlight an important class of threats. Put simply, an ‘anthropogenic existential threat’ is a threat that has its origins in human agency and could cause civilizational collapse or human extinction. The spectrum of anthropogenic existential risks is potentially broad and growing, including persistent threats to international security (e.g. nuclear and biological warfare), looming dangers from the large-scale intervention in the natural environment (e.g. climate change, biodiversity loss, and geoengineering), and prospective risks from emerging technologies (e.g. biotechnology, nanotechnology, and artificial intelligence).4

The threats to humanity are exacerbated by the complexity of social, technological, and natural systems, which create lethal combinations (e.g. nuclear war and ‘winter’) (Baum et al., 2013; Ehrlich and Sagan, 1985; Liu et al., 2018), feedback loops (e.g. ‘runaway’ climate change) (Steffen et al., 2015, 2018), small triggers (e.g. cyberattack and nuclear escalation) (Acton, 2018; Gartzke and Lindsay, 2017), chance accidents (e.g. viruses escaping from laboratories) (Merler et al., 2013; Rees, 2003; Torres, 2017), ‘normal’ accidents (e.g. human and/or technical glitches in nuclear command and control) (Blair, 1985; Sagan, 1995; Schlosser, 2013), epistemic uncertainties (e.g. about ‘planetary boundaries’ and climate ‘tipping points’) (Baum and Handoh, 2014; Rockstrom et al., 2009; Steffen et al., 2018), technological diffusion (e.g. terrorists employing advanced biotechnology to release ‘bioengineered pathogens’) (Posner, 2004; Rees, 2003; Torres, 2017), technological disruption (e.g. artificial intelligence destabilizing nuclear deterrence) (Boulanin ed., 2019; Geist and Lohn, 2018; Scharre, 2018), control problems (e.g. an ‘intelligence explosion’ in artificial intelligence) (Bostrom, 2014; Russell, 2019; Shanahan, 2015; Tegmark, 2017), and the cascading collapse of complex systems (e.g. ‘synchronous failure’ of interdependent ecological and social systems) (Diamond, 2005; Homer-Dixon et al., 2015; Kareiva and Carranza, 2018; Manheim, 2018). Perhaps it was this growing spectrum of threats that led the late Stephen Hawking to conclude, ‘I don’t think the human race will survive the next thousand years unless we spread into space. There are too many accidents that can befall life on a single planet.’ 5

#### Err AFF---uncertainty makes it try-or-die.

Leopold Aschenbrenner 20, Researcher, Global Priorities Institute, Oxford University, "Existential Risk and Growth," Global Priorities Institute, Working Paper No. 6, 2020, pg. 48-49.

Human activity can create or mitigate existential risks. Analyzing this in a model of endogenous growth, when the scale effect of existential risk is moderate and the marginal utility of consumption declines quickly enough, this paper grounds the intuition of some prominent thinkers that humanity may be in a critical “time of perils.” We may be economically advanced enough to be able to destroy ourselves, but not economically advanced enough that we care about this existential risk and spend on safety. This “time of perils” implies that working on reducing existential risk now could be very impactful from an altruistic perspective.

Faster economic growth appears to generally improve the odds of humanity’s survival. When the world is not very fragile, growth straightforwardly reduces risk. When the world is extremely fragile, growth increases risk, but humanity is doomed to destruction anyway—the odds of humanity’s survival are zero anyway. In the moderate fragility case, faster economic growth, while initially increasing risk, can help us get through this “time of perils” more quickly and thus increases the long-run probability of humanity’s survival. In particular, note that this effect doesn’t require a permanently higher growth rate; the improvement in humanity’s odds of survival are potentially substantial even for a temporary period of faster growth. Conversely, even a temporary period of slow economic growth—as we have arguably been experiencing in the developed economies in recent decades—could substantially curtail the future of human civilization.

This model suggests even if you care only about the very long-term future of humanity, the pace of economic growth in the short run could be key to whether we make it there.

### Alt---1AR