SYMPOSIUM ON THE GLOBAL GOVERNANCE IMPLICATIONS OF BLOCKCHAIN

CENTERS AND PERIPHERIES IN A WORLD OF BLOCKCHAIN: AN INTRODUCTION TO THE SYMPOSIUM

Fleur Johns*

If, as has been claimed by one of their most successful proponents, blockchain technologies "automate away . . . center[s]" of authority, in lieu of subordinating peripheries,[1] then what might this imply for global governance: already the work of a distributed politico-legal regime without a single center? Does blockchain seem likely to emancipate and equalize in the ways frequently anticipated? Whose authority is being "automate[d] away" and whose is being augmented by prevailing blockchain implementations? How might blockchain-borne redistribution bear upon law and legal institutions, or what might it demand of those, on the international plane? How might we envision blockchain-based futures on the global plane? These are among the questions taken up by contributors to this symposium. Before examining the various ways in which this rich suite of essays approach these and other cognate questions, the central object of their concern—blockchain—warrants brief, explanatory attention.

What Is Blockchain?

The world, supposedly disenchanted,[2] seems increasingly riddled with things that appear everywhere and nowhere—at once ubiquitous and elusive. Blockchain is one of those things. The block chain that revolutionized cycling in the nineteenth century was a steel chain composed of alternate blocks and links—something that one could observe being smelted, weigh in one's hand, and hear and see at work on a bicycle.[3] The blockchain with which this symposium is concerned manifests very differently. Anyone can observe, minute-by-minute, the mining of blocks and the "hashing" of transactions (more on those below) underpinning the cryptocurrency Bitcoin,[4]

[1] Yoav Vilner, *Some Rights and Wrongs About Blockchain for the Holiday Season*, FORBES (Dec. 13, 2018) (quoting Vitalik Buterin, co-founder of the cryptocurrency-supporting blockchain Ethereum as follows: "Whereas most technologies tend to automate workers on the periphery doing menial tasks, blockchains automate away the center").

[2] Max Weber, *Science as a Vocation*, *in* MAX WEBER: THE VOCATION LECTURES, 1, 12-13 (David Owen & Tracy B. Strong eds., Rodney Livingstone trans., 2004 [1907]) (arguing that a "growing process of intellectualization and rationalization" over the modern period has generated a "conviction that if *only we wished* to understand [the conditions under which we live] we *could* do so at any time" and "[t]hat [this] in turn means the disenchantment of the world") (emphasis in original).

[3] Paul Harwood, *The 19th Century Blockchain*, MEDIUM (June 24, 2019).

[4] Matthew Sparkes, *What Is Bitcoin and How Does It Work?*, NEW SCIENTIST.

through Blockchain.com's Explorer for instance.[5] Yet this does not concretize the phenomenon or bring it closer to hand. Even as it is the subject of any number of online explainers and tossed around with increasing frequency in conversation and popular culture,[6] the blockchain is still invested with something of the sublime.

Mystique notwithstanding, descriptions of the blockchain are, on their face, quite straightforward: the blockchain is a particular type of distributed ledger technology[7] in which transactions are recorded in a series of blocks each of which is brought to a close by an immutable, unique cryptographic signature—a numeric or alphanumeric string—of fixed length, generated algorithmically, known as a "hash" (derived from the French *hacher*, meaning to chop up finely or mince).[8] Each block in the chain is composed of a set of transactions to which a randomizing hash has been ascribed, with "transaction" implying input data of any size or kind. Each time a new transaction occurs on or is submitted to the blockchain, a hashed record of that transaction is added to every participating computer's ledger after a multi-party process of authentication and approval conducted in accordance with the protocols to which participants in the relevant network have agreed.[9] In its dependence on and mobilization of "participants," both human and non-human, blockchain discloses itself as a matter of relations, legal relations included. It is into these relations, as they are being imagined, performed, and structured on a global scale, that contributors to this symposium invite readers to enter.

Contributions to the Symposium

For Outi Korhonen from Turku University and Juho Rantala from Tampere University (both in Finland), blockchain is "essentially a political, not a technological, idea."[10] The kind of political or governance work that blockchain does, however, depends in part on the ontological position that blockchain technology is assigned in relation to humans. Drawing on Martin Heidegger's writings on technology, as well as other work in philosophy, Korhonen and Rantala give pause to the reflex association of blockchain with libertarian or anarchist ideology, whether on the Right or the Left. Blockchain technology, they contend, may have divergent ideological inflections depending on the communities in and by which it is advanced; creator communities engaged in blockchain-based experiments are more variegated in their dispositions and goals than commonly acknowledged. These communities merit closer study, Korhonen and Rantala argue, but not to the end of pinning them down politically, once and for all. Rather, the networked character of the blockchain keeps it open—openness that Korhonen and Rantala suggest may be generative of yet unforeseen societal directions on the global plane.

Primavera De Filippi from the National Center of Scientific Research (CNRS) in Paris and Andrea Leiter from the University of Amsterdam similarly understand blockchain technology as capable of evoking narratives beyond the libertarian repertoire. The setting in which they pursue this intuition is outer space where, they highlight, the potential applications already enumerated for blockchain are many: "from property registries for asteroid mining, to supply chain management systems in the space economy, or even interplanetary cryptocurrencies."[11] Thanks to

[5] *Explorer*, BLOCKCHAIN.COM.

[6] Gregory Barber, *Hollywood Does Blockchain—with Not-Disastrous Results*, WIRED (Apr. 17, 2019).

[7] BlockstreetHQ Team, *Before Blockchain, There Was Distributed Ledger Technology*, MEDIUM (Sept. 7, 2018) (outlining a brief history of distributed ledger technology: that is, the term for a technological infrastructure and suite of data-processing protocols that allow simultaneous access to, and validation and updating of, a "ledger" that is duplicated and concurrently held in identical form by multiple entities and at many locations within a computer network).

[8] *Hash, n.1; v.*, OED ONLINE (Sept. 2021); Euromoney Learning, *Blockchain Explained—How Blockchain Data is Stored and Secured*.

[9] Euromoney Learning, *How Does a Transaction Get into the Blockchain?*

[10] Outi Korhonen & Juho Rantala, *Blockchain Governance Challenges: Beyond Libertarianism*, 115 AJIL UNBOUND 408 (2021).

[11] Primavera De Filippi & Andrea Leiter, *Blockchain in Outer Space*, 115 AJIL UNBOUND 413 (2021).

the ambiguities of the international legal framework for outer space—the Outer Space Treaty of 1967 in particular —private, commercial actors are able to work toward the appropriation of celestial resources in ways that public actors cannot, De Filippi and Leiter note, provided that they keep an apparent distance from the state. The decentralized character of blockchain technology—the sense of it "automat[ing] away the center," noted above—serves this strategic separation well.[12] And yet, De Filippi and Leiter contend, accounts of the blockchain as self-executing "fall short" insofar as they disregard the technology's reliance on human-generated inputs (such as reliable or actionable data for hashing) and human-mediated outputs (such as third-party enforcement mechanisms, for when automated dispute resolution fails).[13] The range of external governance arrangements with which blockchain implementations could interact is not, moreover, exhausted by the current line-up of public and private actors, De Filippi and Leiter emphasize. By their estimation, blockchain creates room for experimentation with a far wider range of commons-based governance models, including for outer space. Like Korhonen and Rantala's, their essay concludes with a gesture of opening out, but not onto the supposedly untrammeled expanses of a libertarian worldview.

Blockchain has potential too, in the account by Emmanuelle Ganne of the World Trade Organization, but it is of a different kind to that with which the symposium's first two essays are concerned. In Ganne's essay, blockchain technology is a means to a knowable end: the more frictionless, less labor-, time-, and paper-intensive conduct of international trade, from which companies and governments worldwide would stand to benefit.[14] Rather than tempt readers to look beyond the techno-libertarianism often cast as central in any blockchain-based future, as the earlier essays do, Ganne brackets political controversies of this kind as well as those surrounding the impacts of international trade. Ganne's focus is, instead, on how blockchain might help to draw more participants into a realm of trade-based opportunity, and to maintain higher levels of efficiency and transparency in that domain.

Ganne's essay canvasses a range of actual or potential applications for blockchain in international trade and trade finance, and casts law—both national and international—as an obstruction to their fulfillment. More far-reaching mimesis of UN Commission on International Trade Law (UNCITRAL) model laws, alongside further regulatory guidance from the United Nations and the World Trade Organization, are necessary, Ganne argues, if blockchain's potential and associated commercial benefits are to be realized. Employing the Heideggerian distinction introduced by Korhonen and Rantala's essay—between ready-to-hand technological tools (generally compliant; responsive to, and extending, human purposes and perceptions) and present-at-hand technological tools (not necessarily compliant; making apparent their properties, limitations, and disfunctions)—it is clear that Ganne casts both blockchain and law in the former category.

From international trade to global finance, Iwa Salami from the University of East London takes readers into the "ecosystem" of decentralized finance (DeFi): a form of "non-custodial finance" built on blockchain networks that allow "borrowing and lending, savings, investments, derivatives, and insurance" through peer-to-peer exchange and validation of digital tokens.[15] Although they both store and represent value, these tokens differ from cryptocurrencies in that they are usable and tradeable in a range of settings, and can represent assets of many different kinds, whereas each cryptocurrency exists as a unit of value only with reference to its own "native" blockchain ledger.

The regulatory challenges posed by DeFi are the focus of Salami's essay, with particular attention paid to two: the risk of unchecked financial volatility presented by one type of digital token—stablecoins—the supply of which and

---

[12] Vilner, *supra note* 1.

[13] De Filippi & Leiter, *supra note* 11, at 413.

[14] Emmanuelle Ganne, *Blockchain for Trade: When Code Needs Law*, 115 AJIL UNBOUND 419 (2021).

[15] Iwa Salami, *Challenges and Approaches to Regulating Decentralized Finance*, 115 AJIL UNBOUND 425 (2021).

maintenance of reserve assets for which are generally unregulated;[16] and the danger associated with the fact that DeFi protocols are not required to fulfill the requirement (to which traditional financial service providers are subject) to "know your customer" or verify the identity of counterparties and establish the risks associated with maintaining a business relationship with them.[17] Salami puts forward some ideas about how these risks might be countered on the global plane. These offer a somewhat different framing of the law-blockchain relation to that advanced in Ganne's essay. Salami's essay anticipates less a process of law smoothing the way for blockchain than a prospect of embedding regulatory requirements into blockchain protocols. Insofar as Salami's essay envisages the development of protocols and code constitutive of blockchain (specifically, blockchain underpinning DeFi) as regulatory work, it sublimates the sense, that the first two essays in the symposium convey, that blockchain is "essentially a political, not a technological, idea."[18]

Friction, Fuel and Lumpiness in the "Flat" World of Blockchain

Blockchains "automate away the center," and potentially offer "workers on the periphery" something beyond subordination to automation, the co-founder of the cryptocurrency-supporting blockchain Ethereum, Vitalik Buterin, has been quoted as saying.[19] Yet this is not exactly the impression with which readers of this symposium may be left. Rather, our contributors avail readers of eloquent depictions of global engagement with blockchain involving: cyberpunks, hackers, and a diversity of "public and private powerhouses," including the FANG+ group of technology corporations and the Chinese Communist Party;[20] space prospectors such as SpaceX, Blue Origin, and Virgin Galactic;[21] transportation and logistics companies shipping goods "from Mombasa to Rotterdam" as observed from the World Trade Organization;[22] and entrepreneur-founders and community developers of Maker DAO and other decentralized autonomous organizations.[23] Multiple centers seem to emerge from this composite, each with "workers on the periphery."[24] Among them are not just miners for blocks on the blockchain, but workers in coal mines still fueling much of the energy consumed by blockchain networks.[25] Through the mechanisms of blockchain, and the networks of value and power that blockchain is propagating, connecting and breaking apart, the jurisdiction that international law tries to call its own promises to become not so much frictionless and flat as "frictionful" and lumpy in all sorts of new and old ways. Our symposium contributors offer invaluable insight for those seeking to anticipate and navigate these frictions and lumps thoughtfully.

[16] Christina Segal-Knowles, *Stablecoins: What's Old Is New Again*, Speech at the Westminster eForum Policy Conference (June 10, 2021) (describing stablecoins as "digital tokens that aim to maintain a stable value vis-a-vis existing forms of money" and as "a new form of private money").

[17] PwC, *Know Your Customer: Quick Reference Guide* (Jan. 2016).

[18] Korhonen & Rantala, *supra* note 10, at 408.

[19] Vilner, *supra* note 1.

[20] Korhonen & Rantala, *supra* note 10, at 408.

[21] De Filippi & Leiter, *supra* note 11, at 413.

[22] Ganne, *supra* note 14, at 419.

[23] Salami, *supra* note 15, at 425.

[24] Vilner, *supra* note 1.

[25] Christophe Schinckus, *The Good, the Bad and the Ugly: An Overview of the Sustainability of Blockchain Technology*, 69 ENERGY RES. & SOC. SCI., 101614 (2020); Johannes Sedlmeir, Hans Ulrich Buhl, Gilbert Fridgen & Robert Keller, *The Energy Consumption of Blockchain Technology: Beyond Myth*, 62 BUS. INF. SYST. ENG. 599 (2020).