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The Rule of Code vs. The Rule of Law

Many compare the emergence of the blockchain to the arrival of the internet, and anticipate a corresponding transformation in communications, business, and individual freedoms. In [Blockchain and the Law](#), new this month, Primavera De Filippi and Aaron Wright examine both the profound opportunities the technology presents and the legal and even ethical challenges it poses. In the brief excerpt below, they consider possible paths away from our current crossroads between the rule of code and the rule of law.

When Satoshi Nakamoto released Bitcoin to the world, he had a clear idea in mind, which was reflected in the message he included in Bitcoin's genesis block:

The Times 03 / Jan / 2009

Chancellor on brink of second bailout for banks

Nakamoto released the Bitcoin network in the middle of a financial crisis, as a reaction to an unstable international banking system. In doing so, he gave birth to a new currency—one controlled not by any government or central bank but only by cryptography and code.

As a global and decentralized payment system that operates without centralized control, Bitcoin held out the hope of newfound economic freedom for those dubious of governmental authority. Early Bitcoin adopters subscribed to the notion of *vires in numeris* (strength in numbers), a motto emphasizing the fact that, when it comes to money, only math can be trusted.

But Bitcoin was only the first step in a much grander vision. Shortly after Bitcoin's release, technologists began to realize that the true potential of Bitcoin—the real innovation—was its underlying data structure: a blockchain. While Bitcoin offered the ability to replace the role of central banks and eliminate the need for financial institutions, blockchain technology could be applied more generally to reduce the need for middlemen in many sectors of the economy. Whenever a trusted authority is necessary to coordinate social or economic activity, blockchain technology could provide the necessary infrastructure to replace this activity. The roles of banks, financial institutions, stock exchanges, clearinghouses, content providers, online operators, and even governmental systems could all be modeled by a set of protocols and code-based rules deployed on top of a blockchain-based network.

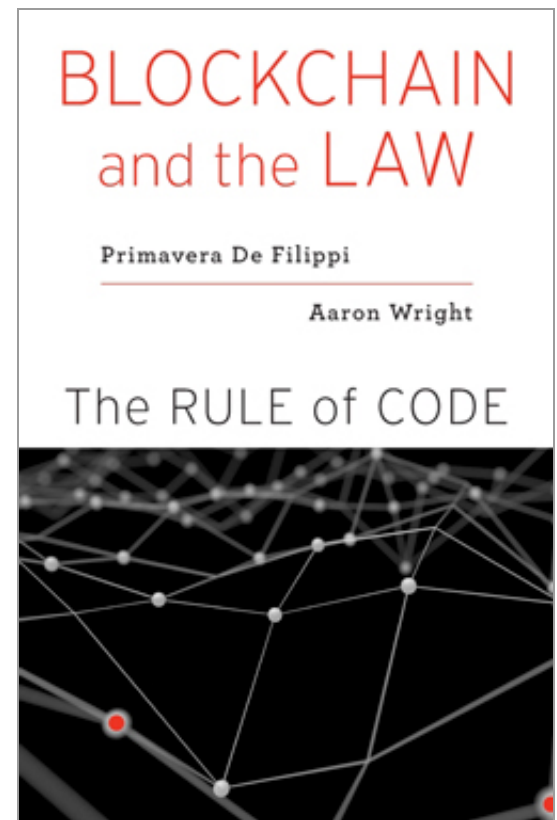
Blockchain technology presents some risks, however. The technology supports technological systems and decentralized applications that operate independently of any centralized institution or trusted authority. They implement their own internal systems of rules, which often ignore or attempt to circumvent traditional systems of control. Unlike other technological constructs currently deployed on the Internet, these decentralized systems and applications can be governed almost exclusively by the rules of code.

The Internet had already raised a fundamental tension between the *rule of law*, based on geographical boundaries, and the *rule of code*, based on topological constructs. The regulation of “cyberspace” lies at the intersection between these two normative systems—which can either cooperate or compete with one another, depending on the circumstances at hand.

At the outset, legal scholars thought that the rule of code would ultimately prevail on the Internet. With code, people could implement their own systems of rules, enforced by a technological construct that operates outside of any legal jurisdiction. This is what inspired a number of technology activists to believe that cyberspace was an unregulatable space that governments did not have the right or ability to control—as opposed to the “meat space,” which is mostly governed by the rule of law.

Eager to bypass the politics of enclosure and control enacted by governments and corporations, these groups believed that the Internet would foster new normative systems, which would facilitate the free flow of information and promote political and cultural autonomy. The Internet marked the beginning of a new paradigm for regulation—one where regulation would be applied through the rule of code, with power dynamics that *differed significantly* from those of the physical world. Over time, however, governments recognized and embraced the potential for the *rule of code* to maintain the *rule of law* on the Internet. Governments have extended their control by requiring that intermediaries change their code to maintain and respect jurisdictional laws.

With the advent of Bitcoin and blockchain technology more generally, we are poised to witness a new wave of decentralization and new calls that the world will—once again—be governed by the rule of code. Echoes of the first Internet wave permeate the discourse around blockchains, with claims that blockchain technology will lead to greater individual freedom and emancipation, as these early technology advocates initially aspired to. Blockchain technology is viewed as a new opportunity



by many cypherpunks and decentralization advocates, who see it as a new means for people to liberate themselves from the tyranny of governments and corporations—in ways that are quite reminiscent of the Internet's early days.

Blockchain technology facilitates the emergence of new self-contained and autonomous systems of rules that create order without law and implement what can be thought of as private regulatory frameworks, which we refer to as *lex cryptographica*. These systems enable people to communicate, organize, and exchange value on a peer-to-peer basis, with less of a need for intermediary operators. They provide individuals with the opportunity to create a new normative layer or a customized system of code-based rules that can be readily incorporated into the fabric of this new technological construct—thereby making it easier for people to circumvent the law.

Lex cryptographica shares certain similarities with the more traditional means of regulation by code. Both purport to regulate individuals by introducing a specific set of affordances and constraints embedded directly into the fabric of a technological system. *Lex cryptographica*, however, distinguishes itself from today's code-based regimes in that it operates autonomously—independently of any government or other centralized authority.

If the vision of blockchain proponents edges toward reality, we may delegate power to technological constructs that could displace current bureaucratic systems, governed by hierarchy and laws, with algocratic systems, governed by deterministic rules dictated by silicon chips, computers, and those that program them. These systems could improve society in demonstrable ways, but they also could restrain rather than enhance individual freedom.

When it comes to freedom and autonomy, the assumption that the rule of code is superior to the rule of law is a delicate one—and one that has yet to be tested. As Lawrence Lessig has already warned, “When government disappears, it's not as if paradise will take its place. When governments are gone, other interests will take their place.”

Those working to liberate individuals from the whims of governments and corporations could wind up surrendering themselves (and others) to the whims of a much more powerful entity: *autonomous code*. If blockchain technology matures, we will need to acquire a greater understanding of the impact that *lex cryptographica* could have on society, observing and analyzing the deployment of blockchain-based systems and carefully evaluating how to regulate the technology. As one might expect, the deployment of autonomous systems regulated only by code is likely to raise new challenges when it comes to establishing liability and responsibility, creating tensions between existing legal rules, focused on regulating intermediaries, and these newly established code-based rules.

In the end, however, blockchain technology does not spell the end of the rule of law as we know it. Even in a world with widespread use of blockchains, governments still retain their four regulatory levers—*laws, code, market forces, and social norms*—which could be used to either directly or indirectly regulate this new technology.

Blockchain-based systems can be controlled in areas where they intersect with regulated entities—such as individuals, network operators, and all those intermediaries who either develop or support the technology. New intermediaries servicing blockchain-based networks are already beginning to emerge, including hardware manufacturers, miners, virtual currency exchanges, and other commercial operators interacting with a blockchain-based system. So long as these intermediaries remain subject to the rule of law—because of their country of operation or incorporation—governments will be able to enforce their laws, either directly or indirectly impacting the way in which *lex cryptographica* will be defined and enforced.

Governments could, for instance, exert pressure on the intermediaries in charge of developing, deploying, or maintaining the technology. They could require software developers and hardware manufacturers of mining devices to implement specific features into their technology to ensure that governments can intervene, if necessary, to regulate autonomous blockchain-based systems. In the case of harm, they could demand that miners censor certain transactions or even revert the blockchain back to its previous state to recover damages or remedy harm. Governments could also impose laws on commercial operators interacting with decentralized blockchain-based applications to regulate the use of these technologies indirectly.

Alternatively, or in addition to this, governments could intervene to regulate a blockchain's underlying incentivization schemes and influence social norms. They could introduce a set of economic incentives aimed at shaping the activities of autonomous blockchain-based systems. Governments also could try to influence social norms, shaping the moral or ethical standards of the community of users and miners supporting a particular blockchain-based network. Indeed, because a blockchain operates through distributed consensus, all parties supporting the network have the power to intervene—through a coordinated action—to enforce the application of specific legal or community norms.

When combined, these different approaches could constrain the operations of *lex cryptographica*. However, it is far from apparent what combination will enable governments to regulate these emergent blockchain-based systems without excessively limiting the opportunities for innovation.

Given that blockchain technology is still largely immature, there is a danger that regulating the technology too early could preclude the emergence of new and unexpected applications that have not yet been fully explored or discovered. Permission-based regulations could prevent public and private parties from freely experimenting with this new technology, ultimately chilling innovation.

At the same time, a complete lack of regulation could also prove problematic. Given the lack of a well-defined regulatory framework for blockchain-based applications, parties seeking to deploy the technology could find themselves in a legal gray area, incapable of knowing whether what they are doing today is lawful and whether it will continue to be so further down the line. The lack of a proper regulatory framework for blockchain technology could dissuade entrepreneurs, start-ups, and incumbents from deploying these new technologies for fear of stepping too early into untested waters.

Only time will tell whether blockchains will transform and seep into the fabric of society, shaping an increasing range of social interactions and market transactions. If such a future comes to pass, the ideals of disintermediation, free markets, anarchy, and distributed collaboration could blur into each other, with *lex cryptographica* facilitating the emergence of new blockchain-based systems that are less dependent on the government, enabling capital and value to flow across the world in a more unconstrained manner.

Law and code are two important regulatory mechanisms, each of which comes with its own benefits and limitations. The main drawbacks of the law—in terms of ambiguity and uncertainty—are also its greatest strengths, in that they provide legal and contractual rules with an increased degree of flexibility and adaptability. Similarly, the main advantages of smart contracts—in terms of automation and guaranteed execution—also constitute their greatest limitation, which might lead to excessive rigidity and an inability to keep pace with changing circumstances.

As Yochai Benkler puts it, “There are no spaces of perfect freedom from all constraints”—all we can do is choose between different types of constraints. While some people might be tempted to use blockchain technology to escape from the law, others might use it to establish an alternative or complementary system, made up of self-enforcing technical rules that are much more rigid and restraining than traditional legal rules.

If blockchain technology matures, we may need to ask ourselves whether we would rather live in a world where most of our economic transactions and social interactions are constrained by the rules of law—which are universal but also more flexible and ambiguous, and therefore not perfectly enforceable—or whether we would rather surrender ourselves to the rules of code. Decentralized blockchain-based applications may well liberate us from the tyranny of centralized intermediaries and trusted authorities, but this liberation could come at the price of a much larger threat—that of falling under the yoke of the tyranny of code.

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