BLOCKCHAIN AS A SOCIAL REGULATOR: ELABORATION OF THEORY FOUNDATIONS

Dr. Vladimir Troitskiy[*]

I. INTRODUCTION

The recent development of blockchain and its applications in the virtual and natural realm brings expectations of a new technology that will affect everyone's life. However, "how?" and "when?" are still great discussion questions for the blockchain enthusiasts, philosophers, leaders, futurists, scholars, economists, and policymakers. There is hardly a blockchain project without a global perspective. The hype of blockchain, crypto and its fancy derivatives like Initial Coin Offerings ("ICOs") and Token Generation Events ("TGEs") have brought huge human resources and substantial financing into technology development. Inventing blockchain use cases became a competition involving multifaceted participants: IT companies, banks, transnational corporations, individuals. Lots of people are expecting a revolution, one which is able if not to turn the world upside-down, at least could destroy or rebuild some areas of social life.

Blockchain determinations vary in different sources. In this article "Blockchain" is used in reference to any distributed, immutable ledger that facilitates the process of recording transactions and tracking records on a peer-to-peer network without the need of any central clearing authority. Don Tapscott in his "Blockchain Revolution," published in 2016, states that "the technology likely to have the greatest impact on the future of the world economy has arrived, and it's not self-driving cars, solar energy, or artificial intelligence. It's called the blockchain."[1] Robert Herian underscores that "blockchain may indeed offer a unique technical opportunity to change cultures of transparency and trust within cyberspace, and as 'revolutionary' and 'disruptive' has the potential to shift global socioeconomic and political conventions,"[2] referring to the conceivable shift of world economy towards

---

[*] Senior Partner, Lex International Law Firm. PhD in Law, MBA.

[1] DON TAPSCOTT & ALEX TAPSCOTT, BLOCKCHAIN REVOLUTION: HOW THE TECHNOLOGY BEHIND BITCOIN AND OTHER CRYPTOCURRENCIES IS CHANGING THE WORLD (2016).

[2] ROBERT HERIAN, REGULATING BLOCKCHAIN: CRITICAL PERSPECTIVES IN LAW AND TECHNOLOGY (2018).

planned model based on fair distribution by means of blockchain. Some research works pin expectations on blockchain as positioned to save an entire country, Bangladesh, from poverty and other hardships by digitizing transfers and identity verification.[3] Blockchain is widely referred to as a "catalyst to totally reshape [the economic] system in ways that are more powerful,"[4] defeat bureaucracy, [5] form a new mean of social communication, [6] revolutionize almost every industry[7] and change the world in many other senses.[8] The coming years are expected to be focused on experimenting and applying the disruptive applications of blockchain to all aspects of society. For many, "the indisputable fact is that Blockchain is here to stay and is radically changing how our society functions at all levels."[9]

Still, most use cases are lacking what can be called a "life-changing" global perspective. Crypto currencies and blockchain-based platforms will potentially facilitate and expedite transactions and accounting in the financial sector, ICO-type mechanisms may become a useful tool of fundraising in both for-profit and non-profit projects, smart contracts are hoped to make entering and maintaining contractual relationships more convenient and secure, other blockchain implications are seen as efficient tools for operational management, voting, healthcare, IP as well as various fields where identity verification or authenticity validation is essential. All these innovations are promising and can do our lives somewhat better and easier,

---

[3] *E.g.*, Paul Bryzek, *Blockchain Positioned to Save Bangladesh*, MEDIUM (Feb. 26, 2018), https://medium.com/p/blockchain-positioned-to-save-bangladesh-9a7397c03a5b.

[4] Marc Andreessen, *Why Bitcoin Matters*, N. Y. TIMES (Jan. 21, 2014, 11:54AM), https://dealbook.nytimes.com/2014/01/21/why-bitcoin-matters.

[5] Bob Violino, *Can blockchain help fix government bureaucracy?* ZDNET (Feb. 27, 2019), https://www.zdnet.com/article/can-blockchain-help-fix-government-bureaucracy/.

[6] Carlos Cordon & Arturo Bris, *Is blockchain all hype? A financier and supply chain expert discuss*, THE CONVERSATION (Jan. 31, 2019, 10:53 AM), https://theconversation.com/is-blockchain-all-hype-a-financier-and-supply-chain-expert-discuss-106584.

[7] Bernard Marr, *30+ Real Examples of Blockchain Technology in Practice*, FORBES (May 14, 2018), https://www.forbes.com/sites/bernardmarr/2018/05/14/30-real-examples-of-blockchain-technology-in-practice/#2ccc9f6b740d.

[8] Jon Southurst, *Peter Thiel Claims Bitcoin Has the Potential to Change the World*, COINDESK (Nov. 15, 2013), https://www.coindesk.com/peter-thiel-claims-bitcoin-potential-change-world.

[9] Paul Bryzek, *A quick glimpse of Blockchain and its Revolutionary Applications*, MEDIUM (Jul. 5, 2018), https://medium.com/coinmonks/a-quick-glimpse-of-blockchain-and-its-revolutionary-applications-3624d2455e69.

or under some circumstances bring new dangers, but few of them can alter fundamentals of our world.

II. EXISTING BLOCKCHAIN USES

The most famous uses of blockchain for now are crypto currencies and related financial transactions platforms. As technology develops, some researchers predict extinction of traditional currencies[10] and of what we now call banks [11] and consequently narrowing the role of central banks worldwide. [12] However, these trends are not formed exclusively by blockchain. Harbingers of world banking system shift towards digital platforms which appeared long before Bitcoin gained its top position in daily news headlines. For many in the industry, it was obvious already in the first decade of the present century, and even earlier, that small retail banks will disappear being unable to invest in complicated IT platforms,[13] transactions of individuals will be handled by non-banking payment networks[14] and eventually the fiat money can cease to exist.[15]

The development of interstate integration and other types of economic cooperation along with software and hardware progress were key factors to initiate a wide discussion on what will replace fiat money and banking systems in facilitating exchange. Just as monetary emissions rights stopped

---

[10] *E.g.*, Frank Holmes, *Bitcoin could replace cash in 10 Years*, BUS. INSIDER (May 1, 2018, 5:44 PM), https://www.businessinsider.com/bitcoin-might-replace-cash-10-years-2018-5.

[11] *E.g.*, Glyn Britton, *Why retail banks will disappear*, FINTECH FUTURES (May 4, 2018),https://www.bankingtech.com/2018/05/why-retail-banks-will-disappear.

[12] *E.g.*, PRIMAVERA DE FLIIPPI & AARON WRIGHT, BLOCKCHAIN AND THE LAW: THE RULE OF CODE 70 (2018).

[13] *E.g.*, Rob Cox, *So Long, Bailey Building & Loan*, N. Y. TIMES, (Dec. 22, 2010), https://www.nytimes.com/2010/12/23/business/23views.html.

[14] *E.g.*, Odysseas Papadimitriou, *Why You Will Soon Cut Up Your Debit Card*, FORBES (Dec. 7, 2010, 6:28 PM), https://www.forbes.com/sites/moneybuilder/2010/12/07/why-you-will-soon-cut-up-your-debit-card/#666544da6562.

[15] *See* Bruce Champ, *Private Money in our Past, Present, and Future*, FED. RSVR. BANK OF CLEVELAND (Jan.1, 2007), https://www.clevelandfed.org/newsroom-and-events/publications/economic-commentary/economic-commentary-archives/2007-economic-commentaries/ec-20070101-private-money-in-our-past-present-and-future.aspx.

being an unequivocal sovereignty attribute[16] or "barter was supplanted first by commodity money and then by fiat money because these were superior transactions technologies," [17] so various digital currencies and their transmission platforms started to partially replace fiat money long before someone named Satoshi Nakamoto introduced Bitcoin as a decentralized digital currency.[18] From this point of view, the blockchain technology in finance is just a next step in its evolution.

Another candidate to become a revolutionary use of blockchain is voting, meaning using blockchain to collect votes and eventually express the general will of voters. There should be two subcategories of voting mentioned. The diverse set of situations when, for example, fans vote for a favorite singer to advance him in a radio chart, support a new movie, an actor, or a scientific article, put a like to an Instagram post, vote in a survey on quality of banking service in local branch, or choose a speaker for a college commencement ceremony could be called "private voting." Such voting should be considered to be a form of measuring common opinion rather than common will. Accusations of chart manipulation have been surrounding the entertainment industry for years,[19] debunking the reputations of the artists or art pieces brought to the top, and thus affecting credibility of the organizers. Utilizing blockchain technology to take the vote counting and voters' identification away from biased organizers is an absolute benefit. This process is already on the move and there are many blockchain based technical solutions implemented for private voting usage. Although filled with good intentions, nothing is changing the world yet.

---

[16] Many relatively small countries (Ecuador, Salvador, Panama, Zimbabwe, Palau and others) started using foreign currency instead of their own. *See* Lawrence Wintermeyer, *Could Developing Nations Follow El Salvador's Move To Bitcoin?*, FORBES (August, 5 2021) https://www.forbes.com/sites/lawrencewintermeyer/2021/08/05/could-developing-nations-follow-el-salvadors-move-to-bitcoin/?Sh=7021f02a28b7. Moreover, the European Union introduced EURO in 1999 following the 1993 Maastricht treaty as a European currency replacing national currencies. *See* https://europa.eu/european-union/about-eu/euro/history-and-purpose-euro_en.

[17] Forrest H. Capie et al., *Modelling Institutional Change in the Payments System, and its Implications for Monetary Policy*, INSTITUTIONAL CHANGE IN THE PAYMENT SYSTEM AND MONETARY POLICY 63 (Stefan W. Schmitz & Geoffrey Wood eds., 2007).

[18] De Filippi & Wright *supra* note 12, at 20.

[19] *E.g.*, *Realtime Music Charts May Undergo Changes or Be Abolished After Chart Manipulation Controversy*, SOOMPI (May 15, 2018), https://www.soompi.com/article/1170839wpp/realtime-music-charts-may-undergo-changes-abolished-chart-manipulation-controversy.

The other type of voting could be named "public," "civil," or "political" voting. It results or may result in important political decisions: creating rules of law or appointing political figures that are to create rules of law. In this case, voting is the mechanism by which the will of individual voters is measured and expressed as a general will of the community. Cybersecurity and voter scams have been one of the major concerns for democratic ruling to be effective. When, in 2016, rumors about external IT interference into the United States presidential elections became one of the most popular discussion issues nationwide, it was not the first time when voter legitimacy has been questioned. Voices all over the place alarmed that voting fraud poses a major threat to the fundamental stability of democracies throughout the world, including the United States.[20]

Blockchain technology can make various types of elections and referendums more transparent, almost exclude voter fraud risks, and even eliminate the necessity for the voters to attend polling stations. Some blockchain believers assure that the "technology can offer an immutable, 100% accurate digital vote-counting system. This technique can secure an election's voter enrollment and accounts for the voter's id to ensure each vote is not tampered or modified as a result of the immutable nature of Blockchain."[21] Blockchain will add legitimacy and credibility to the voting process: a voter could have no doubt that his vote is accurately recorded and counted while simultaneously remain anonymous to everyone who may observe the ledger. "Just as Blockchain functions as a general ledger for cryptocurrencies, it may also create a permanent and open public ledger for the votes counted—promising equitable, democratic elections all over the world."[22]

In 2018, during midterm elections in West Virginia, an experiment was conducted. Overseas citizens and members of the military from twenty-four counties had the option to vote using an app called Voatz.[23] This blockchain-based app records participants 'votes, and then ballots are transmitted to processors that make vote validation before the votes are counted. The app uses end-to-end encryption and biometric verification, such as through the

---

[20] *See* Bryzek, *supra* note 9.

[21] *Id.*

[22] *Id.*

[23] Aaron Wood, *West Virginia Secretary of State Reports Successful Blockchain Voting in 2018 Midterm Elections*, COINTELEGRAPH (Nov. 17, 2018), https://cointelegraph.com/news/west-virginia-secretary-of-state-reports-successful-blockchain-voting-in-2018-midterm-elections.

fingerprint or eye-scan technology built into some smartphones.[24] There is an obvious scalability of this experience; it can be expanded nationwide and obviously may be implemented in other countries. It adds convenience, and it potentially allows having more voters, bringing in those who are out of state or not willing or incapable to visit polling stations.

Yet there are numerous voices expressing concerns about using blockchain for civil voting.[25] Most of these voices criticize existing technical solutions that are obviously not ideal; but the further-evolved technology seems to becoming an effective tool. However, for nations that are developed democracies it can hardly be called a great shift. Electronic voting, for example, is available in many US elections,[26] is supported by modern security technologies, and covers almost all advantages attributed to Voatz or analogical solutions except for the use of a distributed network. The distributed data storing mechanism prevents those that control the electoral management (individuals who are in charge of technical control of the centralized server) to manipulate the elections. In other words, blockchain technologies prevent cheating by manually changing protocols for the centralized server that leads or may lead to distortion of the results and hence misrepresenting of the voters 'will. Can it potentially revolutionize political elections in developed countries? It is hardly so. In spite of some concerns, developed democracies have a reasonably good system of voter fraud prevention through established effective legal mechanisms of vote counting. Numerous studies have shown that voter fraud in the US is rare and is more of a myth than a real threat.[27] Blockchain can make voter fraud almost impossible, but apparently it will hardly change much. Eventually the same people will be elected, and the same decisions will be accepted on referendums.

Using blockchain technology for countries with much less developed

---

[24] Vanessa Bates Ramirez, *Could Blockchain Voting Fix Democracy? Today, It Gets a Test Run*, SINGULARITYHUB (Nov. 6, 2018),https://singularityhub.com/2018/11/06/could-blockchain-voting-fix-democracy-today-it-gets-a-test-run/#sm.000018j0ann4l2e46wypzzav8u29m.

[25] *See* Stephen Shankland, *No, blockchain isn't the answer to our voting system woes*, CNET (Nov. 5, 2018, 5:00 AM), https://www.cnet.com/news/blockchain-isnt-answer-to-voting-system-woes.

[26] *E.g.*, Gloria Lin & Nicole Espinoza, *Florida Congressional Elections: November 2006*, ELECTRONIC VOTING, https://cs.stanford.edu/people/eroberts/cs181/projects/2006-07/electronic-voting/index_files/page0004.html (last visited May 19, 2019).

[27] *See Debunking the Voter Fraud Myth*, BRENNAN CENTER FOR JUSTICE (Jan. 31, 2017), https://www.brennancenter.org/analysis/debunking-voter-fraud-myth.

democratic culture could seem like a great idea. There are many countries on this planet that are notorious for electoral manipulations, allowing leaders to be reelected endlessly, as well as pro-government parties to maintain majority in the parliament. The blockchain technology could resolve it all by putting some overextended periods of ruling to an end, stopping manipulations, and eventually letting the people of these countries elect whomever they want to elect. But it will never happen. Most of these 20+ year rulers are authoritarian leaders who are not going to step down. They fully control voting management and voting processes and will never allow any technology to revoke their manipulation mechanisms as it will remove them from power and potentially bring them to jail. Such countries would probably need an "offline" revolution first in order to give way to integrating blockchain technologies into the voting process.

III. HOW BLOCKCHAIN MAY CHANGE THE LAW

Most lawyers and researchers rushed to examine legal aspects of various blockchain use cases and to look for answers to the questions like: "How to regulate blockchain?"[28]" Will blockchain technologies replace lawyers?"[29] "How could governments employ blockchain as a regulatory tool?"[30] And even more practically oriented questions, like "Are crypto currencies legal?" "Are incomes in crypto currencies taxed and how?" [31]" Is the WIPO convention applicable to blockchain?" [32]" Are smart contracts based on blockchain technology enforceable?"[33]" May blockchain be used to store

---

[28] Trevor I. Kiviat, *Beyond Bitcoin: Issues in Regulating Blockchain Transactions*, 65 DUKE L.J. 569 (2015).

[29] Ameer Rosic, *Smart Contracts: The Blockchain Technology That Will Replace Lawyers*, BLOCKGEEKS (Nov. 25, 2020), https://blockgeeks.com/guides/smart-contracts/.

[30] Dennis Kunschke & Stefan Henkelmann, *Blockchain & Cryptocurrency Regulation 2019 Germany*, GLOBAL LEGAL INSIGHTS, https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/germany (last visited May 16, 2019).

[31] Mordecai Lerer, *The Taxation of Cryptocurrency: Virtual Transactions Bring Real-Life Tax Implications*, THE CPA J. (Jan. 24, 2019), https://www.cpajournal.com/2019/01/24/the-taxation-of-cryptocurrency.

[32] Birgit Clark & Baker McKenzie, *Blockchain and IP Law: A Match made in Crypto Heaven?*, WORLD INTELL. PROP. ORG. MAG., Feb. 2018, at 30.

[33] Cardozo Blockchain Project, *"Smart Contracts" & Legal Enforceability*, CARDOZO L. (Oct 16, 2018), https://cardozo.yu.edu/sites/default/files/2020-01/smart_contracts_report_2_0.pdf.

property records and votes?"[34]

The emerging popularity of smart contracts raises questions regarding the impact that they will have on the legal system. The abolishment of the legal system is not a plausible consequence.[35] By using technology, contracting parties would gain the ability to create arrangements that are hard to modify, dynamic, and potentially less ambiguous than traditional legal contracts.[36] Once again, smart contracts are seen as a progress in the current legal system, which will make it somewhat better and more accessible for the general public.

There are other creative ideas on possible applications of blockchain in law. Using blockchain in dispute resolution is encouraging, but generally can be characterized as a secure and effective tool to streamline existing processes in managing arbitration proceedings.[37] Storing copyright data by means of blockchain, and further using it to resolve IP disputes, is another interesting suggestion which is already experimentally implemented in some countries.[38] These are all very promising use cases that can adjust traditional law practices, reshape legal procedure, and change the nature of law-related businesses and jobs. However, there is another implication of blockchain technology for the law as a social institution. This implication only peripherally attracted the attention of researchers. What if blockchain becomes the law? In other words, what if blockchain becomes the mechanism of social regulation?

A lot has been discussed about smart contracts, which, in addition to being a secure and convenient way of data exchange and storage, are also a new way of expressing parties 'wills. With many people being involved, the blockchain technologies are becoming the channel to directly, reliably, and what is most important, legitimately expressing the majority will. This can be

---

[34] Don Tapscott & Alex Tapscott, *The Impact of the Blockchain Goes Beyond Financial Services*, HARV. BUS. RES. (May 10, 2016), https://hbr.org/2016/05/the-impact-of-the-blockchain-goes-beyond-financial-services.

[35] Maria-Laura Gotcu, *Legal Breakthrough for Blockchain Technology* 29 (Tilburg University 2016), http://arno.uvt.nl/show.cgi?fid=142016 (last visited June 1, 2019).

[36] Cardozo Blockchain Project, *supra* note 34.

[37] *See* Nevena Jevremović, *2018 In Review: Blockchain Technology and Arbitration*, Kluwer Arb. Blog (Jan. 27, 2019), http://arbitrationblog.kluwerarbitration.com/2019/01/27/2018-in-review-blockchain-technology-and-arbitration.

[38] *E.g.*, Ana Berman, *Russian Intellectual Property Court Trials Blockchain to Store Copyright Data*, COINTELEGRAPH (Dec 4, 2018), https://cointelegraph.com/news/russian-intellectual-property-court-trials-blockchain-to-store-copyright-data.

a will of the homeowners of a condo, of populations of a town, a continent, the world, or the will of the majority of members of any social group, no matter professional, age or gender-based. Can the will expressed via such channel become the law? In other terms, the question could be whether a group of condo owners or a community of city residents can become a Decentralized Autonomous Organization (DAO)?[39] Or even more, can the entire world become a DAO? Yes, we assume, it can.

Many studies agree that blockchain can transform the government[40] and limit its authority, thus presenting a channel for a more direct democracy.[41] Government resources are constrained, and blockchain-based solutions could increase efficiency in the government's ongoing challenge with reconciling intragovernmental transfers,[42] in distribution of social benefits,[43] in state compliance and managing public records,[44] in government borrowing,[45] and in many other smaller and bigger issues. This could serve as an explanation to the wide interest of the governments across the globe in developing their own blockchain projects. The diversity of such countries is maximal. On one side, these are small IT advanced states like Singapore[46] or Estonia[47] taking

---

[39] DAO (Decentralized Autonomous Organization) here and after is used as a reference to a community of members of any decentralized blockchain based network.

[40] *E.g.*, *How the Blockchain can transform Government*, KNOWLEDGE@WHARTON (July 5, 2018), https://knowledge.wharton.upenn.edu/article/blockchain-can-transform-government.

[41] De Filippi, *supra* note 12.

[42] *See* Kate Boeding & Richard McConkie, 3 *Potential Benefits of Blockchain For Government*, BOOZ | ALLEN | HAMILTON, https://www.boozallen.com/s/insight/blog/3-potential-benefits-of-government-blockchain.html (last visited May 29, 2019).

[43] *How the Blockchain can transform Government*, *supra* note 40.

[44] *See* Brian Forde, *Using Blockchain to Keep Public Data Public*, HARV. BUS. REV. (Mar. 31, 2017), https://hbr.org/2017/03/using-blockchain-to-keep-public-data-public.

[45] *See* Joseph Birch, *Government Bonds: How Blockchain Can Beat the Red Tape*, COINTELEGRAPH (Oct. 3, 2018), https://cointelegraph.com/news/government-bonds-how-blockchain-can-beat-the-red-tape.

[46] *See* Nicholas Say, *Singapore Emerges as Premier Blockchain Development Destination*, BLOCKONOMI (Nov. 1, 2018), https://blockonomi.com/singapore-blockchain-destination.

[47] *See* Anne Veerpalu, *Tartu Node*, 1 STAN. J. BLOCKCHAIN L. & POL'Y 124 (2018).

efforts to implement effective government services digitalization. Even small, much less digitalized ex-offshores like Malta, Lichtenstein or Puerto Rico are enacting blockchain-friendly regulation as part of their attempt to replace fading revenues of their offshore industries that were almost exterminated in the course of the last decade by Organization for Economic Development and Cooperation (OECD) and Internal Revenue Service of the United States (IRS)[48]. On the other side, we can see the largest countries in the world, including western democracies, and highly populated developing countries like India, Bangladesh, China,[49] and notorious dictatorships or authoritarian countries like Venezuela[50] or Iran,[51] that have been living under international sanctions for decades. They all want blockchain, but for radically different political purposes. For some countries. blockchain is the way to enhance democracy and transparency as described above, but for others, it is a promising tool to sidestep financial sanctions[52] or "expand the power of rigid and authoritarian regimes, which would gain a greater ability to control their citizens through a series of self-executing code-based rules."[53] All mentioned use cases have one thing in common: the governments are somehow employing blockchain technologies to make themselves more efficient or more powerful. Consequently, blockchain is widely seen as an instrument to conquer influence on the international scene.[54] However, this

---

[48] Vladimir Troitskiy, *Trends in International Tax Planning: New Qualifications and Tax Jurisdiction Shopping*, in CHALLENGES OF THE KNOWLEDGE SOCIETY 836-37 (Gabriel Boroi, et al. eds., 2019).

[49] *See* Andreas Sandre, *Blockchain for government*, HACKERNOON (June 2, 2018), https://hackernoon.com/blockchain-for-government-41e3b097356d.

[50] *See* Kirk Semple & Nathaniel Popper, *Venezuela Launches Virtual Currency, Hoping to Resuscitate Economy*, N. Y. TIMES (Feb. 20, 2018), https://www.nytimes.com/2018/02/20/world/americas/venezuela-petro-currency.html.

[51] *See* Yaya Fanusie, *Blockchain Authoritarianism: The Regime in Iran Goes Crypto,* FORBES (Aug. 15, 2018, 9:30 PM), https://www.forbes.com/sites/yayafanusie/2018/08/15/blockchain-authoritarianism-the-regime-in-iran-goes-crypto.

[52] *See* Nathaniel Popper Et Al*., Russia and Venezuela's Plan to Sidestep Sanctions: Virtual Currencies,* N. Y. TIMES (Jan. 3, 2018), https://www.nytimes.com/2018/01/03/technology/russia-venezuela-virtual-currencies.html.

[53] De Filippi, *supra note* 12, at 203.

[54] *E.g.,* Li Jie*, China's Ambitious Blockchain Plans Could Cast US Dollar out of the Game,* THE EPOCH TIMES (Apr. 1, 2019), https://www.theepochtimes.com/chinas-ambitious-blockchain-plans-could-cast-us-dollar-out-of-the-game_2849020.html.

is only one implication of blockchain in making politics.

We're still in the early stage of blockchain technology evolution, but looking to the future of politics in a broader sense, the potential appearance of rules that are not sanctioned by any governments at all, but approved by the majority of people or companies covered by this type of regulation should attract even more attention. Such a mechanism has a potential of making significant shifts or even rebuilding social structures and hence, is a better candidate to match revolutionary aspirations. The blockchain ruling, or the blockchain regulation, (meaning not self-regulation of blockchain systems or networks, but rather blockchain as a tool for regulating behavior by means of gathering positions of individuals and providing an interpretation of the will of majority) is a phenomena definitely worth a comprehensive study.

The modern law is inextricably linked with the state. There are well-known theoretical disputes on the character of this relationship,[55] but in real life, laws are the products of the state and its institutions. Governments either create rules or sanction them. Laws are generally territorial and are thus limited by the state's territorial sovereignty. The international law is also a product of the state as it is a result of some form of meeting of wills of states.[56] We make a hypothesis that blockchain regulation can be totally delinked from the state, functioning as a direct implication of people's will and can be applicable to the groups of people regardless of existence or absence of any link with the state (citizenship, residency, physical presence) or its territory. Such regulation can also have its own mechanisms of enforcement and other attributes of a regulatory system.

Though this construction might seem rather hypothetical, it is high time to start such research. The future is coming faster than ever and the penetration of blockchain technology rolls progressively. We have most of the elements of the structure in place. There are test samples – elements of the system presented by efforts of some governments to build crypto economies and attempts to establish "crypto sandboxes"[57] – zones where

---

[55] *See* Hans Kelsen, *Law, State and Justice in the Pure Theory of Law,* 57 YALE L. J. 377 (1947-1948).

[56] David Held, *Law of States, Law of Peoples: Three Models of Sovereignty*, 8 LEGAL THEORY 1 (2002).

[57] Here we refer to steps taken by the government of Switzerland and some announcements made recently by the governments of the UK (https://www.coindesk.com/markets/2018/07/09/uk-watchdog-welcomes-first-crypto-startups-to-regulatory-sandbox/), Hong Kong (https://www.reuters.com/article/us-hongkong-regulator-crypto/hong-kong-securities-regulator-to-propose-sandbox-for-crypto-exchanges-

crypto-based regulation will be applicable to business activities. We even have the opportunity to explore a prototype, such as an experiment to establish Crypto Utopia in Puerto Rico to live above (or outside of) government regulations.[58]

Sourced directly from individuals or companies, rules formulated through blockchain platforms meeting criteria of transparency, efficiency, quickness, and stability (protected from arbitrary changes), will almost inevitably become a key use case of blockchain technology.

It is a good time to review the law theory and try to model whether such blockchain regulation would undermine its fundamentals and whether our modern legal science can accommodate this new phenomenon. The methodologies that are to be employed will primarily include traditional comparative legal study as well as modeling, which is less common for legal science. It should be an instrumental (concept building) research deep into nuances of the conceptual framework of legal doctrine, focused on systematization as well as functional, structural, and dialectical analysis of blockchain regulations that only may appear in the imminent future.

IV. VIEWS ON BLOCKCHAIN AS REPLACEMENT FOR THE LAW

The idea of blockchain regulation replacing traditional law is not new. Yet in 2015, Marcella Atzori researched blockchain technology as a "*hyper-political tool*, capable to manage social interactions on large scale and dismiss traditional central authorities."[59] She "advocates the role of the State as a necessary central point of coordination in society, showing that decentralization through algorithm-based consensus"[60] should be hardly anything more than a tool for governments to improve its performance and a *pre-political* instrument employed by civil society. The researcher's main argument is that risks of eliminating centralized governments or significantly diminishing their roles may bring numerous dangers and unprecedented shifts

---

idUSKCN1N63DU), US (https://www.natlawreview.com/article/hardly-child-s-play-north-carolina-joins-growing-number-states-fintech-regulatory) and Russia (https://news.bitcoin.com/bank-of-russia-tests-services-related-to-cryptocurrencies/).

[58] *See* Nellie Bowles*, Making a Crypto Utopia in Puerto Rico,* N. Y. TIMES (Feb. 2, 2018), https://www.nytimes.com/2018/02/02/technology/cryptocurrency-puerto-rico.html.

[59] Marcella Atzori*, Blockchain Technology and Decentralized Governance: Is the State Still Necessary?,* SSRN*,* (June 13, 2016), https://ssrn.com/abstract=2709713.

[60] *Id.*

in balance between individual interests and the common good, falling within the concept of "*amoral antipolitics*." Containing a set of legitimate arguments, this position answers the question of whether blockchain technology should replace centralized governments or not. But it is hardly something that can be influenced. The snowball is already rolling, and the correct questions are whether blockchain can replace traditional regulation mechanisms, and if so, how it will affect the environment.

Primavera De Filippi concludes her comprehensive study "Blockchain and the law," acknowledging that blockchain technology development may lead to the establishment of "an alternative or complementary system, made up of self-enforcing technical rules that are much more rigid and restraining than traditional legal rules." [61] Blockchain regulation is called "Lex Cryptographica," and the order powered by code is "Algocratic Governance."[62] The "tyranny of code" is seen as a potential cost of liberation from centralized intermediaries.

Kevin Werbach in "The Blockchain and the New Architecture of Trust" considers Blockchain a potential substitute for law.[63] The "extralegal trust regime" is Werbach's name for Filippi's "Algocratic Governance", and such a regime is not seen as something that can "overwhelm the power of territorial sovereigns."[64] Numerous technical flaws, risks of corrupt outside data entries (data oracles), and the absence of "state-backed enforcement mechanism to fall back on" are reasons to designate blockchain technology as a complement or supplement to law rather than its potential substitution.

"Blockchains are a social technology, a new blueprint for how to govern communities," Paul Vigna and Michael J. Casey state in their "The Blockchain and the Future of Everything."[65] Self-sovereign identities can create a self-regulative world, but the authors do not provide details of the mechanism. However, they warn that society should not "let the people with the greatest capacity to influence this technology and shape it to suit only their narrow interests."[66] Wright and De Filippi, in 2015, were warning that we should examine the prospect of automated legal governance with great

---

[61] De Filippi, *supra note* 12, at 203.

[62] *Id*.

[63] KEVIN WERBACH, THE BLOCKCHAIN AND THE NEW ARCHITECTURE OF TRUST, 171 (2018).

[64] *Id*. at 171.

[65] MICHAEL J. CASEY & PAUL VIIGNA, THE TRUTH MACHINE: THE BLOCKCHAIN AND THE FUTURE OF EVERYTHING, 14-15 (2018).

[66] *Id*. at 15.

caution as the consequences of its development could not be easily foreseen.[67] It was also stated, that "by automating the enforcement of the law, we may perhaps gain in efficiency and transparency, but we might eventually also reduce the freedoms and autonomy of individuals."[68]

To put all opinions in a nutshell, we can infer that most researchers agree that blockchain technology can become a social regulator. What is disputable is the efficiency of such regulation and its comprehensiveness. What is worrying everyone is that the result could be worse than what we have now. Without any doubt, risks related to automated legal ruling are enormous, and the drawbacks and flaws are numerous. However, this paper is not focused on researching the dangers that blockchain regulation of social relations can bring, the key issue for this research is whether the blockchain law theoretically can replace conventional law or not and if it can, what it will look like and what are the factors affecting the transition process. For instance, not many people enjoy getting old, but unfortunately, this process is ongoing and there is little sense to study whether it is good or bad being old compared to being young. Similarly, the transition to an automated decentralized regulation system, if theoretically viable, can become a self-driven autonomous process that rolls no matter if researchers, lawyers, politicians, or anyone else likes it or not.

V. BLOCKCHAIN AS A TYPE OF SOCIAL REGULATOR

We've been there before. This mantra is repeatedly applied to the idea that the introduction of the Internet in the 1990's brought to the global society the same aspirations as blockchain does now.[69] In the same fashion as today, many commentators feel inspired or frightened dealing with blockchain. Thirty years ago, the internet was simultaneously seen as life-changing technology, a threat to established social order, a universal solution, and a new reality. Though the internet has not yet destroyed the planet, changes that were brought to our lives by internet-related technologies should not be underestimated and in some regards, the world we are dealing with now differs drastically from what it used to be thirty years before and that, to some

---

[67] Aaron Wright & Primavera De Filippi*, Decentralized Bockchain Technology and the Rise of Lex Cryptographia,* SSRN, (July 25, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664.

[68] Primavera De Filippi & Samer Hassan*, Blockchain technology as a regulatory technology: From code is law to law is code,* FIRST MONDAY (Dec. 5, 2016), https://journals.uic.edu/ojs/index.php/fm/article/view/7113.

[69] Marco Iansiti & Karim R. Lakhani, *The Truth About Blockchain,* HARV. BUS. REV., Jan. –Feb. 2017, at 118.

extent, is due to the existence of the internet. This comparison is relevant to emphasize the scope of expected changes but is less appropriate if we make a functional comparison.

From the legal analysis standpoint, to try the role of social regulator on blockchain, we should primarily look at other social institutions that perform or performed the same function. Presently, mainly governmentally set laws fulfill this job. There are numerous determinations of law in theory of law and philosophy. "Law is the source of the precepts we most need to direct us in our conduct,"[70] Marcus Tullius Cicero wrote in his famous De Ligibus. According to the Collins Dictionary, "law is a system of rules that a society or government develops in order to deal with crime, business agreements, and social relationships."[71] And this is pretty much the commonly accepted meaning for this term. Will the blockchain regulation still be the law? It doesn't matter much. Similarly, to whether or not a bitcoin is a contract in the traditional sense, both bitcoins and traditional contracts are *artifacts,*[72] and whether blockchain regulation is a law or not, it may perform the same function in the future and become a unique social-political phenomenon. This possibility fully depends on general acceptance, recognition, and acknowledgment, which altogether are called legitimacy.

To be clear on the subject of this particular research, we are talking about the blockchain-based social regulator that is neither created by governmental institutions[73] nor sanctioned, managed, or enforced by such. This is the essential distinguishing feature of a blockchain regulatory system: the absence of the regulator, and the absence of someone who has the monopoly in creating mandatory rules. One can argue that in modern democracies, governments are just intermediaries indirectly expressing the will of people. That is theoretically true, but governments are bad intermediaries. Besides being expensive and slow, governments are biased, corrupt, and transmit the will of citizens in grabbled way, so that what they eventually put into the law sometimes contradicts what citizens are expecting.

---

[70] FRANCIS BARHAM, THE POLITICAL WORKS OF MARCUS TULLIUS CICERO: COMPRISING HIS TREATISE ON THE REPUBLIC, AND HIS TREATISE ON THE LAWS, 68 (1842).

[71] *Law*, COLLINS ENGLISH DICTIONARY (13th Ed. 2018), https://www.collinsdictionary.com/dictionary/english/law.

[72] Jeffrey M. Lipshaw, *The Persistence of "Dumb" Contracts* (Jan. 21, 2019), STAN. J. BLOCKCHAIN L. & POL'Y, https://stanford-jblp.pubpub.org/pub/persistence-dumb-contracts.

[73] Using the term *government* or *governmental* we refer to any governing institution authorized to establish regulation including but not limited to all types of parliaments, executive power bodies, courts and municipalities.

A second important distinction is that law is territorial, while blockchain regulation is, or at least may be, extraterritorial. The territoriality principle is the most basic principle of jurisdiction in international law.[74] Together with population, government, and sovereignty, they constitute four essential attributes of a state. Territory is both a physical and a legal reality. Territorial sovereignty allows governments to use its power over anyone living or present on the territory through establishing regulations and employing state enforcement mechanisms. Blockchain regulatory systems exists in a DAO, which can unite actors based on any criteria and its combinations, or remain random and hence is extraterritorial, unless "people living on a territory of some state" become a DAO. But even in that case, the blockchain regulatory system is absolutely unrelated to sovereignty concept.

The third important distinction also originated from the absence of the regulator — the absence of state-backed law enforcement mechanisms and punishment mechanisms. The absence of governmental tools of enforcing the rules does not mean that something should not take its place. On the contrary, there should be other enforcement mechanisms elaborated by the DAO.

The remaining essential characteristics of a blockchain regulatory system are to correspond to the attributes of conventional law. It should be a set of rules, and it should regulate human conduct. And it is supposed to. There are nuances though. The overwhelmingly popular opinion is that "not all laws can be easily translated into code." [75] Laws leave some space for interpretation, and code is a strict tool intolerant to ambiguity. "The translation of often fuzzy legal predicates, otherwise capable of expression in truth-functional logic, into digital proxies expressible in the non-ambiguous discrete units of code" is a huge challenge.[76] That is a legitimate argument. Mathematical language and human language are obviously not the same. Most authors compare mathematical or code language to the language of their own professional practice, let's say English, and the difference seems drastic. However, if a U.S. criminal lawyer tried to move his practice to a strongly different legal environment, let's say Russian commercial law or Chinese labor law, he would find the differences no less drastic. Not exclusively because of the new juridical language, but rather because of qualification discrepancies, different legal culture, and varied conceptual principles on which legal systems are based. It is a matter of time, education, and technology customization, but lawyers and common individuals will start

---

[74] Santiago Torres Bernardez, *Territorial Sovereignty*, ENCYCLOPEDIA OF INT'L PUB. L. 10, at 487-94 (Rudolf L. Bindschedler et al. eds., 1987).

[75] De Filippi, *supra* note 12, at 199.

[76] Lipshaw *supra* note 72.

speaking "code." Looking one step ahead, we will face further concerns that "aspects of human thinking and interaction will continue to be the most difficult to replicate on a machine"[77] and that "*deciding* will remain something that is fundamentally different than *reasoning* by way of logic or code."[78] Both phenomena are adaptable and though differences will never disappear, human thinking and code reasoning will find the way to be parts of the same process.

As described above, many researchers as well as common people, share an opinion that blockchain is something revolutionarily new; many are charmed, while others are frightened by the radical changes it will bring us. Lawyers are not an exception. So, would it be the first time in human history anyone other than kings, or governments, or gods, can create, or sanction, or authorize "the law"?[79] Probably, it would not.

First of all, "law is not the only normative domain on this planet; morality, religion, . . . etiquette, and so on also guide human conduct in many ways that are similar to law."[80] Though partially the understanding of the nature of law is related to its interactions with other normative orders, like morality or social conventions, the comparison of blockchain regulation and these "other regulations" is relevant to a very limited extent. What these regulators are lacking is certainty in determination.[81] Besides, even having its own mechanisms of enforcement, these rules yield on importance of rules of law in the public mind and mostly serve as something that can complement law rather than substitute it. By contrast, blockchain regulation is widely seen as an instrument reducing uncertainty around interpretation or application of rules.[82]

---

[77] *Id*.

[78] *Id*.

[79] We intentionally avoid deeper analysis of Natural law theory (lex naturalis) based on the idea that some rights are inherent to an individual by virtue of human nature and thus not dependent on being granted, authorized or sanctions by sovereign powers or need to be confirmed through any democratic mechanisms. This is a rather theoretic concept widely examined in law literature. For purposes of this paper, we focus on positive law that is a product of state sovereignty and the possibility of such mechanism as blockchain regulation to replace it in full or in part.

[80] Andrei Marmor & Alexander Sarch, *The Nature of Law*, STAN. ENCYCLOPEDIA OF PHIL. (Aug. 22, 2019),
https://plato.stanford.edu/entries/lawphil-nature/.

[81] Liam Murphy, *The Boundary of Law: Law, Morality, and the Concept of Law*, EDMOND J. SAFRA CTR. FOR ETHICS (Oct. 28, 2004), https://ethics.harvard.edu/event/boundary-law-law-morality-and-concept-law.

[82] De Filippi, *supra* note 12, at 195.

Comparing blockchain regulatory systems to public international law could bring us some interesting outcomes. Though public international law is undoubtedly created directly by states and its analogs (such as Holy See), or indirectly through their derivatives (International organizations), as a regulatory system it has much in common with blockchain regulation. The sovereign equality of all States as enshrined in the UN Charter[83] means that none of the states have the superpower to regulate the behavior of others, neither do other subjects of international law, including the UN. Instead of having a supreme regulator, international law entitles states to set rules through a consensus mechanism which they are to create. The absence of enforcement mechanisms supported by a higher power is a logical extension of the absence of a supreme regulator and once again states must somehow work together to make the rules work. Isn't that similar to distinguishing features we've identified while comparing traditional law and blockchain law? Many critics insist that nowadays international law is in a deep crisis.[84] We should agree that there are problems related to this mechanism's efficiency; however, one cannot deny that almost 65 years of international law history proves the ability of an autonomous system of law to exist without a supreme regulator. The argument potentially undermining the relevance of presented comparison is the size of "DAO." There are around 200 states in this world, [85] which is a very limited number of system members. Nevertheless, one should not forget that international intergovernmental organizations, though being creations of the states, are also subjects of international law and their will is separated from the will of their founders. Adding this category will legitimately allow us to increase the total number of actors involved in the regulatory system to 500,[86] which is still a relatively

---

[83] U.N. Charter art. 2, ¶ 1.

[84] E.g., Rafael Domingo, *The Crisis of International Law*, 42 VAND. J. TRANSNAT'L L. 1543 (2009).

[85] There are 193 states members of the UN organization. (*See* Growth in United Nations membership, UNITED NATIONS (Nov. 15, 2021), https://www.un.org/en/about-us/growth-in-un-membership). In addition to this, Holy See and Palestine have the observer status in the UN (*See* Non-Member States, UNITED NATIONS (Nov. 16, 2021), https://www.un.org/en/about-us/non-member-states). We should also count partially recognized countries that are involved in public international law regulatory system (though with some restrictions), such as Republic of Kosovo, Turkish Republic of Northern Cyprus, South Ossetia Republic, Republic of Abkhazia, Sahrawi Arab Democratic Republic and others (*See* Not on the Map: The Peculiar Histories of De Facto States. Lexington, 2021).

[86] *See* Richard Woodward & Michael Davies, *How Many International Organizations Are There? The Yearbook Of International Organizations And Its*

small sample size.[87]

Another reference point for comparison is the nature of self-regulatory organizations: industry unions, bars, insurance associations, investment advisors 'associations, homeowners 'associations, etc. They are not government, but they set the rules that are mandatory and regulate behavior of not their members (insiders) only but also of the outsiders. It looks like a very close and applicable example. However, when we are trying to compare blockchain, the self-regulatory system, to the self-regulatory organizations, we can discover that names are sometimes confusing. These organizations create rules, but they do not establish a self-sufficient regulatory system. Governments delegate their regulatory functions to third parties similar to how some governments hire third parties to perform other public functions like penitentiary, tax collection, or even some foreign consulate services. Governments nonetheless strictly regulate "the self-regulation process", authorize self-regulatory organizations and their acts, as well as back them with state enforcement power.[88]

A.Lex Mercatoria

Some researchers characterize collections of international trade customs as examples of regulatory mechanisms different from national and international law.[89] Sergey Bakhin in 2002 published a book, "Sublaw:

Shortcomings, POL. STUD. ASS'N (Oct. 11, 2015), https://www.psa.ac.uk/insight-plus/blog/how-many-international-organisations-are-there-yearbook-international.

[87] Numerous scholars assume that individuals as well as sometimes transnational NGO's and multinational corporations can directly participate in relationships regulated by public international law backing that by argument of their ability to take part in international courts/tribunals procedure or their influence on international politics or economics. (*E.g.* Karen J Alter et. al., *Theorizing the Judicialization of International Relations,* 63 INT'L STUDIES QUARTERLY, 449-63 (2019). Leaving this discussion apart, we are to emphasize that neither individuals nor international NGO's and multinational corporations are creating or enforcing international law.

[88] The self-regulatory organizations practices are still a valuable research material and can serve as samples of consensus mechanism. Some of them may pioneer to employ blockchain as management and decision taking tool and such experience would be of great value as a prototype of some blockchain regulatory system elements.

[89] *E.g.*, PRINCIPLES OF EUROPEAN CONTRACT LAW: PARTS I AND II (Ole Lando & Beale G. Hugh eds., 2000).

International Codifications of Unified Contractual Law,"[90] characterizing both historical *lex mercatoria* and modern collections of trade customs as "Sublaw" meaning regulations which are not created or authorized through governmental institutions. There is much in common between *lex mercatoria* and Blockchain law. In the middle ages, the nascent *lex mercatoria* was a set of rules voluntarily followed by entrepreneurs relatively free from the regulation of states for the purpose of trade. The rules were created directly through repetitive behavior of traders accepted by others. Hence, the will of DAO participants (traders 'community) was not accumulated and interpreted by an intermediary but expressed directly through repetitive conduct. The flipside of this system was that it sometimes took a long time to form a rule and it was often difficult to understand the rule's formal meaning or whether the norm existed.[91] In its early and romantic stage, *lex mercatoria* was growing as a set of norms, procedures, and institutions outside of the state jurisdiction. However, in the course of time, the development of both trade and state changed its original characteristics. *Lex mercatoria* became more formal, easier to find and understand but also became subject to state sanctioning. As Ralph Michaels comments, "although an anational law merchant would be theoretically possible, the true *lex mercatoria* we are currently observing is not such an anational law."[92] Modern *lex mercatoria* is dependent on national norms and the freedom of contract they provide, as well as on the enforceability of arbitral awards by national courts.[93] It is sanctioned by legal systems mostly as customary law which is a recognized source of law within jurisdictions of the common law tradition. Moreover, it widely relies on intermediaries like UNIDROIT or the International Chamber of Commerce that are preparing and publishing sets of customs such as Principles of International Commercial Contracts or INCOTERMS.

In spite of its modern nature, the historical example of *lex mercatoria* is of a great value for this research. It proves the anational regulatory system that directly transforms the will of participants into functional rules. Meanwhile, the shortcomings of early *lex mercatoria* can be effectively cured when regulation is based on a blockchain technology. Norms can be established quickly, formally, and accessibly.

There are other examples of regulative environments not related to the

---

[90] S.V. BAKHIN, SUBLAW: INTERNATIONAL CODIFICATIONS OF UNIFIED CONTRACTUAL LAW (2002).

[91] Gilles Cuniberti, *Three Theories of Lex Mercatoria,* 52 Colum. J. Transnat'l L. 369 (2014).

[92] Ralf Michaels, The True Lex Mercatoria: Law Beyond the State, 14 IND. J. GLOB. LEGAL STUD. 447 (2007).

[93] *Id*.

state. Technical regulations, both national and international, are worth mentioning. If we exclude such implications as sanitary requirements and other technical regulations related to safety, which are subjects of public interest, the technical standards are mostly formulated and brought into action via private channels. Intermediaries like industry unions, professional associations or other so called self-regulatory bodies, which are often authorized or supported by governments, present these channels.

The given examples are sufficient to prove the hypothesis that blockchain law can exist and function. The regulatory systems functioning in the absence of supreme power such as international law or historical lex mercatoria as well as self-regulatory mechanisms of professional associations and industrial unions form a strong ground for such statement.

VI. TECHNOLOGY ESSENTIALS AND BLOCKCHAIN LAW KEY CHARACTERISTICS.

What is discussed above is not exclusively about blockchain, but rather about any tool with a set of characteristics currently attributed to blockchain technology. These characteristics are: the ability to function as a decentralized network, immutability, provenance, finality, as well as ability to process large amounts of data rapidly.

In terms of human conduct regulation, these technical characteristics are transformed into socially valuable basics of the system:

A. Absence of sovereign or any other subject with superpowers (Distributed network);
B. Legitimacy – wide acceptance of set of rules as a regulatory regime. (Provenance and immutability, new mechanisms of trust);
C. Formal clarity (Finality);
D. Ability to function as boundary-free regulatory system (Decentralization and accessibility);
E. Accessibility for unlimited number of users (Data processing).

Blockchain-based protocols are layering additional technology to process what can essentially be thought of as small computer programs—what technologists often refer to as "smart contracts."[94] The peer-to-peer network using public-private key cryptography based on a set of rules aimed to manage how information is recorded in the shared database and verified by

[94] An introductory paper to Ethereum, introduced by its co-founder Vitalik Buterin before launch, which is maintained and available at https://ethereum.org/en/whitepaper.

the network can be called a "consensus mechanism."[95] This technology may allow "meeting of the minds" of unlimited numbers of people, accurately capturing each and every intent, being indicative of a parties 'will and producing the mathematical truth.

May the blockchain law theoretically replace conventional law? To answer this major question, we are to examine two issues. Can our planet become a DAO, type of a global smart social contract? Is there any critical function of conventional (state) law that cannot be performed by blockchain regulation?

To keep it simple, we will not develop the first question by researching when and under what condition all conscious human beings can become members of one DAO. It is obvious that every member should have relatively easy and reliable access to the network and be a little bit technically educated, which is not the case nowadays. However, the world is evolving.

When talking about each and every conscious person on earth being part of one DAO, then without any doubt the answer would be negative. There always will be someone out of the system; these could be disrupters, or technically illiterate people, people living in remote areas, or just people not willing to be parts of the system. What if everyone is not needed and an overwhelming majority is enough? Talking about conventional law, which is the product of sovereign power, we are aware that it does not cover everyone on this planet. This is not only about stateless people living in international waters. There were, and there are, territories that due to civil wars, natural disasters, or other reasons, are temporary not covered by regulation of any law. The example of Somalia is a relevant one.[96] In many countries, especially in rural areas, newborns are not always inscribed in civil registers and hence have no access to expressing their will through established conventional channels. According to research conducted by Inter-American Development Bank in 2007, up to 5% of newborn Paraguayans are not registered during first year of their life, and there are a number of people that live their entire life without any interaction with the state, including registration, voting, and receiving any documents or social benefits.[97] The mentioned examples do not undermine the credibility of law in general. Laws can be enforced despite some individuals intentionally or unintentionally existing out of the system or network. The fact that the government has not counted someone does mean that this person will not get protection or social

---

[95] Cardozo Blockchain Project, *supra* note 33.

[96] *See* Stig J. Hansen, *Warlords and Peace Strategies: The Case of Somalia*, 23 J. CONFLICT STUD. 57 (2003).

[97] *See* DWIGHT ORDÓÑEZ BUSTAMANTE, EL SUBREGISTRO DE NACIMIENTOS EN PARAGUAY: LAS CONSECUENCIAS (2007).

benefits from the government. Instead, his opinion will not be taken into consideration in the law-making process, but it is not a problem as there is a sovereign that will decide for him. If an unregistered Paraguayan killed someone or tried to overthrow the government, there are few doubts that someone would come after him. The same thing would happen to any Somalian who leaves the territory of chaos, or even with a stateless person in international waters violating someone's rights and lawful interests. Thus, law is perceived as existing even by those who are ignored by governments or consider themselves out of the system. If we will imagine the universe of subjects of law as a DAO (though it isn't), then membership in this quasi-DAO is not voluntary, it is mandatory.

In contrast, participation in the real DAO is voluntary by nature. One can own Bitcoin, thus be part of Bitcoin DAO, and put his own will in decision making process. In his mind Bitcoin has its value, the DAO exists and everything happening inside the DAO really happens. On the other hand, someone who is not in the system can totally ignore both Bitcoin and network, and hence it has no value and virtually does not exist for that person. There is no sovereign or supreme power that will knock the nihilist's door and force him to buy Bitcoin and become part of the DAO. That means that blockchain law could be non-existent for those out of the DAO. Rule violations would not be treated as such, and there would be no coercion mechanism that could force someone to obey the DAO rules. However, it would be wrong to state that there would be no enforcement mechanism for blockchain law, and that there are no ways to bring outsiders into the DAO.

B.Execution and Enforcement: Perception, Acceptance, and Compliance

There could be three potential types of blockchain rule violators. Those that are out of the DAO and do not know that the rule exists, those that are out of the DAO, know about the rule but do not respect it and those that are part of the DAO, know that the rule exists but intentionally or unintentionally violate it.

The administration system addressing the last group depends on the DAO. If the particular DAO manages or is integrated into payment system, violations of rules can result in feasible sanctions like increased commissions, and additional fees and charges. Account blocking or limiting access to data could be examples of non-monetary penalties. However, sanctions are only one tool in the law enforcement system. The disapproval of peers, propaganda of proper behavior, and motivation can also work for blockchain regulation. Blockchain regulation can effectively employ most operations currently used by online businesses to motivate the users to behave properly. Take booking.com, Expedia, or any other tourist website providing hotel

booking services. The service provider sets some rules for the hotels including the accuracy of information available to the customers, time of response for requests, etc.; it is also interested in high clients 'satisfaction rate. Besides fines and financial benefits, these websites have a much more efficient way of influencing hotel's behavior – published customers reviews. Imagine a 5-star hotel that has an extremely low clients 'rating based on hundreds or thousands of reviews. Unless the market where it operates is not free, or it is priced strongly below the average, this business is in trouble.

Although the described mechanism is relatively "soft" as there are no fines or license suspensions, it can affect businesses stronger. For example, a hotel can pay a fine or renew a license, but due to low review rates it would get no clients and eventually be out of business. Platforms like AirBnB, Turo, Uber, and others, are used the same way to promote rule following, not only for the service providers, but for the clients as well, which implies for all users. These platforms are not decentralized, which means they can theoretically manipulate the clients 'reviews by erasing history or changing the way the average rating is counted, making it another source of revenue. Yet, if it would work as a decentralized tool, the manipulation becomes almost impossible. History will be stored forever and the consequences of receiving low reviews will be even more dramatic for the clients.

Applying that tool to blockchain law will mean rating members of the DAO according to their conduct. The network member with numerical characteristics showing that he or she has a history of violations will eventually be limited or restrained from entering almost any civil or commercial activity and, on the other side, the member with high ratios will be a desirable counterparty and will potentially receive favorable conditions entering social interactions.

The scalability effect and the size of the DAO can resolve acceptance and awareness problems. When the telephone system was introduced, the community of users was small, and the phone owners didn't have many numbers to call. Nowadays, though, people who do not use phones probably still exist, the normal social interaction undoubtedly assumes using phones for personal and business purposes, and the community of phone users is almost equal to the number of people that physically can use it. Hence, when most people around are using phones, internet, or are members of some DAO, remaining members of the community have few choices but to become part of this network even if they are not totally happy about that. Imagine that Bitcoin popularity drastically increased, and most people are using it at least from time to time and there are numerous services or goods that are not accessible for purchase by other means of payment but by Bitcoin. In this case, not being a Bitcoin user will place a person in a disadvantageous

position in many ways. Eventually, convenience and the ability to interact with other DAO members will become a strong motivator for those that are still "out" to step in, even though some of them probably do not like or do not trust Bitcoin.

However, disrupters will always be around. Yet, they are not critical for the system sustainability up until they are few. Those mentioned do not participate in formation of the law, but as described above, the law enforcement system possesses tools to enforce the rules even on those who refuse to admit the very existence of law. However, unless, in our attempt to forecast the future of social regulation we will rely on some sci-fi plot that describes world of machines controlling every minuscular area of social life, these mechanisms do not fit for blockchain regulation. The decentralized peer-to-peer law enforcement cannot do much to outsiders of the DAO or even to network members if they commit something serious which is absolutely beyond compare by its danger to society to any of the sanctions in the blockchain law arsenal. Sometimes it can spoil the outers 'life by cutting them from some socially sensible interactions as well as affecting financially, but blockchain regulation is not able to fully replace the law enforcement set of tools. Blockchain law system has no one to come after a killer, a robber, or a rapist, it can hardly sufficiently influence a monopoly seriously abusing its market position.

VII. CONCLUSION

Code is now capable of regulating and constraining our actions in a wide variety of ways. "Code can be the law" (*i.e.,* code having the effect of law) and "law can be the code" (*i.e.,* law being defined as code).[98] However, the replacement is not universal. The autonomous blockchain law can theoretically substitute the conventional law, but blockchain regulatory systems cannot entirely substitute conventional legal systems, which besides the norms include the process for interpreting and enforcing the law. And as soon as the network cannot exist on its own and requests at least some outside intervention, it is not fully autonomous and hence can eventually be affected by the same weak spots as the traditional law and legal environment is.

Nevertheless, the area of regulation where blockchain law can theoretically replace conventional law is huge. Such regulation can take care of the bulk of social relations now covered by private law and a substantial part of public law including such areas as administrative law, tax law, and labor law. For the rest of relations which may potentially request some physical interference of state enforcement power to be efficiently regulated,

[98] De Filippi, *supra* note 68.

it can also perform the key function in creating rules, complimenting enforcement systems, and controlling state enforcement. There are a number of factors and issues that will affect the probability of blockchain law taking over a big share of the regulatory pie and shaping the transition process.

As blockchain law is a global smart contract, it relies on smart contract principles and inherits all its drawbacks. Except for its initial programming, the DAO doesn't need outside help to determine how to carry out its mission – to regulate social behavior. The real issue is how to create a universal and "ideal" set of pre-programmed rules that describes what can happen in DAO, how it would gather wills of members, transform it into the will of majority and interpret it as the norm of "law." Who can take this burden of a "founder"? Is it possible?

We should return to the point where we discussed the target of this research. We are not discussing whether the replacement of conventional law by blockchain law will have positive or negative impact, but trying to realize whether such replacement is theoretically viable and if there are factors that can move this process forward.

This system of norms will not be ideal. Moreover, it can likely appear to be bad or scary. Anyone who will write the set of pre-programmed rules expressed in the form of the code that together will present a mechanism of creating rules by gathering intentions of users and effectuate regulation can become the founder. What can make this system global and allow it to take part in real competition with conventional law is the natural selection. By this we mean natural selections based on criteria of ability to survive as a self-regulation mechanism and avoid quick failure of the first DAO, sustainability, and universality of rules regulating as much as possible of what can happen in DAO. A lot will depend on chance, coincidence, and circumstances. There were many Facebook-like projects but there is no second FB, and there is no unequivocal answer why. The same reasoning is applicable to the blockchain regulation system: any regulatory protocol matching set of criteria turned into DAO may take a lead at some point and take over the regulation of social relations globally.

One of the key issues for currently existing DAO's is the "fork problem". Blockchain forks or blockchain forking is a situation when the blockchain software and data that is supposed to be synchronized for every user becomes desynchronized and, as a result, there is a split in the blockchain network. If the decision-making protocol provides relevant mechanism, DAO members can come to an agreement and resolve the fork issue by leaving only one chain branch but if they do not, then this potentially can result in the creation

of two versions of the blockchain.[99] In blockchain law, the case may turn into the existence of several "overlapping" regulative DAO's which in analogy to other blockchain systems may lead to the "fork competition."[100] The response to this challenge is obvious - the size limits controversy. Generally, the blockchain law is the tool to express majority will and the bigger the DAO is, the smaller is the chance for alternative reality to survive. Whether it will turn the world into a code tyranny – is out of the scope of this research. But without a doubt, the development of blockchain law will shift the regulation priorities towards populism and away from the needs of those deviating from the mainstream. The enforceable regulation is likely to step to the ground where it is not present now, fields like moral, religion, or ethics can suddenly appear to be regulated by imperative rules.

Blockchain law is a phenomenon that may influence the theory of law itself and will probably bring us to the foundations of natural law theory. The difference is that natural law is more of a theoretical concept whenever the blockchain regulation is an efficient modern technocratic tool. Natural laws are supposed to exist objectively and thus belong to everyone throughout their entire life with no need to be granted by sovereign or law;[101] blockchain regulation may exist quasi objectively, not dependent on will of state and its institutions. It may become a new measure of objectivity meaning "compound judgment of majority", competing with the traditional one meaning "lack of judgment and prejudice."[102]

Blockchain is coming whether society is comfortable with it or not. It is crucial that countries make an effort to incorporate blockchain into the impulse of evolving law, rather than its resistance creating the explosion of a revolution. The existing law theory might be reshaped, but most of its foundations will stand while accommodating blockchain-based tools. This

---

[99] Neo C. K. Yiu, *An Overview of Forks and Coordination in Blockchain Development*, CORNELL UNIVERSITY (Nov. 15, 2021), https://arxiv.org/abs/2102.10006.

[100] *See* Joseph Abadi & Markus Brunnermeier, *Blockchain Economics*, NAT'L BUREAU ECON. RES. (Dec. 2018), https://www.nber.org/papers/w25407.

[101] Robert P. George, *Natural Law*, 52 AM. J. JURIS. 55 (2007).

[102] In my publications devoted to technical regulation I often refer to an act of municipal authority of City of Tomsk (Western Siberia, Russia) adopted in 2006, according to this act the criteria of the cold weather was stated. It was just a technical rule saying, "8'C(46'F) is cold". There was a higher-level legislation referring to this term, stating that heating season will start when the outside temperature becomes cold according to regional rules and standards. Which meant that unless the outside temperature falls below 8'C the central heating will be off. But most people felt cold even when outside temperature was 10'C or 15'C, however not "objective" atmospheric processes determine the coming of cold weather but the rule of law.

evolution, being slow and mild by character, has a strong potential to trigger comprehensive changes in the core values of modern social structure.

* * *