

Toward Frictionless Trade and Frictionless Compliance: The Challenges and Opportunities of Blockchain

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In this article, the authors discuss blockchain-based business models, including their unique fundraising mechanisms and decentralized nature, and explore options for using blockchains and artificial intelligence to resolve the problems of enforcing tax and trade regulations in this new market. The authors present a vision of a world in which frictionless compliance allows for freer market entry and becomes a tool to enhance equity in the business domain and beyond.

The internet is rapidly evolving from a tool for information exchange to a tool for value exchange. The internet of value — driven by blockchain and digital currencies — is enabling peer-to-peer commerce on a global scale. Finding, accessing, transacting, paying, and settling with counterparties worldwide is becoming frictionless. Blockchain is at the heart of these developments. Although it started in the digital currency realm, it is quickly becoming known as perhaps the most important breakthrough for advancing and enhancing global trade. It provides a networked platform that grants any user access to the global scale and payment capabilities traditionally only enjoyed by multinational enterprises. Yet, in the midst of this potential, the challenge of regulatory compliance and enforcement looms.

In this article, we discuss the nature of blockchain-based business models and explore

options for regulatory compliance enforcement in the tax and trade arenas. We also propose next steps across government, business, and academia. Our underlying belief is that the very technologies that are causing the disruption may be able to create the solutions: namely cloud computing, blockchain, and artificial intelligence (AI). Because this space is rapidly evolving, this is merely intended as the starting point for the discussion — we look forward to continued exploration of these issues as blockchain, digital business models, AI, and regulatory regimes evolve and mature.

Blockchain-Based Business Models

From Networks to Markets

Blockchain enthusiasts envision a brave new world in which technology empowers individuals and small and medium-size enterprises to build businesses without relying on rent-seeking intermediaries. These businesses are digital natives, existing only in the cloud. They create value through networks of users — leveraging Metcalf's law, which states that the value of a telecommunications network is proportional to the number of connected users of the system squared (n^2). They hope to create tradeable liquid markets in both established industries previously dominated by intermediaries and industries in which effective trading was not feasible in the past. Land rights in developing economies and user time spent reading blogs are two examples of the latter — both are now being traded via blockchain.

Disrupting the Disruptors

Regulators today are struggling with how to adapt old practices to e-commerce players, like

Amazon, Google, and Facebook, and to peer-to-peer businesses like Uber and Airbnb. While regulation of these disruptive firms is being discussed and debated, distributed peer-to-peer blockchain-based competitors are preparing to disrupt the disruptors. Their plans leverage the power of the blockchain to connect buyers and sellers, renters and owners, social media users and advertisers, and other business counterparts directly without a central corporate entity in the middle.

The new blockchain-based business models rely on computer code uploaded to tens of thousands of servers around the globe that work together and enable anyone to exchange information and payments immediately, directly, securely, and at a low cost. Rather than trusting central intermediaries like Airbnb (to find renters) or Citibank (to process payments), these firms and their customers trust the software, which is transparent and available for inspection by all. The traditional functions of an intermediary — including market access and facilitation of value exchange — are taken over by a shared, distributed set of computer code running autonomously on the cloud. Individuals and SMEs can operate globally, conducting direct-to-consumer trade without barriers and at low cost.

New business models are emerging and attempting to disrupt the traditional, centralized incumbents. Challengers include IPFS (interplanetary file system) (disrupting Amazon's cloud storage space), Virtue Poker (disrupting the centralized gaming industry), and Uport and Civic (disrupting state-issued identity systems, such as identity cards and passports). There are also a multitude of blockchain payment companies disrupting the financial services industry. These new companies all have something in common. They are using blockchain technology to reduce the frictional costs of doing business with a counterparty. This reduction in friction leads to reduced transactional costs, enabling new business models to emerge that were cost-prohibitive in the past.

Fundraising and Cryptoeconomics

To realize their vision, blockchain enthusiasts need resources; resources require capital, and lots of it. Instead of raising capital through traditional

rounds of equity financing, these companies are issuing utility tokens¹ — units of service that can be purchased in advance. Blockchain entrepreneurs sell a percentage of these tokens to willing purchasers of the (to-be-developed) service while reserving additional tokens for the engineering team, for future development needs, or for the community of blockchain users. If you own a token, you can redeem that token for access to the service. The service provider receives a token for providing the service and can either hold it or redeem it into another currency. This exchange between users and providers — that is, token buyers and sellers — is managed by the software distributed across the cloud with no need for an intermediary.

One real-world example involves tokenizing the market for storing data on the cloud. There is a decentralized cloud storage token that holders can redeem to store files on peer computers accessible via the cloud. If you want file storage, you purchase tokens and exchange them for file storage services. The service provider hosting the storage space receives tokens in return for providing the service according to agreed-upon rules. These tokens are liquid, float in value, and can be exchanged in a global marketplace. If the network becomes more valuable, then so do the underlying tokens. Founders and engineering teams have an incentive to grow the network because they have a financial stake in the underlining protocol, as do the buyers and sellers of the disk storage. Thus, tokens are a hybrid instrument — part prepaid service, part investment in the overall network business model. Therefore, in addition to their utility value, tokens are akin to shares of a company — or, perhaps more appropriately, a working interest in profits such as is seen in the oil and gas sector.

This example illustrates the essence of so-called cryptoeconomics. All holders of tokens have a vested interest in seeing the network succeed since the value of their tokens will increase. By tying incentives for all participants together through tokens — including users who

¹For a discussion of token-based fundraising and its tax consequences, see Marius Breier, Peter Hongler, and Maurus Winzap, "Taxing Tokens — A Swiss Perspective on the Taxation of Initial Coin Offerings and Blockchain-Based Tokens," *Tax Notes Int'l*, Mar. 19, 2018, p. 1159.

purchased tokens, providers who earn tokens, or development teams that create software (and hold back tokens) — the power of Metcalf’s law is applied to funding and building a business. In this model, the development team has an incentive to avoid programming the software to enable themselves to capture the majority of tokens because users will self-select (sell) out of the tokens — the network will not flourish, and the token value will fall.

Challenges regarding disclosures of token ownership exist. Historically, initial coin offerings (ICOs, also called initial token offerings) were unregulated and investors relied on inspection of the open-source code, the published plans of the business, and online chat forums. However, markets are developing rapidly and various governments are bringing securities regulations to bear in token exchanges. While it is not yet a rational market, the tokenized economy (as it has begun to be called) has the potential to change the incentives and economics of business formation. It offers an advantage to companies that operate transparently using open-source software and protocols and that have direct, distributed ownership rather than traditional corporate ownership. A big question remains as to whether the historically anti-government, libertarian-bent blockchain-enthusiast crowd will choose to ignore regulations because they believe they are cloaked in anonymity and beyond jurisdictional reach: As governments begin to apply existing regulations to the tokenized economy, will companies comply or will they take a “catch me if you can” stance?

Regulatory Compliance Challenges

Yesterday’s disruptors operated from a central organizing entity — a corporation — to which we have become accustomed and to which regulatory compliance obligations attach. But in blockchain-based business models, there isn’t a central entity. Instead, network participants leverage self-executing software running on servers around the world. The software developers set the rules and generally receive some interest in the profits for doing so, as described above. Applying regulations and enforcing compliance with trade and commerce rules — notably including indirect taxation, customs regimes, restricted party and

restricted product screening, know-your-customer (KYC) rules, and anti-money-laundering (AML) regulations — becomes problematic because there is no company to which these obligations can attach. Also, enforcing direct income tax regulations becomes challenging with broadly dispersed profit participation, and with governments varying widely on whether they treat tokens as commodities, money, or shares.

Regulation has begun to visit blockchain businesses in the form of AML and KYC regulations. The imminent crackdown on securities regulation violations involving fundraising via ICOs may enhance innovators’ awareness of the need to comply with government regulations. Yet, in our experience interacting with leading entrepreneurs in the blockchain space and reading several dozen business plans from prominent blockchain firms, the business leaders developing these intermediary-free, peer-to-peer, global business models appear to be blissfully ignorant of the trade and commerce compliance obligations that they will be subject to as their businesses mature. There’s simply no acknowledgement of the role of government regulations (beyond KYC and AML rules) in their business plans — plans that have attracted large investments with almost \$3 billion of risk capital invested in the last 18 months alone.

Even putting aside the entrepreneurs’ disregard for compliance regulations, the regulations themselves are often a poor fit for business models driven by networks and exponential technologies. Regulators worldwide are struggling to make sense of these new business models and determine how to apply existing regulations to these entities. Regulatory change is clearly not keeping pace with technological change. Even as the challenges of cross-border digital trade are being feverishly discussed and debated, the exercise seems to largely focus on finding the heart of a blockchain-based entity. Without a single entity at the center — with regulators unable to identify what many in the field refer to as “the one throat to choke” — this may be a breaking point for the traditional approach to business regulation. Thousands of businesses are now being organized as distributed networks of peers without a central

corporate form or central server location to which one can attach regulatory compliance obligations. The vast majority of these enterprises will fail. But many believe that the next Facebook, Amazon, Netflix, and Google (or the Asian equivalents: Baidu, Tencent, and Alibaba) will be among the select few blockchain-based enterprises that do succeed.

Whether or not global challengers to today's large businesses emerge from this developing sphere, SMEs will benefit from becoming sellers on blockchain commerce platforms as a result of reduced cost, increased market access, and token-based incentives. However, it is equally clear that SMEs lack the time, energy, and sophistication to manage the ever-changing morass of global regulatory promulgations and edicts. It is patently unfair — and likely unwise — from a social policy perspective to restrict SMEs' access to global markets because of a lack of compliance capabilities.

The world of distributed blockchain-based organizations is one in which computer code uploaded to tens of thousands of servers across the globe enables participants in the network to exchange information, goods, and services for payment without a central controlling entity. In the traditional market, MNEs — along with commerce and payment intermediaries — play a significant role in ensuring compliance with regulatory regimes. However, with the emerging blockchain business models lacking those intermediaries and organized as peer-to-peer networks rather than around a central entity, it is unclear how compliance will occur or who will be responsible for regulatory obligations. We believe this argues for the development of a new means of facilitating compliance in a peer-to-peer, intermediary-free world — a set of capabilities to enable frictionless global compliance for frictionless global trade.

Modern Compliance: Options and Opportunities

Beyond the benefits to business, especially SMEs, governments also stand to benefit from a new approach to compliance. Out of the \$75 trillion global economy, approximately \$11 trillion is collected in taxes. Still, estimates suggest that a tax gap of up to \$4 trillion exists. The opportunity to leverage the power and

transparency of blockchain to recapture some of this tax gap through reduced fraud, higher compliance, and reduced cost may be significant. This may sound anathema to those who think only of bitcoin, ransomware, fraud, or money laundering when they hear of blockchain. How can a technology whose initial successes involved avoiding monetary and tax regulations become the solution to these same ills? However, the transparency and adherence to rules that are the hallmarks of blockchain solutions may be just what the tax world needs. Designing compliance into the fabric of these new blockchain technologies would offer automation, transparency, and the assurance of compliance with clear-cut rules. Blockchain-based businesses provide a unique opportunity to rethink the nature of compliance, potentially moving from a regime of periodic payments and reporting in which audits are the enforcement mechanism to a real-time flow of payments and information in which the automated monitoring of proper system use becomes the primary enforcement mechanism.

When rules are clear, such as in the indirect tax arena, developing blockchain-native compliance services — services that encompass tax, customs rules, restricted product and party screening, AML regulations, and KYC regulations — that can be quickly and easily tapped by any business operating on compliant blockchains presents an important opportunity. Developing these “white” blockchains — in which automated compliance is a core component of the coded architecture — allows compliance to be built into the basic business processes that the platforms enable. “Black” blockchains will exist, providing no compliance capabilities and perhaps even touting the lack of compliance as a feature. An example is the digital currency Monero, which touts absolute secrecy and therefore has attracted a wide range of questionable uses. As entrepreneurs choose a blockchain on which they will deploy their innovations, selecting a white blockchain may go a long way to de-risking the business from the perspective of investors and participants.

When rules are unclear and subject to legal interpretation, blockchain alone will not achieve compliance. A key set of examples here are the

various international initiatives aimed at preventing international tax avoidance in the area of income taxation; these initiatives may see many countries across the world implementing or redesigning similar sets of both specific and general rules in their domestic tax laws and tax treaties. Complying with those rules can be a difficult, complex task for taxpayers engaged in cross-border business activities. Here, we look to AI for assistance achieving frictionless compliance. With more detailed information flowing through blockchains in real time, AI technologies may be able to use this data to determine potential income tax obligations, including not only domestic obligations but also international obligations stemming from tax treaties.

Increasingly, AI agents use deep-learning artificial neural networks capable of performing tasks unimaginable less than a decade ago from designing industrial-grade objects to generating scientific hypotheses, composing music, and answering questions posed in natural language.² Deep-learning AI agents can mimic key elements of children's cognitive development, namely acquiring an understanding of language generally as well as specific words and their meaning.³ Today's AI might be used to decode complex anti-tax-avoidance rules and, correspondingly, assess the risk and outcome of various cross-border scenarios. For AI to succeed in these efforts and similar regulatory initiatives, it will need access to large databases — for example, the International Bureau of Fiscal Documentation's library and the case law archives from the Court of Justice of the European Union — to develop algorithms to predict tax avoidance. As in any tax law dispute, parties may provide more specific data sets on a case-by-case basis. With access to these databases, AI can self-teach using a carefully predetermined set of searching conditions and tax avoidance fact patterns. Ultimately, AI can learn to perform compliance-

related tasks, such as recognizing when an arrangement or transaction is totally lacking (or has minimal) economic substance and nontax business purpose. This is a particularly relevant and useful undertaking since international tax avoidance typically revolves around arrangements of that nature.

The goal of marrying the high-quality, detailed, company-specific data collected via blockchains or from existing audit files with a properly trained AI engine is to develop technologies that will *assist* tax lawyers, MNEs, governments, judges, and others dealing with cases that trigger (or may trigger) anti-tax-avoidance rules. Indeed, AI seems to be the perfect partner to support high-value jobs (for example, tax attorneys) that require human judgment, domain expertise, goal setting, good client relations, and creativity.⁴ We do not propose using AI to make decisions, only to assist, much like country-by-country reporting should not be used to produce a final tax assessment but rather as a tool for risk assessment. Using an AI tax assistant may reduce much of the regulatory and compliance friction that can arise between taxpayers trying to carry out cross-border activities in a tax-optimal manner (and, in most cases, a tax-compliant matter) and tax authorities that might deny them tax benefits under the new anti-tax-avoidance rules. The potential application for an AI tax assistant is vast. The first and, ultimately, the primary group of potential users will probably be MNEs that want to self-assess risks before making a change, taking a position, or making a filing.

Conclusion

The rapid rise of digital commerce is upon us. Amazon and Alibaba alone account for over \$200 billion in sales each year, a number that is growing by more than 40 percent annually. All businesses are being affected by digitization. Extraordinary wealth is being created and centralized by those most adept at taking advantage of these trends. Growing concerns about the inequality of globalization are giving

² See Andrew McAfee and Eric Brynjolfsson, *Machine, Platform, Crowd: Harnessing Our Digital Future* (2017).

³ See Jean-Pierre Fillard, *Brain vs Computer: The Challenge of the Century* 86 (2017). For a discussion about using AI to apply the principal purposes test in tax treaties, see Blazej Kuźniacki, "The Principal Purposes Test (PPT) in BEPS Action 6/MLI: Exploring Challenges Arising From Its Legal Implementation and Practical Application," 10(2) *World Tax Journal* (Mar. 12, 2018).

⁴ See Arvind Krishna, Martin Fleming, and Solomon Assefa, "Instilling Digital Trust: Blockchain and Cognitive Computing for Government," in *Digital Revolutions in Public Finance* 194 (2017).

rise to social unrest. Varied voices are calling for the creation of a digital platform that might allow small and medium-size businesses to level the playing field relative to multinationals. At the same time, regulatory policies are struggling to keep pace with evolving digital business models — a problem that will only get worse as blockchain-based models begin to be deployed on a larger scale. The same digital technologies that are disrupting business and upending traditional tax compliance and enforcement mechanisms may also present opportunities for enhanced efficiency and improved collections within tax and customs authorities via a digital revolution.⁵

We offer a scenario that integrates existing technology with a vision of a future in which digitized compliance is designed as a natural part of business operations small or large, domestic or cross-border, assisted by AI where complexity necessitates. We believe this opportunity can be best realized by integrating designed compliance solutions into blockchain platforms to create a class of “white” blockchains. The ability of these entities to be fully compliant globally would be a key part of their inherent value proposition. The data captured on the blockchains would also enable the use of an AI assistant to help risk assess the complex compliance questions that typically arise in the income tax arena.

⁵ See Sanjeev Gupta, Michael Keen, Alpa Shah, and Genevieve Verdier, *Digital Revolutions in Public Finance* (2017).

The advent of blockchain technology is extraordinarily timely as politicians have recognized that globalization is concentrating wealth in the hands of a few. Enhancing the capacity of tax administrations in developing economies and leveling the playing field for SMEs are hot topics. No other technology on the horizon has as much potential to contribute to these goals as blockchain. A number of business and policy leaders have identified making frictionless global trade available to SMEs as a significant step toward reducing wealth concentration, alleviating poverty, and improving the standard of living, especially in developing economies. The stakes are high — economic disparity has historically led to unfavorable outcomes. Frictionless compliance is a necessary precondition for achieving frictionless global trade.

As the basis of a call to action — or at least one step in that call — we propose a collaboration between business, government, and academia in a multi-stakeholder environment in which:

- businesses work to create a trusted compliance fabric and integrate its use into blockchain-based business operations;
- governments support development by acknowledging the enhanced certainty businesses will be afforded when this compliance fabric is provably integrated into their business processes; and
- academia helps develop a framework for AI and proof of concept of an AI tax assistant. ■