

**Written Testimony of Jeff Bandman,ⁱ Principal, Bandman Advisors
Securities and Exchange Commission, Investor Advisory Committee
October 12, 2017**

1. Thank you, Madame Chairman. Good morning to Chairman Clayton and Commissioners Stein and Piwowar and the members of the Investor Advisory Committee, as well as my fellow panelists. Thank you for inviting me to speak and to assist in today's proceedings. It is an honor to appear here today.

By way of introduction, I currently run my own advisory firm, Bandman Advisors. Previously, I served at the CFTC, where I was FinTech Advisor to Chairman J. Christopher Giancarlo and set up LabCFTC. I also led the staff blockchain working group, as well as a workstream of international regulators evaluating DLT use cases. I was Special Counsel to Chairman Timothy Massad, and then ran the CFTC's Division of Clearing and Risk and the Office of International Affairs. Prior to that I spent my career as a lawyer and business executive in the financial industry in New York and London.

2. Overview of Remarks: I plan to cover four principal topics, each briefly, to stay within my allotted 10 minutes. The written statement that I have submitted to the Committee, available on the SEC Investor Advisory Committee website, provides additional details. These four topics are:
 - 2.1. The role of the regulator – in relation to innovation, and with particular focus on the nascent and transformational technology of blockchain/DLT.
 - 2.2. Next, two exciting opportunities from this groundbreaking technology – first, the potential for this new decentralized technology to give investors greater control over their own data.
 - 2.3. I will also discuss the second exciting opportunity, the transformational opportunities for regulators to harness real-time data from DLT to empower Real-Time Regulation.
 - 2.4. Fourth and finally, I'll address what I see as some basic obstacles to regulators' digging in to this new technology themselves. There are obstacles that I believe can be simple to fix – with a proportional, flexible approach – but regulators will need some help from Congress and the executive branch.
 - 2.5. I'll conclude with a few observations about the SEC's recent activity in this space.
3. Moving then to the first topic - what is the proper role of the regulator?
 - 3.1. My perspective on blockchain and FinTech is shaped by my own experience as a regulator and supervisor of critical market infrastructure. At the CFTC I was responsible for running the division that supervises many of the world's largest clearinghouses.ⁱⁱ
 - 3.2. At the time we formed the CFTC staff working group to monitor developments in blockchain, DLT and bitcoin, it was already being suggested that these new technologies could revolutionize clearing and settlement. The excitement of these opportunities was balanced by my awareness of the importance of the regulator's mission – customer protection, market integrity, financial stability. These novel

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

technologies should not be deployed into production on critical market infrastructure until we can be confident it will not jeopardize those core mission objectives, will not put investors at risk. The idea of operating a clearinghouse on an anonymous, permissionless, decentralized distributed ledger -- with no central operator responsible -- initially seemed somewhat terrifying. But blockchains can be offered in a variety of shapes and sizes, this is not a one-size-fits-all proposition. Blockchain networks can also be operated by a central operator with access by permission only and restricted to a known and trusted network. This resembles the relationship of an exchange or clearinghouse with its members, a framework more familiar to regulators.

3.3. Thus the regulator wears two hats –

3.3.1. One hat is to engage with these new technologies and innovators, to learn about their capabilities, and make themselves accessible to innovators

3.3.2. Yet as for the other hat -- the regulator can't just be a cheerleader. It is important for regulators to be the wet blanket, to ask the tough questions.

4. So what should the members of this Advisory Committee bear in mind – in terms of the role of the regulator with regard to this emerging technology – blockchain or DLT?

4.1. There is a transformational opportunity with this new technology – and there are two complementary facets:

4.1.1. New technology can benefit the markets the SEC oversees

4.1.2. The regulator itself is a major user of technology – this is only growing in importance with the rapid digitalization of markets

5. What is the proper role of the regulator?

5.1. Regulators do not regulate “technology” itself. They regulate the application of technology. By this I mean applied technology in activities and entities and markets in the space it regulates.

5.2. Regulators should not pick winners and losers. That is the role of the market. Not only does the regulator wish to avoid picking winners and losers among companies, it also should remain technology-neutral when there are competing technologies.

5.3. Regulator needs to look at risks as well as opportunities. The mission of the regulator remains constant – market integrity, customer protection, access to markets, safeguard confidential information, capital formation, financial stability, systemic risk. These remain a constant beacon despite changing technology and circumstances.

5.4. I believe there is a great history of innovation in financial services, particularly in American markets. That is part of what makes our markets the strongest and finest in the world. These include technology innovations as well as other types of innovation. I disagree strongly with those who say there have been no financial services innovations since the ATM. Regulators have been a great partner to innovators, and a principal reason for U.S. global market leadership.

5.5. Investors are attracted by safe and trustworthy markets.

5.6. I would also note the importance of engaging with innovators – as the SEC Blockchain Working Group has been doing since 2013. Other regulators in the U.S. and around the

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

world have likewise set up formal or informal mechanisms or programs – like LabCFTC at the CFTC, the OCC’s Office of Innovation, state blockchain initiatives like those in Delaware and Illinois, the FCA’s Project Innovate, the Bank of England’s FinTech Accelerator, and others in Brussels, Paris, Amsterdam, Tokyo, Hong Kong, Singapore, Australia and elsewhere.

- 5.7. Within this context, there are risks and opportunities specific to blockchain of which regulators should be mindful.ⁱⁱⁱ
- 5.8. Clearly, cybersecurity must be placed at the forefront. Recent events have shown the increasing capabilities and sophistication of hackers and the vulnerability of data including personally identifying information.^{iv} Nevertheless, advances in cryptography and a decentralized, distributed architecture may make information stored in distributed ledgers safer than traditional methods as these techniques are refined.
- 5.9. A unique risk from distributed or decentralized ledgers is the dispersion of responsibilities – do parties know they have the risks – do they have controls in place, how do they monitor them? This could be major paradigm shift for regulators – we are used to dealing with a central operator, a single responsible adult.
- 5.10. Traditionally, regulators regulate registered entities and markets – increased adoption of distributed ledgers, particularly in decentralized models, may require regulators to shift to regulating activities rather than focusing on actors.
- 5.11. Another unique feature of blockchain is that it is inherently a collaborative technology. Success of any particular blockchain or distributed ledger initiative requires the scale and breadth of broad adoption – the valuable network effect. Because it is so collaborative, most blockchain initiatives in financial services are developed out in the open, to attract as many qualified participants as possible. Thus it is natural for those working on these open collaborative initiatives to engage with the regulator. This is potentially in contrast to advances in other technologies, where innovators may be far more secretive, in the absence of incentives to be open and collaborative. The regulator may only learn about the other type of innovation after it has already been deployed.

6. Investor Control of Data. The first innovation specific to blockchain I will focus on is the potential for investors to control access to their own data.

- 6.1. In traditional markets and systems investor data is held by a central operator or intermediary, like an exchange or broker, who maintains a master database or ledger of information. The information holder is overseen by the regulator and must meet a host of important requirements, including cyber resilience and conduct rules. The information holder is also positioned to correct errors, and provides reports to the regulator.
- 6.2. When customers or end users manage their data, it is through a portal that ultimately is operated and governed – and safeguarded - by the central information holder.
- 6.3. Blockchain offers revolutionary potential for decentralized, distributed systems where users can own and control their own data. They can determine themselves who is or is not trusted. They can determine who has access to their data, their behavioral history

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

and other information. This is being explored not just in financial services, but with health records and with digital rights to intellectual property.

- 6.4. How would investors in securities markets benefit? With greater control over their own data – combined with safeguards like cryptographic protection and biometric identification – investors can more safely and easily explore new services. The investor can control who receives and has permission to access its data – the investor is in control and chooses products – the investor ceases to be the product. The investor decides who sees her personal and financial data, her investment and transaction history, instead of relying on a third party financial institution to transfer her information, or having to start over and reenter all the information every time. Such a ledger could also contain other non-traditional types of data, potentially expanding access for investors to financial services.
 - 6.5. Of course, there are risks – investors remain vulnerable to cunning, sophisticated fraudsters and must be protected. Much work needs to be done, and tested, in cyber risk, governance, permissioning and many other fronts -- before this vision may be realized.
7. Real-Time Regulation: A second transformational innovation is the potential for regulators to harness real-time data from distributed ledgers to empower what I call “Real-Time Regulation”.
- 7.1. With distributed ledgers, data becomes available on the ledger right away to everyone with access and permission to see it. Data becomes available in real-time not only to the parties to the transaction, it can also be made available and visible to regulators, who may have what are called “regulator nodes” or auditor nodes”.^{vi}
 - 7.2. This is a transformational shift from the way regulators receive data and see markets today. It may offer a completely new paradigm of the reporting regulators rely on. It presents an exciting opportunity.
 - 7.3. Today, most data and reporting comes into regulators at the end of the day, or else the next day, or later – at the end of a month or quarter, and so on. Regulators are therefore seeing events in the rear-view mirror, well after they have already occurred. To be clear, I am not criticizing this work – it is of the utmost importance in making our markets safer and more resilient, and protecting investors. For example, the implementation of the Consolidated Audit Trail for equity markets is a major step forward, massive in scale, that will help regulators and protect investors, and promote transparency and market integrity.
 - 7.4. That said, with this new next-generation technology, and harnessing real-time data from distributed ledgers, future regulators may be able to monitor events as they unfold. To see through the windshield, instead of the rear-view mirror. They may be able to detect wrongdoing, or predatory or deceptive practices, at a much earlier stage.
 - 7.5. Use of this technology by regulators could therefore provide enormous benefits to investors. It could strengthen the ability of the SEC to protect investors, through earlier detection and earlier intervention. When you see dangerous or suspicious activity

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

through the windshield, it puts you in a position to apply the brakes or turn the wheel, to take action earlier, possibly to avert danger, and before further damage occurs.

- 7.6. Thus regulators could be in a position to detect fraud or market manipulation earlier, perhaps detecting and halting schemes before they have unleashed the full degree of harm that might otherwise occur.
 - 7.7. Looking back to the time of the financial crisis, regulators could not see the buildup of risk. When the crisis came, it was difficult or impossible to see the liabilities and exposures, huge as they were, of one counterparty to another. Using existing technology, regulators have made progress in improving transparency. Distributed ledger technology, if it had been in use at the time, could have made this information instantly available, and the buildup of risk would have been more visible as well.
 - 7.8. While the potential is enormous for making our markets and investors safer, further work is needed to develop the technology, to develop common standards so that data is available in consistent and comprehensible ways. New tools and analytics will be needed to make sense of the data, process larger volumes of data in real time, and separate signal from noise.
 - 7.9. Regulators need to roll up their sleeves, test real-time data from distributed ledgers, start to access these regulator nodes, and learn to use real-time data. U.S. regulators can and should be leaders in shaping the way these powerful new tools become part of the regulator toolkit. And I believe they will be leaders, and have the talent, vision and willingness to do so.
8. Obstacles to Innovation – and some simple fixes: This leads to the fourth topic I wish to focus on – the obstacles. Obstacles to regulators fully immersing themselves in these exciting new technologies and learning their capabilities and boundaries.
- 8.1. Well-intentioned rules to deter corruption and promote transparency in government are standing in the way of progress – these are rules that govern procedures for procurement, ethics rules and so on. I learned about these obstacles first-hand earlier this year during my work to design and launch LabCFTC. It was Chairman Giancarlo’s vision and our ambition to roll up our sleeves and dig deeper into these technologies ourselves.^{vii} These new technologies have the potential to make regulators more effective and efficient in carrying out their jobs.^{viii} Regulators need to use the technologies themselves to keep up with digital markets, to avoid being left behind in an analog world.
 - 8.2. To be absolutely crystal clear, I am not suggesting removing these protections. We need them to prevent corruption and protect the taxpayer. They are there for important reasons.
 - 8.3. However, greater flexibility and an approach based on proportionality is needed to embrace the potential of this transformational technology.
 - 8.4. Why are procurement rules a problem?
 - 8.4.1. Procurement is designed for situations where you know exactly what you need, how the solution will meet your requirements, and where there are multiple providers.

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

- 8.4.2. When it comes to these new technologies, you don't know exactly what they can do, or even whether they will work. The system is not designed for something that may not work, or where you are trying to learn the capabilities of technologies.
- 8.4.3. Next, these processes are lengthy and time-consuming. Twelve to 18 months is not uncommon, or longer. Technological change is moving so quickly, that by the time the process is completed, you may be on to the next generation and whatever you were considering may already be obsolete.
- 8.4.4. Most technology start-ups have not gone through the process and expense to become approved government contractors. Regulators are generally a small market, not the primary market, so this process is viewed as a time-consuming distraction, perhaps to be considered at a more mature stage of the business.
- 8.4.5. Procurement requires a competitive bid from multiple providers – there may not be multiple providers of some of these new tools and technologies.
- 8.4.6. Yes, there are waivers available – but these can take months or over a year to obtain.
- 8.5. Ethics rules pose another well-intentioned obstacle. Start-ups often license technology to prospective users on a pilot basis at reduced or no cost. Businesses are thus able to explore new technologies in a cost-effective way. Regulators however may be constrained – accepting technology at below full fair market value can be deemed a “gift” of the amount of the difference. Ethics rules preclude government officials, including regulators, from accepting anything of value without providing fair compensation
- 8.6. While common sense suggests that doing more with less is commendable, it may even be seen as thwarting the will of the Congress under the Anti-Deficiency Act, because Congress set the regulator's appropriations. No responsible regulator wants to be thwarting the will of Congress.
- 8.7. Similarly, some distributed ledger technology is being developed collaboratively, for example through groups like foundations and consortia. Joining these groups can give regulators access to research and white papers, and to participate in discussions and development of technical standards at an early stage. Yet accepting free memberships in these organizations could be deemed a gift, while joining would be a procurement.
- 8.8. It is a catch-22 – you can't pay for it due to the procurement rules, nor can you do it for free – that would be accepting a gift. So you are stuck on the sidelines.
- 8.9. CFTC Commissioner Quintenz recently commented on this quandary.^{ix} The CFTC is exploring experimenting through hackathons and prize competitions – this is the best available approach and I strongly support it. But this is a workaround – and something this important should not be left to workarounds.
- 8.10. On this topic, I will conclude by reiterating that these rules are important in protecting against corruption and promoting transparency. However, they are a concrete obstacle to progress, to regulators harnessing powerful technology and learning its capabilities, possibly steering development to meet unique regulatory needs. Safeguards must be retained – but they should be proportionate and flexible so that regulators can themselves innovate. Regulators want to comply with procurement

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

rules. Regulators want to comply with ethics rules. Regulators are, by nature, compliant. While there is much talk of sandboxes for innovators, I would suggest we need a “Sandbox for Regulators”, where they can explore these new technologies while complying with procurement and ethics requirements.^x

8.11. I believe Congress may need to act to enable such a Sandbox for Regulators – and I am hopeful that leadership from the White House Office of American Innovation could be brought to bear as well. DARPA and the Department of Defense have this kind of flexibility when it comes to exploring innovative technology that does not fit within its mainstream procurement rules. Our markets are vital to our prosperity and security as well.

8.12. I believe that this can benefit the taxpayer – as well as investors in our markets.

9. Recent SEC Activity

9.1. I will conclude this morning with a few observations about recent SEC actions in the context of Initial Coin Offerings, also known as ICOs or token sales. This is quite a new phenomenon – and to put it in context, it is the third in a series of enormous interconnected innovations in a few short years

9.1.1. First, the rise of cryptocurrencies that started with the Bitcoin in 2008 and the first bitcoins mined in 2009;

9.1.2. Second, the emergence of blockchain and distributed ledger technology – a new generation of distributed database management system;

9.1.3. And most recently ICOs and token sales, with huge implications for investment and capital formation, for democratizing access of retail investors to new and innovative businesses, and opportunities to incentivize and monetize really interesting ideas at an early stage of their development, through funding of so-called “utility tokens”.

9.2. I believe the SEC is doing an excellent job of balancing its responsibilities to protect investors while allowing new technologies to develop. The SEC’s 21A Report of Investigation, issued in July 2017, provided a crystal-clear analysis of the issuance of the so-called DAO tokens in 2016.^{xi} It made clear that the Howey test applied, and laid out how the components of the test applied to these instruments, looking at substance rather than form. It was extremely well-received by the market, and it is an important step on the path toward greater legal certainty.

9.3. I view that report as a “Digital Marbury versus Madison”. By that I mean it is a true landmark in its sphere, in clarifying the SEC’s jurisdiction in this space, just as that early U.S. Supreme Court case was a landmark in establishing the principle of judicial review. And like Marbury versus Madison, it neatly established the principle without the cloudiness of further litigation or enforcement action in the particular case. It put the market on notice that these tokens can be securities, but did so without a blanket or extreme approach that some jurisdictions have applied in banning all ICOs. The SEC took a balanced approach, recognizing that one size does not fit all. A one size fits all approach would stifle innovation, and fail to distinguish the variety of facts and circumstances of a token offering or ICO – which must be reviewed under the

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

longstanding Howey test. Where tokens are securities, if offered to U.S. persons or with a U.S. nexus they fall under the SEC's jurisdiction. And the SEC has already started to act, with the creation of a cyber task force and the announcement at the end of last month of its first enforcement actions against ICO fraudsters.

- 9.4. I believe the markets are welcoming and adapting to greater legal certainty accompanied by robust enforcement.

I thank you again for inviting me here to address this distinguished forum, and I would be happy to answer any questions or provide further comment during the discussion section of today's meeting, or afterwards.

ENDNOTES

ⁱ Jeff Bandman is Founder and Principal of [Bandman Advisors](#), an advisory practice focused on helping financial services clients ranging from start-ups to global firms meet innovation and regulatory strategy challenges. He is also a member of the Blockchain for Algorithmic Regulation and Compliance (BARAC) initiative at University College London's Centre for Blockchain Technologies, and serves as FinTech regulation mentor for the Techstars Barclays FinTech Accelerator in New York.

Previously, Jeff served at the U.S. Commodity Futures Trading Commission from 2014 to 2017. As FinTech Advisor to Chairman J. Christopher Giancarlo, he was Founding Director and architect of LabCFTC, the CFTC's new hub for engagement with FinTech innovation. Jeff led FinTech and RegTech coordination with domestic and international regulators, and led an international regulator workstream on post-trade digital innovation in distributed ledger technology and blockchain for reporting and data management. He established and chaired the CFTC blockchain/DLT/FinTech staff working group. Jeff previously led the CFTC's Division of Clearing and Risk, which oversees many of the world's largest clearinghouses (CCPs). He led the negotiations resulting in "Clearinghouse Equivalence" with the European Commission. He joined the CFTC as Special Counsel to Chairman Timothy Massad, and also led the CFTC's Office of International Affairs.

Jeff worked for many years in the financial industry in New York and London. He advised the Futures Industry Association on launching the SEF Tracker data product. As Head of Partnerships & Alliances of LCH's SwapClear, he helped design and launch the SwapClear "FCM service" for clearing interest rate swaps through US intermediaries. He also devised the innovative CCP Squared partnership program and led the award-winning SMART margin simulator. Jeff earlier worked on a variety of new market structure and FinTech initiatives in New York and London, including LiquidityHub and the Project Rainbow consortium. Before that he rebuilt Cantor Fitzgerald's market data business after the events of September 11. Jeff started his career as an associate at Cravath, Swaine & Moore in New York, and was Americas General Counsel for Prebon Yamane, now part of the ICAP group.

Jeff Bandman, Principal, Bandman Advisors
Testimony to SEC Investor Advisory Committee
October 12, 2017

He graduated from Yale *magna cum laude*, with honors in History and English, and has a law degree from Stanford, with honors as a member of the “Order of the Coif”. He is a five-time Jeopardy! Champion and spent his winnings backpacking around Africa, Asia and Europe.

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ⁱⁱ These institutions are systemically important, critical market infrastructure - responsible for holding over \$300 billion of collateral in cash and securities, 2/3 of which - \$200 billion – comes from customers like asset managers, pension funds and insurance companies as well as end user businesses, farmers and ranchers.

ⁱⁱⁱ These have been discussed at far greater length in a number of useful white papers and consultations. Excellent examples include the Federal Reserve Board’s December 2016 white paper “Distributed ledger technology in payment, clearing and settlement”, available at <https://www.federalreserve.gov/econresdata/feds/2016/files/2016095pap.pdf>; CPMI’s “Distributed ledger technology in payment, clearing and settlement – an analytical framework”, published in February 2017, available at <http://www.bis.org/cpmi/publ/d157.pdf>; the IOSCO “Research Report on Financial Technologies”, also published in February 2017 <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf>; the FSB’s Financial Stability Implications of FinTech, published June 2017, available at <http://www.fsb.org/wp-content/uploads/R270617.pdf>; FINRA’s January 2017 report entitled Distributed Ledger Technology: Implications of Blockchain for the Securities Industry, available at http://www.finra.org/sites/default/files/FINRA_Blockchain_Report.pdf; World Economic Forum, “Beyond Fintech: A Pragmatic Assessment of Disruptive Potential in Financial Services,” August 22, 2017; [http://www3.weforum.org/docs/Beyond_Fintech - A Pragmatic Assessment of Disruptive Potential in Financial Services.pdf](http://www3.weforum.org/docs/Beyond_Fintech_-_A_Pragmatic_Assessment_of_Disruptive_Potential_in_Financial_Services.pdf); and “Implications of FinTech developments for Banks and Bank Supervisors,” Bank for International Settlements, Basel Committee on Banking Supervision, August 2017, <http://www.bis.org/bcbs/publ/d415.htm>.; Financial Conduct Authority Discussion Paper on Distributed Ledger Technology, <https://www.fca.org.uk/publication/discussion/dp17-03.pdf>; and European Securities and Markets Authority Discussion Paper, June 2016 https://www.esma.europa.eu/sites/default/files/library/2016-773_dp_dlt.pdf

^{iv} During my tenure running the Division of Clearing and Risk at the CFTC, a major priority and accomplishment was the formal adoption by the Commission, after full notice and comment rulemaking, of a major new cyber security rule for clearinghouses, which our division drafted in conjunction with the division overseeing exchanges – thus raising the bar for clearinghouses to evolve and apply best practices. It also imposed new requirements for independent testing, and gave stronger authority to our examiners to look at enterprise risk safeguards.

^v For greater detail about “Real-Time Regulation” and policy and operational implications for regulators, see “Real-Time Regulation and Blockchain Data,” available at <https://www.bandmanadvisors.com/publications/>.

^{vi} See, e.g. Financial Conduct Authority Discussion Paper on Distributed Ledger Technology, p. 15 <https://www.fca.org.uk/publication/discussion/dp17-03.pdf>; European Securities and Markets Authority Discussion Paper, June 2, 2016 https://www.esma.europa.eu/sites/default/files/library/2016-773_dp_dlt.pdf.

^{vii} See Address of CFTC Chairman J. Christopher Giancarlo before the New York FinTech Innovation Lab: “LabCFTC: Engaging Innovators in Digital Financial Markets”, in particular the section “Introducing CFTC 2.0”.
<http://www.cftc.gov/PressRoom/SpeechesTestimony/opagiancarlo-23>

^{viii} <http://www.bankofengland.co.uk/Pages/fintech/default.aspx>. In fact, the Bank of England’s first Proof of Concept (POC) focused on blockchain technology, and whether it was sufficiently developed to underpin their next generation real time settlement system. The Bank concluded that it was not sufficiently developed. However, they determined to make their new RTGS system compatible with blockchain.

^{ix} Commissioner Quintenz said, “Interestingly, a legal barrier has actually prevented us as a federal agency from effectively “demo-ing” technology and having the same authorities and flexibilities as some of our foreign counterparts to work on ‘proof of concept’ projects with innovators. Ethics rules preclude the agency from accepting “anything of value” without providing fair compensation. However, providing compensation would trigger an arduous and tightly framed procurement process, making sandbox demos enormously burdensome and time consuming.” Keynote Remarks of CFTC Commissioner Brian Quintenz before the Symphony Innovate 2017 Conference, <http://www.cftc.gov/PressRoom/SpeechesTestimony/opaquintenz1>

^x A simple fix could be to establish *de minimis* dollar threshold limits that would allow regulators to implement small scale experimental FinTech and RegTech procurements outside of existing procedures, along with narrowly tailored and proportionate ethics exceptions. I am most definitively not advocating a *carte blanche* exception to either procurement or ethics rules.

^{xi} <https://www.sec.gov/news/press-release/2017-131>