

Six Mega-Trends Facing 21st Century Financial Markets **CFTC Commissioner J. Christopher Giancarlo**

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Hello. I'm Chris Giancarlo, a Commissioner of the U.S. Commodity Futures Trading Commission. In this podcast I will present my views on six major challenges to world financial markets in the early 21st century. These remarks reflect my own views and do not necessarily constitute the views of the CFTC, my fellow CFTC commissioners, or the CFTC staff.

In June of 2016 I will celebrate my second anniversary as a commissioner. As a new market regulator and a longstanding supporter of thoughtful market reform, I have met with fellow financial regulators in North America, Europe and Asia. I have spoken with institutional participants in all the major global trading markets, and I've traveled throughout the United States, meeting with American farmers, dairymen, pork producers, row crop farmers, oilmen, energy producers and industrial manufacturers who all use derivative markets to control production costs and other risks. Before being sworn-in as a commissioner, I served over a dozen years as a senior executive of a leading operator of electronic and hybrid-trading platforms for cash and derivative products. In that role, I helped build a global business that fosters trading liquidity for thousands of institutional clients in all the major wholesale markets.

I provide this background to demonstrate how my work at the CFTC and my prior business experience gives me a critical understanding of U.S. and global financial markets and the major challenges facing them today. Yet in my first year in Washington, I have been struck by how backward-looking is much of the discussion around global financial markets. The Dodd-Frank Act was passed over five years ago, but market participants and financial regulators must still spend much of their professional time arguing over and addressing its myriad mandates and peculiar prescriptions, regulatory edicts ostensibly designed to prevent reoccurrence of the last crisis. Now, just as peacetime generals are always fighting the last war, and economists fight the last depression, so too do financial regulators outlaw past market abuses that are not a looming threat to our financial markets and economies. The hue and cry of the ongoing financial market reforms under Dodd-Frank leaves market regulators and participants with very little available bandwidth to assess and prepare for the next financial crisis, a crisis that we can all be certain will be unlike the last one. In fact, formidable challenges to capital markets are emerging in the U.S. and global markets, challenges for which Dodd-Frank provides little guidance and few solutions. Challenges, that unaddressed, could be the catalyst for future crisis. Last month, I described these challenges in a lecture I gave at Harvard Law School. Today, I would like to share with you my view of the real challenges facing capital and risk-hedging markets in the first quarter of the 21st century.

I believe there are six overarching challenges facing global financial markets. They are:

- Cyber threats;
- Disruptive technology;
- Central bank intervention;

- Market illiquidity;
- Market concentration; and
- Deglobalization.

I will describe those for you now. And it's appropriate to begin by discussing cyber threats that I believe are the biggest risk facing global financial markets today. The U.S. Department of Defense identifies cyberspace as a new domain in warfare, as critical to military operations as land, sea, air and outer space. Today, this battlefield is active, with relentless cyber attacks on U.S. financial market participants. Former U.S. Defense Secretary, Leon Panetta, has warned of a potential "cyber Pearl Harbor." My colleague, CFTC Chairman Timothy Massad, says that cybersecurity is the most important single issue facing our markets today, in terms of market integrity and financial stability. I fully agree. Market regulators should have no illusions that cyber-belligerents, foreign and domestic, view the world's financial markets as 21st-century battlefields. Cyber-enemies could use a range of new battle tactics to try to cripple financial markets, from destroying the course of banking and trade-settlement transactions, to using poison-pill algorithms to flood markets with bad data and fake trades in order to drive trading volatility and market collapse. And attacks would not just be directed to western financial markets. All markets around the globe are vulnerable to cyberattack, whether as a primary target or as an attack response. Unfortunately, cyber-hostilities will not end any time soon. They will be relentless for years, if not decades to come. As mega-trends go, cyber-risk is the number-one threat to 21st-century financial markets. It is a threat for which Dodd-Frank provides no guidance. As market leaders and regulators, we must make it our first priority in time and attention. We must leave no step untaken or precaution unavailed to thwart cyber-destruction of the world's financial markets.

Now these 21st-century cyberthreats exist within the context of a new phase in human history, when exponential digital technologies are rapidly changing the very nature of human identity, work, leisure and society. Contemporary financial markets will experience this evolution most acutely in three areas: automated electronic trading; blockchain ledger methodology; and financial cartography.

The electronification of trading over the past 30 to 40 years, and the advent of exponential digital technologies, have transformed financial businesses, markets and entire economies, with dramatic implications for capital formation and risk transfer. In U.S. futures markets, we see this change most presently in the area of algorithmic or automated trading that now constitutes up to 70 percent of regulated futures markets. Automated trading can lower transaction costs while increasing trader productivity for greater transaction speed, precision and sophistication. For many markets, automated trading brings trading liquidity, broader market access, enhanced transparency, and greater competition. At the same time, automated trading presents new challenges. They include increased risk of sudden spikes in market volatility and phantom liquidity arising from the sheer speed of execution, flawed algorithms and position-crowding.

Legal scholars raise important questions about the continuing viability of traditional market regulation and well-recognized legal concepts in rapidly evolving automated markets. To ensure, vibrant, accessible and durable markets, we must emplace effective safeguards without harming innovation and promising market development. The only effective way for a regulatory

agency to stay abreast of the rapid advances of trading automation is to be informed through an ongoing, bottom-up process. That is, through industry working groups setting industry best practices and procedures that are adopted as standards by market self-regulatory organizations. Regulatory frameworks for automated trading must enhance, not stifle, such best practices. They must be informed by technological innovation and improvement, not media headlines, bestselling books or political campaign agendas. In November, the CFTC issued proposed rules for the registration and regulation of automated trading. While I voted to put the rule out for public comment, I questioned whether the proposal sufficiently benefits the safety and soundness of America's futures markets to outweigh its additional costs and burdens. I voiced three primary concerns.

First, the apparent window-dressing of requiring risk controls and testing that are already widely adopted by industry. Second, the high cost and burdens the rule places on small market participants. And third, the rule's inconsistencies regarding what firms must comply with it. I also voiced particular concerns about the proposed requirement that CFTC registrants hold their proprietary source code in data repositories that are available at any time, for any reason, to any representative of the CFTC or the United States Department of Justice. I asked why the Commission thinks it needs access to source code, what it will do with it, and how it will keep it confidential from data breaches and cyber-attacks. It is clear that finance is increasingly becoming an industry where machines and humans are swapping their dominant roles, transforming modern finance into what scholar Tom Linn has called "cyborg finance." How markets around the world adjust to this evolution from human to automated trading will be extremely important. It requires delicate balancing, and again Dodd-Frank offers no guidance whatsoever.

A similarly significant technological evolution may be about to occur in the inefficient and unstable underpinnings of the current closed-ledger financial system, in which centralized third parties authenticate financial information in generally three-day settlement timeframes. This process adds undue risk, cost and volatility to the marketplace. The rapid development of distributed open-ledgers has the potential to revolutionize modern financial ecosystems. Unlike current settlement processes, distributed ledgers use open, decentralized, consensus-based authentication protocols. They allow people who have no particular confidence in each other to collaborate without having to go through a neutral central authority. Distributed ledgers will have broad implications for financial markets in payments, banking, securities settlement, title recording, cyber security and the process of collateral management that is made infinitely more complex by new regulations. Open ledgers may make possible new "smart" securities and derivatives that can value themselves in real time, automatically calculate and perform margin payments and even terminate themselves in the event of a counterparty default.

Enormous resources are being invested in developing the distributed open ledger known as the blockchain. Over two dozen major global banks have joined together in a consortium to build a framework for using blockchain technology in markets. The London Stock Exchange, CME Group, Euroclear, Société Générale and UBS have set up the Post Trade Distributed Ledger Working Group to look into how blockchain technology can be used in clearing, settlement and reporting of trades.

The Bank of England has called the blockchain “the first attempt at an ‘internet of finance’” with the potential to de-centralize legal recordkeeping the same way the Internet de-centralized data and information. This transformation will not come without consequences, however, including a greatly disruptive impact on the human capital that supports the recordkeeping of contemporary financial markets. On the other hand, the blockchain will help reduce some of the enormous cost of the increased financial system infrastructure required by new laws and regulations, including Dodd-Frank.

I will mention one further technological breakthrough, that is network science, an interdisciplinary field that draws upon evolving peer-to-peer methodologies to enhance human understanding of the networks that make up the natural and scientific world, from biological to technological networks. The continued development of interactive financial network maps allows analysts to explore and diagnose system fragilities and mitigate critical vulnerabilities and escalating risk patterns.

At the heart of the 2008 financial crisis was the inability of regulators to assess and quantify the counterparty credit risk of large banks and swap dealers. The legislative solution was the establishment of swap data repositories under the Dodd-Frank Act. Yet seven years after the financial crisis, and despite much hard work and effort, swap data repositories or “SDRs” as they’re known, still cannot provide full transparency into global counterparty exposure that Dodd-Frank was designed to provide. That is because international regulators have not yet harmonized global-reporting protocols and data fields across international jurisdictions. Harmonization has been hindered by a major flaw in Dodd-Frank, imposing indemnification obligations on overseas regulators in the course of sharing swap trading data information. That Dodd-Frank flaw was, at last, corrected in the FAST Act signed in December 2015. I am hopeful that this statutory fix is a signal that further steps are possible to correct other flaws in Dodd-Frank and its implementation.

Of all the many mandates to emerge from the financial crisis, visibility into counterparty credit risk of major financial institutions was perhaps the most pressing. The failure to accomplish it is certainly the most disappointing, especially as the emerging science of financial cartography is so promising. The truth is that global regulators cannot by themselves achieve the objective of full counterparty credit risk transparency. What is needed is a concerted effort by regulators, academics and the private sector that draws on the emerging network science of financial networks. It is well past time to make that happen.

Now, turning from the impact of new technologies, let me now identify another major market disrupter of enormous proportion: the Federal Reserve and its overseas brethren. Since the 2008 financial crisis, the Fed has made itself an increasingly outsized player in the U.S. government debt markets, roughly quintupling its balance sheet from \$905 billion in early September 2008 to almost \$4.5 trillion today, equal to one-fourth of the U.S. economy and nearly five times its pre-crisis level. Through its quantitative easing or QE program, the Fed has purchased an unprecedented 61 percent of all Treasury issuance, peaking at close to 80 percent in calendar year 2014.

Today, the Fed has become the multi-trillion dollar “Washington Whale.” Its intervention in the Treasury and mortgage-backed security markets misprices the true cost of credit below its

natural level and distorts the integrity of prices and exchange rates. The Fed is having an increasingly direct and immediate impact on all other markets, from corporate bonds to equities and foreign exchange rates, to developing nations' sovereign debt. It has reduced the heterogeneity of the investor base, herding it into one-way bets on anticipated changes in Fed policy rather than traditional fundamental credit or value analysis. When I spoke at Harvard in December 2015, I said that the Fed's outsized market participation contributes to greater market volatility. It hazards periods of sharp illiquidity in response to relatively normal market shocks as crowded market participants quickly seek to adjust such correlated positions upon the slightest hint of changes in Fed policy. It has increased the risk that when investors rush to reduce those correlated positions, they will flood the market, causing a pronounced drop in prices and the possibility of a new crisis.

I said that the Fed is not the only central bank engaging in such extraordinary market intervention. The phenomenon extends to the People's Bank of China, the Bank of Japan and the European Central Bank. Well, just two days later, on Thursday, December 3, 2015, the ECB unveiled new monetary policy-easing measures that fell far short of consensus expectations. As I would have anticipated, the market reaction was violent. European stocks fell by more than three percent, the Euro hiked more than three cents against the dollar, and the Eurozone bond yields rocketed higher. As a result, some of the world's largest hedge and investment funds lost as much as five percent of their value in one trading day.

Unfortunately, as we begin 2016, this type of sudden market volatility is now the new norm. Market leaders and regulators, who have responsibility for market health and safety, must account for the new impact of the Fed's role as the Washington Whale, and that of its overseas brethren. Central banks have replaced major dealers and money center banks as marketplace leviathans plunging into increasingly shallower pools of trading liquidity. With one flip of their policy tails, these central bank behemoths can whack a whole lot of smaller market participants out of once-liquid markets and leave them gasping. As market overseers, we must understand the risks posed to market liquidity and price integrity by the ballooning role of central banks in increasingly shallower financial markets.

Speaking of liquidity, the diminishment of it is the fourth mega-trend that I would like to address. In essence, liquidity is the degree to which a financial instrument may be easily bought or sold with minimal price disturbance by ready and willing buyers and sellers. Quantifying liquidity is challenging, but not impossible. A range of characteristics such as market depth, width, volume, resiliency, immediacy, participation and turnover can more readily qualify it.

Today it is widely apparent that many of these liquidity characteristics have been fundamentally changed in many asset classes and marketplaces. Accounts of liquidity distortion extend from U.S. Treasury securities to German bonds, to corporate bonds, equities, U.S. and euro interest rate swaps, single-name credit default swaps, cross-currency swaps, repos and energy swaps and futures.

Concerns about liquidity deterioration have been voiced by the International Monetary Fund, the Bank for International Settlements, the Bank of England, Fed Chairwoman Janet Yellen, financier Stephen Schwarzman and noted economist Nouriel Roubini. While some central bankers voice skepticism over the lack of quantitative evidence of illiquidity, there is real

concern amongst those with financial market responsibility and knowledge, including financial market regulators and major market participants.

We saw evidence of pronounced liquidity contraction, as I described in December 2015, following the ECB announcement of less-than-anticipated monetary easing. We saw it in August 2015, in enormously volatile equity markets, when major global banks focused on executing trades for their clients rather than for their own account. We saw it the prior June, with sudden spikes in the German Bond market. And we saw it on October 15, 2014, when the market for U.S. Treasury securities, futures and other closely related financial markets experienced an unusually high level of volatility and a very rapid and pronounced round-trip. And we see it in recent CFTC research that flash volatility spikes have become increasingly common, with at least 35 spike events in 2015 in core futures products such as corn, gold, WTI crude oil, E-Mini S&P and Euro FX products.

Traditionally, large global money center banks served to reduce such market volatility by buying and selling reserves of securities and other financial instruments to take advantage of short-term anomalies in market prices. Their balance sheets served as market shock absorbers in times of market turbulence. Now, market shock absorbers seem to be a thing of the past. Throughout these recent sharp volatility episodes, banks appear to have been unable to step in aggressively to provide additional trading liquidity.

A major catalyst of the reduced bank trading liquidity in financial markets is the new regulatory policies of U.S. and overseas bank prudential regulators imposed in the wake of the financial crisis. Arising from the political narrative that the financial crisis of 2008 was primarily about deregulated banks engaged in excessive trading leverage rather than a burst bubble of toxic mortgages and mispriced credit, many new financial sector regulations are disproportionately focused on capital adequacy of banks and financial institutions without corresponding attention to housing finance reform. Most of the new regulations have the effect of reducing the ability of medium and large financial institutions to deploy capital in trading markets. Combined, these disparate regulations are already sapping global markets of crucial trading liquidity. Many of these new rules were cobbled together in the Dodd-Frank Act, the EU's EMIR and MiFID regulations, the Basel III accords and regulations by other overseas authorities. They have been promulgated in an uncoordinated and ad hoc fashion with a paucity of predictive analysis of their impact on global trading markets.

In trying to stamp out risk, global regulators are instead harming trading liquidity. Capital-constrained banks and other market makers have little choice but to limit their exposure to increasingly fragmented markets, especially in the event of financial turmoil. These changes make the U.S. financial system more vulnerable to debilitating financial shocks, not less.

Some believe that new, non-bank entrants into financial markets will make up for reduced bank trading capital. They contend that bank liquidity will be fully supplemented by proprietary firms using automated trading algorithms with greater speed, accuracy and transaction volume than traditional bank trading desks. Others are less sanguine that the void of bank trading liquidity can so readily be filled by newer market entrants with far smaller balance sheets that cannot access now-constrained major bank capital.

The question that must be asked is whether the amount of capital bank regulators are causing financial institutions to take out of trading markets is at all calibrated to the amount of capital need to be kept in markets to support market health and durability. I understand how prudential regulators want banks to limit trading capital to limit their insolvency risk. But what is missing is any analysis of how much trading capital is appropriate to limit broad liquidity risk. Those of us with direct responsibility of overseeing financial markets need to ask that question and demand that analysis, even if bank prudential regulators will not. Once again, Dodd-Frank provides no answers.

I will now turn to the fifth mega-trend. It is the wave of market consolidation that has taken place across the financial landscape, concentrating the provision of essential market services to fewer and fewer institutions. It is now widely recognized that Dodd-Frank regulations have wiped out small community banks across America's agriculture landscape. It is less well-acknowledged that large banks are broadly reducing market services, jettisoning less-profitable clients and increasing some fees on others in such critical areas as prime-brokerage and administrative services. A similar narrowing of market services is taking place in the swaps markets, where rising regulatory costs are driving consolidation of transaction service providers into a few remaining major swap-execution facilities.

This wave of consolidation is perhaps most glaringly apparent in the case of America's futures commission merchants. While not a household term, futures commission merchants, or FCMs, are the futures market equivalent of stock brokers, providing critical services for businesses and farmers that need to hedge against business and production risks. Today, because of a combination of mismanagement, U.S. monetary policy and over-regulation, FCMs are becoming an endangered species, with dire consequences for America's smaller farmers, ranchers and manufacturers.

A modern, dynamic economy can only prosper if it is supported by efficient banking sectors and capital markets featuring a large and diverse range of service providers meeting changing customer needs. Just as eco-systems in the natural world benefit from broad bio-diversity, so do vibrant and durable financial markets thrive best with a broad array of service providers and trading counterparties. Unfortunately, global financial markets are now undergoing a pronounced reduction in the bio-diversity of market service providers, with deleterious effect on market safety and soundness. Market regulators must find a way to reverse this trend, that threatens the systemic safety that Dodd-Frank was meant to preserve.

I will now discuss one final market mega-trend, and that is de-globalization. Starting in the middle of the second half of the last century, regional and national markets for financial products expanded into global markets with the result of rising employment and standards of living for over a generation. That era produced a new term, "globalization," denoting increased interdependence of economic and cultural activities. Then came the 2008 financial crisis and the political and regulatory response, that seems to have reversed the course of financial market globalization.

One key catalyst for this de-globalization is the swaps trading regulatory framework adopted by the CFTC several years ago. As I described in a major white paper last January, there is a fundamental mismatch between that regulatory framework and the distinct liquidity and trading

dynamics of the global swaps markets. This mismatch, and the application of the framework worldwide, has caused numerous harms, foremost of which is driving away global market participants from transacting with entities subject to CFTC swaps regulation, resulting in fragmented global swaps markets.

Traditionally, users of swaps products chose to do business with global financial institutions based on factors such as quality of service, product expertise, financial resources and professional relationships. Now, those criteria are secondary to the question of the institution's regulatory profile. Overseas market participants are avoiding financial firms bearing the scarlet letters of "U.S. person" in certain swaps products to steer clear of the CFTC's problematic regulations. As a result, non-U.S. market participants' efforts to escape the CFTC's flawed swaps trading rules are fragmenting global swaps trading and driving away global capital from U.S. markets.

Since the start of the CFTC's swaps trading framework in October 2013 and accelerating with mandatory trading in February 2014, global swaps markets have divided into separate trading and liquidity pools, between those in which U.S. persons are able to participate and those in which U.S. persons are shunned. Liquidity has been fractured between a U.S.-person market on one side and a non-U.S.-person market on the other.

Fragmentation has exacerbated the already inherent challenge in swaps trading—adequate liquidity—and is increasing market fragility as a result. Fragmentation has led to smaller, disconnected liquidity pools and less efficient and more volatile pricing. Divided markets are more brittle, with shallower liquidity, posing a risk of failure in times of economic stress or crisis. Fragmentation has increased firms' operational risks as they structure themselves to avoid U.S. rules and manage multiple liquidity pools in different jurisdictions. As structural complexity has grown, operational efficiency has been reduced.

Just as healthy financial markets require biodiversity of service providers and trading participants, so also they benefit from broad continuity of trading systems. The current fragmentation of global financial markets may be likened to habitat fragmentation in the natural world, in which large, continuous biological habitats are divided into a greater number of smaller ecosystems, isolated from each other by a matrix of dissimilar habitats, resulting in broad ecosystem decay. In a similar way, trading market fragmentation caused by ill-designed rules and burdensome regulations, and the application of those rules abroad, is harming market liquidity and market safety and soundness, increasing the systemic risk the Dodd-Frank Act was predicated on reducing. Amidst the current tide of de-globalization and slowing world economic growth, market regulators cannot continue to ignore the growing systemic risk caused by market fragmentation.

So I will now conclude by asserting that modern financial markets are like complex, global ecosystems in the natural world. Today, those market ecosystems face six major challenges:

First, relentless assault by hostile cyber predators;

Second, rapid habitat transformation by new digital technologies;

Third, single-species overexpansion and dominance by "Washington Whale" central banks;

Fourth, ecosystem shrinkage through loss of trading liquidity;

Fifth, reduction in biodiversity of key market service providers; and

Sixth, habitat fragmentation of global trading environments;

Regulators and others with responsibility for financial markets must take steps to address these challenges: prioritize cyber-risk resiliency; foster best practices for new trading technologies; counter the distortions caused by central bank market intervention; acknowledge and address the diminishing liquidity in trading markets; and review and reduce the numerous poorly designed rules and regulations that are causing service-provider concentration and market fragmentation.

Contemporary arguments over the efficacy of the Dodd-Frank Act and its myriad of mandates and prescriptions are increasingly tired and stale. They are especially so when it comes to financial markets in the 21st century. The fact of the matter is that Dodd-Frank provides very few solutions for the challenges that actually face today's financial markets. In fact, Dodd-Frank provides barely any guidance, but quite a few distractions and hurdles, to the complicated issues surrounding us.

It is said that you can avoid reality, but you cannot avoid the consequences of avoiding reality. Only with clear-eyed attention to the true challenges facing contemporary markets can we ever restore the market vitality that will be necessary for broad-based economic prosperity. We must stop fighting the last crisis. The challenges facing our capital markets in the early part of the 21st century are not answered by Dodd-Frank. Instead, flourishing capital markets *are* the answer to U.S. and global economic woes, not diminished trading and risk transfer. We must foster safe, sound and vibrant global markets for investment and risk management if we are to ever escape the new mediocre of prolonged economic stagnation.

Thank you.