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Hearing

*"*US-China: Winning the Economic Competition*"*

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Testimony of

Hon. J. Christopher Giancarlo

Thank you Chairman Cotton, Ranking Member Cortez Masto and members of the Subcommittee for the opportunity to testify today.

I am Chris Giancarlo, Senior Counsel at Willkie Farr & Gallagher. I am also a founder and principal in the Digital Dollar Project.

Three Observations

A few weeks ago, I had the honor to appear before the full Senate Banking Committee. In my testimony, I offered three observations from my years of service on the Commodity Futures Trading Commission. The first stems from the fact that so much of America's physical infrastructure – its bridges, tunnels, airports and mass transit systems – that were state-of-the-art in the twentieth century, have been allowed to age, deteriorate and become obsolete in the twenty-first century.

Sadly, the same is true about too much of America's financial infrastructure. Systems for payment and settlement, shareholder and proxy voting, investor access and disclosure, and indeed, financial system regulatory oversight, that were once state of the art and global models in the twentieth century, have fallen behind the times and, in some cases, embarrassingly so in the twenty-first century. This aging financial system infrastructure puts the United States at a competitive economic disadvantage to economies like China that are building new financial infrastructure based on twenty-first century digital technology.

For example, it typically takes days in America to settle and clear retail bank transfers. In many other countries it takes minutes, if not seconds. It also takes days to clear and settle securities transactions, and weeks to obtain land title insurance. And, nothing reveals the limits of our existing financial system more starkly than the US government's response to the current COVID-19 pandemic, in which tens of millions of Americans had to wait a month or more to receive relief payments by paper check, while an estimated 1.1 million payments totaling nearly $1.4 billion were distributed to

deceased Americans. Meanwhile, other economies, like China's, are advancing rapidly in deploying instantaneous, digital currency payment systems.

Another observation is that the world is indeed entering a new era when things of value, such as money, contracts, stock certificates, land records, cultural assets like art and music, our personal identities, and even our votes, will be stored, managed and moved around in a secure way instantaneously from person to person without central validators. This is what some people call the Internet of Value.

That first internet wave over the past few decades was an internet of information,[1] which was then followed by the Internet of Things, where everything from assembly lines to refrigerators becomes connected to the internet. All of that is about to be superseded by the next wave, the Internet of Value. In this new era, trust will be less often provided by established, central institutions, as is the case in most of the world's existing financial market infrastructure. Rather, with proper governance it will be achieved through cryptography, tokenization, shared ledgers and a network of computational algorithms. In the same way that the first wave of the internet enabled immediate transfer of words and information through distributed computer networks, this next wave will enable instantaneous person to person transfer of things of value, be they shares of stock, automobile titles or money.

My third observation is that, if we act now, we can harness this wave of innovation for greater financial inclusion, capital and operational efficiency, and economic growth for generations to come. If we do not act, however, this coming wave of the internet will lay bare the shortcomings of America's aged, analog financial systems.

These three observations - the aging of our existing financial market infrastructure, the coming Internet of Value, and the economic and social benefits if we do act – have driven my professional engagements since leaving the CFTC.

The Digital Dollar Project

Early this year, I created the Digital Dollar Foundation, a not-for-profit enterprise, along with my brother, Charles Giancarlo, a veteran Silicon Valley engineer, entrepreneur and corporate executive and Daniel Gorfine, the CFTC's former Chief Innovation Officer. The Foundation partnered with David Treat and his innovation team at Accenture on a pro bono basis as lead architect and technology advisor[2].

Together, the Foundation and Accenture launched the *Digital Dollar Project (https://www.digitaldollarproject.org)*. The Project's purpose is to lead public discussion of the merits of a tokenized form of a US CBDC or, what we alliteratively termed in January of this year, a "Digital Dollar." The Project is not a commercial enterprise,

[1] An early example of the first Internet wave is Wikipedia, which is composed collaboratively by largely anonymous volunteers who share information and compose peer reviewed entries without pay. A later example is Facebook, an online social community that is valued largely for its prowess in analyzing and merchandising large data sets.
[2] Globally, Accenture's work on central bank digital currency includes engagements with the Bank of Canada, the Monetary Authority of Singapore, the European Central Bank, and Sweden's Riksbank.

but an effort to encourage research and public discussion on the potential advantages of a US CBDC, convene private sector thought leaders and actors, and propose possible models to support the official sector, from key agencies to member of Congress, as it considers development, testing and adoption. The Project looks to advance the public interest in future-proofing the dollar for consumers and institutions here in America and around the world.

To gain diverse perspectives from key stakeholders, the Digital Dollar Project formed a non-partisan advisory group that includes a broad array of economists, business leaders, technologists, innovators, lawyers, academics, and consumer advocates across the social and political spectrums.[3] The Advisory Group helps explore design options and approaches for creating a US CBDC through a deliberative process, including stakeholder meetings, roundtable discussions and open forums.

The Project recently published its inaugural white paper detailing a path forward and considerations for the development of a US CBDC. The white paper proposes for consideration as a champion model a tokenized US CBDC that operates alongside existing monies, is primarily distributed through the existing two-tiered architecture of commercial banks and regulated money transmitters and is recorded on new transactional infrastructure informed by distributed ledger technology (DLT). The white paper outlines the benefits of a CBDC in the context of the US dollar, and proposes potential use cases and pilots.

Among the multitude of highly effective payment options in the United States (e.g., cash payment, credit, debit, etc.), a CBDC would offer a new choice for digital transactions, instantaneous peer-to-peer payments and in-person transactions. It could also potentially lower costs and further diversify payment rails. A US CBDC could be distributed to end-users through commercial banks and trusted payment intermediaries. It would facilitate financial inclusion by broadening access to services through additional mechanisms, such as digital wallets. In particular, a US CBDC could expand the ability of currently un-or-underbanked populations to access digital financial services and transact on e-commerce platforms that do not deal in physical cash.[4]

Central Bank Digital Currencies: Decentralized Fiat Money

Before delving further into the benefits of a US CBDC, it may be helpful to review the ability to distribute money with existing financial infrastructure. Practically speaking, traditional dollar bank notes are local instruments. They are distributed by the Federal Reserve to local banks and restricted to physical transactions in the presence of payer and payee, making them impractical for large value payments. Traditional dollar banknotes do not work in modern eCommerce.

[3] Members of the Advisory Group are set out in the appendix hereto.

[4] Bank notes are often used to make small payments in the physical world, although, on average, physical cash usage is in decline compared against other payment methods. This dynamic is likely to progress in a post-COVID 19 world, thereby making it increasingly important for digital financial options to extend more broadly.

A US CBDC would represent a new format of central bank money to complement bank notes and reserves while integrating seamlessly with existing banking and payment functions. The innovation rests in the adoption of properties akin to a token or digital bearer instrument, allowing the dollar to become digital and portable. Distributed ledger technology (DLT) may offer the most effective approach to issue, distribute, transfer and redeem tokens. It would enable the dollar to be sent in real time anywhere in the physical and virtual worlds as easily as sending a text message.

The Digital Dollar Project proposes that issuance, distribution and redemption of a US CBDC take place just as cash does today. It would be issued by the Federal Reserve to domestic banks or regulated entities against reserves. Banks would distribute Digital Dollars to domestic end-users' digital wallets against bank deposits and against collateral to non-resident banks. It would be redeemed against bank deposits and collateral at banks and against reserves at the central bank. The token-based properties would allow Digital Dollars to be intermediated through existing channels.

For domestic end-users, digital wallets would offer essential payment functionalities and be integrated with existing banking services to enable a seamless integration with the financial system. Payments at points of sale could still be conducted through conventional terminals or fully contactless solutions. Regulated entities would extend such wallets to their customers through existing outlets for mobile phone applications covering required know-your-customer and anti-money laundering provisions. For unbanked end-users, wallet services could come pre-loaded on mobile phones. Advanced off-line capabilities are possible to allow local transactions to take place when the telecommunication networks are down.

The DLT network would operate on an autonomous permissioned network and ensure validity and integrity of all transactions. The verification of transactions would rest on the complete history or lineage of the tokens from original issuance in order to attest tokens are genuine and have not been double spent. The advantages of tokens derive from their bearer instrument nature and the ease with which interactions with existing banking and payment functions can be performed. Participants only need to interact with the tokens and do not require to be connected to a payment system.

DLT network participants would include the central bank and potentially resident banks, other financial intermediaries, and new entities that can help afford greater resilience in payment processing. The distributed nature of the DLT platform would enhance security as manipulation of the network would be computationally near impossible. The DLT platform would add to payment system diversification by operating on separate payment rails using the Internet, enabling distribution of central bank money independent of the functioning of the banking system.

Tokenized Money: A Brief History

Money has evolved over the span of human civilization. Initially trade was through barter: a chicken for a clay pot. However, what does a society do when a person wants to trade a blanket, but doesn't need a clay pot in return? The answer was

a token that society recognized as representing value and could be traded for any good whether a clay pot, a chicken or a blanket. The first token may have been shells or beads. It evolved to things that carried some inherent value such as salt (the currency of the Roman army from which the word "salary" derives) or coins minted from precious metals like silver and gold. In more recent times, tokens of currency were based on intangible items of little intrinsic value such as paper or, today, polymer notes. As economies evolve into the future, so will their tokens.

The physical paper greenback dollars in circulation today are tokens. In comparison, the Dollars that can be spent by use of credit and debit cards and money drawn with a check are account-based. Most money used in the US economy is account-based.

A major distinction between token-based and account-based money is the process of verification upon use. With token-based money, verification is primarily performed by the recipient confirming that the token is authentic and not counterfeit. On the other hand, accounts-based money requires third-party authentication of the identity of both parties to the transaction and the adequacy of funds in the transferor's account.

Tokenized Money: a Glimpse at its Future

The Digital Dollar Project believes that the time is right for the US to explore development of a token-based form of central bank digital currency. The Project believes that it would bring a number of potential benefits to payment, clearing and settlement systems as well as enable new access points for populations that traditionally have been underserved by financial services. The Project recognizes that such an innovation would undoubtedly pose risks and challenges. That is why the Project recommends that such development be done carefully, thoroughly and thoughtfully through a series of pilot programs.

A US CBDC is ultimately about core financial system architecture. A dollar CBDC would take advantage of emerging distributed ledger technology to enable more direct monetary relations and diversified payment systems. It would offer new functionalities and more refined tools to overcome existing limitations of central bank money. It would enhance the dollar's functionality for a new digital age.

Today, prices for most of the world's key tradable commodities, contracts and significant items of value are established in America's deep and liquid commodity futures markets overseen by the CFTC. Those market prices are set in US dollars. As a result, those commodities are paid and accounted for in US dollars. This dynamic is one of the important pillars of the US dollar's primary reserve currency status.

Tomorrow with the Internet of Value, those US dollar-denominated commodities, contracts and significant items of value will be rendered into digitized, tradable tokens and coupled with algorithmically driven smart contracts. The question is whether the instrument in which those important commodities and contracts are accounted will be correspondingly digitized or whether it will remain an analog instrument. If so, will the

digital commodities and contracts of the future will still be priced and accounted for in analog US dollars? Or will the digital commodities and contracts of the future be priced and accounted for in some other currency that is digitized, decentralized and programmable?

We must face these questions today. It would be foolish to take the Dollar's predominant status in the international financial system for granted. Creating the Digital Dollar will provide it with the best opportunity to maintain that status.

Global Competition for the Future of Money

There is an enormous amount of work being done currently by overseas central banks on central bank digital currency. I have included in the appendix to my testimony a chart of some of the major developments underway around the world.

As this Subcommittee knows well, China appears to be particularly advanced in development of a central bank digital currency, known as the Digital Currency Electronic Payment (DCEP) system. A number of large, important Chinese businesses are now joining this initiative as partners in testing and implementing the technology.

A key purpose of the DCEP is to integrate China's impending digital currency, the Renminbi, into thousands of DLT applications involving autonomous sensors and 5G telecommunications technology. Its development is designed to provide China with a significant advantage in operating outside of the current Western-dominated, bank centric accounts-based financial system.

Imagine, for example, a large African city with a water filtration station in which an electronic sensor developed and provided by China recognizes that its reserves of chlorine are running low. In time, using 5G telecommunications technology, that Chinese-built sensor will instruct a computer to automatically order chlorine supplies from a Chinese supplier in return for a direct, digital Renminbi payment with little to no human management and no transmittal through the global, account-based bank system.

Undoubtedly, creating direct information and money transfer mechanisms that avoid transaction intermediaries will bring efficiency gains to smart cities, supply chains, and electricity grids. At the same time, working around the Western-dominated, traditional banking system will undoubtedly help China's independent economic expansion. In time, China is likely to integrate DCEP into its expanding Belt and Road Initiative by encouraging participating economies to direct peer-to-peer payments using digital Renminbi. Or it could lure developing economies throughout South East Asia and Africa to peg their digital domestic currencies to that of China.

The stakes of the contest for the future of digital money are as high as any of the transformational technological revolutions of the past one hundred years. On the outcome lies a balance of geopolitical power. Chinese technological dominance in deploying digital currency systems that serve the coming Internet of Value certainly pose challenges for the U.S. and other democratic societies. If payment systems can bypass the global, account-based banking system, the United States will lose a

powerful policy tool of economic sanctions, a tool that, whatever one's opinion of specific instances or frequency of utilization, is less widely destructive than a key alternative: warfare. In addition, if foreign central banks come to maintain lesser amounts of dollar reserves to fund purchases decreasingly priced in dollars, demand will decline for U.S. government bonds. This will result in higher interest rates for the United States government and American consumers as well.

With such developments, we are indeed entering a new world. The question is who will design and build those digital systems, what tokenized currency will be utilized within them and what social values will be brought to bear. If the US dollar is to remain the world's primary reserve currency in the unfolding century, then it also must evolve from an analog to a digital currency and a unit of account that measures, supports and transacts with the world's digital tokenized things of value.

Assuring Democratic Values in the Future of Money

This post-World War Two period of the dollar's ascendance has been accompanied by another historical rarity: the birth of a truly global market for goods and services. And that birth led to the emergence into the middle class of hundreds of millions of historically impoverished people. It is not a coincidence, but a consequence, I believe, of the ascendancy of the US dollar as a global reserve currency that today more people than ever before in recorded human history enjoy improved health, child welfare, educational and civil liberty attributes that accompany material where-with-all.

I also believe that this remarkable flowering of human well-being has something to do with the global flowering of democratic ideals of individual liberty, freedom of speech, personal privacy, limited government, the rule of law and the aspirational nature of democratic societies, which I frequently cited during my time in public service. These ideals are encoded in the US currency, the dollar.

Some of those ideals are also set out in America's Constitution. One in particular, the Fourth Amendment's right to privacy, is the source of a rich body of jurisprudence defining the balance between individual rights to privacy, including financial privacy, and the state's ability sometimes to abridge that privacy for legitimate interests in law enforcement, national defense and other overriding concerns. Amongst the major democracies and certainly compared to autocracies, the United States has some of the most constitutionally established and well developed protections against government infringement of individual financial privacy.

With the proper legal and jurisprudential development around the Fourth Amendment and thoughtful design choices around anonymity and individual privacy, the Digital Dollar could well enjoy superior Constitutional privacy rights over many competing instruments, whether provided by commercial interests or other sovereigns. This would especially be so compared to a digital instruments of non-democracies which, it would be implausible to believe, will not be used as an instrument of state surveillance.

It may turn out that the United States has an ace to play in the contest for the future of digital money: privacy rights. Coding traditional American ideals of economic freedom and balanced privacy into a Digital Dollar will surely enhance its global appeal. Hundreds of millions of people in the developing world may well be reluctant to surrender their growing economic security and autonomy to authoritarian state surveillance, simply for the convenience of digital payments. As it has so often in its history, the US has the opportunity to lead in a way consistent with its finest ideals.

Piloting Development of the Digital Dollar

A well-architected, durable and universal US CBDC is in America's national interest and, I believe, in the interest of the world economy. Crafting it will be an enormous and complicated undertaking. It needs to be done carefully, thoughtfully and deliberately. Something as complex and worthy of the US dollar's global importance should not be completed in a hurried manner. It will take time and seriousness to get it right.

Nevertheless, now is the time to get started. The recent launch of SpaceX reminds us that the United States explored outer space and the lunar surface through a series of pilot programs known as Mercury, Gemini and Apollo. So too, should the US explore a Digital Dollar in a series of well-conceived and executed pilot programs.

The Federal Reserve is already looking thoughtfully at central bank digital currency. It has assembled some fine researchers. It should now take the next step and work with the US Treasury to kick off a series of pilot programs drawing upon the innovativeness of the private sector to test various design options and specific approaches, technologies and protocols.

Among other imperatives, the pilot programs should explore how a central bank digital currency can:

- Preserve the effectiveness of US monetary policy and financial stability;
- Enable ease of payments and provision of financial services to those parts of the American population that are financially underserved or excluded;
- Enhance scope, access, diversification and resilience in US dollar payments;
- Provide needed scalability, security and privacy in retail, wholesale and international payments;
- Unlock further innovation by creating the public infrastructure for tokenized and programmable money, upon which the private sector can develop;

- Offer comprehensive and seamless integration with the financial infrastructure and interoperability with central bank digital currency infrastructures being developed outside of the United States;

- Adhere to existing KYC/AML requirements amid distribution through regulated payment intermediaries and banks, preserving the two-tiered banking system;

- Ensure requisite individual privacy and security laws and regulations in payments is preserved and enhanced;

- Enhance economic policy insights through greater transparency offered via digital payments; and

- Develop US leadership and best-in-class technology to support needed digital currency functionalities.

In addition, the US Treasury and the Federal Reserve could regularly update Congress on the progress of these pilot programs and their achievement of these objectives, including enhancing financial inclusion, and offer proposals to further build out and implement a US CBDC across the financial system.

When the US has led the world in technological innovation – whether exploring outer space in the last century or cyber space in the turn of this century – it has done so through public/private partnerships.[5] In these partnerships, the US government has directed central policy frameworks to further the public interest while the private sector supplied technological innovativeness, large project management capability and competitive urgency. Without the blending of the two, exploration of the lunar surface and cyber space may have slipped beyond the twentieth century into the twenty-first.

It may be argued that developing a dollar CBDC is so important to the national interest that it should be the exclusive work of the public sector and not involve the private sector. I disagree. It is because the development of a dollar CBDC is so important to the national interest that it *must* involve the private sector. It is the way America succeeds in doing big technological things. It was the basis for successful exploration of both outer and cyber space. It is the right way to explore the future of money.

Conclusion

A new technological age is unfolding, bringing with it the digitization of things of value that can be tokenized, decentralized and programmed. Across the globe,

[5] In the 1960s, NASA partnered with a host of private sector vendors, engineering firms and contractors to land a man on the moon and accomplish America's then highest priority. Also in the 1960s, the Pentagon's Defense Advanced Research Projects Agency (DARPA) contracted to the private sector development of key Internet components while, later in the century, the National Science Foundation created NSFNET to contract with both private companies and public universities to lay the groundwork for the Internet as we know it today.

governments and private entities are experimenting with tokenized commodities, contracts, legal titles and, most critically, commercial and central bank digital currencies.

A US CBDC would address limitations in the ability to distribute emergency monetary relief revealed by the COVID-19 crisis. It can provide the tools and infrastructure to make emergency liquidity distribution work better and faster. It can provide advantages over traditional bank accounts in terms of expanding access for underserved populations and a foundation for new and more inclusive financial services.

Yet, a US CBDC is about more than financial relief amidst a pandemic. It is about the architecture of money in this new digital era. It offers new functionalities and more refined policy tools. It takes advantage of emerging distributed ledger technology to enable more direct monetary relations and a more diversified payments infrastructure. It recrafts the architecture of central bank money and, in effect, reimagines the future of money itself.

Throughout its history, the United States has been a leader in innovation and building systems for the next generation. Whether launching the space program or building the internet, the United States has conducted large technological endeavors through public and private partnerships reflecting longstanding American values of free enterprise, economic stability, technological innovation, individual liberty and privacy, and the rule of law. It is how America does big things.

This global wave of digital currency innovation is quickly gaining momentum. The questions for the United States are what role it will play in this wave of the Internet and to what degree will its core values be brought to bear. The United States must take a leadership role in this next wave of digital innovation or be prepared to accept that the innovation will incorporate the values of America's global competitors.

The launch of a US CBDC is a logical and critical next step to increase financial inclusion, enshrine democratic values in the future of money, drive societal and economic benefits and future-proof the US dollar for generations to come.

Attachment A

The Digital Dollar Project Summary

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