Senate Banking Committee
Subcommittees on Economic Policy and on National Security and International Trade and Finance

Hearing on "The Present and Future Impact of Virtual Currency"

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Prepared Statement
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Chairman Merkley and Chairman Warner, Ranking Members Heller and Kirk, and Honorable Members of the Subcommittees on Economic Policy and National Security and International Trade and Finance, I am honored to be here with you today to discuss virtual currencies.

Monitoring the developments in virtual currencies and taking a responsible approach to their regulation reflects their growing presence in domestic and international transactions. Recent negative publicity associated with law enforcement action against Silk Road and reports of the disappearance of bitcoin exchanges in China and the Czech Republic raises important public policy concerns.

Part I: Recommendations and a Roadmap to the Balance of This Testimony

The Committee has invited testimony on a variety of subjects that I have addressed in this prepared statement. I have a number of recommendations that pertain to the Committee's question.

My recommendations include:

1. Retain the current division of regulation between the States and Federal Government – with prudential regulation of the non-depository providers of new payments systems with the States and retaining the anti-money-laundering, anti-terrorism and economic sanctions regulations with the Federal Government.
2. Make providers of virtual currencies comply with the customer-identification program and AML compliance program requirements of Sections 326 and 352 of the USA PATRIOT Act, and with the economic sanctions regulations enforced by OFAC, just as other payments systems providers do. Virtual currency customers will have to reveal their identities to issuers of the currencies they use. As a corollary, customers should get the same federal financial privacy rights that users of other payments products have under the Right to Financial Privacy Act of 1978 and Title V of the Gramm-Leach-Bliley Act.
3. Encourage FinCEN to clarify the manner in which customer-identification and AML compliance requirements apply to virtual currencies. This is needed to help banks ensure that they can do business with providers and users of virtual currencies and other payments innovators. Second-stage innovations from distributed computing and database technologies could offer benefits to payments and commerce far beyond those that virtual currencies now offer. If banks cannot determine how to comply with FinCEN regulations, for example, they may continue to terminate their relationships with payments innovators before the innovators can attract investors and users to make it to the second-stage technologies their current work may generate.

4. Encourage payments systems innovators to adopt and publicize transparent payment systems rules for their own systems and even to compete for customers on the basis of the system rules they adopt. It is too early to enact user protections for virtual currencies.
5. Ignore the claims that
    a. additional regulation of virtual currencies will halt innovations,
    b. innovators deserve freedom from regulations that apply to other payments systems and their providers, and
    c. virtual currencies deserve a single federal licensure system that preempts State prudential regulation and licensure.
6. Monitor the development of virtual currency providers in case they transform their products into commodities or securities and, if this happens, then decide whether regulating their products under the applicable regulations makes more sense.
7. Leave room for non-depository and depository providers of payments products to innovate in the virtual currency space.
8. Authorize and fund a study of virtual currencies to be carried out by the Federal Reserve Board or pursuant to the Federal Advisory Committees Act by an inter-agency task force and industry participants.

The balance of this statement begins in Part II with a brief history of "legal tender" and the regulation of payments products in the United States. Part III discusses my recommendations in some greater detail. Part IV responds to questions posed in the Committee's invitation to testify.

<u>Part II: A Short History of "Legal Tender" and Governments' Roles in Establishing it and its Value</u>

The emergence of a large digital "currency" unconnected to a sovereign threatens a sovereign right recognized back to Renaissance times. In one of the earliest court decisions involving "legal tender" – the 1605 decision in Britain of *The Case of Mixed Money*[1] in which the House of Lords observed that the regulation of currency was a sovereign right and declaring the sovereign's right to declare "legal tender" by decree, the affixing of the sovereign's stamp, and to decision of the value of increments of currency – and later to change its mind about valuation. "The prince, the stamp, and the value" became from that point forward hallmarks of what could pass as "legal tender" that participants in trade transactions were required by the sovereign to take from others in satisfaction of obligations (trade or debt) they undertook. Proponents of virtual currencies often seek to end sovereign "monopolies" over legal tender, fiat currencies.

[1] The Case of Mixed Money in Ireland, Trin. 2 James I. AD 1605 [Davies' Reports]. A key sentence from the opinion in that case proclaimed: "that it appertaineth only to the King of England, to make or coin money within his dominions. [2 Ro. ab. 166. 1 Co. 146, 5 Co. 114. 1 H.H.P.C. 188.]" The court also announced its conviction that there were three attributes of "money" and "legal tender" that distinguished them: the price, the stamp, and the value. *Id.*

Contributing to the history of sovereign, stamps, and values was the rambunctious, highly problematic period in the United States in the pre-Civil War 19th Century in which "wild cat" banks operated. Banks issued paper notes – a form of what economists call *fiat currencies* – as opposed to coins or other "specie." Persons who took paper "bank notes" encountered significant problems with redeeming the value that the notes were supposed to represent.[2] They either encountered long waits while the notes moved for collection from banks near them to distant issuers of these notes, additional long periods while the issuing bank assembled enough funds to pay them off, or were forced to take huge discounts from local depositary banks against the prospect of these long waits or insolvency when the notes were eventually presented for payment to their issuing banks. "Wild cat banking" was cited as a cause of regional recessions and of decades of financial instability on the parts of businesses and individuals who had no other providers of financial intermediation services close enough to their homes.

The problems associated with wild cat banks and the pressures of sustaining the federal effort during the Civil War led Congress to create a national paper currency and national banks in the 1860's.[3] Eventually, the need for financial stability, including

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[2] *See* Marine Bank v. Fulton Bank, 69 U.S. (2 Wall.) 252 (1864) (upholding the depositor's right to the sum owed on bank notes by its bank, rather than the lower value prevailing for Illinois notes of the time, which had decreased by 50% in value during the year that collection took). "Wildcat banks" did not have reserves sufficient to back their issues. Lissa L. Broome & Jerry W. Markham, REGULATION OF BANK FINANCIAL SERVICE ACTIVITIES 17 (Thomson Reuters, 2011).

[3] The Stamp Payments Act of 1862, 12 Stat. 592; Rev. Stat. 711, sect. 3583 (prohibiting circulation of bank notes worth less than one dollar); National Currency Act of 1863, ch. 58, 12 Stat. 665 (Feb. 25, 1863) (authorizing the chartering of national banks); and the National Bank Act of 1864, act June 3, 1864, ch. 106, 13 Stat. 99, as amended (superceding the National Currency Act). The goal of these collective National Banking Acts

> … was to create a uniform national currency. Rather than have several hundred, or several thousand, forms of currency circulating in the states, conducting transactions could be greatly simplified if there were a uniform currency. To achieve this all national banks were required to accept at par the banknotes of other national banks. This insured that national banknotes would not suffer from the same discounting problem with which state banknotes were afflicted. In addition, all national banknotes were printed by the Comptroller of the Currency on behalf of the national banks to guarantee standardization in appearance and quality. This reduced the possibility of counterfeiting, an understandable wartime concern.

American History from Revolution to Reconstruction and Beyond, http://www.let.rug.nl/usa/essays/general/a-brief-history-of-central-banking/national-banking-acts-of-1863-and-1864.php (last visited Nov. 17, 2013). Problems of counterfeit or altered notes caused the creation of John Thompson's Bank Note Detector, a precursor of the listing of counterfeit and altered notes issued routinely by the Office of the Comptroller of the Currency and Federal Deposit Insurance Corporation today. The national currency was *commodity currency* backed by specie (e.g., gold certificates) in place of "greenbacks." Eventually, as the Members know, the United States replaced commodity currency with fiat currency in the form of Federal Reserve Notes. Proponents of virtual currencies and other followers of the Austrian School of Economics distrust fiat currencies for their roles in business cycles and consequences of monetary interventions reasons as explained well in the European Central Bank's 2012 report on Virtual Currency Schemes, virtualcurrencyschemes201210en.pdf, at 21. The Austrian School economists also prefer the "de-nationalization" of currency, effectively an end to governments' monopoly on the issuance of money. *Id.* These economists criticize fractional-reserve banking systems like ours, and urge the re-adoption of the gold standard. *Id.* Broome & Markham also note that as "electronic money" came into the stable prices, and sound monetary policy was so great as to cause Congress to establish the Federal Reserve System. Federal authority in this arena has remained in place since that time – through various "gold standard" debates, the creation of the Bretton Woods' Agreement that established the current international monetary systems in the 1940's, and to the present. The federal government has the sole power to issue "legal tender."[4]

All of our principal trading partners also operate in national systems in which a single, state-specified currency constitutes "legal tender" for all transactions. There is little literature on the attitudes of our principal trading partners about "virtual currencies" – with the exception of coverage of Canada's development and plan to issue as "legal tender" forms of "digital currencies known as "MintChips,"[5] and the European Central Bank's 2012 report on *Virtual Currency Schemes*.[6] Canada's "Mint Chip" experiment reveals no intention of abandoning the principles set forth in *The Case of Mixed Money* in 1605: the prince, the stamp, and the value will continue to be the province of the sovereign. The ECB's report, as one would expect, also favors a continuing role for central banks and sovereign currencies.

But, just because "legal tender" exists as a fact in most developed nations, it does not follow that individuals or businesses cannot agree to take barter or non-legal tender in exchange for goods and services. It just dramatically increases some, primarily legal risks in those transactions, much as we saw with "wild cat" banking in the pre-Civil War period here, and in the disappearance of bitcoin exchanges in China and also the Czech Republic. In these cases, the risk of engaging in virtual currency transactions currently falls entirely on users.

We must recognize that some individuals and, apparently, an increasing number of businesses, see value in using forms of "virtual currencies" to complete their own transactions.[7] Can we prevent them from doing so? Probably not. Should the United States step up their regulatory efforts in this arena? My answer is not yet, and not until such time as stronger evidence suggests problems exist with these currencies that contribute to financial instabilities, or otherwise enable issuers or intermediaries to commit fraud on users or complicate monetary or other important public policies.

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market in the 1990's, commentators considered The Stamp Payments Act to bar its issuance in the nation. *Supra,* note 1 at 19.

[4] Congress' authority was upheld in a series of decisions including United States v. Van Auken, 96 U.S. (6 Otto) 366 (1977); Legal Tender Cases, Know v. Lee & Parker v. Davis, 79 U.S. (12 Wall.) 457 (1870); Veazie Bank v. Fenno, 75 U.S. (8 Wall.) 533 (1869). The federal government's authority thus preempts the issuance by states such as Virginia of competing currencies, as the Virginia Legislature proposed to do in the past year.

[5] Canada's plans have revolved around a state-created digital "currency" that they call "Mint Chips." For more information on the status of this development, see John Greenwood, *Canadian Mint ready to test its own digital money project,* FIN. POST *(*Canada) (Sept. 19. 2013).

[6] Available at virtualcurrencyschemes201210en.pdf (last visited Nov. 17, 2013). (The ISBN for this report is 9778-92-899-0862-7 (online).)

[7] Media reports cite reasons such as avoiding the expense of exchange of currencies and other transaction costs associated with use of debit or credit cards, or even checks.

Part III: Discussion of Recommendations

> **Recommendation 1**: Retain the current division of regulation between the States and Federal Government – with prudential regulation of the non-depository providers of new payments systems with the States and retaining the anti-money-laundering, anti-terrorism and economic sanctions regulations with the Federal Government.

The current balance between State and federal regulation affords more opportunities to follow developments in this area with lots of eyes on these innovations, ensure AML and economic sanctions goals are met, and allow room for innovation of these intriguing technologies that a comprehensive federal licensure and supervision scheme might not allow as well. Furthermore, having prudential regulation should contribute to the confidence among users – whether consumers or businesses – that their stored value is safe and that their transactions will be executed as expected.

The split between prudential money transmission regulation by the States, and anti-money laundering and economic sanctions/ anti-terrorism regulations by the Department of the Treasury reflects a robust regulatory, supervision and examination scheme for virtual currency transactions with much room on the prudential side of State regulation to promote product innovation without sacrificing important protections for users or, on the federal side, anti-money laundering (AML) or economic sanctions goals.

Some advocate for a single, federal scheme of licensure and regulation of virtual currencies and their providers. The proponents of this view should be careful what they wish for: they could find themselves unable to qualify for a federal license as the efforts of certain retailers to obtain approval from the Federal Deposit Insurance Corporation for their industrial loan operations (even after they had obtained a state ILC charter) or national bank or federal savings and loan charters. These federal approvals are also expensive and time-consuming processes with considerable discretion left to regulators to reject applicants. It is not clear to me that early applicants will enjoy the relief from 50-state regulation that they seem to expect.

Some individuals will not adopt payment methods they do not understand and whose rules of the road are not transparent. Thus, we should appreciate the longstanding role the States have played in *innovating regulations that have encouraged users to adopt new payments methods*. The work of the Uniform Law Commissioners and American Law Institute, begun more than 65 years ago, created the uniform and predictable provisions of the Uniform Commercial Code (UCC) that State Legislatures enacted. The UCC's predominance in payments regulation is now complemented by payments systems rules and bilateral agreements, including those that govern transactions that the UCC does not address, as well as limited federal laws and regulations. Federal regulations also may prompt faster user adoptions of new technologies, as many believe the Fair Credit Billing Act (FCBA) and the Electronic Fund Transfers Act (EFTA) did in the late 1960's and 1970's, respectively, even though the EFTA has been criticized for chilling certain ATM developments.

> **Recommendation 2**: Make providers of virtual currencies comply with the customer-identification program and AML compliance program requirements of Sections 326 and 352 of the USA PATRIOT Act, and with the economic sanctions regulations enforced by OFAC, just as other payments systems providers do. Virtual currency customers will have to reveal their identities to issuers or transaction intermediaries of the currencies they use. They should get the same federal financial privacy rights that users of other payments products have under the Right to Financial Privacy Act of 1978 and Title V of the Gramm-Leach-Bliley Act.

My concern is that disintermediation of payments – the separation of payment flows from the comprehensive record-keeping and retention requirements applicable to payments that eventually flow through the banking system – makes it more difficult to determine the identities of senders and recipients of payments. This may contribute to the efficacy of the "layering" stage of money laundering, the passage of the funds or credits through so many hands that the identities of payments participants is obscured. This is an important concern for anti-money-laundering, anti-terrorism, anti-proliferation, and anti-tax-avoidance purposes.

> **Recommendation 3**: Encourage FinCEN to clarify the manner in which customer-identification and AML compliance requirements apply to virtual currencies to a greater degree if that is needed to stop banks from discontinuing their business relationships with virtual currency providers and other payments innovators. If banks cannot determine how to comply with FinCEN regulations, for example, they will cut off payments innovators before the innovators can attract investors and users to make it to the second-stage distributed computing and database technologies their current work may generate.

Depository institutions deserve the clearest guidance on how customer-identification and AML compliance requirements apply to virtual currencies. This is one of the few ways in which we can stop the recent spate of terminations of banking relationships with providers of virtual currencies – colloquially called "bank discontinuance."

Without the clearest possible guidance available for banks and investors, we are likely to experience a domestic decline in innovations and the potential loss of development of future associated uses of the distributed computing and database technologies such as for tracking tangible goods transactions or even in tracking and trading intangibles such as electronic mortgages and other evidences of equity or debt. Moreover, if bitcoins or other virtual currencies prove to garner even more widespread international adoptions, the United States will want to have a share of the productive research and applications capacity in the United States and may regret actions that send it offshore. [8] This would be even more important if distributed technologies developing in

[8] For a valuable discussion of the regulation of virtual currencies from the perspective of the European Central Bank, see *Virtual Currency Schemes*, *supra* note 6. This study does not accurately reflect the

the next five years that would not suffer the perceived disadvantages of bitcoins today were to emerge.

On the other hand, we should not condone the virtual currency systems that market the anonymity of their users or claim immunity from otherwise applicable compliance responsibilities in the name of "innovation." If proponents of virtual currencies want access to profits for transactions in the United States, they should be prepared to comply with applicable laws, and, in specific, they should obtain sufficient information from customers to enable them to respond to properly authorized requests for access from federal or state regulators and law enforcement agencies.

A corollary of this recommendation involves providing financial privacy rights to users of virtual payments systems equal to those provided to users of more traditional payment systems. In the United States, two functionally different, federal financial privacy statutes should govern virtual currency transactions – the Right to Financial Privacy Act of 1978, which governs access to account and transaction information of individuals and businesses by the federal government, and Title V (Privacy) of the Gramm-Leach-Bliley Financial Services Act of 1999, which governs how providers of consumer financial products and services may use and share the non-public, personally identifiable information they hold, including with their functional or prudential regulators and with federal, state, and local law enforcement agencies. It is unclear that participants in virtual currency systems are enjoying these rights today. As banks increasingly buy providers of digital currencies to develop their own products, it is even clearer that customers should enjoy the same financial privacy protections, including due process rights, however limited they may be with border seizures and other Title 18 forfeiture provisions.

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current state of regulation of virtual currencies in the United States in two respects. First, it ignores the presence of state prudential regulation of "money transmitters." Also, it fails to reflect the fact that widely used payments systems here have already moved away from reliance on "payments laws" and towards system rules and bilateral agreements for processing payments. These system rules and bilateral agreements often augment laws that otherwise apply to the underlying form of payment being used, but in other cases they provide uniformity and certainty to forms of payments that neither federal or state laws comprehensively govern (credit cards, electronic fund transfers, and certain aspects of payroll cards, for example).

The Bank's report mentions a case in which French "banks shut down the currency exchange facility for accounts handling [bitcoins], on the presumption that Bitcoin should conform to electronic money regulations. *Id. at* 43, citing Finextra:http://www.finextra.comnews.fullstory.aspx?newscemid=22921.

Recommendation 4*:* Encourage payments systems innovators to adopt and publicize payment systems rules for their own systems and even to compete for customers on the basis of the system rules they adopt.

Whenever a consumer or business prepares to make or receive a payment it will want to have certainty that:

● the payment is authorized by the person from whose funds or credits the payment will be made,

● the person has sufficient funds or credits for the payment processor to deliver those funds on time to the payee/ recipient so that the payee/ recipient will receive "goods funds" instantly or in a reasonable period of time,

● the payment is made to the proper payee and in the time frame specified or expected by the person whose funds or credits are being used or consistently with any applicable contract between the obligor and payee,

● the payment, from the obligee's perspective, will become final at a specified time or after a specified interval and, from the obligor's perspective, that it will discharge the underlying obligation to pay for goods or services or to retire a debt.

● the payment has integrity – that is, the named payee/ recipient has not been altered, the amount has not been lowered or raised, or the funds will not be held up unreasonably in transit.

These are "regulatory" or system rule qualities that will allow the provider to maintain users' trust.

Additionally, every person or business that stores funds or other value with a bank or broker – or in this case with the issuer, exchange or other provider/ participant in a virtual currency transaction – wants suitable assurances that they can redeem/ retrieve their funds or value when they want to do so. This issue surfaced with bitcoins when the federal government froze some bank accounts belonging to the Mt. Gox Exchange and the Exchange was unable to pay holders of bitcoins when they sought to redeem value stored in bitcoins. Other issues related to value storage include whether any form of insurance against the insolvency of the issuer or exchange is available to protect those who deposit value or otherwise hold accounts that they have reasonable expectations to redeem on little or no notice, or even on predictable terms.

Some virtual currencies have attracted negative publicity, including recent publicity about the disappearance of a Bitcoin exchange based in China with $4.1 million of value that belonged to others. This type of negative publicity stands in the way of broader adoption of virtual currencies.

Prudential regulation and transparent system operating rules should help legitimate businesses offering virtual currencies attract more customers – assuming we have no reason today to fear competition for legal tender from current-day virtual currencies.

I encourage virtual currency issuers to create *payment systems rules* for their own systems and harbor some hope that issuers will compete to offer system rules that match the needs of the individuals and businesses who participate. Payment systems rules often precede full government regulations by long periods of time. Examples include traveler's cheques and bank wire transfers, and more recently automated clearing house transactions governed by the National Automated Clearing House Association and electronic checking processing systems that use ECCHO Operating Rules. New payments methodologies regulated too soon often do not receive the same levels of innovations. The primary example I can cite was based on a report by the Board of Governors of the Federal Reserve System following the enactment and implementation of the Electronic Fund Transfers Act in the late 1970's. The alternative to provider-created system rules may be more government regulation. This gives providers a choice between self-regulation for these specific customer protection purposes or more government regulation. I imagine they will give self-regulation careful consideration.

Payments systems that have not established transparent and uniform system rules normally suffer a worse fate: so few individuals or businesses will use them that they wither for lack of investors and of income. This happened to some extent in the United States to early offerors of "electronic money," including Mondex and Digicash, despite talented senior management and significant investments. Consumers did not adopt them so merchants did not adopt them – in part because neither group was certain of their rights if they adopted them.

> **Recommendation 5***:* Ignore the claims that any regulation of virtual currencies will halt innovations or that innovators deserve freedom from regulations that apply to other payments systems and their providers, and their wishes for a single federal licensure system.

I urge Members to resist the "we're new so don't regulate us at all" arguments that you've heard since the advent of electronic commerce. Payments are payments and stored value is value storage. The "don't regulate us or you will stifle innovation" arguments did not persuade many as digital money, prepaid cards, payroll cards and other new products appeared in markets and they offer no reason to abandon existing prudential regulation now.

There also is no reason to reward "innovators" with freedom from regulations with which their "real world" competitors must comply. That would provide anti-competitive advantages to certain new entrants for which no justification appears.

> **Recommendation 6:** Monitor the development of virtual currency providers in case they transform their products into commodities or securities and, if this happens, then decide whether regulating their products under the applicable regulations makes more sense.

Bitcoins' values have been highly volatile over the past year. This volatility looks like price volatility associated with commodities and securities; bitcoin prices seemingly move separately from the values of the world's major currencies. If other virtual currencies demonstrate this market freedom from legal tender currencies, this may be the signal that a reconsideration of type of regulation to be applied from regulation as payment systems to regulation as commodities or securities.

> **Recommendation 7***:* Leave room for non-depository and depository providers of payments products to innovate in the virtual currency space.

It is important not to rush new laws or regulations following negative publicity from a new technology when existing laws regulate issuers prudentially and clarity in enforcement of AML regulations can allow some space for innovators in the virtual currency space. I was delighted to read last week that the New York State Department of Financial Services was considering offering a BitLicense. Careful development of licensure standards will help develop stable payments products. As I have mentioned, virtual currency technologies can produce secondary, distributed computing and database applications that could yield enormous benefits to domestic and cross-border commerce.

> **Recommendation 8***:* Ask for a study of virtual currencies to be carried out by the Federal Reserve Board or the Department of the Treasury or fund a study pursuant to the Federal Advisory Committees Act by an inter-agency task force and industry participants.

The subcommittees sponsoring today's hearing should ask for a study by the Board of Governors of the Federal Reserve System or the Department of the Treasury of virtual currencies, the potential for innovations and efficiencies they may offer more broadly, and the kinds of risks – to price stability, financial stability, payment system stability, reputational risks and for users – identified in an October 2012 report by the European Central Bank entitled "Virtual Currency Schemes."[9]

Another option is for Congress to authorize and separately fund an inter-agency working group to produce a study of how the various federal agencies involved in payments, regulating of banking, commodities, securities and law enforcement.

Regardless of which agency leads the study, the work should be organized under the Federal Advisory Committees Act so that all industry segments can be included.

[9] *Supra*, note 6. For more information about this report, see *supra*, note 8.

Part IV: Responses to Other Questions Posed by the Committee

A. Issues implicated in cross-border payments and cross-border trade and finance

Monetary policy is one of the concerns cited by the European Central Bank in its 2012 report on Virtual Currency Schemes. But that report did not discuss enforcement of collateralized debt obligations.

Virtual currency transactions could render finance transactions non-transparent so that current and potential providers of financing might not be able to ascertain their relative priorities to assets that underlie those trade transactions. The United States will want to follow closely developments that frustrate creditors' claims to inventory or other assets if the obligor fails to complete payments for goods that it has purchased here or abroad.

The trend away from bank-issued letters of credit to supply-chain financing not involving banks – indeed including financing provided by logistics suppliers – has not yet degraded the ability of sellers, buyers or their financers to monitor cross-border trade transactions. This may be because logistics suppliers of supply-chain finance enjoy hard-earned reputations as honest participants delivering the goods they carry and collecting payments if required on behalf of senders. But the potential for trade finance disruption still exists.

B. Possible regulatory models for providers of payments products and systems

In addition to the current state prudential regulation of virtual currency providers and to Treasury's comprehensive registration, AML and economic sanctions regulations applicable to money services businesses, we have a number of potential models for regulating, requiring registration or supervising and examining providers of virtual currencies. I mention these more for future purposes than for any need I perceive at this point, but the eventual use of alternative regulatory models depends in large measure on how the products offered as "virtual currencies" work in fact.

For example, state prudential regulation of money transmitters is framed to ensure that competent transaction execution. Those who take funds from one person with a promise to deliver them to a second person need to have the capacity to do just what they promise – to pay in the manner, in the time, and to the person that the first person instructed them to pay.

Prudential regulation by states establishes qualifications for providers – depository and non-depository providers they license to do business with their own residents, and establishes a system of reserves or bonds or both so that funds will be available to complete transactions on those persons' parts. [10] State licensing and bonding requirements are cited by many entrepreneurs as a reason why virtual currencies are not attracting the widespread uses and investor funding that entrepreneurs seek. However, without these state requirements, the prospect of value disappearing – as it apparently has with the disappearance of the bitcoin exchange in China – likely would rise and injure users of these products.

State prudential regulation began in the late 18th Century when Massachusetts and New Hampshire prohibited unincorporated banks from operating.[11] New York State followed them with its prohibition in 1804. Some states banned banking – period. These included Texas until 1904, and Iowa, Arkansas, Oregon and California before the Civil War. State laws also established "safety deposit" systems and have regulated them. Items in safety deposit boxes are not immune from asset freeze orders issued by courts, or seizure by the IRS. States have been regulating money transmitters since the advent of the telegraph.

The regulation of safe-storage systems is even more ancient, beginning with the Knights Templar and Vatican as lenders in the pre-and early Renaissance periods, and with the Silver Vaults in London and lenders in Belgium, the Netherlands, and Florence whose services contributed to the early Renaissance flows of commerce and modern trade. I mention safety deposit systems because of the similarities they have, and that their predecessors had, to products such as e-Gold, and even bitcoins. Some of these contemporary products are more like commodities to be bartered than they are true "currencies." [12]

Alternative regulatory schemes for virtual currencies include commodities and securities regulation. The securities model offers advantages such as registration and requirements for disclosing material events that may affect the value of the security or the health of its issuer.

One reason to consider commodities or securities regulatory schemes for virtual currencies that do not track the movements of legal tender currencies is evidence that investors are speculating in these currencies. To the extent that virtual currencies seem to be used more for speculative purposes and less for transaction execution, the non-payments models of regulations present feasible alternatives.

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[10] This system has features of fractional reserves that our banking system depends on, as well as of bonding or comparable requirements to ensure completion of transactions in the event of provider failure. The Board of Governors of the Federal Reserve System also establishes reserve requirements for depository institutions on an annual basis, in Regulation D.

[11] For a brief discussion of this period in bank and payments regulation in the United States, see Broome & Markham, *supra*, note 2 at 1-28.

[12] Francois R. Velde, *Bitcoin: A primer*, CHIC. FED LETTER No. 317 (Dec. 2013) (copy on file with the witness) (describes the operations of bitcoins and, particularly, its unique methods for controlling two challenges of digital money – controlling the creation and avoiding duplication of units).

V. Conclusion

I applaud the Subcommittees for holding this important hearing and urge them to continue to watch developments in virtual currencies. Thank you again, Chairman Merkley and Chairman Warner, and Ranking Members Heller and Kirk, for this opportunity to share my views with your Subcommittees. I will be pleased to take questions.