



THE FUTURE OF FINANCE IS FLAT

HOW DIGITAL CURRENCIES ARE TRANSFORMING FINANCE

BK Brian Kelly Capital



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THE FUTURE OF FINANCE IS FLAT

The blockchain is one of the most important innovations in the history of finance. Removing the middleman will transform how we transact, finance projects, and distribute capital. -Brian Kelly

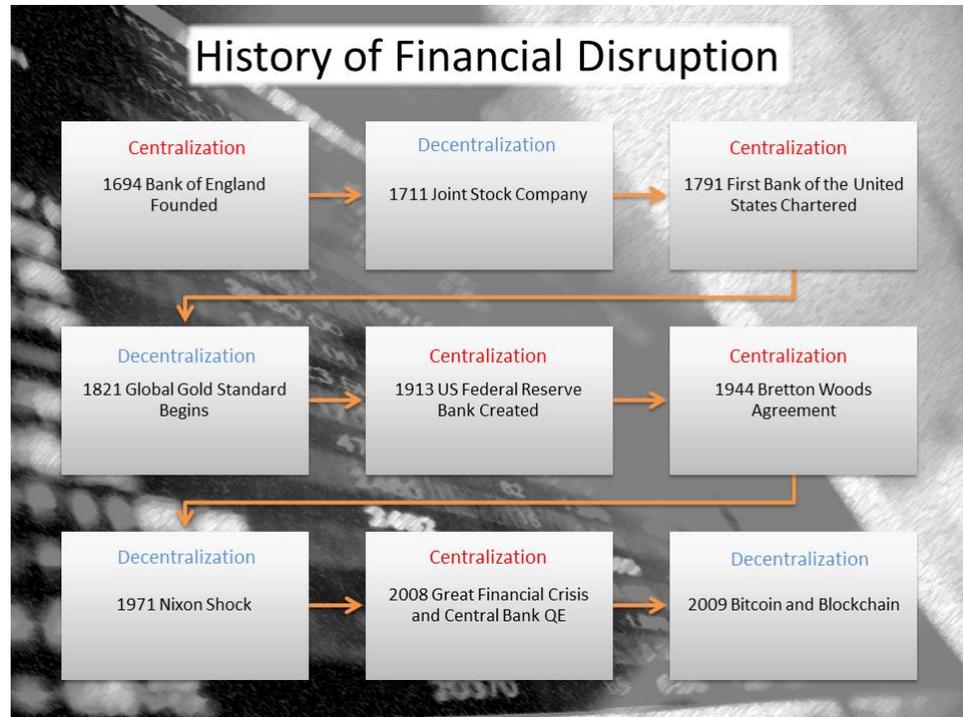
When Thomas Friedman wrote *The World is Flat* he envisioned globalization as creating a level playing field for commerce and providing all competitors an equal opportunity. We extend that metaphor to the world of finance and conclude that the disintermediation caused by digital currencies and the blockchain technology will flatten finance. As the original flattener, Bitcoin illustrates that fiduciaries, intermediaries and trustees will play a diminished role in the future of finance.

Bitcoin's core innovation is the blockchain, a decentralized accounting ledger that facilitates value transfer without a trusted third party. The blockchain is a record of transactions that can be viewed by everyone and changed by no one. A new transaction is verified, conveyed and added to the ledger via the process of mining. For the first time in the history of finance a trusted third party is not needed to verify, convey and record the transfer of value. This disintermediation of financial services will have a profound impact on the future of finance.

Born out of the Great Financial Crisis of 2008, Bitcoin's blockchain technology arrived at a time when trust in traditional financial institutions was broken. Early adopters were seeking an alternative to the centralized financial system. This early enthusiasm for an alternative decentralized financial system allowed the blockchain technology to incubate. Similar to the maturing of the internet, the blockchain and digital currencies are beginning the phase of mainstream acceptance. Thought leading corporations and financial executives have discovered that this breakthrough can be used to eliminate much of the cost and friction in the existing financial system. Far from supplanting the existing system, digital currencies offer a more efficient solution that can be integrated with the current system. However, this process of integration has the potential to disrupt many of the traditional intermediaries.

THE RIGHT PLACE AT THE RIGHT TIME

We place beginning of the modern financial system in 1694 with the establishment of the Bank of England. The creation of the Bank of England ushered in the era of central banking under which the current financial system still operates. In this admittedly unscientific survey of financial history we find that financial disruptions occur approximately every 30-50 years and are typically the result of a crisis.



The Bank of England was established to raise money for the King of England who had experienced dwindling financial resources as the result of war. The Bank of England was given the power to issue currency and in so doing shepherded the age of central banks controlling the money supply.

In 1711 the South Sea Company was created in Britain as a public-private partnership to reduce the national debt. This financial disruptor was given monopoly rights to South American trade. At the time, this joint stock company was an innovation, but unfortunately greed played a role in its collapse. A half a century later the building society - the next financial disruptor - was created in England.

The innovation of the building society was mutual ownership and a pooling of community resources. The building society grew out of the need to finance the rapid expansion of the steel towns of England. Citizens banded together to mutually finance growth and provide a return on savings. This disruptor was so successful that building societies continue to operate. The fact that these building societies still survive is perhaps because of the community focus.

The First Bank of the United States was actually one of three innovations proposed by the first Secretary of the Treasury, Alexander Hamilton. Along with establishing a central bank, Hamilton proposed to establish a mint and impose a federal excise tax. These innovations were the solution to the problem of the United States' Revolutionary War debts.



One hundred twenty five years after its establishment, Britain demoted the Bank of England to the role of caretaker of the gold standard. When England adopted the gold standard in 1821 it was a signal that the third party role of the central bank was no longer desired. Over the next century the majority of the economic powerhouses adopted the gold standard, including the United States in 1871. The era of the global gold standard effectively put central bankers out of business.

It was not until 1913, with the establishment of the United States Federal Reserve, that central bankers were called upon again. This time the disruptor *was* the central bank which was a direct response to multiple financial panics that left private bankers as the buyer of last resort. Over the next 40 years, central bankers were tested by panics and war with mixed success. In 1945, the Bretton Woods agreement disrupted the global monetary system and installed the US Dollar as the world's reserve currency.

The Bretton Woods innovation lasted until the next major economic downturn during the early 1970's. In response to a rapidly depreciating dollar, high unemployment and foreign government demand for gold, President Nixon removed the US from the gold standard. The Bretton Woods agreement was the de facto causality of this disruption.

The solution to the Great Financial Crisis was a centralization and consolidation of private debt onto the public balance sheet. During this period Bitcoin arose as an alternative to the traditional financial system. Bitcoin's popularity was likely the result of a lack of trust with the traditional financial system. However, this distrust masked the true innovation - the blockchain - an immutable electronic ledger that can be integrated into the traditional financial system.

TRANSACTIONAL FINANCE V. CREDIT FINANCE

The initial stage of integration is already occurring with the disintermediation of transactional finance. The blockchain provides a way for transactions to become free or virtually free. Banks, credit card companies and money transfer businesses that currently act as the intermediaries are being disrupted by companies that use blockchain technology to offer a similar service at a fraction of the cost. A nearly frictionless blockchain transaction can be up to 10x cheaper than the traditional methods.

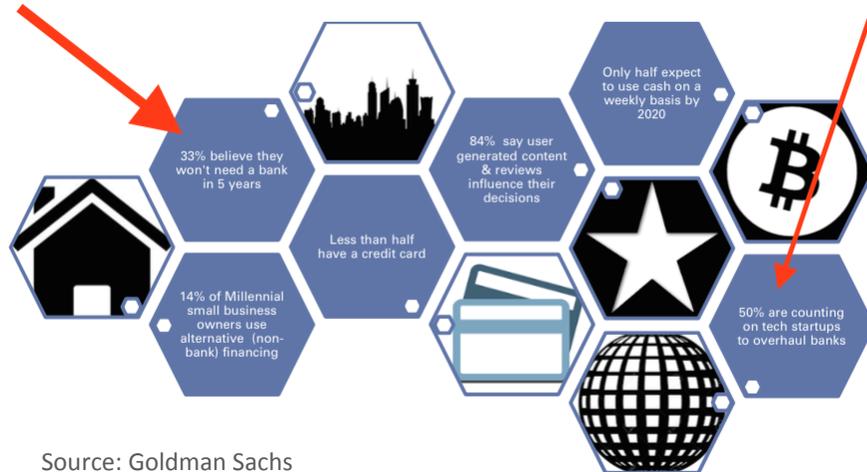
In our view, the disruption of value transfer will result in a split between transactional and credit finance. As the cost of peer to peer transactions approaches zero, revenue streams for value/money transfer businesses will decline and force companies to focus on credit finance. The blockchain technology also provides a more efficient solution to P2P and B2B lending by acting as the custodian. However, the disruption of credit finance requires more infrastructure than currently exists in the digital economy.

MILLENNIALS- THE VOLUNTARILY UNBANKED

The demand to build this infrastructure exists from the Millennial generation which eschews the concept of a traditional bank. A recent survey by Goldman Sachs found

that 33% of Millennials believe they will not need a bank in 5 years. Additionally, 50% of Millennials are counting on tech startups to overhaul banks.

Exhibit 1: Millennials as the agent of change



Source: Goldman Sachs

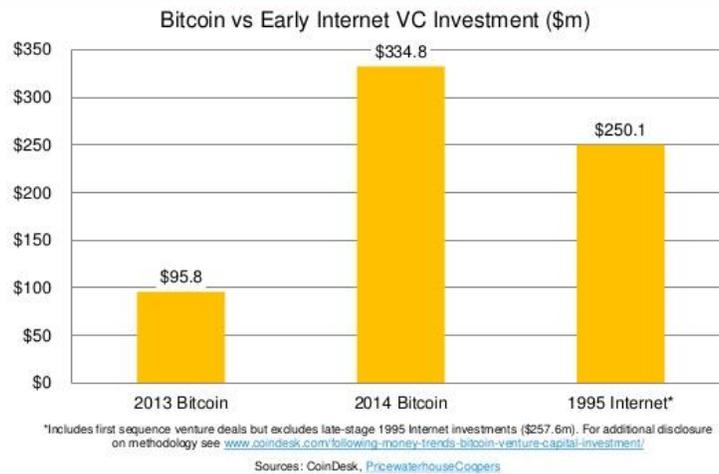
What is most striking about the Goldman Sachs survey is that 33% of Millennials are predisposed to voluntarily becoming unbanked. This is a profound shift from the conventional thought that the unbanked only exist in the developing world. This paradigm shift is fertile ground for the 'killer app' that drives mass adoption of digital currencies.

This wave of expected disruption is providing fuel for next generation blockchain companies developing the new and improved financial system. The new financial system will be flattened by the replacement of the financial intermediary with the blockchain.

VENTURE CAPITAL

The new business potential created by the blockchain has attracted record venture capital investment. In 2014 more than \$300 million was raised by 'Bitcoin' firms or more than 3.3x the amount invested in 2013. The pace of venture capital investment into the digital economy in 2014 surpassed the pace of investment in the internet during 1995.

2014 Bitcoin VC Investment Surpassed Early-Stage Internet Investment



State of Bitcoin 2015

CoinDesk

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The early stage venture capital investment has primarily been in companies building the infrastructure of the digital economy. As those companies mature there is an opportunity to invest in later stage funding rounds. Additionally, other financing models have developed with the emergence of Decentralized Apps or DApps. We explore DApps in a later section - it is important to note that DApps use the tokens (digital currency) created by the blockchain as a self-funding mechanism. The investment opportunity lies in the purchase of the digital currencies that underpin the DApp.

THE VALUE OF DIGITAL CURRENCIES

The blockchain protocol software not only records and stores the general ledger it also distributes the currency according to predetermined rules. Critics have argued that since there is not a central bank issuing the currency then the tokens issued do not have value. In our view, this criticism assumes the narrow use case for the blockchain as a currency. Taking a broader view of the tokens distributed by the blockchain allows us to think of these tokens as digital assets.

The digital asset can be thought of the right to use a specific network - that is to say use of the network and its corresponding software is only available to those who hold the network's digital asset. Blockchain based networks are being used to provide computing power, digital storage and even digital contracts. Therefore, a network that is being used to provide a valuable service will by extension have a digital asset with value. In short, the value is a reflection of utility.

The mechanism by which this value is recognized is the observed price of the asset publicly traded on a digital asset exchange. As the popularity of the software, application, or service grows the value of the corresponding right to use that network



grows, ipso facto the value of the digital asset should grow. This network effect is not linear; it operates as a power law - like social networks, growth becomes exponential.

Scarcity adds another layer of value to digital assets. Most blockchain systems set an immutable maximum number of digital asset issuance and it is this fixed supply that provides an element of scarcity to the digital asset. The digital assets are distributed over a predetermined amount of time and at a predetermined rate. In the case of bitcoin, the digital asset is distributed to miners every ten minutes in exchange for securing the network and verifying transactions. The fixed supply of 21 million bitcoins will be distributed over the next century.

The value of digital assets is a function of the three elements: utility, network effect, and scarcity. When viewed outside the narrow lens of a currency, it becomes clear that digital assets do not require a central authority to provide a mandated value. Digital assets represent a pure form of free market capitalism and the combination of utility, network effect and scarcity makes them an attractive investment.

BITCOIN - THE ORIGINAL FLATTENER

We will never know if the inventor of Bitcoin intended to flatten the cost structure of finance, but the cost savings of disintermediation are too powerful to ignore. The concept of free or virtually free transactions is a revolution in finance similar to the disruption the internet caused in media.

WHAT IS BITCOIN?

In order to understand the disruptive potential of Bitcoin and the blockchain technology it is helpful to look beyond the currency use case. Bitcoin has illustrated that the blockchain can be used for **at least** four broad functions: a payment system, a value transfer system, an information transfer & storage system, and a clearing and settlement system.

Payments	Value Transfer	Information Transfer & Storage	Clearing and Settlement
<ul style="list-style-type: none"> •Provides a low cost alternative to debit cards, international remittances, and wire transfers. 	<ul style="list-style-type: none"> •Flattens the cost of traditional asset exchange , i.e. stocks, bonds and commodities. 	<ul style="list-style-type: none"> •Provides military grade cryptographic data integrity. •Removes centralized database hacking threat. 	<ul style="list-style-type: none"> •Removes the need for third party ownership verification. •Provides automated, programmable, low cost clearing and settlement.

The first use case for Bitcoin is as a payment system that provides a low cost alternative to debit cards, international remittances and wire transfers. This segment of transactional finance is full of frictional costs that can be eliminated with the removal of



the intermediary. For example, payment processors like BitPay can offer merchant solutions that are often 1/10th the cost of debit card transactions.

Value transfer has traditionally been handled by centralized asset exchanges like the NYSE, CME and LSE. The ownership audit trail in all blockchain transactions allows for the removal of many of the intermediaries in traditional asset exchange. Additionally, the trustless verification process at the heart of the blockchain enables asset exchange to occur over unsecured networks. Companies like ChangeTip allow for secure transfer of money (bitcoins) over open social networks like Twitter.

The blockchain technology can also disrupt the information transfer & storage industry through its decentralized network. Decentralized apps (DApps) like Storj and Filecoin, secure data with military grade encryption and store this data on a decentralized network of computers. The decentralized storage removes the ability of a cyber-thief hacking a central database and obtaining personal information like credit card numbers. Moreover, the internal funding of these DApps allows the services to be offered at a rate set by the free market.

The process of clearing and settlement of any financial transaction requires an audit trail of ownership, a verification of identities and finally the asset transfer. The open ledger of the blockchain provides a real-time ownership audit removing the need for an intermediary. Since ownership can be verified and tracked, the identity of the owner is inherent in the verification system. Finally, the P2P network is purpose built to transfer ownership of any asset programmed into the blockchain. In this way, each of the settlement and clearing functions are automated and as a result will likely be offered at a lower price.

GAINING TRACTION

The potential for disruptive flattening has not gone unnoticed by those in the existing transactional finance industry. A March 2015 report by Goldman Sachs concluded that Bitcoin is a 'mega-trend' and could shape the 'Future of Finance'. In the report Goldman noted,

"Given the low transaction fees...there is potential for significant dislocation in the profit pools associated with money transfer."

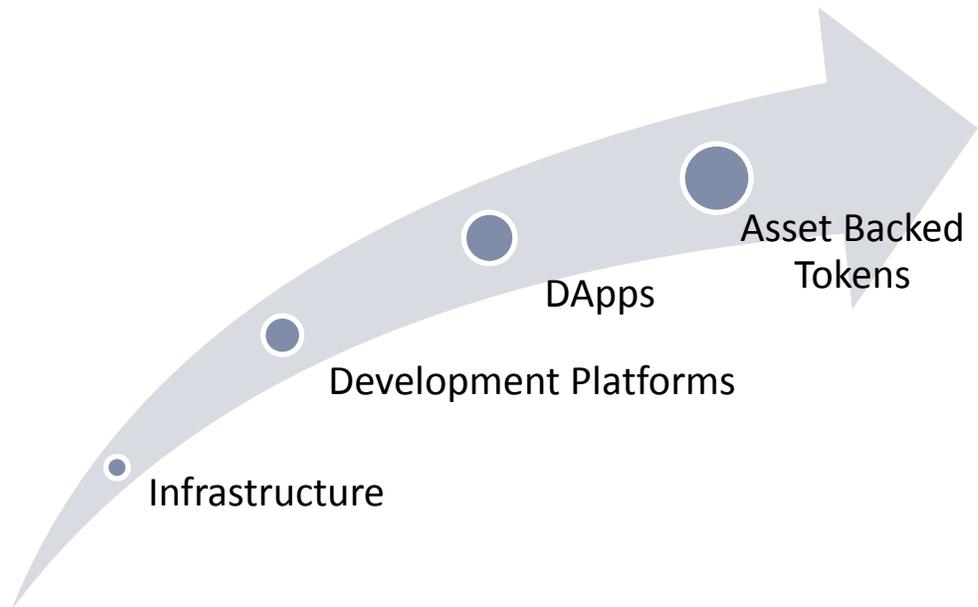
Separately, a survey of Goldman Sachs clients found that digital currencies and blockchain technology are expected to be one of the most disruptive technologies. Finally, recent investments in the digital currency space by the NYSE, former Citi CEO Vikram Pandit and former JPMorgan Executive Blythe Masters suggests that enthusiasm and acceptance of the technology is growing.



FUTURE FLATTENERS NOW

The focus of development in 2013 and 2014 was building the infrastructure for the digital economy. Digital asset exchanges were built to provide liquid markets and an observable value for the utility of the underlying application. Mining operations were scaled to industrial level operations in order to secure the Bitcoin network. Wallet services were refined to provide user friendly on ramps to the digital economy, while payment processors expanded to handle the increase in transactions. During 2014 the list of merchants accepting bitcoin grew to over 100,000 including firms like Dell, Time, and Microsoft. As well, the number of daily bitcoin transactions doubled while wallet services like Coinbase received high profile investments from the NYSE.

Now that the infrastructure has been built, construction has begun on the next level of the economy. This level relies on the solid foundation and provides services to help the ecosystem expand rapidly.



DEVELOPMENT PLATFORMS - FLATTENING THE COST OF FINANCIAL INNOVATION

Development platforms, similar to coding languages, are used to build other projects. These general purpose platforms allow anyone with an internet connection to create a digital asset and extend the use of the blockchain beyond currency. Financial innovation can flourish for simply the cost of a digital token.

Two examples of development platforms are Omni and Counterparty which ride on top of the existing Bitcoin blockchain. Importantly for investors, using these platforms requires the purchase of the native currency. - Counterparty XCP and Mastercoin



(Omni). As the digital economy grows these platforms will likely gain acceptance and the value of the native currency should rise to reflect the network effect.

DECENTRALIZED APPS - FLATTENING THE COST OF APP DEVELOPMENT

Decentralized apps (DApps) are application specific open source software that use a blockchain to store and record all the software's data. In order to gain access to the software, the user must possess a token (digital currency) distributed by the blockchain system. The user can obtain a token through the process of mining and/or adding value to the software, or via an open market purchase. The open market price of the token is a reflection of how valuable the software is to its users.

A DApp operates autonomously with no single entity controlling a majority of its tokens. Decisions about improvements to the software or adapting to market changes are made by a consensus of its users. The DApp not only flattens the operational structure it also flattens the financial structure. The software applications are created by a decentralized group of users which are compensated with the tokens internally generated by the blockchain. The cost of the software is set by market forces and reflects the general usefulness of the application.

DISTRIBUTION OF TOKENS

The tokens are distributed by the blockchain protocol in a predetermined manner similar to Bitcoin. The blockchain protocol sets the maximum amount of tokens to issue and determines how often to distribute the tokens. Tokens can be obtained through securing the network (mining / farming), by adding value to the software or via an open market purchase.

INVESTING IN DAPPS

DApps are not corporations, do not issue equity and do not pay dividends. An investor in a DApp is speculating on the usefulness of the associated app. The investor may think about this asset similar to real estate - a real estate investor is speculating that the real estate owned is in a neighborhood that people will want to live. Another way to say this is that the next buyer of the real estate will find usefulness in its location. In addition, the predetermined limited supply of DApp tokens can be thought of similar to a limited amount of lots in a neighborhood. The combination of limited supply and demand for the software application gives the DApp token its value.

DIGITIZED ASSETS - FLATTENING THE COST OF SECURITIZATION

In our view, the natural progression in the digital economy is the creation asset backed digital tokens. Whether these tokens are linked to a basket of commodities, a pool of securities, or real estate, they can be created easily and cost effectively using the blockchain technology. While it is difficult to estimate timing in a hyper-growth market we expect that 2016 will be the year when digitized assets emerge as an investment class.



REGULATORY ENVIRONMENT

The regulation of digital assets is evolving as consumers and regulators are beginning to look at the tokens distributed by blockchains as 'assets' rather than currencies. This is an important distinction because classification as a currency increases the risk that governments will see digital assets as a threat. In the United States, the IRS has ruled that as it pertains to tax reporting, digital currencies are assets similar to stocks, bonds and real estate. The New York State Department of Finance has taken a leadership role in the regulation of digital assets with its proposal for a BitLicense. The challenge for the NYSDF is to provide regulation that protects consumers without stifling innovation.

Global regulation ranges from *laissez faire* (The Netherlands) to outright bans (Russia - forthcoming). While New York is attempting to hold onto its 'Center of Finance' crown, Hong Kong, London and Dubai are quickly emerging as digital asset hubs with friendly regulation.

BEYOND CURRENCY

The initial wave of venture capital investment has focused on building the digital economy infrastructure. This foundation includes payment processors, exchanges, miners, wallets and merchant services. As these companies mature there will be opportunities to make later-stage equity investments in premier digital economy corporations. The infrastructure that has been built provides a solid foundation for the next investment opportunities in so-called Bitcoin 2.0 assets.

Bitcoin 2.0 is used as a catch-all to describe the blockchain applications that will drive mass adoption. In early 2015, capital shifted to investments in companies and teams focused on developing Bitcoin's 'killer app'. Since development can be a 12-18 month process, this shift has opened a window of opportunity to make early stage investments in a basket of assets and DApps that will appreciate in value with mass adoption. Moreover, many of these DApps are being built on top of infrastructure that is powered by a digital token. This provides an opportunity to make investments in the development tools which will power the 'killer app' without having to make a decision on which DApp will succeed.

Thinking beyond the currency opens the door to multiple use cases and investment opportunities. In the flatter financial system it will be more efficient to transact, to finance projects and to securitize assets. A flatter financial system levels the playing field and enables financial innovation. Even more interesting is that the concept of 'unbanked' is not exclusive to the developing world - the Millennial generation has a proclivity to voluntarily become unbanked. Demand for a mobile, secure, cheaper and decentralized financial solution is transforming finance and the blockchain technology is perfectly suited to meet the needs of this flat system.



ABOUT BRIAN KELLY CAPITAL

Brian Kelly Capital is a global investment firm with a focus on digital currencies. It is the investment manager of the BKCM Digital Currency Opportunity Fund which invests in the companies and technologies building the digital economy. Through investments in equity and digital assets, the fund provides broad exposure to the companies and technologies transforming finance.

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