

Digital Money

Bitcoin and Beyond

April 2015

Prologue

At Difference Capital, we closely monitor the financial technology sector and have invested in a number of companies in the space, which gives us a unique insight into market trends. Earlier this month, we launched our financial technologies series with “Making Cents of Fintech”. For our second installment we are focusing on Digital Money – Bitcoin and Beyond. Stay tuned for more installments to come.

Introduction

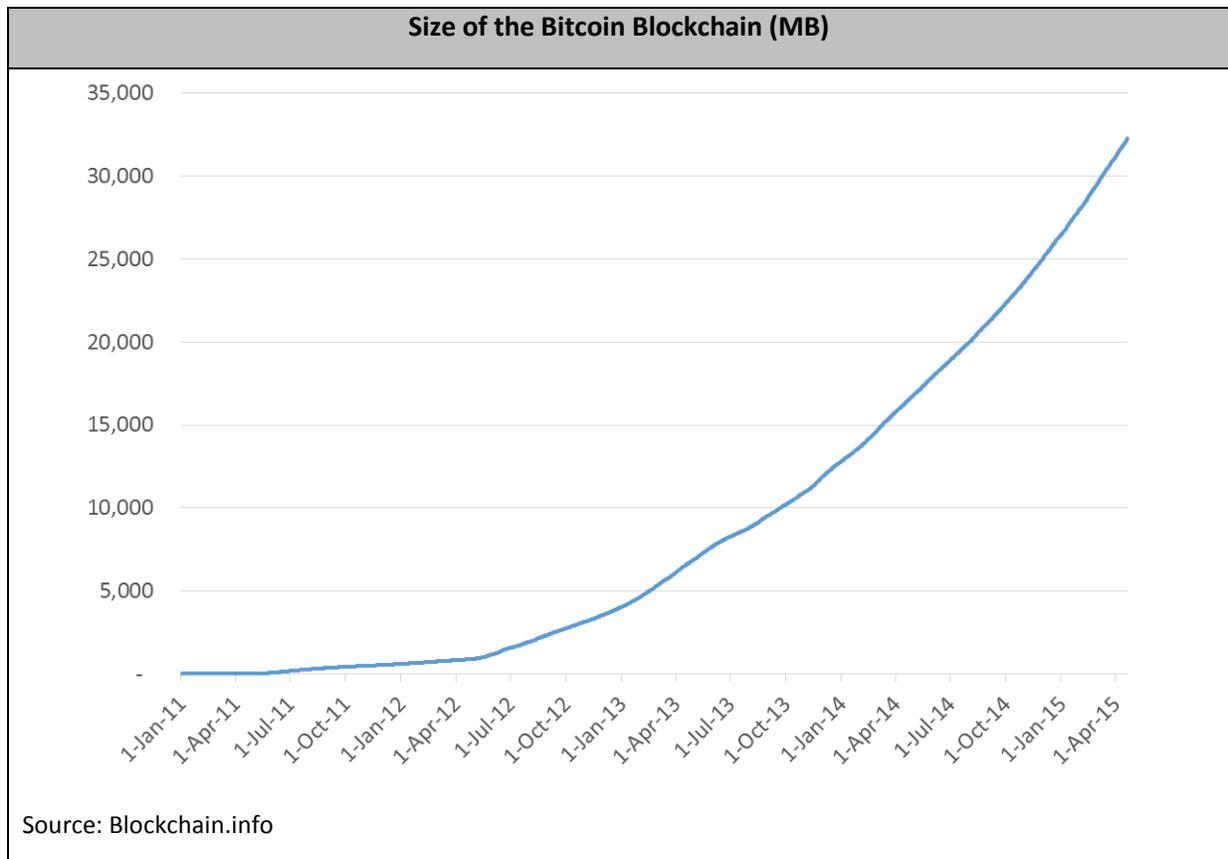
Digital money (or crypto-currency) has been around for a while but the concept has been rejuvenated with the rise in prominence of bitcoin over the past five years or so. We are going to start with a high level description of what this concept entails and then quickly jump into some of the key investable areas that touch digital money along with providing our outlook for the industry. Overall, we are quite enthused about the prospects of the new technology in helping to reduce the roughly \$50 billion in annual friction costs associated with just the eCommerce and global remittance markets. In the longer term, we see lots of potential to repurpose the bitcoin distributed ledger (or blockchain) for a host of other applications outside of the currency markets.

What is Digital Money

Physical currency is relatively simple. I hold my ten dollar bill. You can see that I have a ten dollar bill. I pass my bill to you and now your wealth has increased by ten dollars and mine has decreased by ten dollars. The implementation of digital currency made things more complicated. I can't simply scan my ten dollar bill and email it to you because its too easy to scan, copy and send that image to 10 people instead of just one. Financial institutions have dealt with this problem by creating a central clearing house or ledger where transactions are settled in one place so that I can't digitally try to transfer a ten dollar bill to two different people. However, introducing the concept of the central authority, while dealing with the issue of trust and transaction authenticity, also raises a few problems – mainly it adds friction to the process. The central authority (ie. banks) need to be paid for their service and need time to complete the transaction. So the concept of the trusted central ledger costs time and money.

Cryptographic currency (or Bitcoin, being the most popular type) emerged in 2008. It's major innovation was to move the accounting ledger away from the central authority into plain sight for everyone to view and verify. The initial paper describing Bitcoin was posted to the Internet and described itself as a “peer to peer network” that enables “electronic transactions without relying on trust”. With a distributed ledger in the hands of all network participants, it becomes very difficult to cheat the system.

So where does the concept of cryptography come into play? Cryptography is the process of encrypting data so that nobody can understand the underlying message other than the person who it was meant for (decrypting). When somebody wants to transfer some digital money via Bitcoin, the transaction is encrypted and participants in the network use their computer's horsepower to decrypt the message and verify that the transaction is valid (ie. I in fact have the money that I want to transfer). In return for verifying the transaction, the network participant gets some new Bitcoin currency and the transaction is added to the permanent public ledger. This public ledger, called the blockchain, is now about 32 GB in size, which is 22% larger than it was at the beginning of the year.



Some Bitcoin Specifics

There are a few different cryptographic currencies but we will focus on Bitcoin because it is the most popular by far – about 14x larger than the next closest protocol, Ripple. In order to complete a bitcoin transaction, one needs a public key (which is basically a unique identifier that everyone can see, something akin to an email address) and a private key (which is a corresponding secret code that is mathematically matched to the private key, like your email password). Other users in the network (called miners) use powerful computer systems to verify that the private key and public key match up. A group of transactions is called a block and once a block is verified, it gets posted to the public ledger, called a blockchain and the miner receives 25 bitcoins. There are about 14 million bitcoins currently in

circulation. The supply of new bitcoins entering the market is predetermined in order to provide transparency and remove inflation concerns from the currency. The number of new bitcoins generated per block will decrease by 50% every 4 years until the total number of bitcoins reaches its maximum capacity of 21 million by roughly the year 2040. The current market price of a bitcoin is about US\$220 although it has been very volatile. The price peaked at over US\$1,100 in late 2013. The current market cap of the currency is about US\$3.1 billion.

Summary of Bitcoin Pros and Cons	
Pros	Cons
Low or no transaction fees	Transactions are irreversible
Controlled money supply – no currency manipulation by central authority	No recourse if you lose your private key
Protects against identity theft – no links to credit card or other personal info	High price volatility
Zero fraud for merchants	Volatility in value added services – miners, wallets, exchanges, etc.
Speed of transactions	Regulatory questions – legality, tax issues

Why the Excitement?

There are now nearly 9 million bitcoin wallets and 90K merchants accepting bitcoin including the likes of Dell, DISH, Overstock and Zynga. VC investment in bitcoin-related companies was over \$200M just in the last quarter, which is about one-third of all of the VC dollars that have gone into the bitcoin ecosystem. Noteworthy VC, Marc Andreessen wrote in early 2014 that *“Bitcoin gives us, for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate.”*

The **first key driver for bitcoin is the reduction of friction costs** associated with transferring currency. In the developed world, financial intermediaries routinely take 2-3% off a transaction for their service. In the developing world, this can grow to 5 or even 10%. The World Bank stated that the global remittance market in 2012 was worth over half a trillion dollars and estimated that a few large financial intermediaries annually skim \$16 billion in transfer fees off the top of these global remittances. Fees of up to 29% were being charged between certain countries. The average fee tends to be about 8%. The leader in the money transfer business, Western Union, has a market cap of nearly \$11 billion.

An eMarketer report said global B2C e-commerce sales are expected to be \$1.5 trillion in 2014. Applying a 2-3% transaction fee equates to \$30-45 billion in costs that potentially get eliminated with the adoption of cryptocurrencies like bitcoin. These fees go a long way in supporting behemoth financial intermediaries like FIS, Fiserv, Total Systems, Vantiv and Global Payments, which have a combined market cap of nearly \$60 billion.

The **second major driver for merchant adoption of bitcoin is the elimination of fraud and chargebacks.** A report from CyberSource suggested that online fraud cost e-commerce companies \$3.5 billion in 2012. And this doesn't take into account the portion of sales that online merchants are forced to turn away because a fraud detection system raised flags that were unwarranted (5-10% of sales according to some observers). Bitcoin transactions are permanent and irreversible, which eliminates a lot of the headache that all retailers are faced with. The pricing volatility associated with bitcoin is mitigated by the fact that merchants tend to immediately convert their bitcoin into dollars or other traditional currencies.

In theory, digital currencies like bitcoin have the potential to generate lots of value for consumers and businesses, mainly through the elimination of fraud and friction, which are prevalent under the current trust-based financial system. There are some other smaller benefits, which we will touch on as well, but we believe this is the key driver for the industry.

Why the Concern?

Cryptocurrency and bitcoin has its share of critics. Notably Warren Buffet called bitcoin "*a mirage*" and "*the idea that it has some huge intrinsic value is a just a joke in my view*". We think Mr. Buffet may have been over-generalizing a bit as he was probably reacting to the rapid price volatility of bitcoin rather than the technology itself. In the span of six weeks in late 2013, bitcoin prices went from \$125 to \$1,100 and they currently sit at \$220. This type of volatility is not conducive to a healthy long term store of value. In this respect, we understand why Mr. Buffet would use the term "*mirage*" to describe the value of bitcoin as determined by speculators and hype artists.

We are less concerned by the pricing volatility because we believe that focusing on the exchange rate of bitcoin misses the bigger picture. Our key concern over the long term viability of bitcoin is the calibre of companies and applications that are built on top of the protocol. We liken bitcoin to TCP/IP from the olden days of the Internet – just a protocol that needs a credible group of users and companies to build the right applications. There have been a few big failures in the bitcoin ecosystem. Mt. Gox was a large bitcoin exchange that filed for bankruptcy under suspicious circumstances and Silk Road was deep web marketplace that used bitcoin as the preferred currency for illegal drug transactions. Another round of high profile cases of fraud and failure could really hamper bitcoin's market traction. A recent survey from the Digital Currency Council suggested that only 3% of Americans would trust bitcoin to send money to a family member overseas. This compares to 23% for Western Union and 22% for Paypal.

So far, bitcoin has been the domain of techies and early adopters. We believe that a new wave of companies really needs to build some value on top of the bitcoin protocol. So yes in theory, bitcoin facilitates cheap and fast cross border money transfers but has a company emerged yet that makes this process as smooth and easy as buying a book on Amazon? An ecosystem of startups needs to take the spotlight away from the bitcoin protocol and shine the light on their value add and differentiators.

Painting the Ecosystem

There are different ways to characterize the bitcoin ecosystem. We like how CoinDesk has segmented the market into five sections. We summarize these below:

Mining – these are companies that either directly process the transactions or supply specialized equipment (ie. chips, servers, ASICs, etc.), which are purpose-built for bitcoin processing. Their revenue model is basically built around being the first to verify a block (or set of transactions) and thereby earn 25 bitcoins, which at current prices is worth about US\$5,500. The difficulty of the encryption is designed to increase over time in order to keep pace with computing power. Some of the companies in this market include Bitfury and CloudHashing. Another large miner, CoinTerra, recently filed for bankruptcy as Bitcoin prices have declined.

Exchanges – exchanges are used to trade bitcoins and to convert bitcoins into other currencies (ie. traditional money like USD). These exchanges work similar to stock exchanges where users can place buy-sell limit orders or market orders. A few of the larger exchanges include Bitstamp, which is based in Slovenia, and Bitfinex, which launched in 2013. One of the most high profile failures in the bitcoin market was with the largest exchange in 2013, Mt. Gox. This exchange was based in Tokyo and handled about 70% of all bitcoin transactions at the time. In early 2014, it suspended trading and filed for bankruptcy protection, losing about 850,000 bitcoins.

Wallets – these are basically the places where your private and public keys are stored. Private keys are typically a set of 64 numbers and letters. Clearly, remembering this set of characters is not practical for most humans, so wallets are used to hold the information, allowing you to manage ownership of your bitcoins and transact accordingly. Wallets can come in many forms, including desktop, mobile, web-based or even physical (ie. USB or dongle). Some of the larger wallet providers include Armory, which touts its “cold storage” or offline wallet. Having your wallet connected to the web always leaves some room open for hacks and security breaches. Armory claims to address this issue directly. Coinbase claims to be the largest wallet provider with 2.7 million bitcoin wallets. The company recently raised \$75 million in a large VC financing in order to develop a broad base of services including an exchange, processing and other merchant services.

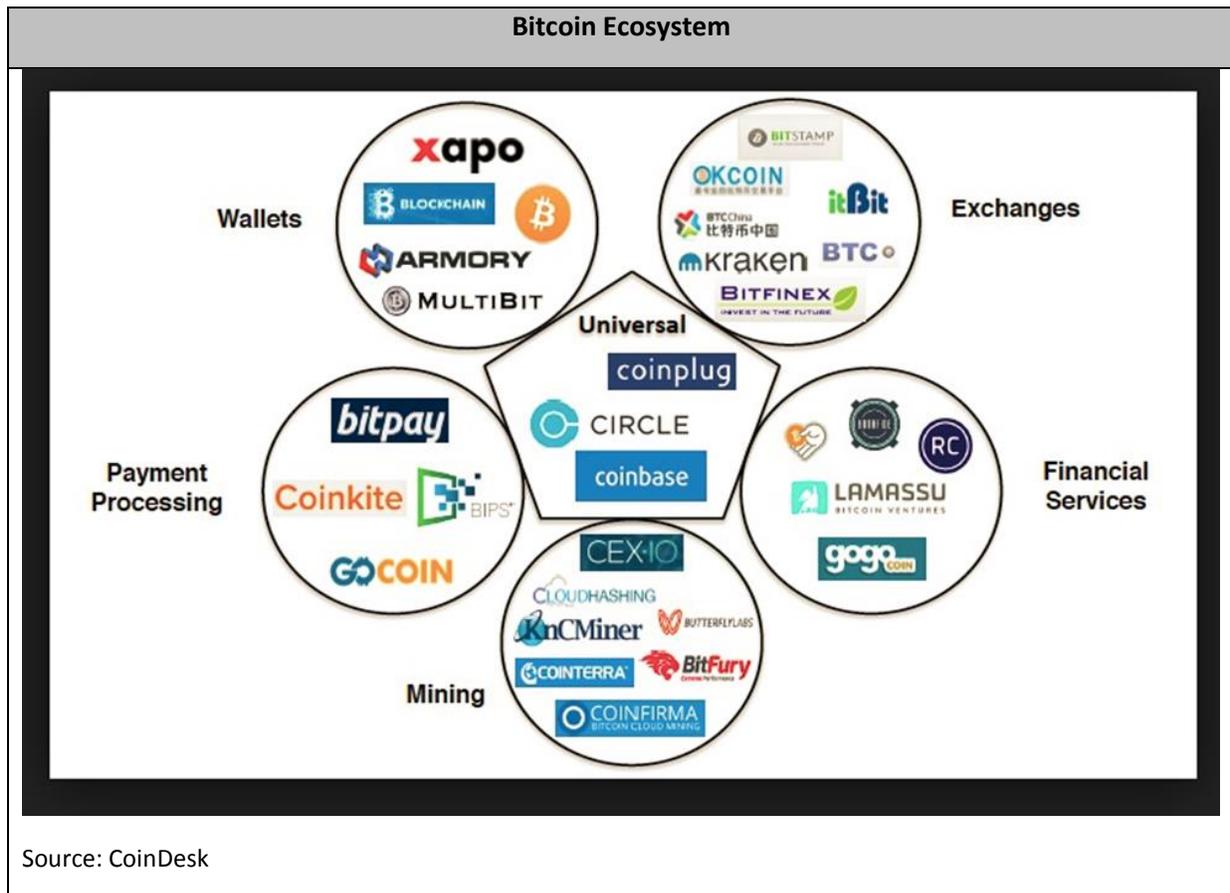
Processing – this segment addresses the merchant’s need to transact in bitcoins. In order for merchants to accept payments through credit cards, debit cards, prepaid cards, paypal, etc. they need to work with payment processors such as First Data, Global Payments or Moneris. If these same merchants want to begin accepting bitcoin, they will need to work with companies like bitpay, Coinkite or GoCoin. There are about 88,000 merchants accepting bitcoin payment at last check with some of the largest including Dell and Overstock.com.

Financial Services – this is a catch-all segment of the ecosystem, which encompasses many value added services that apply to traditional currencies. For example, there are a host of bitcoin ATM companies, such as ExpressCoin and Lamassu, which allow users to exchange bitcoins for cash and vice versa without having to work through an exchange. Also there are bitcoin crowdfunded lending platforms similar to LendingClub, but exclusively for bitcoin. Finally, there are vaults, which claim to house your

bitcoins with greater security than you are able to achieve with just your wallet. These include companies like Elliptic and Xapo.

Summary

Many of the companies in the above categories are beginning to expand into multiple segments in order to create full platforms that encompass everything from wallets, exchanges and processing. The most notable examples are Coinbase, Circle and Coinplug. A stealthy bitcoin startup called 21 Inc. recently raised the largest bitcoin related VC round yet at \$116 million. While there are few details around what this company actually does, they will most likely encompass many of the categories described above.



Canadian Participants

There are a few Canadian companies that appear to be making some headway in the cryptocurrency ecosystem. We mention a few below:

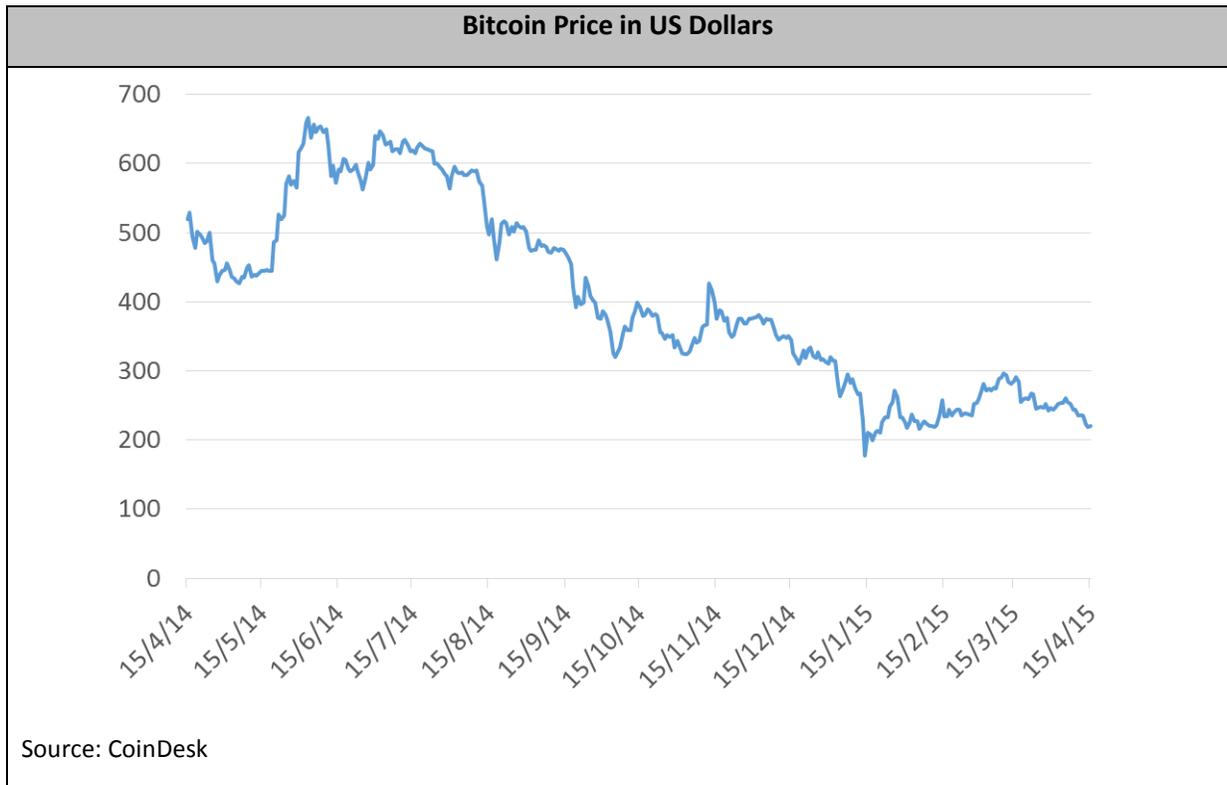
- **Coinkite** – a Toronto-based company that looks to offer bitcoin solutions for both consumers (wallets) and merchants (processing and POS terminals). The company has touted its developer relationships, suggesting that over 1,000 developers are using Coinkite’s API
- **Bex.io** – a Vancouver-based company that has built a bitcoin exchange platform. It announced \$525K seed round in late 2013 with some high profile investors including HootSuite founder, Ryan Holmes.
- **BitAccess** – an Ottawa-based company that makes bitcoin ATMs. The company was founded in 2013 and claims to have its machines deployed in six countries. BitAccess was selected to join Y Combinator last year.
- **CoinPayments** – a Vancouver-based company that focuses on processing solutions for merchants. The company allows 11,000 merchants to accept over 55 different cryptocurrencies, including bitcoin, litecoin, and dogecoin.
- **CoinTrader** – a Vancouver-based company that has built an online trading platform and claims to have launched the world’s first bitcoin ATM. It was acquired in March 2015 for \$1.5 million by Newnote Financial.
- **Blockstream** – a Montreal and San Francisco-based company that is aiming to advance the underlying protocol that supports the bitcoin blockchain. Blockstream is terming this innovation as a sidechain. The company raised a \$21 million seed round in late 2014 with notable investors including Khosla Ventures, Real Ventures, Reid Hoffman and Eric Schmidt.

Industry Metrics

The bitcoin ecosystem has been growing quite rapidly over the past few years although the pace of growth is losing some steam. On a year-over-year basis, the total number of bitcoin wallets grew from 4.4 million to 8.5 million and the number of merchants accepting bitcoin expanded from 53K to 88K. The price of bitcoin has declined considerably in the past year and there have been some regulatory questions, which have likely impacted the recent growth trends. In Q1 2015, the number of wallets only grew 14% sequentially and the number of new merchants only grew by 2K. This compares to 16K new merchant additions made in the year-ago quarter.

Select Bitcoin Industry Metrics		
	Mar-14	Mar-15
Wallets	4,448,142	8,457,207
Merchants	52,704	88,000
ATMs	47	374

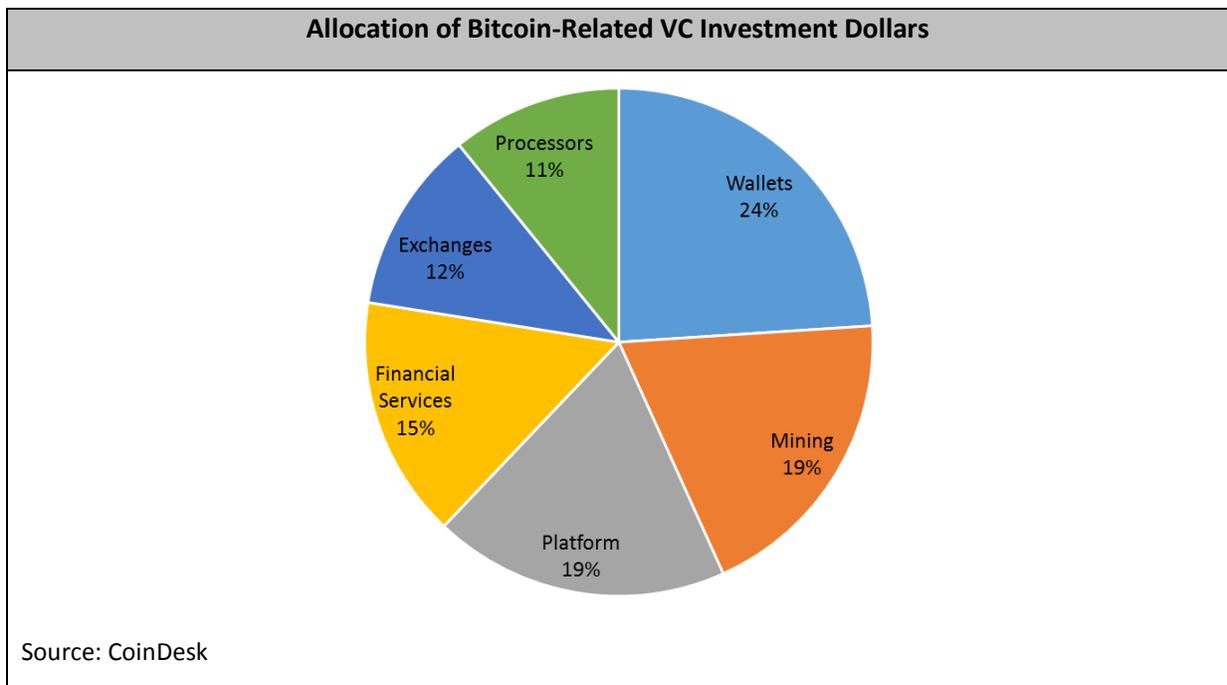
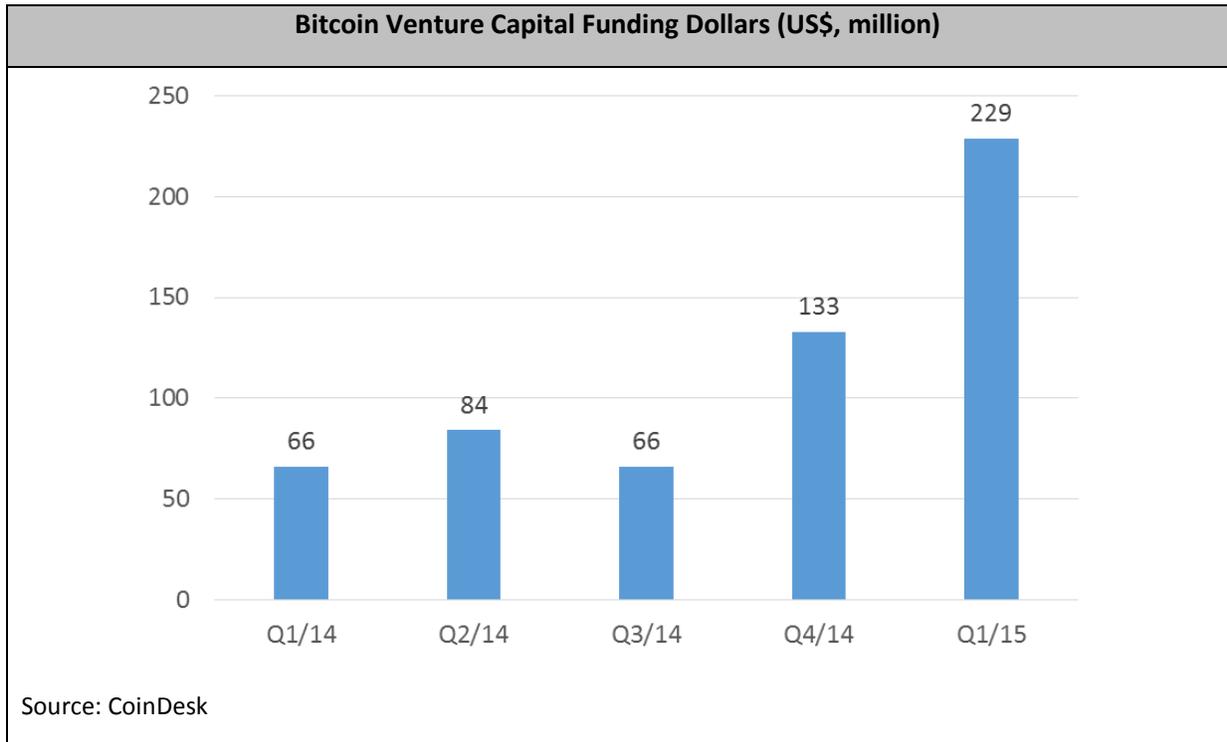
Source: CoinDesk



VC Funding Trends

Despite the price drop and market growth slowing, venture capital investment in bitcoin has exploded recently. Over \$200 million was invested in bitcoin-related startups in Q1/15, which is about one-third of all the VC funding ever directed at the bitcoin market. The growth in funding was driven by two major investments in the quarter – a \$75 million round by Coinbase and a \$116 million round by 21 Inc. Some of the backers of these rounds include the likes of Andreessen Horowitz, Qualcomm, Peter Thiel, DFJ, Union Square and DoCoMo. We would put both Coinbase and 21 Inc. into the platform category, which encompasses several of the bitcoin segments described above. Prior to these financings, the VC investment dollars were split more evenly. Wallets drove about 24% of the investment dollars, followed by miners at 19% and platform companies at 19%.

Our overall thoughts on the digital money market are in sync with the recent VC investments. We believe the market is fragmented and requires considerable consolidation. We like the idea of investing in larger platform companies that have an opportunity to pick up smaller assets for a minimal price tag. We believe a combination of wallets, exchanges and processing makes strategic sense. We are less enthused by the mining category as we see lots of potential for commoditization over time.



Long Term Potential

If we filter through the noise around bitcoin valuation bubbles, price volatility, the Mt. Gox fiasco and Silk Road scandal, we see an underlying technology that could really be a game changer for applications beyond just currency. The real gem in the bitcoin ecosystem is the blockchain or distributed ledger because it creates a method by which to transact or simply hold data on the public web without an intermediary. If we step back from the currency aspect, why not use the blockchain to hold and transfer medical records? Or for land registration? Or for financial contracts? Or for real estate title transfers? We are quite intrigued by the opportunities to repurpose the blockchain. A few companies like Blockstream and Factom are promising to do just that.

To conclude, in the nearterm, we see lots of merit in using bitcoin to ease the friction costs of buying things online and transferring money overseas. This is a \$50 billion annual tax imposed by the big blue chip financial intermediaries. But the market needs to mature and the right group of companies with lots of credibility need to emerge to clarify where bitcoin's value really is. Longer term, we can't wait to see what new applications are born on the blockchain concept. Perhaps in a few years, our election voting will take place on the blockchain. That would be pretty cool.

About the Authors

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Mr. Batrovic brings over 10 years' experience in capital markets and equity research. He is recognized as a technology industry thought leader, having published reports related to software, networking, wireless and digital media and making regular appearances in news media including the Financial Post, Globe and Mail and BNN. Prior to joining Difference, Mr. Batrovic was a co-founder of 4Front Capital Partners and was a Vice-President of Equity Research. Previously, Dushan was a senior technology analyst with Dundee Securities and an equity research analyst at Canaccord Capital. Dushan graduated with a Bachelor of Applied Science and Engineering from the University of Toronto, where he ranked top of his senior year class. Dushan has a Master of Business Administration from the University of Toronto, where he earned Deans' List Honours status in both years of the program.

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Difference Capital Financial Inc. invests in and advises growth companies. We leverage our capital market expertise to help unlock the value in technology, media and healthcare companies as they approach important milestones in their business lifecycle. Difference Capital Financial Inc. is traded under the Toronto Stock Exchange under the symbol "DCF". www.differencecapital.com

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