

Computer Services: Financial Technology

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Digitizing Trust: Leveraging the Bitcoin Protocol Beyond the "Coin"

- We believe Bitcoin and its associated technology represent a potential disruption to our covered companies. Furthermore, we believe Bitcoin's potential lies beyond the "coin" as the underlying blockchain protocol can be used to replace traditional intermediaries by acting as an exchange mechanism for a multitude of transactions.
- We see the potential for bitcoin technology (lowercase 'b'; formally *distributed consensus-based asset ledger technology based on proof of work*) to digitize and decentralize trust. The implications of eliminating the need for centralized trust may go beyond payment networks to areas such as securities markets, sports gambling and even legal contracts. We believe the evolution of the protocol to allow embedded meta data and code in the blockchain paves the way for distributed exchanges to leverage the blockchain protocol in other ways beyond traditional financial transactions.
- We believe 2014 will see considerable innovation around bitcoin, leading to increased consumer adoption further out. We expect recent investments in bitcoin startups by venture capital firms Andreessen Horowitz (Coinbase), Founders Fund (Bitpay) and Accel (Circle) to lead to additional VC investments as the value of the bitcoin technology becomes more prominent. We believe many of these new ventures will be formed with the goal of making Bitcoin accessible to the mainstream in the way browsers/HTML/HTTP did for the internet.
- Although the pace and scale of innovation around bitcoin has been staggering, we believe there are two main roadblocks the bitcoin economy must overcome in the US before achieving widespread adoption – securing bank relationships and money transmitter licenses. However, we would point out that given the decentralized structure, we expect bitcoin technology will thrive regardless, as innovation and innovators gravitate to the country with the most accommodating regulatory environment.
- While we see possible upside in the direct investment in Bitcoin (see our previous report [Bitcoin: Intrinsic Value as Conduit for Disruptive Payment Network Technology](#)), we also explore other potential impact on publically traded companies from the emergence of bitcoin technology:
 - Retailers and Retail Facilitators – we believe OSTK will benefit from lower transaction charges as it starts accepting Bitcoin in 2014 (as well as related publicity push within the bitcoin community). We see EBAY's PayPal benefiting from lower funding costs when it allows Bitcoin in its digital wallet.
 - Payment Network Operators – we see some risk to money transfer companies such as WU and MGI as bitcoin technology makes it possible to perform remittance at a radically lower price. We also see some longer-term threat to V and MA, especially in cross border and micro payments.
 - Securities Exchanges – although this may be even further out, we see a potential for the technology to encroach on exchange companies such as CME, NYX, NDAQ.
 - Technology Providers (page 3) – we believe IBM has become an early adopter of bitcoin technology ([link](#)), but other technology companies may benefit from the buildup of the crypto currency network almost unwittingly. We estimate >\$200 million has already been spent on Bitcoin network (mining) equipment this year, most meaningfully on chip fabricators TSM and AMD (page 3).
 - Financial Institutions – we believe financial institutions that embrace the new technology and the innovators it creates will benefit from the new business formation. For now, SIVB appears to be the only US bank to do so.
- We continue to believe there is a meaningful probability Bitcoin (the specific currency/conduit) may not succeed, but this will most likely be a result of the emergence of a better crypto currency. We believe alternative currencies will continue to emerge, though none of the current batch appears to be superior enough to overcome the substantial head start for Bitcoin. As with any new disruptive technology, we would expect the new powerful technology to continue to be utilized for nefarious purposes. We also believe that given the early stages of development and revolutionary technology, weaknesses will continue to be identified and at times exploited.

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Risks to Target Prices of Covered Companies

Risks to our target prices include an economic slowdown, accelerated bank consolidation and the revaluation of the U.S. dollar.

Additional Analysis

2014 The Year of Bitcoin Innovation

We view the rapid growth of Coinbase (650k+ user accounts, 250k of which added within last 2 months) and Bitpay (\$100 million in processed Bitcoin transactions) as an indication that consumers are receptive to Bitcoin as a financial asset and medium of exchange and we expect this trend to continue as the bitcoin protocol exits beta and becomes more accessible to the mainstream. We believe new users will either enter the Bitcoin network knowingly through an exchange or unknowingly through companies such as ZipZap that leverages crypto currency to facilitate remittances.

Crypto Network Technology May Go Well Beyond Payments

The most recent Bitcoin software update allowed for meta data to be embedded in the block chain, which creates the potential for entities to sit on top of the blockchain and utilize the protocol to facilitate the exchange of assets ranging from other crypto currencies, financial securities, commodities, etc. Ultimately, we believe the protocol will be leveraged beyond financial assets and fulfill the role of trusted intermediary in a variety of settings, including property, legal documents, escrow, sports betting, etc. We believe this development will extend Bitcoin's reach beyond early adopters to the mainstream public who either choose to utilize the network to due to superior cost/efficiency or through an intermediary that chooses to operate their business on top of the block chain instead of traditional rails.

Mastercoin, for example, aims to take advantage of these recent updates and operates as a distributed exchange that sits on top of the blockchain. This development would enable any financial asset (bonds, stocks, commodities, etc.) to be exchanged across the bitcoin network in the same way the Bitcoin currency is exchanged currently. In this way, the blockchain acts as a trusted intermediary.

Bank Regulators Represent Biggest Hurdle in the U.S.

Two of the main areas of early innovation have been companies that enable users to enter and exit the Bitcoin ecosystem (e.g., exchanges) and companies that seek to enhance the user experience of the ecosystem (e.g., wallets).

Due to unclear and evolving regulation around the status of crypto currencies, Bitcoin businesses are finding it increasingly difficult to secure banking relationships. We believe that as regulations are clarified and the stigma (from a banking perspective) around Bitcoin businesses dissipates, the pace of innovation will intensify. At the Inside Bitcoin conference in December we heard from a number of entrepreneurs who were waiting on the sideline because they were not able to secure a bank account. We believe bank regulators have communicated to their banks that they currently see a Bitcoin business as a risk to the rest of the bank's business.

Additionally, a Bitcoin business that acts as an exchange must file for a money transmitter license with the federal government and 48 individual states and comply with FinCEN requirements, a process that consumes a considerable amount of time and resources.

Crypto Network Technology Buildup Could Impact Broad Group of Publicly Traded Companies

We have identified a number of public and private companies that are positioned to benefit from the growth of Bitcoin network (mining) operations. Bitcoin mining equipment consists of four main components: processor, power supply, motherboard, and cooling system. Due to the growth of the Bitcoin network, mining machines now require powerful application-specific integrated circuits (ASICs) that are designed specifically to mine Bitcoins. We believe the majority of these ASIC chips are fabricated at Taiwan Semiconductor and GlobalFoundries. We also believe AMD is positioned to benefit from the rise of alternative coins such as Litecoin as AMD chips are preferred by Litecoin miners over other competitor GPU chips.

Figure 1: Technology Companies Providing Network (Mining) Equipment Components

	Public	Private
Processor	TSM, AMD	GlobalFoundries
Power Supply Units	HPQ	Corsair
Motherboard	ASUUY, PMCS	ASRock
Cooling System	IR (Trane), EMR	CoolIT

Source: Company data, Wedbush Securities, Inc.

Public companies mentioned in this report (closing prices on 12/31/13)

COMPANY	TICKER	RATING	PRICE	PRICE TARGET
Visa	V	NEUTRAL	\$222.68	\$200.00
Mastercard	MA	NEUTRAL	\$835.46	\$720.00
eBay	EBAY	OUTPERFORM	\$54.89	\$70.00
Advanced Micro Devices	AMD	OUTPERFORM	\$3.87	\$5.00

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I, Gil Luria, Aaron Turner, certify that the views expressed in this report accurately reflect my personal opinion and that I have not and will not, directly or indirectly, receive compensation or other payments in connection with my specific recommendations or views contained in this report.

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Neutral: Expect the total return of the stock to perform in-line with the median total return of the analyst's (or the analyst's team) coverage universe over the next 6-12 months.

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Neutral: 41%	Neutral: 2%
Underperform: 4%	Underperform: 0%

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Company	Disclosure
eBay	1
Visa	1
MasterCard	1
Advanced Micro Devices	1

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AMD

1) 01/11/11	2) 07/18/11	3) 07/22/11	4) 09/29/11	5) 10/26/11	6) 01/23/12	7) 04/20/12
NEUTRAL \$8	OUTPERFORM \$9	OUTPERFORM \$10	OUTPERFORM \$9	OUTPERFORM \$8	OUTPERFORM \$9	OUTPERFORM \$10
8) 07/10/12	9) 07/20/12	10) 09/18/12	11) 10/12/12	12) 04/16/13	13) 06/14/13	14) 07/19/13
OUTPERFORM \$7	NEUTRAL \$5	NEUTRAL \$4.50	NEUTRAL \$3	NEUTRAL \$2.75	NEUTRAL \$4	NEUTRAL \$4.50



MA

1) 12/15/10	2) 12/17/10	3) 05/03/11	4) 06/08/11	5) 06/29/11	6) 08/03/11	7) 11/02/11	8) 02/02/12
NEUTRAL \$270	NEUTRAL \$238	NEUTRAL \$272	NEUTRAL \$258	NEUTRAL \$280	NEUTRAL \$320	NEUTRAL \$330	NEUTRAL \$365
9) 05/02/12	10) 07/31/13						
NEUTRAL \$460	NEUTRAL \$640						



V

1) 12/15/10	2) 12/17/10	3) 05/05/11	4) 06/08/11	5) 06/29/11	6) 10/26/11	7) 02/09/12	8) 05/03/12
NEUTRAL \$87	NEUTRAL \$72	NEUTRAL \$78	NEUTRAL \$73	NEUTRAL \$80	NEUTRAL \$83	NEUTRAL \$90	NEUTRAL \$110
9) 07/25/12	10) 10/31/12	11) 07/24/13					
NEUTRAL \$140	NEUTRAL \$145	NEUTRAL \$180					



EBAY

1) 01/03/11	2) 04/28/11	3) 07/21/11	4) 09/16/11	5) 07/16/12	6) 07/18/12	7) 08/22/12
NEUTRAL \$31	NEUTRAL \$34	NEUTRAL \$35	OUTPERFORM \$48	OUTPERFORM \$52	OUTPERFORM \$55	OUTPERFORM \$57
8) 10/09/12	9) 01/16/13					
OUTPERFORM \$60	OUTPERFORM \$64					



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