

## Computer Services: Financial Technology

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### Bitcoin: Intrinsic Value as Conduit for Disruptive Payment Network Technology

- Among other facets, we believe Bitcoin and its associated technology represent a potentially game-changing disruption to our covered payments companies.
- We see the intrinsic value of Bitcoin as the conduit in a new global crowd-funded open-source payment network.
- We observe three key sources of demand for Bitcoin - as a disruptive payment network technology, an alternative uncorrelated asset class, and a safe haven currency, but believe the payment network capabilities are the key to the sustainability of crypto currency, with Bitcoin the early leader.
- We believe that by decentralizing processing, allowing for market-based fees and adding new functionality, crypto currency technology provides a powerful alternative to branded networks. Initial benefits for crypto currency technology may be in processing micro transactions and cross-border payments, but the potential for innovation is significant. With a flexible fee structure and competitive price/lag dynamics, we believe Bitcoin is better suited to replace high-cost branded network micro payments charges. We believe cross border transactions would benefit from the ability to avoid currency translation or conducting the foreign exchange outside the payment network. We further believe crypto currency technology will develop new advantages over existing payment networks such as transaction-linked code, differential settlement fees/timeline and currency flow analysis.
- We believe the key to Bitcoin's success so far, and significant promise going forward, is in crowd-funding the development of the first new global payment network in decades. By allowing infrastructure providers to get compensated in the conduit/currency (Bitcoin) and then adding more investors by selling them the conduit/currency, the payment network is being capitalized by a very broad set of infrastructure providers and investors.
- We see some evidence for this in the willingness of key countries (Germany, USA, China) to regulate, not shut down Bitcoin, in spite of the perceived risk to their sovereign currency. More importantly in our mind is that with a decentralized structure even if a small number of countries choose not to interfere or are not able to interfere, Bitcoin's technologies are likely to thrive.
- We do 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. We also believe that given the early stages of development and revolutionary technology, weaknesses will continue to be identified and at times exploited.
- Based on the order of magnitude of the overall opportunity and some very rough calculations we also believe scenarios exist by which a Bitcoin could be worth 10-100x its current price (pages 2, 3). We believe rising Bitcoin prices help build the network thus entrenching its value, especially vis-à-vis other alternative coins/conduits. Based on this framework, we would postulate that current Bitcoin prices reflect a peak penetration of 1% of total potential demand in 10 years.
- We believe the volatility in Bitcoin prices is a result of an extended price discovery process as the market overcomes substantial friction and the very divergent set of outcomes. In terms of the broad divergence of outcomes (zero or 10x+), we think of Bitcoin as the equivalent of a biotech that had a molecule that may cure the common cold. Therefore, we do not expect volatility to subside anytime soon.
- The long-term threat posed by this technology is mostly to the payment networks (V, MA) and technology facilitators such as ACIW, in our opinion. We believe crypto currency technology may have advantages in introducing new capabilities and a superior point-to-point cost structure to the current hub-and-spoke branded networks.
- We see the long-term opportunities presenting themselves to payment-type-agnostic technology providers such as EBAY. For PayPal, Bitcoin represents another potential low cost funding method. PayPal is already incorporating private label cards, gift cards and miles into the digital wallet and we believe that with more regulatory clarity PayPal would likely embrace Bitcoin.

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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

We observe three key sources of demand for Bitcoin - as a disruptive payment network technology, an alternative uncorrelated asset class, and a safe haven currency. Based on the order of magnitude of the overall opportunity and some very rough calculations we also believe scenarios exist by which a Bitcoin could be worth 10-100x its current price (Figure 1). Based on this framework we would postulate that current Bitcoin prices reflect a peak penetration of 1% of total potential demand in 10 years.

As an uncorrelated alternative asset class we believe Bitcoin may succeed in replacing some demand for gold, which represents total financial holdings of \$1.9 trillion. As a currency of refuge, we believe the demand represents a way for consumers in high inflationary countries to preserve the value of their income, and opportunity that could represent an additional \$4.3 trillion of demand.

We believe the lynch pin for demand is the functionality of crypto currency technology in facilitating payment transactions, especially cross border. The foreign currency reserves supporting cross border trade are around \$7.5 trillion. We believe that if Bitcoin is able to become the conduit for a subset of these transactions, it can justify the usages as an alternative currency and currency of refuge.

Figure 1: Implied 1-Year Bitcoin Price

		Years to Achieving Peak Penetration			
		20	10	5	1
Penetration of Potential Demand	1%	\$520	\$1,041	\$2,081	\$10,407
	5%	2,602	5,204	10,407	52,035
	10%	5,204	10,407	20,814	104,070
	20%	10,407	20,814	41,628	208,141

(in millions)

Global Foreign Currency Reserves	\$7,453,736 (1)
Money Supply in High Inflation Countries	\$4,305,488 Figure 2
Gold as Financial Asset	\$1,900,000 (2)
Total Potential Aggregate Demand	\$13,659,224

Estimated supply in 2014 13 million BTC

(1) Source: IMF

(2) Source: WGC

Source: IMF, WGC, Wedbush Securities, Inc.

**Figure 2: Money Supply in High Inflation Countries**

Country	Inflation	M2 in USD (millions)
RUSSIA	6%	\$869,663
BRAZIL	6%	808,988
TURKEY	8%	420,940
MACAO	6%	414,179
INDIA	7%	309,868
INDONESIA	8%	304,501
SOUTH AFRICA	6%	198,462
EGYPT	10%	193,682
VIETNAM	6%	166,914
VENEZUELA	47%	152,474
ARGENTINA	11%	89,510
BANGLADESH	7%	79,806
NIGERIA	8%	79,781
PAKISTAN	9%	49,316
JORDAN	5%	38,234
ANGOLA	8%	36,192
IRAN	32%	34,401
SRI LANKA	7%	22,387
KENYA	8%	18,120
SYRIA	50%	18,070
		\$4,305,488

Source: Trading Economics, Wedbush Securities, Inc.

### Public companies mentioned in this report (closing prices on 11/27/13)

COMPANY	TICKER	RATING	PRICE	PRICE TARGET
Visa	V	NEUTRAL	\$203.99	\$200.00
Mastercard	MA	NEUTRAL	\$760.40	\$720.00
ACI Worldwide	ACIW	NEUTRAL	\$64.70	\$50.00
eBay	EBAY	OUTPERFORM	\$49.30	\$64.00

#### Analyst Certification

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.

Disclosure information regarding historical ratings and price targets is available at <http://www.wedbush.com/ResearchDisclosure/DisclosureQ313.pdf>

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The Investment Ratings are based on the expected performance of a stock (based on anticipated total return to price target) relative to the other stocks in the analyst's coverage universe (or the analyst's team coverage).\*

Rating Distribution (as of September 30, 2013)	Investment Banking Relationships (as of September 30, 2013)
Outperform: 55%	Outperform: 14%
Neutral: 41%	Neutral: 2%
Underperform: 4%	Underperform: 0%

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#### Wedbush Equity Research Disclosures as of December 1, 2013

Company	Disclosure
Visa	1
MasterCard	1
ACI Worldwide	1
eBay	1

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**ACIW**

1) 02/15/11	2) 04/28/11	3) 07/26/11	4) 05/03/12	5) 07/26/12	6) 08/13/12	7) 11/08/12
OUTPERFORM \$33	OUTPERFORM \$37	OUTPERFORM \$42	OUTPERFORM \$47	OUTPERFORM \$50	NEUTRAL \$50	NEUTRAL \$46



**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					



\* WS changed its rating system from (Strong Buy/Buy/Hold/Sell) to (Outperform/ Neutral/Underperform) on July 14, 2009. Please access the attached hyperlink for WS' Coverage Universe: <http://www.wedbush.com/services/cmg/equities-division/research/equity-research> Applicable disclosure information is also available upon request by contacting Ellen Kang in the Research Department at (213) 688-4529, by email to [ellen.kang@wedbush.com](mailto:ellen.kang@wedbush.com), or the Business Conduct Department at (213) 688-8090. You may also submit a written request to the following: Business Conduct Department, 1000 Wilshire Blvd., Los Angeles, CA 90017.

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