

TAKEN ON TRUST: DISRUPTING MONEY

April 2018

FRANKLIN TEMPLETON THINKS™ DISRUPTION



How Cryptocurrencies, Blockchain and Digital Payments Are Changing Our World

“Money makes the world go around.” As the famous song from the musical *Cabaret* reminds us, money is the driving force behind just about every aspect of our day-to-day lives. But our relationship with money is changing.

New technology is challenging our centuries-old conventions for creating, storing, valuing and exchanging money, as well as who controls it. And that could have far-reaching consequences by disrupting financial services as we know them and creating new avenues for virtual monetary exchange across the globe.

Developments in three areas in particular have the potential to drive this disruption: cryptocurrencies, blockchain and digital payment systems. In this piece, we explore each of these phenomena, and consider their potential for reshaping the world in which we live and invest.

Our interactions with the firms we are researching indicate the next several years will be an important time for the evolution of this disruption. As active investors, we are evaluating opportunities to take advantage of these dislocations while being careful to evaluate the risks.

KEY TAKEAWAYS

- 1** Cryptocurrencies are not straightforward forms of digital cash. Each is created with a certain intent, which requires understanding how they will be used. Speculative investment trends and the prevalence of initial coin offerings (ICOs) are pushing boundaries of traditional investment channels, making regulation challenging in these early stages of development.
- 2** Blockchain offers an innovative new method of recordkeeping that is more secure, transparent and efficient than many recordkeeping systems in place today. This improvement could benefit not just financial services companies such as banks and insurance companies but also health care, real estate and other sectors that rely on detailed recordkeeping over time.
- 3** China is leading the way on digital and mobile payment usage. The prevalent use of mobile phones can empower millions of poor individuals and women who have not typically used banks. These digital payment systems are becoming ubiquitous for many daily needs—from receiving income to paying for groceries and hospital stays.

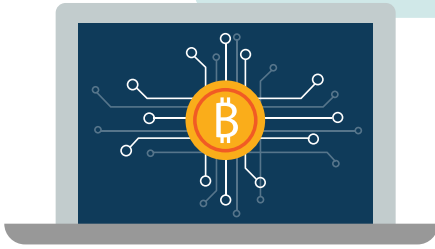
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CRYPTOCURRENCES— DECIPHERING THE VALUE



WHAT IS CRYPTOCURRENCY?

Cryptocurrencies represent a form of digital cash.



Rather than being issued by a central bank, issuance of cryptocurrencies is generally controlled by a decentralized network of computers.

Money doesn't grow on trees, but it can now be created on computers. The modern development of cryptocurrencies began gaining traction around 10 years ago at the height of the global financial crisis (GFC). As disenchantment with banks and governments grew in the wake of the GFC, initial attention focused on the development of peer-to-peer digital cash payment systems that were independent of state or traditional financial service companies.

The most famous cryptocurrency, bitcoin, traces its roots back to a 2008 white paper written by "Satoshi Nakamoto." It subsequently emerged that Nakamoto may not even exist and the true identity of the originators of bitcoin remains a mystery—it could even be several people. Bitcoin started as a peer-to-peer payment system in the so-called "dark web," a non-exposed segment of the internet that has been a breeding ground for illicit activities. In many ways, that was the perfect origin because in an environment in which people don't know each other, they have to find a basis of trust as a foundation for conducting transactions. As bitcoin has emerged into the mainstream internet, it seems most holders of bitcoin use it as a store of value rather

than as a way to buy and sell things. The inability to use bitcoin in more practical ways has contributed to it serving as a speculative investment.

In the past few years, there has been an explosion in the number of cryptocurrencies. And the explosion has brought a lot of hype as the price of these cryptocurrencies has been widely

touted across the news. Franklin Templeton Research Analyst Robert Stevenson puts the hype into perspective. According to Stevenson, "In our view, the focus on the price of bitcoin is really missing the mark in terms of trying to help investors understand how or why cryptocurrencies can be used and why they should have value in the long term."

NETWORKED TRANSACTIONS

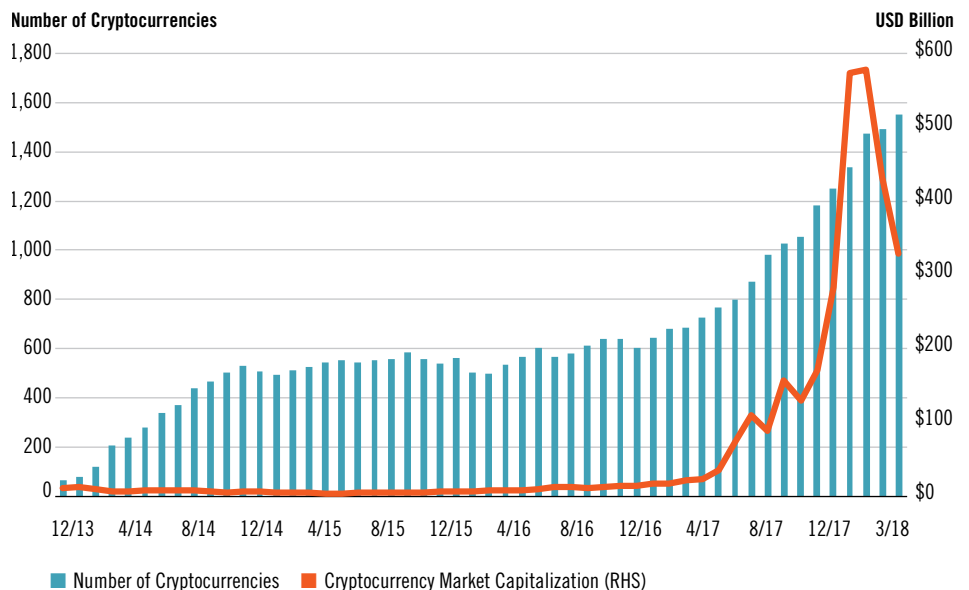
The cryptocurrency network relies on cryptography and other techniques to regulate supply.



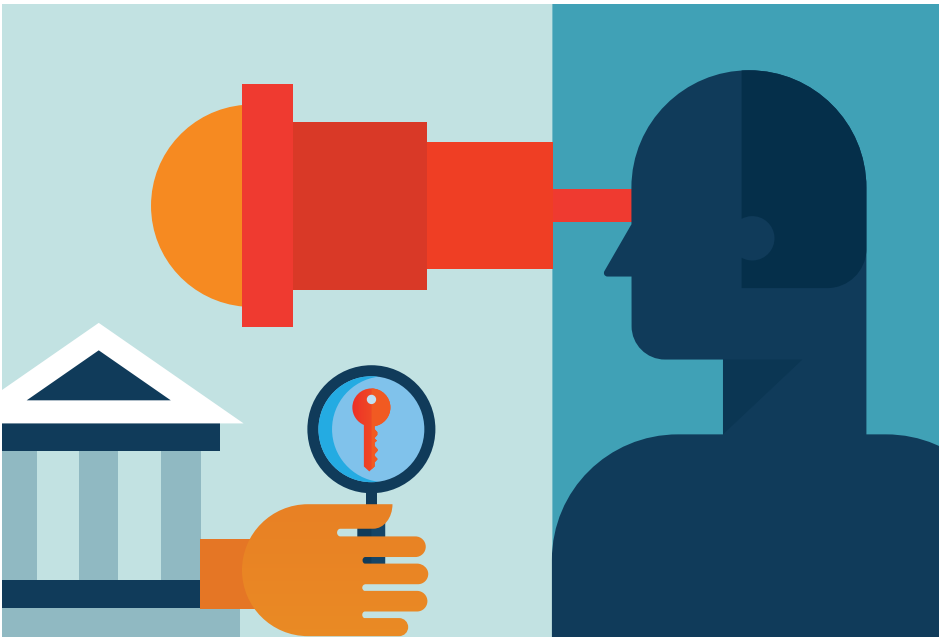
A shared ledger, recording the use and ownership of the tokens or coins comprising the cryptocurrencies, offers the trust required for the system to operate effectively for most cryptocurrencies. The ledger is known as *blockchain* and is maintained collaboratively by the decentralized network of computers. It offers transparency and a single source of truth for the transaction records.

Cryptocurrencies Have Seen Rapid Growth

Number of Cryptocurrencies vs. Cryptocurrency Market Capitalization
December 2013–March 2018



Source: Coin Market Cap.



Unlike other forms of currency traditionally issued by a government, cryptocurrencies are being created in response to an array of use cases to facilitate a method of exchange for a particular purpose. For example, ethereum, which was launched in 2015, is a software platform that uses “ether” both to run its applications and to monetize work within the platform.

There are technical differences between bitcoin and ethereum in terms of the way the two cryptocurrencies are structured and run. But the most significant

difference is the purpose and intent of the two currencies. According to Investopedia, bitcoin was designed as an alternative to money while ethereum was developed as a platform which facilitates peer-to-peer contracts and applications through its own currency, ether.

New cryptocurrencies with different intents and purposes are being created and launched every day. Realistically, we expect only a handful to survive. Many, such as dogecoin and paycoin have proven to be scams in which the founders ran off with everyone’s money.

Like the dot.com days, many will likely go bust or be taken over. Those that do survive will have a particular use case that solves a problem and adds value for their users.

For instance, bitcoin was one of the original digital payment alternatives, but its transaction times have slowed and transaction costs have increased. That has made paying for everyday things using bitcoin more challenging. We see an opportunity for other cryptocurrencies to step in to fill that payment need. An ability to easily exchange these currencies could promote more widespread adoption. Currently, a handful of very big wallets (a place where bitcoins are electronically stored and accessed) hold the lion’s share of cryptocurrencies.

Money Tree Policy: Raising Capital

While most consumers can’t easily exchange these digital currencies for everyday goods and services, cryptocurrencies are at the heart of a changing approach to raising capital among some companies.

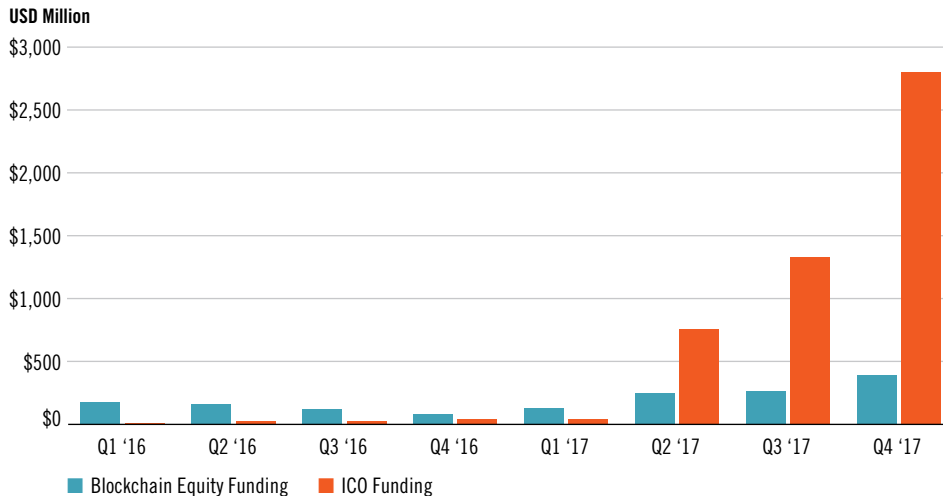
ICOs represent the sale of cryptocurrency tokens or “coins.” These offerings are emerging as an alternative to initial public offerings for some start-up

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Robert Stevenson
Research Analyst, Franklin Equity Group

ICOs Have Become More Prevalent among Blockchain-Focused Start-Ups

Blockchain Equity Funding vs. ICO Funding
Q1 2016–Q4 2017



Source: CB Insights.

entrepreneurs to access capital and raise money for their ventures. Among start-ups focused on the blockchain arena, funds raised through ICOs in the second quarter of 2017 surpassed total funds raised through traditional equity financing for the first time.

By the end of 2017, ICOs had raised \$5.6 billion for blockchain start-ups versus around \$1 billion through traditional equity funding.¹ Investors in these ICOs hope to turn a profit by getting in at the ground floor of new protocols that could expand in the way bitcoin and ethereum have. Significantly, the participation of well-known venture capital names in some ICOs indicates this could be a growing area of interest for institutional investors.

There are still plenty of reasons for caution. Investors should be wary because these ICOs are taking place outside of normal markets. This means normal investor protections are not necessarily in place, and some of the ICOs have been fraudulent. Major internet firms such as Google, Facebook, Twitter, Alibaba, Baidu and Tencent no longer carry advertisements for ICOs on their sites. We are reminded of the old adage: If it sounds too good to be true, it probably is.

To Regulate or Not to Regulate? That Is the Question.

Ironically, while cryptocurrencies were initially developed because of a lack of trust in governments and the financial system, maturing and broadening their appeal to investors may ultimately require the application of a clear regulatory framework. Otherwise, investors may never feel comfortable with these new paradigms.

As yet, no consistent approach to cryptocurrency regulation has emerged across the globe. In our experience, regulatory agencies tend to take a wait-and-see approach when new technologies appear. They tend to develop rules after the innovation has already occurred.

Cryptocurrencies have caught regulators' eyes, and some countries have taken a firm approach. China recently banned financial institutions from handling cryptocurrencies. Indonesia and Bangladesh have banned bitcoin as a payment tool, and India's central bank has issued a number of warnings about cryptocurrency risks. In a speech in London in March, the governor of the Bank of England, Mark Carney, said the time had come to hold the

cryptocurrency ecosystem to the same standards as the rest of the financial system. And while he stopped short of calling for a ban, he did indicate he favors greater regulation of the space.

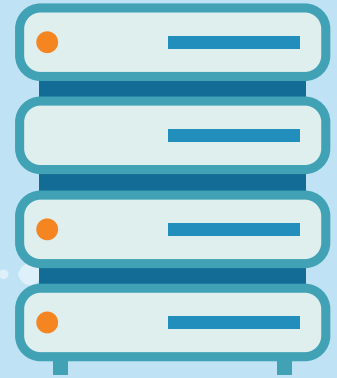
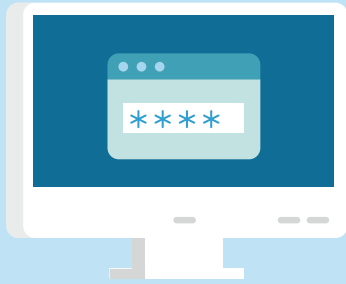
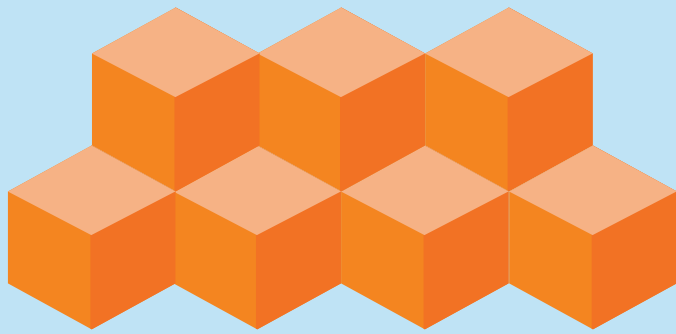
One challenge for authorities is agreeing to a clear definition of cryptocurrencies. Even in the US there is a wide range of opinion. For example, the US Internal Revenue Service (IRS) considers cryptocurrency as property (for tax purposes). The US Treasury Department, on the other hand, views cryptocurrency as having the essential functions of money (though doesn't designate it as legal tender). The US Commodity Futures Trading Commission considers cryptocurrency as a commodity. And the US Securities and Exchange Commission (SEC) views it as a security.

Regulatory Body	Cryptocurrency Designation	
US Internal Revenue Service	Property	
US Treasury Department	Money-Like	
US Commodity Futures Trading Commission	Commodity	
US Securities and Exchange Commission	Security	

Given the dramatic increase in the value of certain cryptocurrencies, such as bitcoin, tax-collecting bodies around the world are likely to be looking for ways to tax them. One way may be through taxing the capital gains when investors sell those cryptocurrencies at a profit. Another way could be through sales taxes when individuals use them to purchase goods.

We imagine a clearer regulatory framework will begin to take hold as wider adoption continues in the global economy and as legitimate businesses expand their use of these protocols in order to advance their economic interests.

1. Source: Fabric Ventures and TokenData, "The State of the Token Market: A Year in Review and an Outlook for 2018," January 2018.



BLOCKCHAIN'S EXPANDING ROLE

Sitting at the heart of the technology that facilitates cryptocurrencies is blockchain. But the value of blockchain extends well beyond record-keeping for cryptocurrencies.

In simple terms, blockchain is a decentralized distributed ledger that records transactions in a secure manner. Each transaction is verified

and synced with every node affiliated with the blockchain before it is written to the system, which makes it both transparent and difficult to deceive. Until this verification has occurred, the next transaction cannot move forward. Anyone with a computer and internet access can set up as a node, or connection point, that is then synced with the entire blockchain history.

Blockchain's application offers new ways to solve some of the traditional challenges of managing records and transactions across disparate systems and organizations. This has the potential to improve and streamline recordkeeping services, especially within financial services where multiple parties are trying to track and reconcile the same transaction.

If the following conditions apply, then blockchain has strong potential to provide a solution.

Multiple parties share data	Multiple parties update data	Requirement for verification	Intermediaries add cost and complexity	Interactions are time sensitive	Transaction interaction
Multiple participants need views of common information	Multiple participants take actions that need to be recorded and change the data	Participants need to trust that the actions that are recorded are valid	Removal of "central authority" record keeper intermediaries has the potential to reduce cost (e.g., fees) and complexity (e.g., multiple reconciliations)	Reducing delay has business benefit (e.g., reduced settlement risk, enhanced liquidity)	Transactions created by different participants depend on each other

Public versus Private Networks

There are some perceived downsides for companies using a public blockchain, most notably the transparency: In a public blockchain, transactions are visible to everyone. In financial services, this isn't feasible from a privacy perspective. Additionally, the threat of hacking could be a risk for both public and private networks alike. With all this innovation, there could be new risks we haven't yet anticipated related to the access and use of personal data, virtual networks and currencies driven by technology.

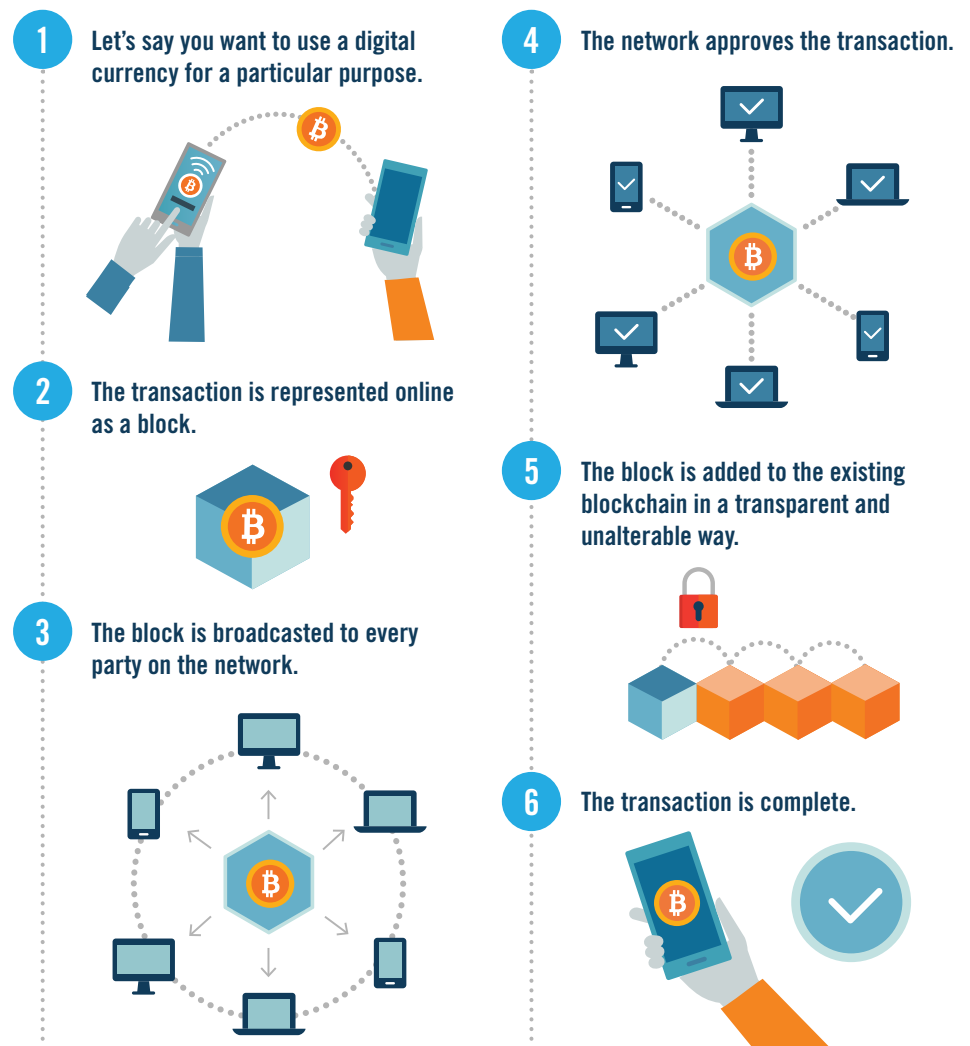
Still, blockchain technology remains attractive. There's been growing interest and investment in so-called "private network blockchain." For example, trading a complex financial instrument might require as many as 20 banks to maintain their own individual ledgers of the transaction. They have to reconcile with each other and that requires often laborious communication between individuals and systems. Blockchain offers a shared ledger that allows each of the participating banks access to one single, shared and inherently reliable data source. This could allow banks to reduce costs and potentially to reduce the capital required to put up against these trades.

Ironically, given that this whole ecosystem started as a way to disrupt banks, banking could be one industry that emerges among the big winners from this technology. On the other hand, banks that capture more value than they're putting into the ecosystem may find themselves disrupted by the wider application of blockchain technology.

As we research the financial services sector space, our question is whether existing intermediaries (banks) are going to find a way to maintain their place in the ecosystem by managing their existing processes using blockchain, or if new and emerging innovators will come in and replace them because of the benefits their services can offer.

	Features and Uses	Accessibility	Considerations
PUBLIC BLOCKCHAIN	Underpins cryptocurrencies such as bitcoin and ethereum; often features an incentivizing mechanism to encourage new participants to join	Completely open and anyone can join and participate in the network; transactions are transparent and decentralized	Little privacy; slow; requires massive computational power and electricity, which only increases as new transactions are added
PRIVATE BLOCKCHAIN	Private networks for use among trusted partners; requires invitation or permission to use	Only the entities participating in a particular transaction will have knowledge and access to it; lower costs and faster transaction speeds than public network	Lacks the democratized security of public blockchain

WHAT IS BLOCKCHAIN?



PAN-SECTOR OPPORTUNITIES FROM BLOCKCHAIN

Blockchain will benefit more than just financial services firms. Any industry where accurate, detailed records and privacy are factors can take advantage. Here are a few sectors we view to be poised for opportunity.

INSURANCE

Not only does blockchain offer the promise of cost reduction and efficiency, but it could also enable revenue growth, as insurers attract new business through higher-quality service.

Some potential benefits of blockchain include:

- Fraud detection and risk prevention
- Claims prevention and management
- New distribution and payment models



HEALTH CARE

One of the challenges hospitals face is the lack of a secure platform to store and share data, and they are often victims of hacking because of outdated infrastructure. Blockchain technology can allow hospitals to safely store data like medical records and share it with authorized professionals or patients. This can improve data security and can even help with accuracy and speed of diagnosis.



REAL ESTATE

Bureaucracy, lack of transparency, fraud and mistakes in public records all impact the efficiency of buying and selling property. In our view, title insurance companies or securities exchanges could use blockchain to reduce the time needed to transfer mortgage titles or settle trades, respectively.



PRIVATE TRANSPORT AND RIDE SHARING

Blockchain can be used to create decentralized versions of peer-to-peer ridesharing apps, allowing both car owners and users to arrange terms and conditions in a secure way without the need for third-party providers.



Future Developments

We don't expect the adoption of this new blockchain technology to be linear. It's likely to take companies some time to figure out the best way to take advantage of the opportunities and it is starting to become more evident who is serious about it.

Disruption may lead to widespread reorganization in the financial services sector as banks and companies involved in reconciling transactions between institutions no longer need to perform this type of work because blockchain

offers a common source of truth to each institution that needs information about a particular transaction. This technology can potentially reduce costs of doing business substantially.

For publicly traded companies with incentives to improve efficiency and drive up productivity, disruption in this sphere could potentially prove positive for some stocks.

Franklin Templeton Research Analyst Anthony Hardy offers insights about the way companies are embracing blockchain. According to Hardy, "We talk

with both publicly traded incumbents as well as disruptive privately held start-ups. It is becoming more evident who is taking blockchain seriously and who is not. Everyone says they are doing something. We are evaluating who is really thinking about this in the right way, who is partnering with the right vendors, and who is making the right strategic moves as a company."

We believe companies that aren't thinking about all the ramifications of the application of this technology and how to monetize it now could potentially face significant disruption in five years or so.

In terms of long-term winners and losers, we see opportunities in places where large networks have been built up, whether they are physical, technological or people. Networks in which the amount of time, effort and investment is significant and offers the potential to generate outsized profits are very difficult networks to disrupt. But, if new entrants can find new ways of offering the same or a better service at a reasonable cost, they have the potential to capture some market share from established players. This is not dissimilar from what major credit card companies such as Visa and Mastercard are experiencing with the evolution of digital payment systems.

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Anthony Hardy
Research Analyst, Franklin Equity Group

MOVING TOWARD A CASHLESS SOCIETY

For most individuals, the most apparent example of innovation leading to the disruption of money can be seen in society's diminishing reliance on cash.

As a society, we have evolved our payment methods to increasingly more convenient ways to pay for goods and services—from cash to checks to credit and debit cards to online banking. Today, new digital payment systems stand poised to eliminate the use of credit and debit cards and change the nature of online banking. And, there

is a whole generation of young people who are quite comfortable with the idea of never having to carry cash or even a credit card for their daily needs.

But this adoption of a “cashless society” suggests significant changes in the way companies in many industries do business. Unencumbered by legacy systems and concerns, the experience of emerging markets in general—and China specifically—may give us some clues as to the trajectory of the “cashless society.”

China is widely regarded as a leader in the e-payment space. Smartphones are easily accessible and affordable in China. For many in this market, it's easier to get a phone than it is to get a bank account through a traditional bank.

Chinese companies have been innovative pioneers in this space, including Ant Financial's Alipay and Tencent's WeChat Pay. They have created an easy experience for consumers to pay for goods and services across their daily lives by scanning QR codes or using app-based payments.



A wide variety of service providers now accept these forms of payment. You can pay for a taxi, take the Shanghai metro, pay your utility or hospital bills, purchase groceries at the supermarket, and pay for meals at a restaurant through your phone.

By making it easy for consumers to use this new technology, Alipay and WeChat Pay have over 520 million and 600 million users, respectively, of their online and mobile payments services.² Combined, they fulfill over 66% of the third-party payments market in China, based on research by Analysys International. And, as these Chinese tourists travel the world, they expect to be able to use these payment systems outside of China too.

The accessibility aspect of digital payment systems offers great promise for the millions of individuals at the lower socio-economic end of the emerging markets. The vast majority of



these individuals will never experience walking into a bank to open a personal account, whether because there are no banks in their remote areas or simply because of social norms related to the perceptions of banks. But being able to access payment systems through their phones enables them to transform the way they manage their daily lives.

In particular, we see the growing prevalence of digital payment apps in emerging markets extending the consumer universe to include individuals that don't currently have bank accounts. That's a huge potential source of clients—and client data. And it presents a challenge to the traditional banking sector.

Consider Gap Inc., the US retailer, which recently set a goal for all of its “tier 1 suppliers—approximately 800 factories in 30 countries” to make the transition from a cash-based system to digital payments by 2020.³ The company noted that more than 60% of Gap's supplier factories already provide digital payment methods, such as online transfers to bank accounts or mobile wallets.

Gap has joined the United Nations-based “Better Than Cash Alliance,” a partnership of governments, companies and international organizations that accelerates the transition from cash to digital payments. The Alliance advocates the benefits of digital payments including cost savings, transparency and security, and empowerment of more than two billion individuals worldwide who would not normally have access to financial services. As we have seen hundreds of millions of Chinese consumers adopt these mobile payment services throughout China, the goals of these organizations do not seem as remote as they might have been just a few years ago.

Another potential impact of digital payment providers is using data to improve the overall consumer experience. By its nature, digital payment providers have the ability to collect customer data through apps, giving them never-before-available insights into customers' behavior and needs. For some time, a crucial advantage online retailers had over their brick-and-mortar peers was the ability to gather data to understand their users. These data allow online retailers to target customers more effectively and nudge up their conversion rates.

The broader use of digital payment apps should give offline stores and service providers access to similar levels of data, allowing brick-and-mortar services to understand their customers in a deeper way. We see this potentially having a meaningful impact not just on the retail sector but also on the range of sectors now using these payment systems.

The way merchants do business will likely need to change as they learn to understand how they can leverage the data from these digital payment apps to increase their productivity as well as drive sales. This could lead to new ways to offer and price services based on



2. Source: Alipay, Tencent websites, March 2018.

3. Source: Gap, Inc., “Gap Inc. Sets New Goal for Apparel Suppliers to Pay Garment Workers Digitally by 2020,” 3/14/18.

usage and demand, real-time discounts based on the consumer's activities, and new promotion methods—potentially delivered through the phone to the consumer in a highly personalized manner.

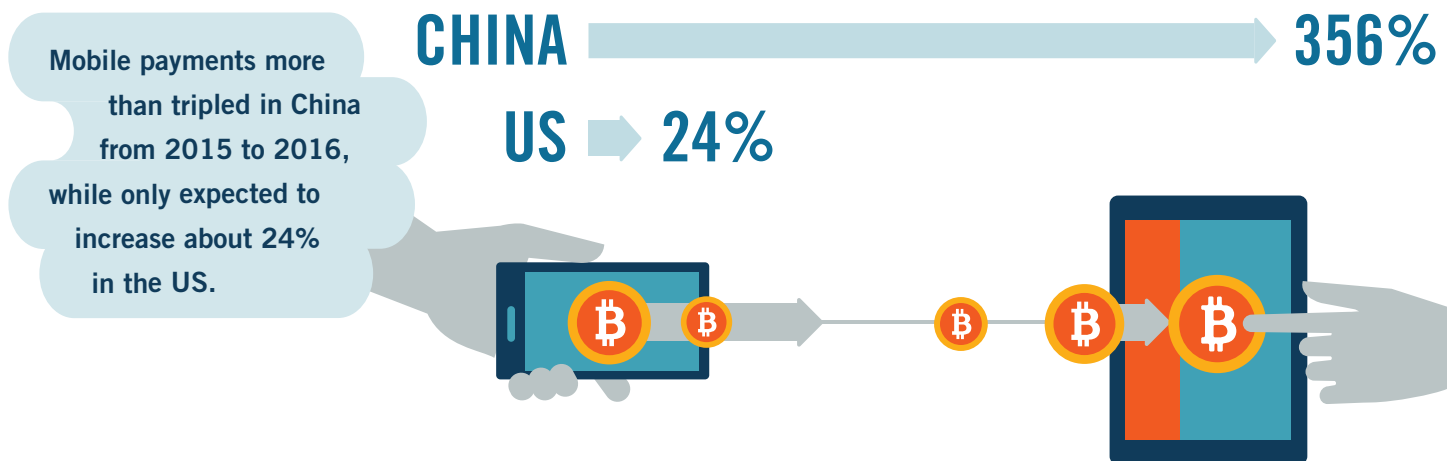
Developed markets should be taking notice. We foresee that many traditional banking functions in the United States and Europe will have to change dramatically as their clients adopt digital payment apps that are totally different

from the user experience of a traditional bank. Operations, client acquisition and customer service are just some of the areas in which firms will need to adapt.

Yet, success in one large market doesn't guarantee success in all markets. For example, in China an all-in-one app with a wide range of functions such as WeChat is very popular. But in the United States people tend to spread out their online activities across apps with different apps for social media versus banking versus shopping.

Franklin Templeton Research Analyst Gervin Kyle Yang observes, "This rapid adoption of digital payment systems in China may not be the future model for the developed world. But we see opportunity for certain parts of it to become a blueprint for different companies globally."

RAPID ADOPTION



Source: Statista, Forrester Research; iResearch. Data for the United States are estimates for 2015 and 2016. There is no assurance that any estimate will be realized.

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Gervin Kyle Yang
Research Analyst, Franklin Templeton Emerging Markets Equity

WHERE NEXT?

New forms of digital money enabled by innovative technology and digital payment systems have the potential to facilitate the exchange of goods and services within global economies in ways we are only just beginning to see. In developed markets, a new generation of potential consumers is growing up with less familiarity handling cash and more acquaintance managing their lives through their phones. And large portions of the population in emerging markets are seeing new forms of digital payment systems available to them, which has the potential to impact the traditional uses of cash in these markets.

As these new digital payment systems evolve into large networks of consumers and transactions, there are opportunities for convergence with digital currencies and blockchain technologies. It could offer another step toward mainstream adoption.

Disruption of money can mean significant reorganization of financial services as we know them and of payment systems, in general. Our interactions with the firms we are researching indicate the next several years will be an important time for the evolution of this disruption. As active investors, we are evaluating opportunities to take advantage of these dislocations while being careful to evaluate the risks.

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