The future of money

Back to the future: the internet of money

EY
Building a better working world

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Executive summary

The growth of the digital economy has already disrupted industries as diverse as media, music and transportation. The penetration of thousands of FinTech start-ups into all spheres of financial services has now brought this revolution to the disruption of money itself.

It's a development that will increasingly blur the distinction between money and data. To some degree, this has already happened. The growth of e-commerce and apps for ordering taxis or paying for restaurants means that the physical act of paying is already somewhat forgotten. As the internet of things enables a new round of machine-to-machine transaction growth in the years ahead, payment virtualization will intensify, with the potential for a proliferation of new stores of value to escape the cost, complexity and regulatory rigidity of traditional money.

Regulators, governments and businesses alike have much to gain as the internet of money gets under way. Leveraging low-cost, open-source technologies — such as cryptocurrencies blockchain or other distributed ledgers — opens the door to reaching poorer or excluded customers and serving needs that are not met by the existing financial services infrastructure. It could expand digital commerce above and beyond national lines, while allowing new forms of taxation to cater for an expanding mobile workforce.

The opportunities are limitless, but the obstacles to creating, managing and regulating a proliferating array of digital forms of money are substantial. These challenges raise questions that will be difficult to answer until the new reality of the internet of money dawns — questions that will reshape the role of the regulator and, potentially, how governments define themselves before their citizens.

Building the right regulatory template offers a good chance to harness this generation's greatest driver of growth and productivity. Creating trust in digital money as a safe store of value, while encouraging disruptive innovation, will require governments and regulators to work more closely with a wider range of stakeholders — including technology start-ups — than would previously have been thinkable. In the countries that have taken the biggest steps so far, including Sweden, Estonia, the UK and the United Arab Emirates (UAE), it's also about a pragmatic response to local dynamics and an ambition to be at the forefront of the digital economy from the top of government.

As central banks and governments around the world continue to experiment with new money, businesses of all sizes will continue to innovate to plug digital gaps in service exposed by the analogue rigidity of existing financial architecture. The question is, how, and by whom, should they be regulated?

01
Back to the future

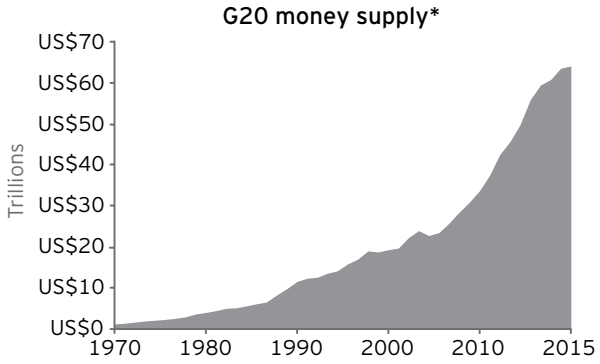
Since Richard Nixon's decision to remove the dollar's peg to the gold standard in 1971, the supply of money in the global economy has exploded. Nearly five decades later, as the financial services industry is transformed by a wave of digital disruption, the implications of that decision are still being interpreted.

As the financialization of the economy took hold during the market liberalization of the 1970s and 1980s, growth in financial transactions and the availability of credit helped drive massive growth in electronic payments. That detached money from cash and, in turn, made the concept of money increasingly abstract. Money moved from being the physical representation of a valuable commodity to an intangible symbol of trust.

Nearly a decade on from the financial crisis, the collapse in trust and the credit crunch that followed has helped to enable a parallel universe of alternative financial service providers to flourish. There are now an estimated 12,000 FinTech companies, proliferating into all areas of the financial services industry – from payments to lending, wealth management and capital markets. Once perceived as a threat to the traditional banking industry, incumbents are increasingly grasping opportunities to partner or forge alliances with newer FinTech entrants.

It is against this backdrop that this paper explores the implications for the next phase of the FinTech revolution – the future of money itself. At a time when the consumer relationship with cash is more virtualized and abstract, and where use of physical cash continues to decline in many markets, the next phase offers as-yet undiscovered potential for unleashing a new period of expansive growth in transactions, above and beyond the limits of national borders.

Growth of global money supply



*Broad money, which includes cash and instruments that are near substititues for cash.

Sources: IMF; Elite Economics.

Building the blockchain

Blockchain is simply a cloud-based ledger or shared database. As the technology that supports Bitcoin, blockchain has attracted a much wider range of supporters than the varying degrees of suspicion that have greeted the virtual currency – partly because of its association with the dark web.

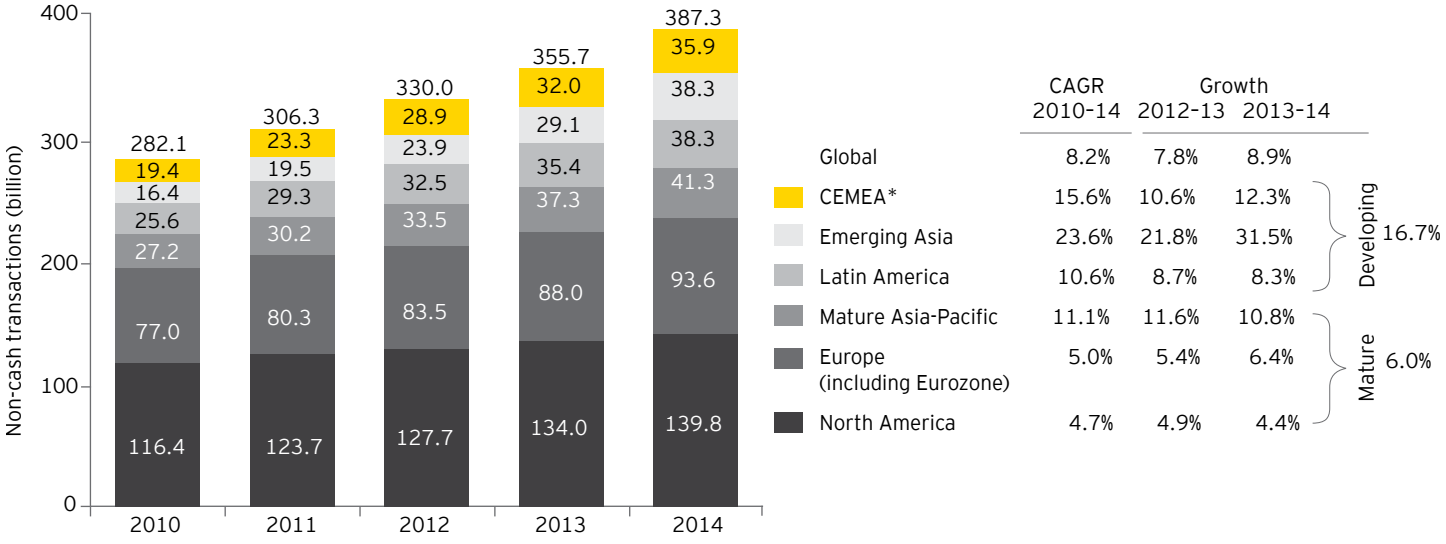
With no central authority, blockchain enables any user on the network to make and verify a transaction that is permanently recorded on the ledger. While most blockchain applications so far have been on public ledgers, an ability to reduce the cost and time of verifying transactions across a wide range of industries and uses is causing a surge in corporate experimentation with private blockchains.

The possible applications of the blockchain technology that underpins new currencies, such as Bitcoin, are endless, but Bitcoin transactions and working blockchain business models have been confined to a limited number of uses so far. At the same time, FinTech transaction volumes remain small, relative to the size of the total financial services market. Their impact, however, has already demonstrated the opportunity for all sides of the financial services ecosystem to reduce costs, improve efficiency and extend the reach of financial services to underserved customers.

Rightly, the explosion in FinTech and the increased virtualization of money, accelerated by the growth in the digital economy, has caught the eye of regulators and governments across the globe. Understanding the implications of a world beyond physical cash raises important questions for the role of regulators and traditional financial services intermediaries, as well as the limits and the reach of governments over their citizens.

While this paper does not seek to answer all the questions it poses, it does seek to contribute to the debate around the role of money in the digital era, confirming that it can reach its potential as this generation's greatest driver of growth and productivity.

Non-cash transactions worldwide (billion) 2010–14



Sources: Capgemini Financial Services Analysis, 2016; ECB Statistical Data Warehouse, 2014 figures released October 2015; Bank for International Settlements Red Book, 2014 figures released December 2015; and Country's Central Bank Annual Reports, 2014.

* Central and Eastern Europe, the Middle East, and Africa (CEMEA)

02
Building the internet of money

The growth of the digital economy and smartphone penetration have already enabled an explosion in nontraditional financial services over the last decade, spurred on by the need to service new forms of interaction between individuals. IIn the decade ahead, as more devices become connected and the internet of things (IOT) takes off, a second round of machine-to-machine transactions is expected to add to the intensity of transaction growth, further blurring the distinction between money and data.

In this new, digital-only world, the concept of physical money is fast becoming redundant. The transaction – whether a payment or other form of virtual exchange – is increasingly invisible. In real world commerce, too, the "act of paying" is gradually disappearing. Master Card's Qkr! pay-at-table restaurant app lets customers book a table, eat and then leave in much the same way as Uber allows passengers to get out of the taxi without formally verifying a transaction. Gyft – a partnership between payment industry stalwart First Data and blockchain start-up Chain – lets consumers buy, redeem or swap gift cards for real world stores online or on their phones, while small merchants can create gift card programs for customers without the heavy cost of investment in development and marketing.

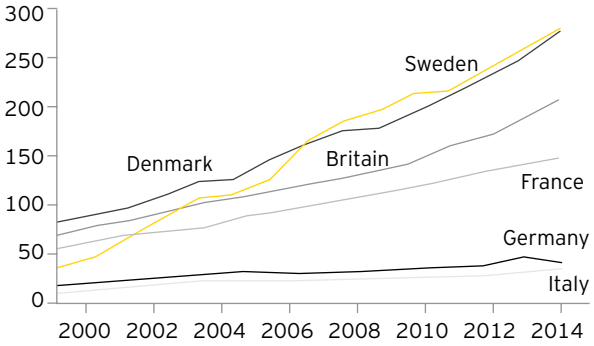
Much of this is not new. Customers have been paying "on account" using card or bank account details stored with a retailer for decades. What's changing, is that the combination of higher volumes of digital transactions and the automation of the payment is converting money from a physical form of exchange into another form of data. In the case of blockchain-based social network Steemit, for example, users are rewarded in virtual, but convertible Steem dollars for creating content that helps drive use and interaction on the platform.

The potential for transaction growth in the connected economy is seemingly limitless. What's less clear is whether existing forms of payment are adequate to support it or if new digital stores of value need to be created to realize the potential. Certainly, in developed markets at least, the immediate replacement of existing payment systems does not seem to be necessary.

Throughout the financial crisis and beyond, payment volumes have continued to rise while the ratio of cash-to-card and electronic transactions has fallen, provoking a concerted policy drive toward realizing a cashless economy in some markets, such as the UK and Scandinavia.

Card payments* per person in Europe

Number of transactions per person



Source: European Central Bank.

*Using cards issued by resident payment service providers, excl. e-money cards.

Replacement of traditional payment rails may, in fact, never be an option. The risks and costs associated with this – first to design and implement a new system, then to adapt consumer behavior to meet new rules or protocols – are beyond the steps regulators and banks are prepared to take to accommodate the digital economy. At least in the near term.

Indeed, replacing cash with other means of electronic payment has been less successful than imagined. Although electronic payments continue to grow in dominance relative to the use of cash, the amount of cash in general circulation also continues to grow substantially. In the UK alone, the value of all banknotes in circulation jumped from £60b to just under £70b between 2014 and 2016, according to the Bank of England.

Abandoned efforts to remove checks from circulation in the UK also show that, in future, regulators and governments will be reluctant to reduce choice in the multichannel payment environment, preferring instead to regulate for multiplicity. While this conservative approach to payment infrastructure prevails, so far it has not proved to be a barrier to innovation. Among the payment FinTechs that have succeeded — such as Apple Pay and Android Pay for consumers, Square and iZettle for merchants — the key to their success so far has relied on innovation that works with the payment infrastructure that is already in place.

This has been coupled with identifying previously unserved needs. Innovations that introduce proprietary technology to improve the customer experience by reducing pain points — looking for money to pay the taxi driver, or speeding up the process of ordering and paying in restaurants for example — or providing additional data to the merchant to drive take-up of the application or service.

Future innovations for the internet of money will therefore be likely to concentrate on serving unmet, and quite likely still unidentified, needs as this borderless digital universe expands, and on exploiting the opportunities it creates. As more businesses straddle both virtual and physical worlds, the potential for creating experiences that can take advantage of this new reality will increase. In some cases, this may need to be complemented by transactions, whether as tokens or other forms of cryptocurrency that can be traded or redeemed in return for a digital good or service.

The success of gaming app Pokemon GO was largely down to its ability to overlay the real world with a virtual game. Similarly, the introduction of gaming-style elements into FinTech applications to help customers save or manage their personal finances better is another example of the growing trend of transaction virtualization.

In such a scenario, the proliferation of stores of value will create new challenges around inter-operability between platforms, tokens and currencies — both real and virtual. The type of technology used to facilitate the transactions between them or to enable convertibility may well be insignificant. Instead, resolving intractable cross-platform challenges will require digital businesses of all types to focus on flexibility of architecture and identifying the right form of technology to meet the emerging needs of their customers.

Whether this is a wallet or token for gaming applications, or blockchain and distributed ledger technology for back-office and commercial transactions to create an indelible record, the internet of money will be less concerned with creating one coin to rule them all than it will be about finding one rule to coin them all. Adapting to this brave new world of proliferating virtual currencies will require an open mind and the institutional framework to adapt to the shifting landscape by banks, payment service providers and regulators alike.

03
Africa: mobile money's heartland

Africa is often viewed as the home of mobile money after the success of Kenya's M-Pesa SMS payment service, launched in 2007. Today, there are 30 million users in 10 countries and a range of services, including international transfers, loans and health provision. The system processed around 6 billion transactions in 2016 at a peak rate of 529 per second.

The success of M-Pesa has been its ability to provide an economically viable model for mass adoption of mobile payments (M-Pesa was designed to give farmers and smallholders from remote regions of Kenya an easy way to sell and receive funds for their produce). As a result, no other region has done more to raise awareness of the potential for electronic payments to drive financial inclusion and reduce poverty.

Safaricom's success in Kenya spawned other mobile money services across the continent. Mobile operators' Airtel Money, available in 16 countries in Africa and MTN Mobile Money in 15 countries are amongst the most successful.

As the digital wave of financial services has spread across Africa, early leadership in using affordable technology to "leapfrog" the need for traditional financial infrastructure has given way to a new raft of alternative financial services providers. Many of these are taking advantage of Africa's growing consumer economy to find new ways to integrate consumers, business and merchants into the financial system.

In East Africa, Weza Tele is integrating mobile payments into small and medium-sized enterprises (SME) supply chains while Tanzania's Mobisol is providing mobile microloans to finance solar panels and improve access to power. In West Africa, companies such as Flutterwave and Pagatech, are identifying new ways to help merchants accept payments to compensate for a fragmented financial marketplace, while mobile money services such as GT Mobile Money and Pocket Moni are compensating for low rates of account ownership in Nigeria.

While there is still work to be done to get banks, operators and market participants to integrate efforts to drive financial inclusion, private sector solutions that bridge the gap between mobile money and banking are also growing in number. These include e Tranzact, operating in five countries, and txtNpay and expressPay in Ghana, which enable consumers to bank and pay bills.

Proliferation in payment services has been helped by a decade of economic growth and should continue as financial inclusion marches in step with digital enablement. While this is an exciting time for the region's digital entrepreneurs, growth in payment services, most of which are "walled gardens" with limited interoperability, is creating a new challenge for consumers and regulators — the need for cost-effective solutions to overcome advancing fragmentation balanced with the need to adopt a regulatory framework that protects consumers without impeding access to financial services to more vulnerable members of society.

The next evolution of digital enablement in Africa is likely to progress to government-issued digital currencies with imminent eCFA launch, the name of its digital currency by the West African Economic and Monetary Union (WAEMU).

Beyond the centralized concepts of money, the advancement and adoption of peer-to-peer (P2P)-based blockchain technology to increase global interoperability of money across borders is likely to advance rapidly. Foreign aid into Africa is more likely to reach its intended donor target using new P2P technologies. Fraud, corruption and volatile currencies remain drivers of new age currencies that are not centrally governed or issued.

Although blockchain so far has been limited to trials among South Africa's largest banks, there may be substantial opportunities for the technology to integrate the region's multiple platforms. This will continue the country's drive toward financial inclusion, helping overcome entrenched obstacles to intra-African and global trade in the process. This will ultimately result in a true shared economy that embraces the age old African principle of Ubuntu – "the belief in a universal bond of sharing that connects all humanity."


90°
45%

04
India: toward a cashless society

Home to the second-largest internet user base and a world-renowned technology industry, India has been less strident in the adoption of new forms of digital currency than other regions, such as Africa. A relatively well-established national banking and payments infrastructure and local regulation are part of the reason. Government efforts to demonetize the economy in November 2016 by removing larger notes from circulation, and a booming e-commerce market, however, mean the country may be at an inflection point.

Given India's size, there is much to play for. Before the demonetization program, more than 78% of consumer payments were made in cash and three-quarters of payments for internet purchases were made via cash on delivery.[1] In the days following demonetization, the National Payments Corporation of India, an umbrella body for retail payments systems, reported that transactions on RuPay, a domestic payment card scheme, doubled. Paytm, a mobile wallet provider, now has more than 200 million users.[2]

There is still a long way to go. India has 13 mobile money providers,[3] second only to Nigeria, but less money moves through wireless transfers than in neighboring Pakistan or Bangladesh.[4] Regulation plays a part — local rules require licensed prepaid entities work with banks, which requires mobile operators to manage customer balances in an escrow account with a bank to provide payments services.

To overcome this, the Government launched the Unified Payments Interface in 2016 to let mobile users link bank accounts to their mobile. Although bank account ownership has improved, building the link between mobile and bank accounts could help to reduce relatively high levels of account dormancy.[5]

Uses for blockchain are also being tested. ICICI, India's largest private sector bank in terms of assets, is piloting a service with Stellar, a not-for-profit organization, to enable lower cost international remittances for nonresident Indians with partners in Africa, Europe and the Philippines. The Reserve Bank of India has also expressed interest in using digital currency for commercial transactions.[6]

Adoption of digital currency is still a long way off. India's style of electronic payment migration — moving banks, operators and consumers toward electronic payments in lockstep — has its advantages, avoiding the fragmentation that is common to other regions. A stepping stone approach such as this will gradually move the country from a less-cash society toward a cashless one.

[1] Economic Times, Boston Consulting Group, 2016

[2] PayTM, February 2017

[3] GSMA Mobile Money Deployment Tracker 2017.

[4] InterMedia FII Tracker surveys, 2016

[5] InterMedia FII Tracker surveys, 2016

[6] Reserve Bank of India - Press Release, Feb 2017

05
MENA: unleashing a digital payment dividend

The Gulf Cooperation Council (GCC), and the Middle East and North Africa (MENA) region more generally, has a mixed record in payment virtualization. The fundamentals are there. A high proportion of the population is made up of under-30 digital natives whose use of smart phones and social media in some countries is among the highest in the world. The region's e-commerce marketplace is thriving too, but it depends more on cash on delivery than on electronic payments. At the same time, a relatively low share of adults have bank accounts, while mobile money accounts have had limited success.

That could be about to change. New FinTech entrants are playing their part in helping drive payment digitization. Egypt's PAYFORT has successfully helped smaller merchants accept electronic payments, and offers instalment payment options to help merchants improve sales. In the GCC, Dubai-based bank Emirates NBD partnered recently with Open Bank Project on a FinTech hackathon to identify new financial start-ups.

The Dubai Government has also taken up the potential of next-generation e-commerce. The Global Blockchain Council, founded in 2016 by the Dubai Future Foundation, a government initiative, is bringing together public and private sectors to identify test cases for new blockchain business models. Similarly, Dubai Smart Government initiative aims to record all government transactions on blockchain – an initiative that could amount to savings of more than US$1.5b in document processing and more than 25 million hours in lost productivity[7].

While these pockets of progress are encouraging, a coherent plan is needed to harness the open source approach to the development of financial services, and reap the rewards offered by the digital and demographic dividend. The natural place to start is installing the flexible but robust regulatory infrastructure needed to leverage mobile money.

Africa transformed global perceptions of the potential of mobile financial services by using them to leapfrog its missing payments infrastructure. With the right approach, the UAE and the wider Middle East could do the same with the next generation of money and blockchain.

[7] Global Blockchain Council 2016


78%

06
Retooling the regulator

Establishing the right regulatory template for the advent of digital money is crucial. The implications of this complex, multiparty world of digital financial services for banks, governments and regulators are far-reaching. Indeed, regulators everywhere are concerned about the systemic impact of non-regulated entities that operate in parallel to established banks, particularly for retail financial services customers. As nontraditional methods of payment and virtual currencies proliferate, and issuers of digital currencies get closer to real money in the decade ahead, their cries will get louder.

Although too early to determine exactly how such a template should look, some governments are taking the steps to lead the way. With blockchain technology and cryptocurrencies turning value into just one more type of data, enabling money to flow as freely as data in the process, it's hard to know where the regulator's line should be drawn and which parts of the existing financial services industry should be protected.

As the internet of things gets under way, unleashing a potential surge in machine-to-machine transaction growth, the perception of value may be transformed and moved around in fundamentally different ways. Quite possibly, in the not-too-distant future, consumers may be buying devices for the home that make purchases on their behalf without any secondary configuration by the house owner. If that machine automatically performs the transaction and transfers the funds, who is responsible for them? Should standard forms of regulation apply — such as know your customer, anti-money laundering and consumer protection? And if so, how?

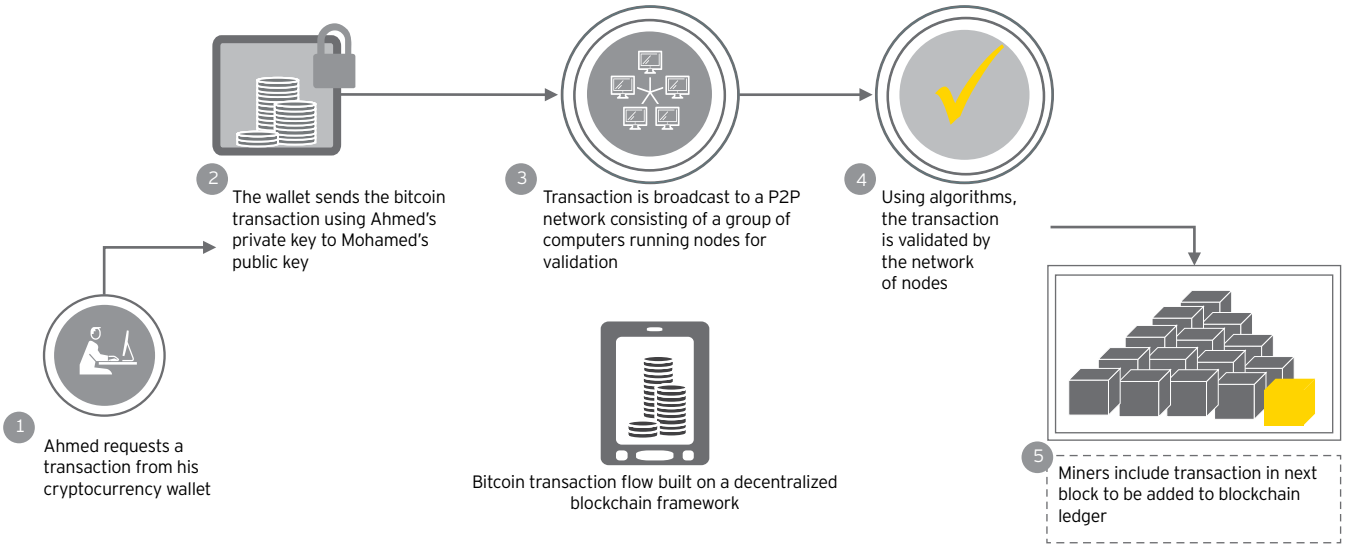
The problem is compounded in the digital universe where value is increasingly likely to come in multiple forms in order to take advantage of greater flexibility and lower costs than processing transactions in national currencies. While regulators understand their place in regulating fiat currency, what skills are required and how much regulation is needed for these new forms of money, and the proliferation of them, in the decade ahead?

In the case of distributed ledger (or blockchain) technology, which allows a direct transaction between two entities, the traditional transfer of value within an economy could be disrupted. A transaction and a medium of exchange can occur without the need to use regular money, reducing costs and improving transaction times at a stroke. Such transactions have already been piloted by global financial institutions, including Barclays, Goldman Sachs and UBS, for transaction settlement and corporate trade finance businesses. The World Economic Forum estimates that four-fifths of the world's commercial banks will have initiated projects using the technology in 2017.

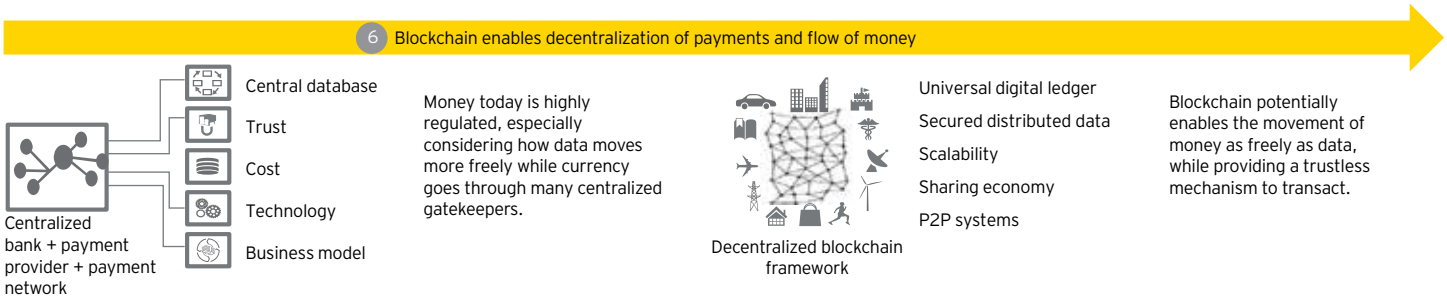
With central banks around the world also exploring the use of blockchain for creating their own digital currency, this raises fundamental questions around who should have access to central bank money and what it means when they do. They will also be forced to address the implications for the wider economy of the return to a (digital) gold standard, and where they sit in regulating money, both old and new.

Regulators will need to be innovative in their thinking and tread a careful line to avoid the creation of a parallel financial system that might later pose a risk to consumers, at the same time making sure they don't stifle innovation just as the digital age reaches its height. The approach of governments in Sweden, Estonia and Dubai, among others, toward blockchain shows how an enhanced role for regulators in the digital economy might look. Cracking the right regulatory code will require a progressive approach that involves closer collaboration with a broader range of stakeholders — including banks, businesses, start-ups and national government — than previously necessary. It will also have to acknowledge consumer preferences for existing payment channels and reassure them that new channels are robust enough to withstand being hacked.

The clock is ticking. Although low consumer tolerance of software bugs in money movement might slow adoption of new forms of currency a little, the proliferation of FinTech start-ups over the last 18 months into all areas of financial services, shows the speed at which consumer perceptions of what it means to be a bank can be transformed. Regulators will need to pick up the pace if they want to lead the market rather than follow the FinTech herd.



Bitcoin, which is on the blockchain framework, can facilitate scalable, secure and efficient cryptocurrencies by enabling P2P communication among devices without the need for any centralized control.



07
Extending the reach of governments

For regulators with a lighter touch, there is a lot to play for. Despite the significant challenge of redefining their role in the digital era, uses for technology that can authenticate, trace and record digital assets are potentially limitless, creating substantial opportunities for governments everywhere that surpass the shorter-term, one-off advantages of cash replacement.

The breadth of possible applications goes far beyond the conversion of physical currency into digital money. Opportunities to drive efficiencies in public service delivery, reduce costs and improve transparency have caught the attention of national governments. Pioneering governments are experimenting internally to improve public procurement, contracts and administration and introducing new blockchain-supported programs to their citizens.

A particular area of interest for governments is the potential for currency virtualization to make ultra-low value payments economically viable by enabling payments in smaller denominations of currency than is currently possible. Protecting transactions at much smaller levels will also help to accelerate the transition to a cashless society and drive financial inclusion — especially in poorer and rural economies.

The blurring of online and offline commerce is also increasingly matched by the shifting working patterns of the mobile workforce. With employees tied neither to one physical location or even one employer, the limits of national taxation policy are being stretched further and further. There are some experiments already under way. The Government of Estonia's e-Resident identity card program, for example, has been launched to leverage the benefits of blockchain to encourage "digital migrants" to set up businesses there. As working patterns evolve in the future, it's not inconceivable that such programs could be extended to help governments collect taxes from overseas citizens, or that taxes on goods and services are controlled using a traceable register.

For employees in the digital workforce and migrant workers, the process of getting paid immediately, or sending money home without incurring hefty transaction fees, is often impossible. Cryptocurrencies could help reduce the costs of these monetary flows, and ultimately amplify the supply of goods, services and labor across national borders.

As the pressure for digital money builds, creating widely accepted, fully convertible cryptocurrencies could be a process managed in the private sector, challenging the role of the state in managing money. In order to improve transaction transparency and reassure consumers that virtual currencies are safe, however, governments need to provide firm foundations — such as digital identities, legal standing and the right kind of regulations.

The opportunities are limitless and without precedent. For those countries with the boldness to pursue it, the internet of money presents an invaluable tool to unleash the potential of this powerful driver of growth and productivity. The challenge is to encourage and harness that potential without stifling it.

08
Your government: powered by blockchain

A series of innovative pilot programs in Sweden, Estonia and the UAE indicate the potential for governments to leverage the power of blockchain in a way that redefines their role and their relationship to businesses, citizens and even the rest of the world.

Estonia, for example, introduced a blockchain-supported virtual residency card, open to anyone who wants one, that extends the definition of what it means to be a national citizen in the digital age. The idea is to encourage entrepreneurs to set up businesses in the country, with the goal of creating 10 million e-residents by 2025–10 times the country's current population.

The Dubai Government plans to run all its transactions on blockchain by 2020, but it is also trying to position the Government and the emirate at the forefront of technology development. The aim is to create an environment in which government departments naturally work with established businesses and start-ups to tackle specific challenges, while creating the infrastructure to allow Emiratis and expatriates to start new blockchain-based businesses. Where solutions would previously have been developed in isolation, the digital age and the agility of start-ups to innovate faster than institutional peers has encouraged the Government to develop new relationships.

One project, for example, works with a local telecom provider to test the use of blockchain as a protocol for sharing health records in real time between doctors and patients. The sea change in institutional innovation is opening doors for start-ups such as Dubai-based BitOasis, a local bitcoin exchange, to work with regulators and banks to educate them about the potential of the technology and reduce regulatory resistance.

The biggest leap yet toward the brave new world of digital money is likely to come from Sweden. The country is already testing the use of blockchain for recording land registry transactions in conjunction with start-up and telecom operator Telia. A sharp drop in the use of physical cash (notes in circulation have fallen 40% since 2009) to cards and other forms of electronic payment is adding pressure on the world's oldest central bank to issue its own digital currency.[8]

Being a pioneer will carry its own burden — with no regulatory template to borrow from, the regulator will need to work in concert with banks, business and the country's ample pool of FinTech start-ups to make the world's first publicly controlled digital currency a success for its citizens and a beacon for other governments.

[8] FT.com, 2016

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