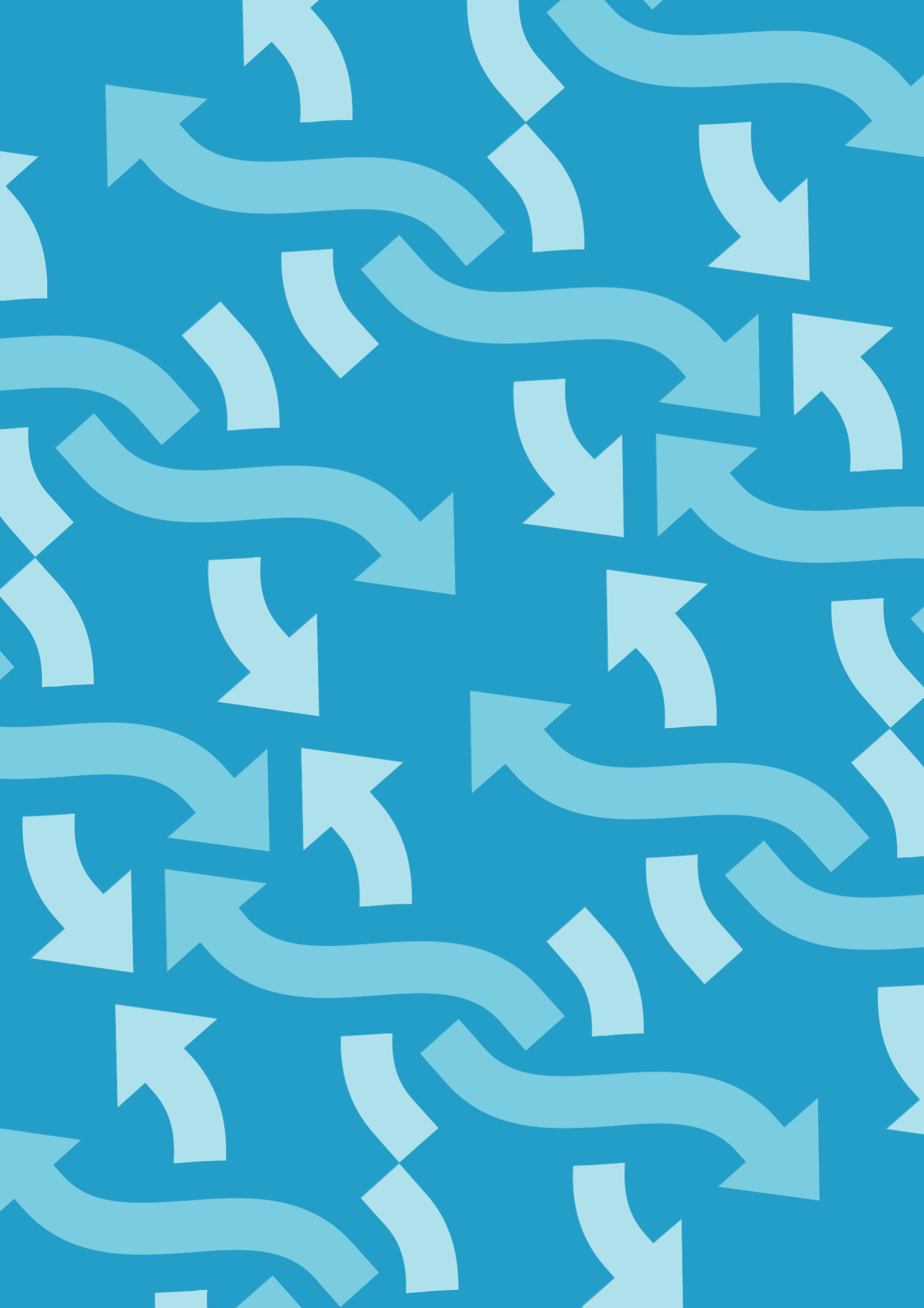




The Future of
Exchanging Value
Cryptocurrencies and
the trust economy

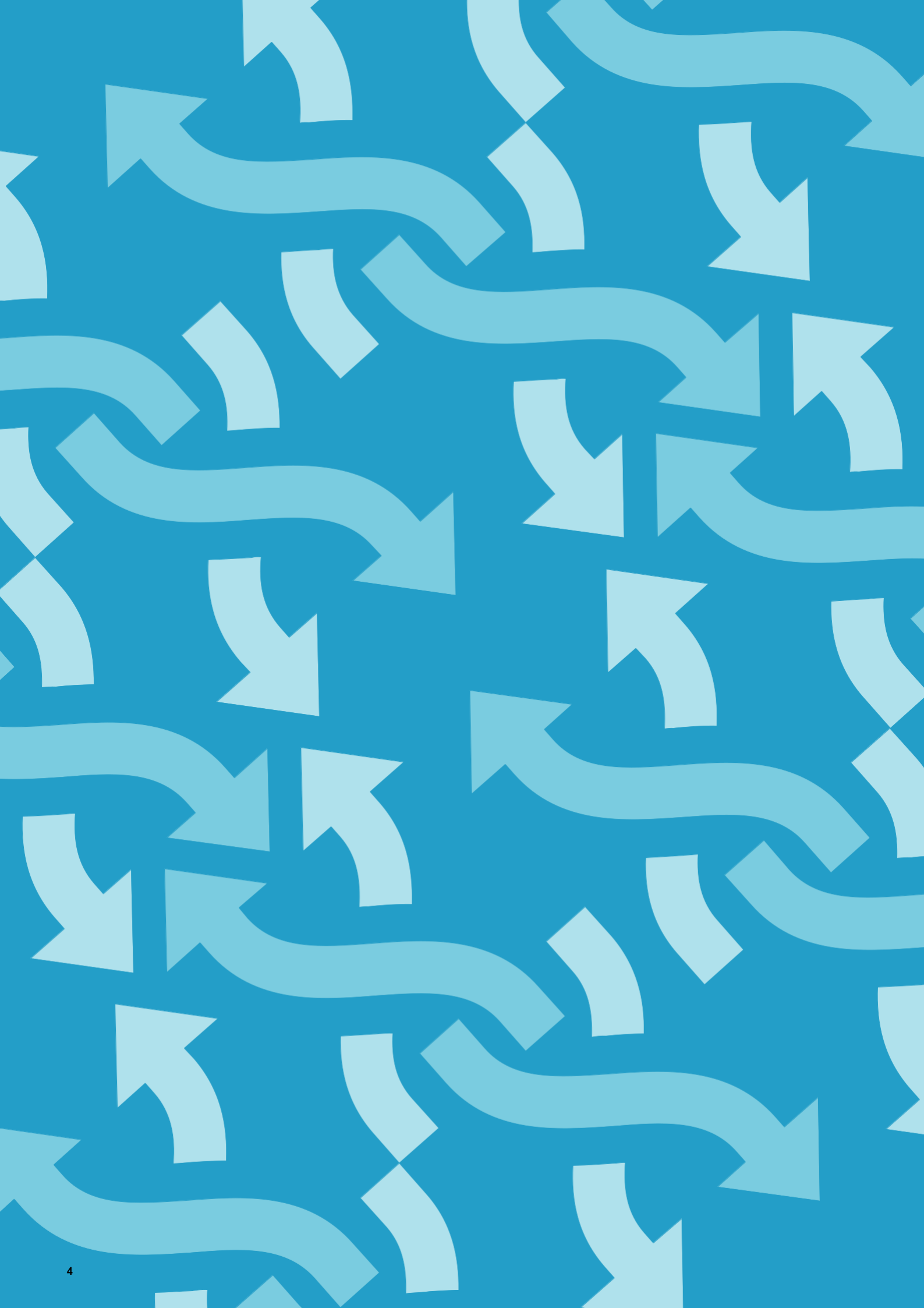
Centre for the *Edge*
Australia





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Foreword

Ice becomes water when warmed. Only familiarity prevents us from marvelling at the mysteriousness of this 'phase change', as physicists call it. Nevertheless, we've witnessed a similar phase change as the physical hardware that delivered the phone network was repurposed to also deliver a new network – the Internet.

And where the phone network depended on point-to-point connections, the Internet connects people via packets of information that travel through cyberspace until they arrive at their address.

Initially, the old 'connect first' phone network was monopolistically competitive. The upshot of that market structure has produced all manner of frustrations and complexities, such as incomprehensible pricing structures and prices way above cost for peripheral services such as texting and international roaming. However, all this is different online because of the different market structure produced when each node in the network helps out – redirecting digital packets in return for reciprocal help from other nodes.

Thus, all the transaction costs of the old network melt away. If you have a great product – such as Google, Wikipedia, Salesforce or Xero – you can just put it on the net and it's there for everyone. And we've watched on as this miracle has unfolded, just as astounded as if we were watching ice melt for the first time.

This analogy helps us understand the potential costs of a financial system that looks like the phone system – with complex terms, price gouging, etc. For me to exchange value with, say, an American airline, I'll pay about 2 per cent commission to a bank to facilitate the cross-currency transaction. That amount vastly exceeds the bank's cost. Large corporates get the same service for a 20th of that margin!

So the hunt is on for the 'internet of money' – a technology and overarching architecture to displace the oligopolistic position of the too-big-to-fail banks.

It's a reflection of these exciting times that less than four years after the first instalment *The future of exchanging value: uncovering new ways of spending*, Deloitte is up for a sequel. *Exchanging value 2* explores this world pregnant with possibility ranging from the edges of the payments system to its centre and it shows that the architecture of the system is up for grabs.

Read it and try to keep up with our runaway world.

Nicholas Gruen
CEO, Lateral Economics
Chair, The Australian Centre for Social Innovation,
Open Knowledge Foundation (Australia)

1

Exchanging value





In 2012, we published a report entitled *The future of exchanging value – uncovering new ways of spending*, which broadly examined how money is used rather than focusing on individual elements such as payments, currency, and so on. Our view was that only by looking at the whole system could we understand how the financial system might evolve.

Our findings in that report centred on the realisation that we were reaching the end of the initial build-out of a digital payments infrastructure. The task of provisioning the infrastructure merchants require to accept real-time digital payments, or for two individuals to settle a debt, was largely complete. Consequently, our focus had shifted to streamlining the buying journey – from the pieces and parts to the whole.

The rush to implement near-field communication (NFC) technology such as payWave and PayPass and the then recent emergence of Bitcoin and other complementary digital currencies were part of this shift. The business case for NFC has been built around streamlining the checkout experience and reducing fraud rather than providing a distinctly new capability. Bitcoin was proposed as a cheaper, more efficient mechanism for peer-to-peer payments and currency transfers.

In the first report, we reasoned that the future of exchanging value would stem from how consumer behaviour changed. Like many areas of society, consumers rather than businesses or governments are setting the technological ground rules. We suggested that organisations needed to look beyond traditional payment platforms, narrowly defined in terms of features and functions, and consider their customers a broader 'job to be done'.

What was needed was a customer-centric approach – one focused on simplifying the buying journey by ensuring the right payment solution was available in the right place at the right time. Payment solutions needed to be perceived as instantaneous by their users, allowing users to exchange value and move on with their day,

whether they were interacting with an established merchant or simply standing on the kerb splitting a bill with friends after an evening meal. The solutions needed to be ubiquitous, allowing customer and merchant to transact at the far end of the store or deep in the aisles just as easily as if they were both standing next to the till. And finally, these solutions needed to be open, both in their implementation and governance, so consumers could understand and develop trust in these new ways of exchanging value. The next generation of finance solutions should be seen as tools to improve engagement with customers rather than as service delivery platforms.

As it turns out, the first report was published at the leading edge of an explosion in the use of new payments technologies and complementary currencies. Many of the predictions we made in the first report came true.

We saw NFC as an interesting technology but the business case was not as strong as the technology's proponents claimed. Most of the wasted time and effort in the buying journey was in taking the goods to the till and tallying them, not in the final transaction, which would lead many merchants to view NFC as an excuse for the card providers to increase fees at the expense of the merchant's margins. Since then, some retailers in the US have banded together to create an alternative payments platform, called CurrenC™, intended as a lower-cost alternative to the solutions from the entrenched payments providers. There is also anecdotal evidence of many merchants adding a surcharge for using a card, or providing incentives such as prize draws for customers who pay cash. Apple also introduced Apple Pay, which showed the industry how to build a payments solution using existing standards and deliver a much higher-quality and more compelling user experience. to invest in cryptocurrencies and access to the latest information and research click here:

<https://bit.ly/3r05JMs>

We considered Bitcoin and other cryptocurrencies (which use cryptography for security and anti-counterfeiting measures) in the context of the long history of complementary currencies – from recent schemes such as Bartercard through the demurrage currency from the Austrian town of Wörgl in the 1930s, and back into history. We viewed with scepticism claims that cryptocurrencies were unique and unprecedented and would result in a huge shift of value from traditional state-sponsored commodity and fiat currencies to stateless cryptocurrencies. We expected cryptocurrencies to have a role, as the idea of a virtual, digital currency is a good one, but we saw nothing inherently different from the more traditional complementary currencies.

All complementary currencies have since been brought into existing regulatory frameworks once they threatened the tax base. The same is true for Bitcoin and the other recent cryptocurrencies, which are being pulled gradually into established regulatory frameworks.

We also highlighted how moving the exchange of value from the physical to the digital – and the creation of virtual (borderless) currencies – would create new opportunities for fraud and crime. Digital networks have fundamentally different threat and risk profiles than the physical environment, and organisations that choose to transact via digital technology can easily be caught unawares. The root of this difference is that

in the physical world – the defender has a significant advantage, while in the virtual world, the attacker has the upper hand. In the physical world, the attacker must struggle with the challenge of marshalling the necessary resources to attack the defender's heavily fortified castle. In the virtual world, this is no longer true, attackers can co-opt resources and marshal them to attack from the dark corners of the Internet.

Operational risk is disconnected from a physical presence and established governance. More, and often small firms, are also coming under the eye of anti-money laundering/counter-terrorism financing (AML/CTF) regulators in the online marketplace. Online businesses are finding their services used for laundering money. Examples range from the prosaic, such as fraudsters washing money from stolen credit cards through myki (the Victorian transit pass) and eBay²

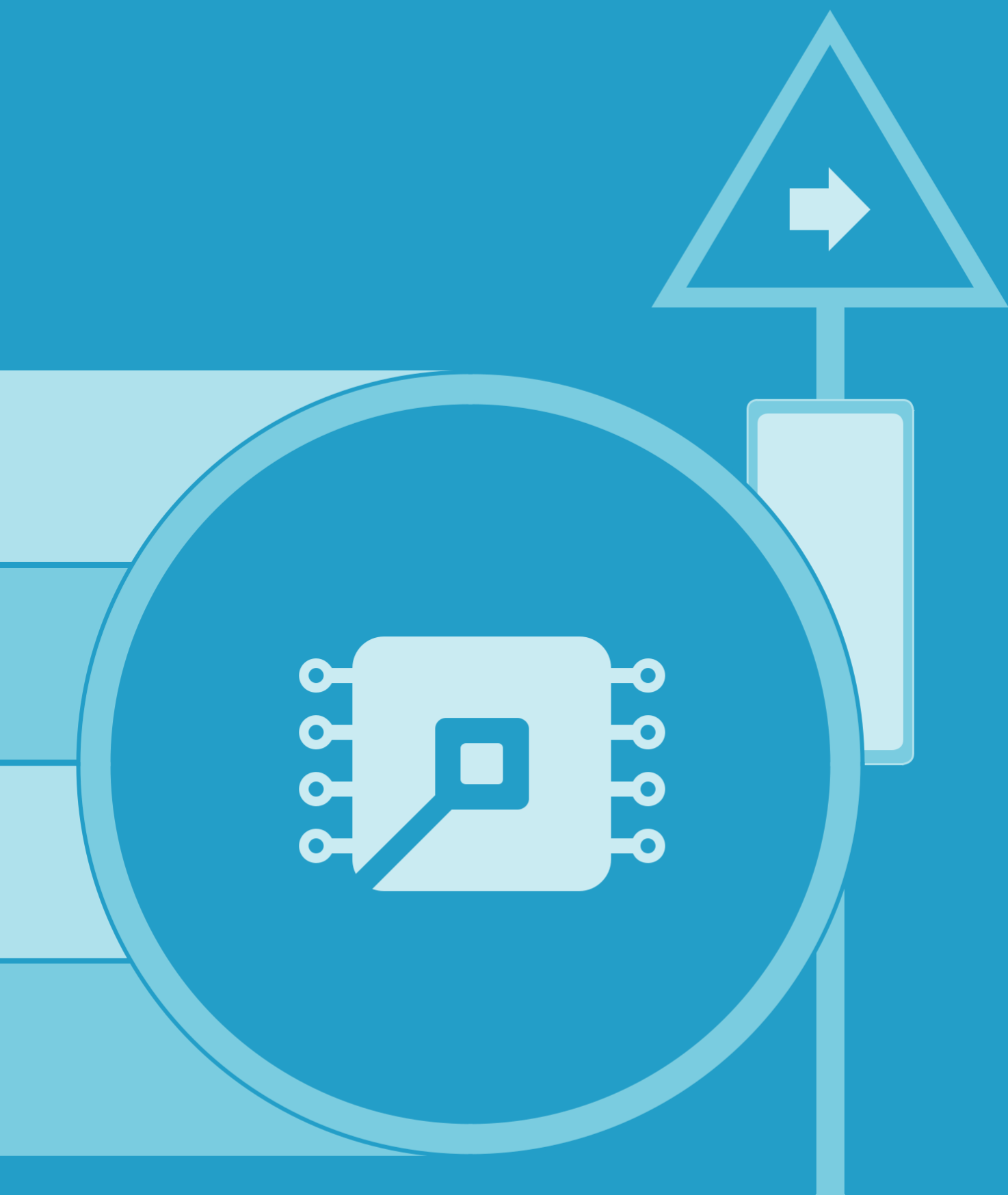
, through to more innovative solutions such as thieves crowdfunding themselves³. Even pubs and clubs with pokie machines and ATMs are coming under the wary eye of the regulator. An extreme example of this is Bitcoin mixers⁴, which were developed to industrialise the process of mingling legitimate and illegitimate transactions, rendering illegitimate transactions untraceable and facilitating money laundering on a large scale at a fairly low cost. Participating in the digital economy means being exposed to new and unfamiliar risks.

In this report, we explore the pros and cons of the proliferation of new payments solutions, technologies and currencies, and how they are shaping the way we exchange value.

2

Technology-driven change





How we pay for goods and services and exchange value is clearly changing. Cheap and ubiquitous digital communication is moving payments from the physical to the digital world. Actions that would have seemed bizarre only a few years ago – such as buying clothes or renting a movie using our phones – are now common practice. We are organising our lives differently, storing our savings in our mortgage or investments then using credit to manage our daily cash flow. We have the convenience of debit and credit cards to pay for even quite cheap items.

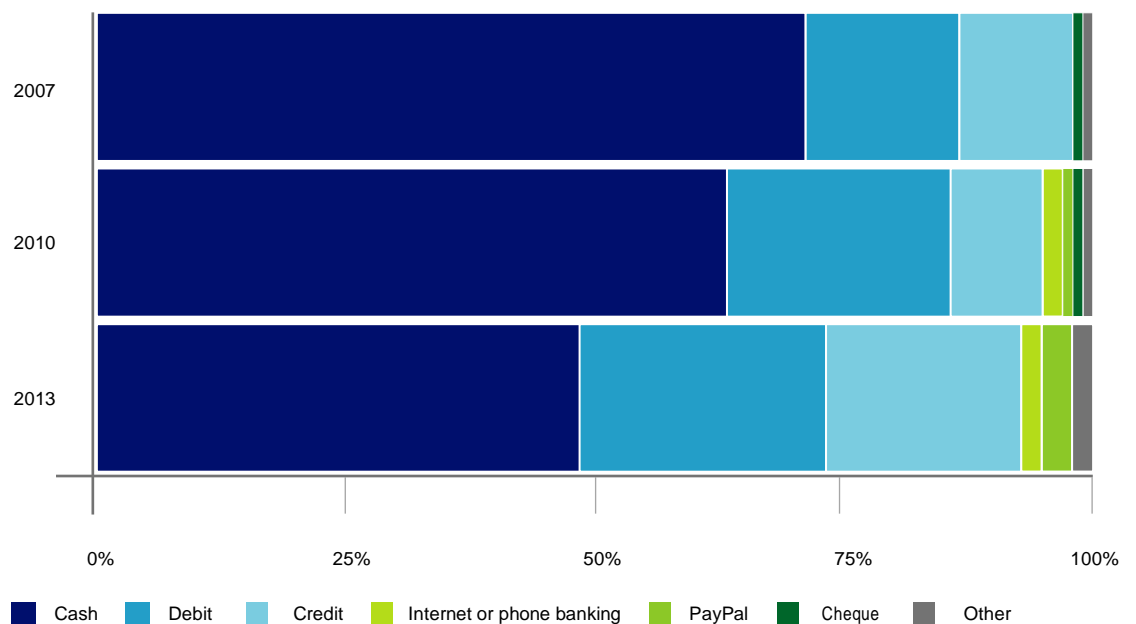
The introduction of the consumer Internet – and the smartphone in particular – has resulted in a raft of new payments solutions and financial products, each designed to erase one of life’s little annoyances or provide access to a financial product. New technologies and the new payments solutions that use them are shaping how we think about and pay for the products and services we consume. We are choosing to pay with the tap or wave of a card, click of a mouse or the tap of a finger, rather than handing over the folding currency that has been used for generations.

Payment trends

There is plenty of anecdotal evidence that how we exchange value is changing, the most obvious being the rapid growth of the FinTech (financial technology) start-up community. Consumers must be using at least some of the solutions coming out of this area for the sector to be growing so strongly. There’s a lot of noise, but is this noise borne out by data?

The most recent Reserve Bank of Australia’s (RBA) Trends in Retail Payments⁵ survey (the third in a series) found that the use of cash and cheques – the two main physical mechanisms for exchanging value – had both declined noticeably over the previous three years, while the main electronic forms of payment (debit and credit) increased. The hurried trip to the bank late on a Friday afternoon to obtain enough cash to last the weekend is a distant memory.

Figure 1. Percentage of each payment type

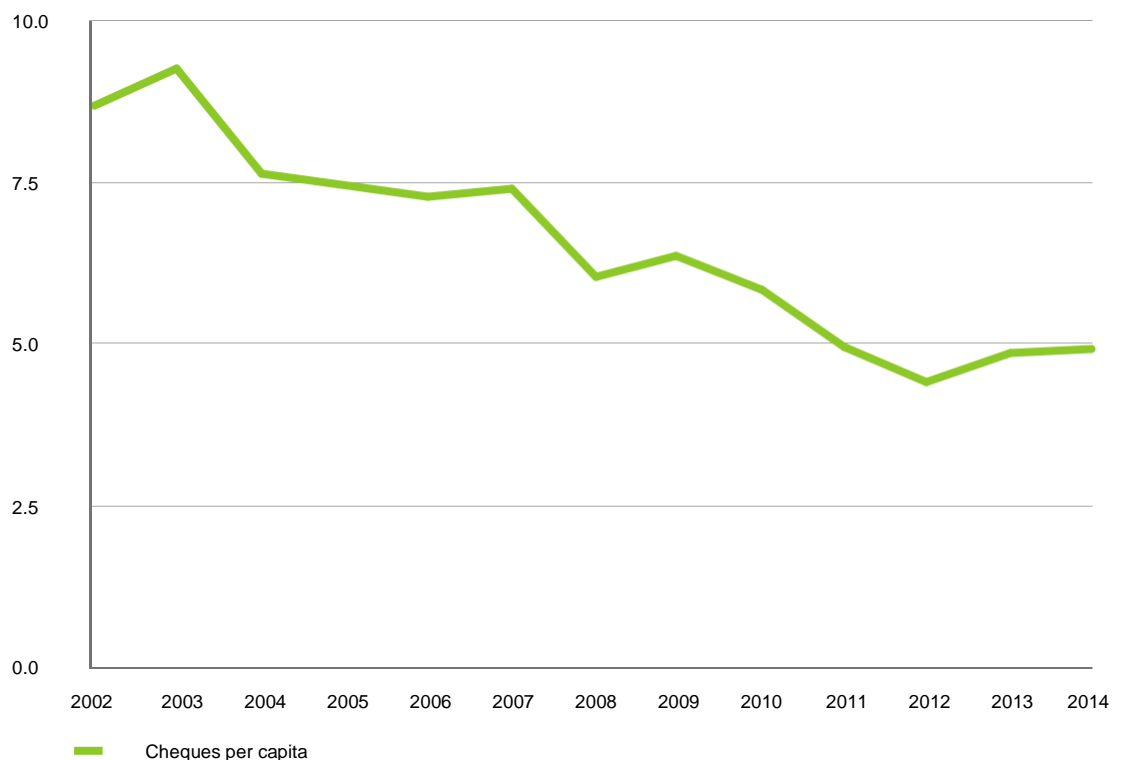


Source: RBA⁵

The use of electronic funds transfer is increasing at the expense of cash and cheques due to a number of factors. Cards are being used in preference to cash and to buy more expensive things; transaction value and volume are increasing across all digital mechanisms. Point-of-sale technologies have streamlined the buying experience, the most recent of which is NFC-based contactless cards. The convenience of contactless cards is leading consumers to use them even for quite minor purchases and was one of the drivers of Apple Pay in the U.S. At the same time, the increasing importance of remote transactions (particularly to support online commerce) is moving many transactions from the physical to the digital world. The number of electronic transactions⁷ averaged about 353 per person per year in Australia in 2013, an increase of about 48 per cent from 2007.⁸ In 2013 cash payments accounted for only 18 per cent of the value and 47 per cent of the number of transactions.⁹

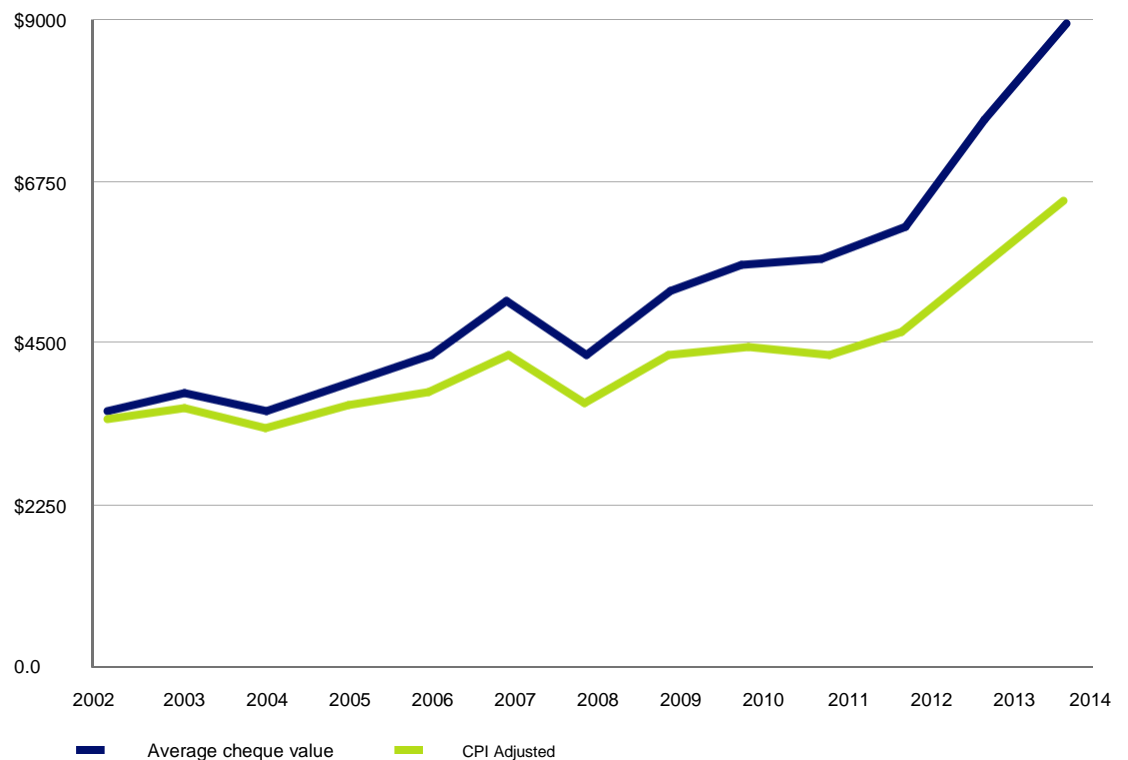
Despite all this technological innovation, and the fact that the use of cash is in decline, cash is still the most frequently used form of payment. Consumers use it for most of their low-value transactions – about two-thirds of all payments under \$20. Cheques, in contrast, are retreating to the high ground. While their use is also in decline – with an average of eight cheques written per person in Australia in 2013–14, down from 28 cheques per person 10 years earlier – the average value of a cheque rose by 19 per cent to roughly \$6,800 in 2013–14.¹⁰ Cheques are mostly used for high-value payments where there is currently no suitable digital alternative. This shift to digital payments suggests that the future of payments is online.

Figure 2: Cheques per capita



Source: RBA¹¹, ABS¹²

Figure 3: Average cheque value



Source: RBA¹³, ABS¹⁴

As more payments move online, many are now being processed in real time. New platforms are being developed that enable instant transfers of value – of even quite low amounts – between institutions, between individuals and institutions, and even between individuals by supporting new ‘split the bill’ functions. Start-ups such as Stripe¹⁵ and Square¹⁶ are the architects of some of these platforms, as are industry groups and government bodies such as the Australian Payments Clearing Association’s (APCA) with its New Payments Platform and the Property Exchange Australia, which has launched an electronic conveyancing platform.

Support is building to eliminate physical money. This would improve in-store security and reduce cash-handling costs for businesses. Many governments have a favourable view of a cashless society as it would reduce tax revenue leakage and remove an important tool from organised crime (which is why many governments have been retiring the highest denomination bank notes). Denmark has started down this road by proposing that by January 2016¹⁷, selected retailers (such as clothing stores, restaurants and petrol stations) be no longer obliged to accept cash, though there are some fears this might increase the risk of fraud. Essential services – such as post offices, hospital cafeterias, dentists and chiropractors – would still have to accept Danish krone.

The prospect of a cashless society raises important questions as the less fortunate members of society, who often can be unbanked, could find themselves further marginalised if a bank card of some kind was required to access many products and services. Western populations, with their extremely high banking penetration and ubiquitous payments infrastructure, can address this by ensuring that even the poorest segments of society have access to bank cards. Some governments are even starting to pay benefits electronically, using the savings from electronic payments to offset the cost of issuing cards to the individuals receiving benefits.

Merchants are also turning to loyalty cards, using the value held in the customer's loyalty account to manage the relationship. Research shows that consumers choose brands that offer loyalty rewards – and spend more with them – over brands without, preferring store credit over other rewards. “Basic monetary rewards give retailers a ‘ticket to play’ in the loyalty game but the real opportunity lies in building deeper engagement with members through more personally relevant, unexpected and emotional rewards,” said Adam Posner, CEO of Directivity, a loyalty and retention consultancy. “This plays out in the research, which shows surprise rewards such as a gift on your birthday, exclusive offers or special experiences go a long way to overcoming the belief that programs don't offer any real value.”¹⁸

These loyalty programs, for all practical purposes, often use complementary currencies with an exchange rate is tied to the local sovereign currency. Nowhere is this more apparent than with airline frequent flyer programs where members leverage the program's relationship with other (sovereign) currencies to create value from nothing, such as by buying dollar coins from the US Mint with a credit card and paying off the charge immediately, a practice called ‘manufacturing spend’.¹⁹ The European Central Bank has classified airline miles in the same category as Bitcoin, while *The Economist* magazine valued the global stock of frequent flyer miles at more than US\$700 billion in 2005. Airlines should be considered the central bankers for these complementary currencies, as they can unilaterally set the exchange rate (and devalue the points) or close accounts.

The increasing use of complementary currencies extends beyond loyalty schemes. One example is the small but growing movement to create local currencies. Cities as far apart as Brixton²⁰ and Bristol²¹ in the UK, Langenegg²² in Austria, Nantes²³ in western France, Ithaca²⁴ in New York, and Berkshire²⁵ in Massachusetts have issued their own currencies, pegged to the national sovereign currency. Technically these currencies are not legal tender, and are commonly treated as vouchers.

The intention is to try to keep money circulating in the local economy rather than having it sucked up by the national economy. Local businesses accept local money in payment for food, arts and crafts created locally. The co-founder of the Bristol Pound, Ciaran Mundy, said: “The practical vision was to get something that would connect local communities with their businesses in a way that kept money building up in their local communities. What happens is that if you spend it at a large supermarket chain, 80 per cent of that will exit the [local] economy very quickly.”²⁶ Some communities also allow local taxes and rates to be paid in local currency, keep purchasing power in the region. The mayor of Bristol, George Ferguson, even takes his entire salary in Bristol Pounds.²⁷

There has also been a large increase in the number of cryptocurrencies in the past few years, starting with Bitcoin. Cryptocurrencies are promoted as the future of money, with their low transaction fees and independence from government or central bank control. Distributed cryptocurrencies are often seen as the natural solution for exchanging value in an increasingly networked, interconnected and digitised global environment.

It's the system

The adoption of new technology is rarely straightforward. While technology can change society, society can also change technology.

Past predictions of technology-driven futures have always proven to be far from the mark. For instance, few of us have a flying car or a landing pad on the roof. We forget that our overflowing optimism for a new technology ignores many of society's constraints, and the technology's limitations, or unfortunate side effects. The invention of the nuclear reactor, with its promise of an unlimited power source, did not result in a nuclear reactor in every home, nor was the nuclear-powered Ford Nucleon²⁸ ever developed beyond a concept car. It's also unlikely that recent developments in artificial intelligence will put us all out of work or result in the creation of some analogue to either *The Terminator* or *The Avengers' Ultron*.

Our enthusiasm for a new piece of technology leads us to consider only the technological possibilities it seems to present – the world of the possible. We don't consider the social aspects – what society will allow or accept. History has shown repeatedly that the social aspects are as important, if not more important, than the technological aspects. The reductionist approach of technological determinism, which presumes technology drives the development of social structure and cultural values, often has proven to be wrong. Even if we can find a way to miniaturise a nuclear reactor, social pressures will shape how and where it can be used, or even if it is appropriate to use the technology at all.

As this example suggests, technological and social systems shape each other. The same is true on a larger scale. Technologies – such as gunpowder, the printing press, the railroad, the telegraph and the Internet – have shaped society in profound ways. On the other hand, social systems – governments, the courts, formal and informal organisations, social movements, professional networks, local communities, market institutions and so forth – shape, moderate and redirect the raw power of technologies.

If we are to understand the possible futures the rapidly expanding world of FinTech is presenting, we need to expand our view to consider the social systems as well as the technological systems. Nintendo's Wii and Apple's iPhone were able to sweep aside more complex and technically sophisticated rivals by paying attention to the social systems. Both products were widely considered under-powered, under-featured and technologically inferior to their competitors at their launch, but they were successful because their creators paid close attention to how consumers related to the products and how the product fitted into consumers' lives.

What is true for 'hard' technology is also true for money.

Indeed, money is a technology. What we think of as modern money emerged as a solution for streamlining commercial exchanges between two parties who know little of each other. Money is a technique – a way of carrying out a particular task, especially the execution or performance of an artistic work or a scientific procedure – for resolving the problem of the double coincidence of wants²⁹ in barter exchanges.

Money is a formalisation of the technique of using a third commodity with a stable value – such as gold – to facilitate the exchange of goods. Money initially was the testing of a commodity's quality and weight, and stamping a seal on it meant you knew it was good. Bank notes were created from the realisation that a deed granting ownership of a valuable commodity stored in a safe place could be exchanged instead of the commodity itself. This raised the interesting question: is money founded on debt (an IOU), or is it a commodity itself? The obvious answer is that it's both.

Before barter and the double coincidence of wants, there was debt and obligation. Communities were small (by today's standards), few people travelled more than a day's walk from home and most commerce was done with someone who was part of the same social tribe. 'Money' was used primarily to pay taxes to a distant ruler or to quantify criminal damages. The need to pay taxes in a sovereign currency drove many communities to adopt money even though they found it largely unnecessary otherwise.

The key point is that barter and money developed in response to the need to resolve obligations between individuals who don't know, or don't trust, each other. Neighbours had little need for formal money as they had little reason to engage in barter. Most debts were accounted for informally and were grounded in the individual's shared trust or their trust in the community to enforce the debt.

The degree of trust between two parties is one of the strongest factors shaping how money and the technologies around it are considered, adopted and used. English shops issued their own wood or leather money tokens for many centuries, providing customers with small change in the form of IOUs redeemable at their own stores. Often these IOUs were accepted at other stores in the local area, though merchants would demand that larger debts be settled in money accepted anywhere, typically a sovereign currency. This token money was unlikely to travel far from its source and typically never circulated more than a few blocks. This practice, while technically illegal, continued until quite recently. The development of local currencies (mentioned earlier) is a continuation of this.

Trust underpins what we think of as money.

This reliance on trust means that, fundamentally, money is a social construct. Money – any form of it – has value only when we all, as a society, agree that it has value.

Commodity money's value stems from the commodity from which it is made. Typically, that underlying commodity has value only because as a society we have agreed that it is valuable. Take gold, for example, which is chemically uninteresting as it barely reacts with any other elements and has few industrial uses. It is because gold is chemically uninteresting, rare (but not too rare, like many other noble metals) and fairly easy to refine and reshape, that makes it useful as a currency, even though it has little practical value elsewhere. Gold is valuable simply because it is attractive and its chemical and mechanical properties make it a good choice for creating physical money.

A fiat currency derives its value from government regulations or laws and is pushed into circulation by a government issuing debt and/or demanding taxes in the fiat currency. In the first instance, it is our trust that the government will honour its debts – primarily as a government can compel the governed to pay taxes – that makes the currency valuable. In the second instance, the need to obtain fiat currency to pay taxes is what makes the currency valuable.

Even Bitcoin is based on trust, as Bitcoin is only valuable if everyone in the community using it agrees that it has value. You must trust that someone will be willing to exchange the currency for the goods and services you want. There is nothing preventing society from deciding that Bitcoins are worthless and abandoning them. This would be a bad outcome for all cryptocurrencies, as it would imply that a loose community of otherwise unrelated entities is not a suitable foundation on which to build a currency, casting doubt on the suitability of other cryptocurrencies.

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