

Digital currency

Transacting and value exchange in the digital age

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An overview of the consultation on digital currency held as part of the Corsham Institute Thought Leadership Programme 2017

This report was produced following a consultation at St George's House, as part of a programme of events in the Corsham Institute 2017 Thought Leadership Programme.

This report should be read in conjunction with the 'Building our Connected Society' summary report and the perspective papers from the series (which are available at www.randeurope.org/connectedsociety and <https://corshaminstitute.org/research>). The consultations in the 2017 programme were:

Digital learning: Digital technology's role in enabling skills development for a connected world – March 2017

Open science: the citizen's role and contribution to research – April 2017

Currency: Redefining the way we transact in a digital world – May 2017

Civic engagement: How can digital technology encourage greater engagement in civil society? – June 2017

This programme hosted at St George's House was developed in partnership by Corsham Institute and RAND Europe.



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Published by the RAND Corporation, Santa Monica, Calif., and Cambridge, UK

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Foreword

The pervasiveness and ubiquity of all things digital has accelerated over the past 20 years and continues to grow exponentially. Digital technology is becoming increasingly intertwined with everyday life: from schooling and education, to political engagement and even financial and health management. Developments in digital technology, and the speed at which they emerge, drive innovation and new applications that touch our lives in different and often profound ways. While there are numerous opportunities and aspirations associated with digitalisation, there is also a crucial need to understand and mitigate the challenges it presents to society.

In partnership, Corsham Institute and RAND Europe design and deliver an annual programme of Thought Leadership at St

George's House. From its inception in 2016, the aim of the programme has been to explore the opportunities and challenges that digital technologies are creating within different aspects of society.¹

The Currency and the Future of Transacting Consultation on 4 and 5 May 2017 was the third of the four consultations that took place as part of the 2017 Thought Leadership Programme. Other events in the series focused on:

- Education and skills
- Open science
- Civic engagement

'Building our Connected Society', a summary of the key findings identified across the four events in the 2017 Thought Leadership Programme, is published alongside this report.

¹ For more information, visit:
<https://www.rand.org/randeurope/research/projects/corsham-institute-thought-leadership-programme.html> or
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Background

Our ability to exchange value and make commercial transactions relies on connectivity: the ability to identify, communicate with and exchange goods or services with another individual or entity that is willing to trade with us. In enhancing this connectivity, digital platforms have also led to innovation in the way we trade: from early online mail order shops, to today's complex cryptocurrencies and digital assets, which can be created and traded with no material equivalent. Understanding the economic, social and political implications of such change in the way we can transact – and how these fit into the context of wider socioeconomic trends – are key areas of focus for policymakers who wish to address social challenges and also make the best use of such platforms for public benefit.

With these considerations in mind, the overarching question considered for the consultation was:

As digital technology continues to disrupt the way we transact and as new currencies emerge, how can we ensure that the benefits of a connected world remain open to everyone in society?

The consultation was held at St George's House. As is the case for all Thought Leadership consultations, our discussions were held under 'The St George's House Protocol'

and 'The Chatham House Rule'.² Participants at the event included senior figures from academia, industry, government and third-sector organisations, covering both the technical and socio-political aspects of digital currencies and wider transaction practices (for a full list, see page 22).

Ahead of the consultation, a short thought-piece was developed for the participants in order to provide background information on some of the issues as well as set the scene for the discussions.³

The following report provides an overview of the discussions among the participants and key themes that arose over the two-day consultation. It aims to capture preliminary ideas about how digital technology is changing the way we are able to transact and about the implications of such change on society, as well as recommendations for further research. Participants were encouraged to develop and steer the topics under discussion in order to provide a better reflection of the emerging themes. Because these topics were often interspersed, they have been grouped by theme in this report rather than presented as a chronological record. It should also be noted that the views and proposals contained in this report may not necessarily be endorsed by everybody involved in the consultation.

2 See: <https://www.chathamhouse.org/about/chatham-house-rule>

3 Stewart, Katherine, Salil Gunashekar & Catriona Manville. *Digital Currency and the Future of Transacting*. Santa Monica, CA: RAND Corporation, 2017. <https://www.rand.org/pubs/perspectives/PE254.html>

1. Currency in a digital world

To try to develop a shared understanding of the topic for the ensuing conversation, we began with a discussion that explored the nature of currency in an increasingly digital world.⁴ Specifically, we focussed on understanding the potential impact on overarching financial structures, the likely path of adoption for new forms of currency, and our understanding of the concept of currency itself.

Prospects for adoption of digital currency

Prospects for the **adoption and use of cryptocurrencies**⁵ was one of the main themes that emerged from our discussions. Participants noted that Bitcoin, the most prominent cryptocurrency, is still 'scary' for some people. However, while it is still used by some for criminal purposes, certain pull factors – such as the lack of geography, efficiency and low-cost transactions – mean that Bitcoin is gaining further acceptance, with more institutions and hedge funds moving into the market and the potential for machine-to-machine (M2M) transactions. Some suggested that it was becoming easier to buy Bitcoin as a result of the development of better exchanges, although one participant noted that Bitcoin continues to be used more often as a store of value rather than as a medium of exchange.

Views on the future role of cryptocurrencies in day-to-day transactions were mixed. Some

in the group felt that digital technologies were reducing the need for physical currency, particularly among younger generations, who are more used to engaging with digital platforms and virtual communications. In this regard, it was suggested that such 'normalisation' of digital technology (and in particular the ability to transact using smartphones) could entail a diminished need for physical currency, or even fiat currency⁶ more broadly, with citizens able to potentially hold a range of digital currencies for different purposes and to transact in each as required. This led us to consider the prospects for a single 'global' currency and associated global prices, with potential efficiency benefits – although some questioned whether such a loss of diversity would be a benefit, or whether such a global currency would even be needed, given the ability for digital platforms to convert prices in real time.

The view that cryptocurrencies would continue to grow in prominence among the public was challenged by others in the group, on the grounds that, while volatility might be good for investors, currencies with a high degree of stability – such as those backed by a central institution – are preferable for everyday transactions (for example, paying rent and setting trade price lists) and for pegging⁷ alternative currencies. Although some

4 Currency is a generally accepted form of money, including coins and paper notes, which is issued by a government and circulated within an economy. Used as a medium of exchange for goods and services, currency is the basis for trade.' Investopedia. 2017. 'What Is "Currency".' As of 18 August 2017: <http://www.investopedia.com/terms/c/currency.asp#ixzz4hK5hLACd>

5 A cryptocurrency is 'a digital or virtual currency that uses cryptography for security... [It is] not issued by any central authority, rendering it theoretically immune to government interference or manipulation'. Investopedia. 2017. 'What Is a "Cryptocurrency".' As of 18 August 2017: <http://www.investopedia.com/terms/c/cryptocurrency.asp#ixzz4nMrCsTMq>

6 'Fiat money is currency that a government has declared to be legal tender, but it is not backed by a physical commodity.' Investopedia. 2017. 'What Is "Fiat Money".' As of 18 August 2017: <http://www.investopedia.com/terms/f/fiatmoney.asp#ixzz4nMrxow2V>

7 'Pegging is a method of stabilizing a country's currency by fixing its exchange rate to that of another country.' Investopedia. 2017. 'What Is "Pegging".' As of 18 August 2017: <http://www.investopedia.com/terms/p/pegging.asp#ixzz4nMqWg7ve>

initiatives to develop 'stable' cryptocurrencies have been ventured to this end,⁸ it was noted that these are not yet in common use.

Others reasoned that, despite innovations in digital payments, the paradigm remains that people tend to use the currency that they are paid in, and in which they pay taxes, for the majority of transactions. In this regard, it was felt that when discussing alternative or digital currencies, we should also consider the question 'Can the dominant unit of account really be disrupted?'

Another participant contended that efficiencies in connectivity provided by digital platforms are disrupting the very need for currency at all: "as long as we have electric current". However, other participants challenged whether the direct bartering of goods and services could ever be so efficient as to reach mainstream adoption, and argued that currency will continue to retain a role as an IOU in this

regard. The role of currency in enabling clearing for financial institutions⁹ was also discussed,¹⁰ although some noted that digital payments, if used in a coordinated manner, could eventually bring an end to the need for clearing altogether.

Overall, there was widespread agreement that, in the short term at least, we will continue to see an economy involving innovative, new currencies and methods of transaction, as well as traditional, physical currency. It was also highlighted that while we currently use sterling out of convenience in the UK, other types of currency might provide different forms of value, such as community benefits or lower levels of government control. While different currencies – both digital and physical – will be in use for the foreseeable future, the 'matrix of decisions' that we consider when deciding to use one form of currency over another – whether local, national, foreign or cryptocurrency – may become increasingly broad (this will be discussed in greater detail below).

The Bristol Pound

One example of digital platforms facilitating the development of alternative currencies discussed during the event was that of the Bristol Pound. The Bristol Pound was established in 2012 as a community interest company to manage the administration of a local community currency for Bristol, with the aim of keeping money circulating in the local economy. The currency – which is pegged to GBP at a 1:1 exchange rate – collaborates with the local authority and can be used to pay local energy bills, council tax and business rates. The currency is exchanged as paper notes and through text payments (managed by a local credit union), and Bristol Pound plans to launch contactless cards in 2017.¹⁰

8 The suggestion was made of stablecoins as an example of an initiative in this area, albeit one not yet operational. See: Buterin, Vitalik. 2014. 'The Search for a Stable Cryptocurrency.' Ethereum Blog, 11 November. As of 18 August 2017: <https://blog.ethereum.org/2014/11/11/search-stable-cryptocurrency/>

9 'Clearing is the procedure by which an organization acts as an intermediary and assumes the role of a buyer and seller in a transaction to reconcile orders between transacting parties.' Investopedia. 2017. 'What Is "Clearing".' As of 18 August 2017: <http://www.investopedia.com/terms/c/clearing.asp#ixzz4nMsBtpPd>

10 Bristol Pound (homepage). 2017. As of 18 August 2017: <http://bristolpound.org/>; Sánchez, Santiago José, & Ferran Moreno. 2016. 'Bristol to Barcelona: "Be as Ambitious as Possible with New Local Currency".' *El País*, 23 November. As of 18 August 2017: http://cat.elpais.com/cat/2016/11/22/internacional/1479854618_869834.html

Future financial system

A key theme that emerged relates to the potential impact of digital technologies on the structure of the financial system and to the role of the central bank.

Given the increasing ease of use and decreasing costs of implementing digital platforms, and the lack of need for cryptocurrency to go through a central exchange, some participants wondered whether **the central bank's position** as a guarantor of the store of value would be challenged— although, as noted above, some participants felt that a central bank-backed currency would still have benefits for the foreseeable future.

Even with a prominent central bank, cryptocurrencies could influence monetary policy by allowing people to 'opt out' of the system in response to monetary policy decisions.¹¹ This was identified as both a potential benefit, by acting as a check on bad decisions by government, and a potential risk, by diminishing state control and influence over the financial system, particularly in responses to crises. In some situations, such loss of control could even deepen financial crises, by allowing participants to 'opt out of the mainstream financial system and thereby creating additional instability.'¹²

Others noted that the 'traditional model' of careers in banking and policymaking, with a high rate of transfer between the two sectors, may be changing as increasing numbers of people choose instead to make a career in the 'Silicon Valley' venture capital and technology ecosystem, with potential **consequences for the 'power axis' of traditional financial industries.**

Participants noted that 'currency is more than just currency'; a broad financial infrastructure has arisen over time, including complex norms and structures relating to the traditional exchange of value and the physicality of cash. In this regard, Bitcoin and other innovations in the ability to transact represent an **'unbundling' of financial structures:** the ability to separate out some discrete functions of the traditional banking system (such as facilitating transactions between individuals), with no requirement to engage with other traditionally concurrent aspects of the financial system (such as the role of a bank in holding individual deposits). It was noted that if we begin to unbundle such structures, it is not clear what the ultimate impact will be – or what wider beneficial aspects of the current system might be lost.

We also discussed the potential **development of international economic communities** that are not limited by state authorities. Termed 'cloud societies' by one participant, these communities could potentially transact electronically across borders, unrestricted by national laws or trade agreements. Another suggested that such economic activity already occurs naturally, with distinct regional dynamics, rather than uniformly across a state. In this regard, international alliances of certain types of economic regions could develop, with emerging currencies or transaction platforms tailored to their specific needs (for instance, an alliance between cities to transact using a particular alternative currency).

New models of value exchange

Our discussions turned to wider changes in the practice of exchanging value, such as the

11 Participants noted that this was particularly the case in such countries as Venezuela, where it is difficult to obtain foreign currency, gold or other assets.

12 Participants noted that a sufficiently large alternative currency could cause global instability in this manner.

use of time or data to conduct transactions (and the understanding of these as 'alternative currencies'), as well as the wider role of innovative digital transaction platforms to create new ways of exchanging value within society.

One particular focus of conversation was the **role of data in exchange for services**, and the extent to which we will see further development of a 'data economy'. It was noted that at the moment, understanding of the value of data by individuals is low (this perception was likened to that of an individual silk worm, which has no understanding of the collective value of the silk threads that are produced). We also discussed the prospects for greater individual control over data, including what one participant termed the prospect of 'data capitalism': 7 billion individual 'data traders', facilitated by platforms allowing greater control over the use of personal data and with the ability to exchange access to that data for products or services.

However, others suggested that increased exchange and trading of data will require a certain level of knowledge and understanding on the part of the public, and queried whether

such knowledge, and adequate consent in this regard, would even be possible. This also raised questions as to the extent to which individuals could claim ownership over data rights; while some types of information (such as names) are clearly within the individual remit, others – such as national insurance numbers – are artefacts of a separate institution. It was also noted that there are broader economic benefits of data being held, owned and analysed in aggregate form, and that any initiatives to monetise data would have to consider these network effects.

We also discussed the potential use of time as a currency, and its ability to facilitate transactions across extended time periods, even with individuals who have yet to be born. The value of most currencies can't be measured tangibly as units in their own right, because their value stems from the expectation that they can be exchanged for different goods/services that are considered of value to the holder at a particular future moment. However, the **use of time tokens could help to realise the value of social relations**, both now and in the future.

Give&TakeCare

Give&TakeCare (G&TC) is a form of circular economy, based on time banking principles, to encourage people to get involved with befriending and providing assistance to the elderly in their community, developed in 2016 by academics from Brunel University and funded with a grant from Innovate UK, The Innovation Agency. Volunteers who provide one hour of support earn 1 'GAT' – a dedicated time credit intended to remain a store of value (a 'care saving'), and that is immune to wider economic trends – which the bearer can exchange for their own support in later life. GATs cannot be sold or exchanged outside of the scheme, but can be passed to other family members as a gift or legacy.¹³

13 The Economist. 2016. 'A Time-Banking Scheme Aims to Overcome Britain's Crisis in Care for the Elderly.' *The Economist*, December 17. <http://www.economist.com/news/britain/21711844-young-people-who-volunteer-now-could-bank-hours-credit-be-re-deemed-kind-their-own>; <https://www.giveandtakecare.co.uk>.

2. Challenges and opportunities of changing practices

It was generally accepted that the impact of digital transaction platforms will not be felt uniformly or universally. As participants acknowledged, the extent of use and acceptance of various currencies will depend on which sections of society ultimately adopt them. As such, part of the discussion over the course of the event considered the impact on, and roles of, different actors in the system, at the level of the individual citizen and communities, business and government.

In this section, we summarise the strategic themes and issues discussed that are likely to impact on each of these different groups.

Citizens and communities

The discussion on citizens and communities centred on the capacity of digital currencies (whether currencies run by a central authority or cryptocurrencies) to act as a tool to enable change in terms of behaviour within the local and wider economy.¹⁴

A prominent theme of the conversation revolved around the way in which the **design of a currency can influence the way it is used** both by individuals and by communities as a whole, and in doing so increase the value of certain underlying behaviours or assets. In this regard, participants discussed how new currencies could encourage social outcomes by using new forms of currency to **enable and reward behaviour change**, by linking aspects of the generation or use of a

currency to specific actions or behaviours. As an example, we heard about Sweatcoin,¹⁵ a start-up that allows individuals to earn digital 'coins' for the number of steps taken and then to trade these for rewards. The company also intends to pursue commercial deals with stakeholders, such as employers, who would want to incentivise healthy lifestyles among their workforce, or healthcare insurance providers, who would find value in the data generated by the app (for example, by analysing the data provided by users to determine insurance policy premiums).¹⁶ The Sweatcoin founders indicate that the long-term aim is to establish an exchange rate with the British pound (but, as one participant contended, maintaining the value of such currencies for holders of the 'coins' could be a challenge).

We also discussed the development of other new currencies to prioritise local needs and involving local assets, such as time, food or other aspects that are specific to a local community. In this regard, currencies have the potential to **create new forms of liquidity based on local circumstances** and assets in order to meet market needs. As one participant noted, some currencies facilitate the draining of money out of a network, while some encourage re-use by design (for instance, by limiting the currency's ability to act as a store of value). Examples of local, community-driven currencies were raised throughout the discussion, including the Bristol Pound (see box above); WIR in Switzerland¹⁷ and Sardex in

14 Although local and alternative currencies existed prior to the digital age, the conversation was undertaken on the assumption that the connectivity offered by digital platforms is facilitating the creation of such initiatives.

15 Sweatcoin (home page). 2016. As of 18 August 2017: <https://sweatco.in/>

16 Auchard, Eric. 2016. 'New Apple App Launches in Britain That Pays People to Get Fit' Reuters.com, 5 May. As of 18 August 2017: <http://www.reuters.com/article/us-currency-fitness-idUSKCN0XW193>

17 WIR (home page). 2017. As of 18 August 2017: <https://www.wir.ch/fr/>

Sardinia,¹⁸ both of which are complementary currencies (with no physical cash form) used by local businesses to extend forms of mutual credit; and a planned introduction of a local currency in Barcelona in 2017.¹⁹

Emerging local or alternative currencies may, however, face barriers or challenges to their development or viability. Most notably, new currencies may face issues of user buy-in and trust, particularly if they are perceived as complicated or difficult to use. As some participants noted, sterling and other fiat currencies may sit within a complex financial system, but they are relatively easy to use and familiar to most people. The longevity of emerging currencies was also questioned as a potential challenge for citizens, particularly those currencies with a 'controlling' organisation that may not endure in the long term, meaning citizens may not have a guarantee that non-fiat currency or tokens will be viable in the future. For some individuals, the use of 'unofficial' currencies might also mean a lack of a safety net (such as the deposit protection scheme or legal framework), which is often provided for fiat currencies.

Despite the potential benefits for communities and citizens, some participants contended that there could be a potential loss of democratic control over the economy, given the ability for individuals to 'opt out' of the mainstream financial system through the use of non-regulated currencies or through the anonymity granted by certain cryptocurrencies. Such outcomes could potentially deprive local and

national authorities of economic control as well as tax revenues. It was noted that widespread use of local currencies – and the consequential change in the balance of influence over aspects of economic control, such as sales tax or regulation – could also affect the relationship between local and national authorities.

We also discussed the role of digital platforms in facilitating access for the financially excluded or unbanked (discussed in further detail below). As digital transactions move closer to the norm, there will be a need to focus on how various groups fit in to the evolutionary pathway and also to recognise the potential for exploitation, as well as opportunity, for marginal or vulnerable groups.

Business

Our discussions also considered the potential impact of digital technologies and emerging currencies on businesses and markets.

It was suggested that new platforms for transactions could **create new market opportunities and funding models** for organisations (particularly start-ups), with crowdfunding models or micropayment capabilities being offered as two examples. Small to medium-sized enterprises (SMEs) could also benefit from greater equality of opportunity in terms of reaching customers, such as through online advertising platforms.

Businesses could also benefit from **lower operating costs** afforded by digital transactions and new payment technologies (e.g. Blockchain-based solutions).²⁰ In addition to

18 Sardex (home page). 2017. As of 18 August 2017: <https://www.sardex.net/?lang=en>

19 Mount, Ian. 2015. 'What's Paid in Barcelona Stays in Barcelona in Move to Local Currency.' *Fortune Global Forum*, 3 November. As of 18 August 2017: <http://fortune.com/2015/11/03/barcelona-local-currency/>

20 A Blockchain is a form of distributed ledger, in which 'information is stored on a network of machines, with changes to the ledger reflected simultaneously for all holders of the ledger... [and] authenticated by a cryptographic signature. Together, these systems provide a transparent and verifiable record of transactions.' See: Deshpande, Advait, Katherine Stewart, Louise Lepetit & Salil Gunashekar. 2017. *Distributed Ledger Technologies: Challenges, Opportunities and the Prospects for Standards*. London: BSI. As of 18 August 2017: <https://www.bsigroup.com/en-GB/Innovation/dlt/>

efficiencies in payments allowed by digital platforms, this could include efficiencies in back-room processes, such as having a real-time view of tax receipts; improved access to data for audit, through the use of digital ledgers and records; and improved efficiency, accuracy and timeliness in executing the organisation's business intention. It was, however, noted that some businesses (such as small retail establishments) may not be fully prepared for the change in markets and transaction practices that are heralded by digital platforms; the services that such organisations offer might need to change as a result, and this needs to be carefully managed and planned for.

Participants also discussed the ability for organisations to **collect richer data on customers**, for example the ability to collect both end-user data and real-time data on transactions through the use of website and apps for buying and selling; the use of direct digital transaction methods such as cryptocurrencies, removing the need for an intermediary; or the development of payment ecosystems, such as store cards, facilitated by digital platforms. This could facilitate better targeting of services to customers, but could also be used by the traders to manipulate prices for individual customers. A related concern noted by some participants was that ownership of data by one company might also serve to limit market competition.

Participants also discussed how new platforms for transaction can facilitate **better and faster engagement with customers** by allowing faster responses to queries and the ability to reach new markets and customers more cost effectively and rapidly through online platforms. At the same time, others noted that the near-instantaneous – and public – nature

of customer feedback could also serve to destroy reputations. On a related note, some participants discussed the **role and importance of trust in online transactions**. As a widely accepted form of IOU, traditional currency itself facilitates trust. However, new forms of value exchange – including remote exchange in which the receipt of goods is not instantaneous – may raise new questions as to the extent to which individuals can trust the people they are trading with. It was noted that the use of ranking systems, such as the star ratings used by eBay, now provide a collective trading history for the potential purchaser, which can help to facilitate trust in online exchanges.²¹

However, others felt that this rapid feedback cycle could have a negative effect on trading behaviour and create different incentives. As one participant noted, due to the speed of exchange, it is possible that 'observations become definitions' with decreasing incentives for the individual to work to correct low scores. The gathering of collective opinions would have to 'slow down' in some cases to operate as a more effective incentive.

Government, policy and regulation

It was suggested that governments may increasingly choose to engage with cryptocurrencies as a valuable commodity, in order to benefit from their features or to exert influence where possible. It was noted, for instance, by some participants that Japan and Russia have recently taken steps to legitimise the use of cryptocurrencies.²² It was felt that policymakers face a challenge in terms of **deciding when it is appropriate to regulate or not regulate new forms of currency** – and for regulators to understand whether new forms of

21 One participant suggested that this, too, could be considered a form of currency.

22 See: Kharpal, Arjun. 2017. 'Bitcoin Value Rises over \$1 billion as Japan, Russia Move to legitimize Cryptocurrency.' CNBC.com, 12 April. As of 18 August 2017: <http://www.cnbc.com/2017/04/12/bitcoin-price-rises-japan-russia-regulation.html>

currency or transaction methods sit within or outside of the existing regulatory sphere.

Similarly, for competition and antitrust authorities, a key challenge will be to **understand whether the playing field is appropriately level** in light of the availability of emerging technologies and, in particular, the collection and use of customer and market data.²³

At the national level, participants suggested that digital platforms could have broader economic benefits, such as **increasing trade opportunities** through the reduction of barriers. Remittances, both across and within national states, could benefit from more efficient channels. Policymakers may also benefit from **improved access to data** in order to understand real-time transactions and the relationship between events and spending behaviour.

The introduction of various new currencies could also have **wider implications for taxation**. This includes the aforementioned concern that digital platforms could decrease state control over tax revenues by allowing users an 'opt-out' through the use of unregulated currencies and tokens, but also over the appropriate form of the tax itself. As one participant noted, the intention behind certain types of tax,

such as the carbon tax, is not necessarily to collect revenue, but to change behaviours; it is important to recognise that the ethical basis for taxation is that *gains* are taxed, in order not to create skewed incentives.

In this regard, some participants noted the potential use of digital currency for more **effectively targeting tax**. Through more effective analysis of money flows, as facilitated by digital transactions, tax rates and bands could be more effectively targeted to identify the minimum burden and avoid creating skewed incentives. Participants also pointed out that some kinds of specific-use currencies, should they reach widespread use and transferability with regular currencies, could have different externalities and payments 'built in' to their design (such as a carbon credit), and so require different kinds of taxation to reflect this, rather than a 'one-size-fits-all' approach to taxing income or the overall value of money/assets held.

Finally, **cybersecurity** was noted as a key strategic and systemic challenge for government, relating not just to new digital platforms and currencies, but also to more general control over key public services and economic institutions.

23

See, for example: The Economist. 2017. 'The World's Most Valuable Resource Is no longer Oil, but Data.' *The Economist*, May 6. As of 18 August 2017: <https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-anti-trust-rules-worlds-most-valuable-resource>

Smart contracts and the legal system

Some participants discussed how 'smart contracts', facilitated by Blockchain technology, could facilitate changes in the global legal system. A smart contract is a self-executing contract: 'a set of promises, specified in digital form, including protocols within which the parties perform on these promises'.²⁴

It was noted that, just as the Internet has driven innovative commercial practices and helped to diminish the role of the intermediary by connecting consumer to supplier, smart contracts may facilitate increased access to the law and innovative methods of participation by the public in the legal system.

Participants also discussed how changes to the way we write the law itself – for example, by developing 'modular law', with a similar structure to that of computer code – could make it easier to code as a smart contract. One participant raised the idea of developing a global legal 'ecosystem' or standard in this regard, to facilitate cross-border legal agreements, for which core competency could be based in the UK: a 'digital GMT' for digital contracts.

Others noted that this could create a 'mythical' level of legal obligation, which does not reflect the actual functioning of the law; if perfect surveillance is introduced (for example, over traffic violations), we might see how much the functioning of the current system relies on a level of non-transparency.

24 Szabo, 1996, cited in Murphy, Sean, & Charley Cooper. 2016. Can Smart Contracts Be Legally Binding Contracts? London: Norton Rose Fulbright LLP. As of 21 August 2017: <https://sites-nortonrosefulbright.vutuevx.com/596/14051/uploads/r3-and-norton-rose-fulbright-white-paper-full-report-144581.pdf>

3. Strategic challenges

Given that the impact of changing transaction practices is difficult to predict, it seemed more appropriate to consider how such innovations in transaction practices might be harnessed for societal good – and to address any potentially negative consequences.

We identified four overarching challenges related to encouraging responsible use of emerging digital platforms and technologies for societal good:

- Developing a resilient financial ecosystem
- Encouraging digital and financial literacy on the part of citizens
- Encouraging ethical behaviour
- Promoting financial inclusion

Developing a resilient financial ecosystem

Participants noted that one of the main strategic challenges faced by society is the **speed of evolution** of digital platforms and transaction practices. As noted earlier, new platforms have facilitated the entry of new providers, who can ‘unbundle’ services by taking part of the service offering that is usually integrated with other services by traditional financial institutions. Some participants felt that this unbundling of the system may have unforeseen impacts, and may introduce new elements of risk if such services are unbundled too much. In particular, participants noted that changing structures could lead to **more rapid crises**, as individuals and organisations in the system are able to take advantage of faster information flows and transaction times to make and effect decisions en masse, thereby giving regulators and policymakers less time to analyse and assess the situation and react in a careful and measured way.

We noted that this implies foremost the need for **an understanding of ‘where the threats**

are’ in the developing financial ecosystem, and how emerging currencies or digital platforms might affect the functioning of such a system. Similarly, having an **understanding of what resilience means** in this context, and how to identify and measure different types of resilience, are key challenges that need to be considered.

One participant also highlighted that assurance providers may need to be more aware and better educated about the emerging financial and economic landscape and may need to create new assurance products and services which are better aligned to the emerging changes in transaction processes.

Encouraging digital and financial literacy on the part of citizens

There was broad agreement that current levels of economic and financial literacy among the public are low, and that this could potentially limit individuals and communities from being able to make the most of the new opportunities presented by digital platforms. As one participant contended, the key task in this regard should be encouraging wider public understanding of the process by which money is created.

A number of participants suggested including **digital and financial literacy as part of formal schooling**. Suggestions in this vein included the introduction of coding courses at primary school level, both to increase digital skills and to develop logical thinking skills; courses at secondary level on aspects of the history and functioning of the financial system, such as an understanding of money creation; and the use of real-world examples in the curriculum. It was acknowledged that introducing new items to the curriculum would require trade-offs in other areas. The group also noted the utility of online courses, such as massive open online courses

(MOOCs), and online coding academies for encouraging lifelong learning across the population with a view to developing digital and financial literacy.

Developing the capacity of the media with regard to reporting financial news was noted as a further area of improvement in terms of digital and financial literacy. It was suggested that the ‘impact agenda’ in UK higher education incentivises engagement with the media by the academic community and could help to encourage academics to engage with the public on issues of financial or digital technology to widen public understanding and engagement with digital innovations.²⁵ Prominent ‘**digital champions**’ or ‘key influencers’ could also encourage public engagement in this regard.

Making websites user-friendly and adaptable to individual users’ needs could also encourage more sustained engagement with digital platforms and financial providers, and the associated development of skills. We should also consider avoiding the use of jargon, using clear language for terms and conditions to encourage understanding and informed consent, and developing more user-friendly websites that can be adapted to the users’ level of skill.

Encouraging ethical behaviour

Digital platforms offer many new opportunities for innovation in value exchange, but also new vulnerabilities as new platforms offer forms of activity outside existing legal or regulatory frameworks. One strategic challenge discussed was for providers of digital platforms and

actors in the financial system to **understand the extent to which they are responsible for maintaining certain behaviours or ethical standards** in light of changing transaction practices (for instance, the ethical use of emerging data streams), and to understand what responsible citizenship – and responsible governance – may entail when dealing with aspects of digital exchange for which ethical norms have not yet had time to develop.

In this regard, participants noted that, rather than considering ethical questions in isolation, this may call for an understanding of what constitutes an **overarching ‘digital citizenship’** and public acceptance of the definition of ‘ethical behaviour’. The roles of the public in upholding ethical norms in behaviour through the risk of reputation damage, and that of government as the ‘honest broker’, were also noted. The immutability and transparency of certain Internet platforms may also encourage greater reflection on the consequences of actions.

The role of digital platforms in actively driving ethical behaviour through design – such as automating tax payments – was also discussed. Developing ‘ethical currencies’ with a specific goal in mind – such as carbon credits in order to introduce an opportunity cost to the release of greenhouse gases – could also help build in a **greater understanding of externalities** in transactions. Participants also discussed the potential role of smart contracts in ensuring ethical behaviour by removing the option to behave unethically or unlawfully through their nature as an automated mechanism.²⁶

25 Concerns have been raised by others that the ‘impact agenda’ may, however, promote short-term thinking, thus undermining ‘blue sky’ research. See Manville, Catriona, Molly Morgan Jones, Michael Frearson, Sophie Castle-Clarke, Marie-Louise Henham, Salil Gunashekar & Jonathan Grant. 2015. Preparing Impact Submissions for REF 2014: An Evaluation: Findings and observations. Santa Monica, Calif.: RAND Corporation. RR-727. As of 18 August 2017: https://www.rand.org/pubs/research_reports/RR727.html

26 One participant noted, however, that the concept of ‘ethics’ was only coherent in the context of choice.

Promoting financial inclusion

The need to consider the ways in which **barriers to financial inclusion might be addressed by digital platforms** was the fourth area explored as part of our discussions. Suggestions included innovative methods of providing collateral or identification for transactions for those without traditional sources of either, such as using mobile phone payment records as evidence of credit history; using Blockchain technologies to facilitate recognition and legal ownership of assets; developing community currencies relevant to local requirements and conditions; developing digital currency innovations specifically to meet the needs of people in lower income brackets, such as a currency that could be used without incurring sales tax; and using incentives to encourage engagement with digital platforms, such as offering a form of universal basic income (UBI) available only on a certain digital platform.

It was widely acknowledged within the group that perhaps the most fundamental factor associated with inclusion is that of **basic connectivity, and the cost of data**. Inclusion initiatives may facilitate banking access for the digitally included, but still exclude those without a basic level of Internet access. Similarly, as connection speeds increase and platforms are developed on the basis of this, the speed differential in slower geographies may be more keenly felt.

Others noted that there are systemic issues in the banking system that are wider than the digital technology agenda and that result in many unbanked individuals remaining unable to become part of the banked population. Any strategy to increase financial inclusion should bear in mind what one participant termed the

‘systemic global problem of the left-behinds’ and be wary of furthering a situation in which **society is split between the ‘super-connected’ and the ‘others’**, a split which may not be simply generational.

In this regard, it was suggested that using historical evidence on the introduction of different financial products and their financial and wider social consequences would be helpful to inform future strategies.²⁷ Another important factor that was highlighted is how digital platforms and currency innovations can help those individuals who don’t *want* to use the traditional banking system. However, one participant queried whether this would in fact help to change behaviour and the relationship with banks and banking services, or simply reinforce the ability for some people to ‘step out’ of the system, which may not necessarily be a positive thing. It was also highlighted that the number of people wary of the Internet and reluctant to use digital platforms should not be underestimated, and may serve to further compound exclusion.

Our discussions also considered the challenge of extending the potential benefits of digital platforms to vulnerable or marginalised groups. Participants noted that the design of digital platforms should be user-centric, with simple interfaces for customers to navigate an often-complex topic. One participant also suggested that **data analytics and artificial intelligence could help to identify vulnerable individuals** by assessing behaviour patterns to predict individuals’ future behaviour or assess which individuals in a system are following convention, and in doing so identify individuals in potential need of assistance or intervention, such as vulnerable individuals or those who are potentially being defrauded.

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One participant suggested that the role of Safari Telecom in promoting inclusion of the unbanked through mobile telephony is a good example in this regard.

A further unintended consequence of new digital platforms may also be that changes to the wider financial sphere could actually act as a disincentive for financial institutions to offer certain services to individuals, should disruptive innovations and resulting changes in

the market make these services unprofitable. This could therefore risk '**unbanking the banked**' and in fact extending the problem of financial exclusion to groups who are not currently excluded.

4. Harnessing digital transaction platforms for societal benefit

In line with the overarching question for this consultation, we considered how different actors at the local, national and global levels might utilise new digital transaction platforms and emerging currencies to support the wider benefit of society in general, or, as one participant termed it, recognise the ‘art of the possible’.

At its most general, it was noted that to make a concept mainstream, it needs to have mass appeal. In the case of new transaction mechanisms, this means having a general understanding of the benefits of digital platforms, in order to show how specific applications can be of benefit to individuals throughout society. As one participant put it, we have to ‘situate it within the story’.

As mentioned earlier, participants noted the ability for the design of currencies themselves to drive behaviour (such as facilitating the ability to accumulate wealth). Understanding the reciprocal impact of currencies on the world around them is therefore required in order to understand how they can be harnessed for social benefit. Participants noted that key to this process is the need for **discussion on the values underpinning the advice and knowledge we provide about the financial system**. As digital platforms expand, there are a number of key questions that need to be addressed, including:

- Who is responsible for governance?
- Is public education about the use and impact of these platforms adequate?
- How much is the responsibility of the state, the platform operator and the individual?

At a local level, one participant noted, the focus needs to be on *enabling*, rather than *helping* local initiatives to develop, as feedback loops will help such initiatives

to grow once they have started. Local innovations, however, always need someone to lead the implementation effort, and they may face issues of scalability and transferability. The most effective approach may be one of maintaining a manageable system rather than growing a system at scale across different geographies. With regards to local currencies, this might mean thinking about replication, rather than scaling up, as it is easier to keep a focus on local issues and needs – for instance, by replicating the Bristol Pound in Manchester by introducing the Manchester Pound, rather than rolling out a new ‘national local currency’.

At a national level, participants acknowledged that in order to realise the benefits of digital currency and platforms, there is a need to consider the wider adoption of digital technology across the population. Views were mixed on the role of government, with some participants noting that government can help set standards and create an enabling environment, but should not pick the ‘winners’. Others felt that from its position, government could probably see the sectors and areas for priority, and in this regard, there was broad agreement that a **key role of central government should be that of enabler, helper and ‘incentiviser’**, and that government could help to normalise and encourage the use of digital currencies and platforms through example (for instance, by using such mechanisms to pay suppliers or make personal tax and welfare payments). It was also suggested that a ‘digital roadmap’ could help here, as could the existing digital strategy developed by central government.

Participants also felt that there are a number of information gaps that make it difficult to develop a cohesive strategy for utilising new digital transaction technology for the greater benefit of society. They identified a need for

further research in a number of areas, including the following:

- Understanding the drivers behind current transaction choices, including the choice to use cash rather than existing digital currency
- Understanding the extent to which individuals and businesses take value from Internet platforms that is not accounted for
- Understanding the digital skills learning needs of target groups in order to enable the strong return on investment (ROI) from investing in digital skills
- Understanding the ways in which new currencies enabled by distributed technology can enhance living standards
- Understanding at what point (and why) new currencies gain intrinsic value and thus become a commodity rather than a medium of exchange
- Digital technology is enabling a global/national debate on the creation, governance and usage of new currencies. How does this debate move forward?

5. Conclusion

Throughout the course of our discussions, some common themes and ideas that emerged. In this section, we summarise some of the most prominent themes that arose during this consultation.

Unbundling of financial structures

A recurring theme throughout the consultation was the role of digital technology in **unbundling elements of the existing financial system**. Our current financial structures and institutions were not designed at once, but rather have developed over hundreds of years to their current form. Through the use of new digital platforms, new market entrants and non-financial organisations are able to engage with discrete areas of the financial services sector that have traditionally been the preserve of financial institutions. In this regard, we might also see the unbundling of different functions of the financial system relating to roles, risks and institutions. This may even extend to currencies themselves, through the separation of their function as a medium of exchange from their role as a store of value.

The financial system is complex, and while the unbundling of traditional functions and new entrants to the market may have many positive consequences – as discussed above – it may also introduce unforeseen consequences for the system itself and for the provision of various services, which may not necessarily be positive or predictable. Similarly, for the individual consumer, navigating this landscape, and understanding the individual risk to which they are exposed, may present vulnerabilities as well as opportunities. Understanding the way in which these innovations can in fact contribute to social and economic problems, such as introducing new elements of systemic risk, will be also important.

The concept of currency

There was broad agreement that for the medium-term future at least, we will continue to see a mixed-currency transaction landscape, consisting of fiat currency and physical cash alongside new, innovative forms of currency and value exchange.

While participants did not attempt to come to a firm conclusion on the definition of the term currency, our discussions went beyond simply understanding the way in which we tokenise assets. Rather, we discussed the need to situate our understanding of currency and value exchange within the context of changing transaction practices, in which new economic models and information flows facilitated by digital platforms are transforming the way in which we are able to exchange value, in a form increasingly unrestricted by geography, government or even (in the case of time banking) time period. As well as innovative new forms of IOU (such as cryptocurrencies), this may require new thinking about assets such as data, time and space, and the role they play, and will play, in economic organisation.

The link between currencies and assets

We also considered how we understand the **concept of underlying value** when thinking about digital or emerging currencies. As one participant noted, given the lack of hierarchy, cryptocurrencies are best characterised as ‘network-centric protocols and effects’, while another participant compared the development of cryptocurrencies to the move away from the gold standard, in that it further diminishes our connection to real-world assets (for example, bank reserves) by transitioning to a system of IOUs built primarily on trust and software alone.

But this does not necessarily mean that currencies will universally move further away

from real-world assets. New currencies developed with a specific purpose and enabled by digital technologies (such as the Bristol Pound, GATs or Sweatcoin) could serve to facilitate the realisation of value in other spheres by linking the use or generation of the currency to particular behaviours or assets,

such as restricting use to a local economic region or linking it to the generation of data about physical activity. Understanding how the *design* of currencies can influence the behaviour of the holder, and so have an effect on transaction choices and economic activity, will be an important aspect of this.

List of participants

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Organisations

Corsham Institute

Corsham Institute (Ci) is a not-for-profit organisation that is working for a fair, inclusive, prosperous and creative society based on trust and security.

Our focus is on education and research, going beyond traditional ideas of knowledge to promote lifelong learning in the digital age. We aim to empower citizens to develop the critical thinking and creative problem-solving skills they need to make the most of the opportunities that our increasingly networked, connected and data-rich society provides.

The Thought Leadership Programme provides an opportunity to explore the potential and impact of digital technology within society today, focusing on shaping a future where citizens are empowered with the knowledge and skills they require to live their lives socially, economically and even politically.

Our wider programme of work encompasses Research, Learning and Enterprise, placing the citizen in control of the creation, acquisition and exploitation of their knowledge.

RAND Europe

RAND Europe is a not-for-profit organisation whose mission is to help improve policy and decision making through research and analysis. As part of the RAND Corporation, we were founded in 1992 in Europe to provide quality research and rigorous, fact-based analysis to serve policy needs in EU institutions, governments, charities, foundations, universities and the private sector, where impartial research is required.

Our work lies on the spectrum between that of universities and consultancies, combining academic rigour with a professional, impact-oriented approach. In other words, we operate as a research-focused business, using a

professional services model, within the context of a public good mission.

We combine deep subject knowledge across many policy areas – including health, science, innovation, defence and security, transport, infrastructure, criminal justice, education, employment and social policy – with proven methodological expertise in evaluation, impact measurement and choice modelling. Our clients include European governments and institutions, charities, foundations, universities and private sector firms.

St George's House, Windsor Castle

St George's House was founded in 1966 by HRH The Duke of Edinburgh and the then Dean of Windsor, Robin Woods as a place where people of influence and responsibility can gather to grapple with significant issues facing contemporary society.

The House offers a safe physical and intellectual space set in the narrative of history but focused firmly on the future. You will find here an environment receptive to new ideas, conducive to taking intellectual risks and to thinking through challenging topics in imaginative ways. The House is a sanctuary, removed from the pressures of everyday life, where the topic to hand takes precedence. It is this focus that encourages creative thinking, informed debate and sustained engagement. The emphasis throughout our carefully crafted Consultations is on dialogue and discussion. Participants are in a place where a real contribution to society can be made, where personal enrichment and social progress are mutually compatible, a place where Wisdom is nurtured.

In order to offer a safe and secure intellectual space our Consultations are run on the understanding that all debate and conversation takes place under the House Protocol.

Acknowledgements

In addition to the lead rapporteur, Katherine Stewart, this report was also co-authored by Salil Gunashekar and Catriona Manville, RAND Europe.

Ci and RAND Europe would like to thank all participants for stimulating and contributing to

the discussions that took place. It is through the enthusiastic and forward-looking approach of participants that we have been able to generate new insight and ideas to tackle the challenges faced. We also thank Jess Plumridge for her time and effort in creating the design for this report.

