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Paths to success for a Digital Pound: A research note on consumer attitudes to adoption

Andrew Buckley[2], Vasileios Karountzos[3], Markos Zachariadis[4]

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[2] Centre for Financial Technology Studies (CFTS), Alliance Manchester Business School, The University of Manchester, a.buckley@btinternet.com.

[3] The Productivity Institute, & Centre for Financial Technology Studies (CFTS), Alliance Manchester Business School, The University of Manchester, vasileios.karountzos@postgrad.manchester.ac.uk.

[4] Corresponding Author: Director, Centre for Financial Technology Studies (CFTS), Alliance Manchester Business School, The University of Manchester, markos.zachariadis@manchester.ac.uk, Orcid: https://orcid.org/0000-0002-6534-781X

Introduction and motivation for this research

Central banks globally are exploring the potential of new digital monetary technologies, with numerous institutions contemplating the introduction of their own Central Bank Digital Currencies (CBDCs). A few countries have already implemented trial versions of CBDCs, such as China's e-CNY, which can be used for everyday transactions as an alternative to traditional cash, i.e. physical banknotes (Wang, 2023). Additionally, institutions like the European Central Bank (ECB, 2020), Bank of England (BoE, 2021), and the Federal Reserve have started projects to assess the viability of their own digital currencies, regularly releasing interim research and policy documents detailing their findings and considerations. To date CBDCs have only been introduced in a handful of small markets, but over 100 countries are exploring their implementation.

The maxim "What does not scale, does not matter" in payments, will likely also apply to CBDCs. History shows that many innovative new payment services fail, due to lack of consumer adoption. Despite many papers[5] debating CBDC strategies and potential use-cases, there remains a crucial research gap in understanding consumer attitudes towards the adoption of a Digital Pound. This paper - utilising a blend of commercial and academic practice - is an initial contribution to filling this gap and (in doing so) identifies key areas for further investigation.

As discussed above, the Bank of England, like most other central banks, is investing considerable resources and political capital into developing a 'Digital Pound' CBDC. A Digital Pound is intended to ensure central bank money remains available in a digital economy (given the demise of cash) and to safeguard UK monetary sovereignty and to defend against the potential loss of control and oversight, from a 'big tech' or foreign government digital currency. It's also envisaged a Digital Pound would offer a platform for increased innovation and resilience of UK payments. The Bank of England and HM Treasury consider[6] a Digital Pound is likely to be needed in the UK (BoE, 2021).

January's response[7] by the Government and Bank of England to the Treasury Select Committee's Report "The Digital Pound: A solution in search of a problem?"[8] highlights the keen debate regarding the merits of a UK CBDC. Politicians and commentators, including the Conservative Chair of the All-Party Parliamentary Group for CBDCs Marcus Fysh, have expressed concern[9] that a proposed 'Britcoin' could potentially put people's privacy at risk, and has questioned its supposed economic benefits. In other jurisdictions, Ron DeSantis (Governor of Florida) has signed into law a prohibition of a federal CBDC[10].

Irrespective of this debate, it is reasonable to assume - as a defensive measure at least - that a CBDC will be launched within the UK economy within the next several years to support monetary and financial stability and provide a new 'rail' for value transfer that suits a modern and highly digitised economy. With all participants in the financial ecosystem, from retail banks to acquirers and merchants, mandated to support this new form of central bank money for use by consumers and businesses. This Digital Pound would sit alongside cash (coins and banknotes) and be exchanged at par value with commercial money, preserving the "Singleness of Money".

[5] Examples: Ozili, 2023, Themistocleous et al, 2023, Cao et al, 2023, Cotugno et al, 2024, Huynh et al, 2019.

[6] New Prospects for Money – speech by Andrew Bailey https://www.bankofengland.co.uk/-/media/boe/files/speech/2023/july/new-prospects-for-money-speech-by-andrew-bailey.

[7] Government and Bank of England Response to the Committee's First Report https://publications.parliament.uk/pa/cm5804/cmselect/cmtreasy/535/report.html.

[8] The Digital Pound: A solution in search of a problem? https://publications.parliament.uk/pa/cm5804/cmselect/cmtreasy/215/report.html.

[9] Tory MP Warns Downing Street A Centralised Digital Currency Could Risk Privacy https://www.politicshome.com/news/article/marcus-fysh-cbdc-letter-downing-street-bank-of-england-privacy.

[10] Senate Bill 7054 Prohibits the Use of a Central Bank Digital Currency in Florida https://www.flgov.com/2023/05/12/governor-ron-desantis-signs-first-in-the-nation-legislation-to-protect-against-government-surveillance-of-personal-finances/.

[11] https://b2b.mastercard.com/news-and-insights/success-story/thailand-promptpay/ and https://www.bot.or.th/en/financial-innovation/digital-finance/digital-payment/promptpay.html

However, a technical launch without scale consumer adoption, will not achieve public policy objectives and justify the considerable price-tag for its development. Therefore, the question is "What is the path to consumer adoption for a Digital Pound?" In order to answer this question, we need to both consider lessons from previous comparable innovations in payments and research consumer attitudes to adoption of a UK CBDC.

We have personally and professionally experienced the highs and lows of payment and fintech launches. When planning for a CBDC, it is therefore crucial to reflect on and incorporate lessons from previous payment service innovations. For example, although contactless payments now enjoy widespread adoption, there were significant doubts early on. It wasn't until bridgehead use cases, such as acceptance on the London Underground in the UK, were established that contactless payments gained traction. The success of PromptPay[11] in Thailand, where government policy push and strong brand awareness drove widespread adoption, means that today the average Thai citizen uses the service over 200 times[12] per year. One can contrast this to PayM[13] in the UK, a laterally comparable person-to-person service, which arguably failed to reach momentum and was closed in 2023. Think tanks[14], policy makers[15] and academics all stress the importance of customer experience or human centric design for a CBDC. For example, Allen et al. (2020) specify that "just as important as the capabilities of a digital wallet is how it presents these capabilities to CBDC users"[16], thus highlighting how the interface design can profoundly impact the acceptance of a system by users. To this we can also add the degree to which such capabilities are integrated and embedded into existing wallet or banking applications, to allow seamless integration and use of the new form of digital cash and transfer of monetary value between various forms of money (e.g. ability to move funds between central bank money and commercial bank money).

To contribute towards the research gap and stimulate debate on this wicked question, we used a somewhat novel approach of a hypothetical service experience for our consumer research. More common in commercial new services development, it has academic roots in design thinking[17]. Assuming that Digital Pound enablement would be mandated across the financial services ecosystem, we grounded the prompts for the research in the participant's existing financial lives, with sample Digital Pound use cases in a simulated bank mobile app. This prompted participants with a rich experience for a deeper cognitive involvement, more accurate feedback and thick descriptions. Existing literature states that, for a new service product with no existing reference experience, "the correlation between stated intent and actual behaviour is usually low and negative" (Zaltman, 2003; p.122). This is one of the main reasons insights from "needs based focus groups" are often misleading and a large number of new services or products fail within six to twelve months of their launch (Malhotra, 2004; Proctor, 2003; Saunders, 2003; Zaltman, 2003).

[12] https://www.statista.com/statistics/1131100/thailand-volume-of-promptpay-transactions/

[13] https://www.wearepay.uk/paym-closure/

[14] 'The Bank of England should therefore partner with governmental digital service designers to prioritise broad public awareness, confidence, and uptake at minimal cost to the user.' Tony Blair Institute https://www.institute.global/insights/tech-and-digitalisation/digital-pound-digital-public-service.

[15] 'Broad adoption: Design is key' https://www.bankofcanada.ca/2020/02/contingency-planning-central-bank-digital-currency/#5-Broad-adoption-Design-is-key.

[16] See page 37 of Allen, S., Capkun, S., Eyal, I., Fanti, G., Ford, B., Grimmelmann, J., Juels, A., Kostiainen, K., Meiklejohn, S., Miller, A., Prasad, E., Wüst, K., Zhang, F., 2020. Design Choices for Central bank Digital Currency: Policy and Technical Considerations, NBER working paper 27634, August. https://doi.org/10.3386/w27634.

[17] For more literature see following resources: Kelley, T., & Littman, J. (2001). Cooper, R., Junginger, S., & Lockwood, T. (2009). Lindberg, T., Köppen, E., Rauth, I., & Meinel, C. (2012).

Literature and theoretical insights relevant to CBDC adoption and use

CBDCs have garnered significant attention from researchers, policymakers, and financial institutions globally. CBDCs represent a digital form of central bank money that could arguably transform the financial landscape by providing a secure, efficient, and inclusive payment system. Several studies highlight the motivations behind central banks' interest in CBDCs. One primary driver is the declining use of cash in various economies, prompting the need for a digital equivalent (Mancini-Griffoli et al., 2018). Additionally, CBDCs are seen as a tool to enhance financial inclusion by providing access to banking services for unbanked populations (Auer & Böhme, 2020) with the additional potential of enhancing the efficiency and security of payment systems and providing central banks with more effective monetary policy tools (Barrdear & Kumhof, 2016).

Much work has been dedicated to the design considerations and technological and operational challenges of CBDCs over the past few years. A key design distinction has been the implementation of wholesale and retail CBDCs (He, et al., 2022). Wholesale CBDCs are intended for use by financial institutions, while retail CBDCs are designed for the general public. Key design considerations include the degree of anonymity, interest-bearing capabilities, and the underlying technology (e.g., distributed ledger technology or centralized systems) (Kiff et al., 2020). Key debate around the design has been the balance between privacy and the need to prevent illicit activities and ensure financial stability (Prasad, 2021).

Technology and potential impact

As expected, the implementation of CBDCs will involve significant technological and operational challenges. One critical issue is ensuring cybersecurity and protecting against fraud and cyber-attacks (Adrian & Mancini-Griffoli, 2019). Additionally, the integration of CBDCs with existing financial infrastructure requires careful planning and coordination (Kosse & Mattei, 2020). Scalability and interoperability with other payment systems are also crucial factors that need to be addressed (Bech & Garratt, 2017).

It has been argued that the introduction of CBDCs could have profound economic and financial implications. Studies by Andolfatto (2021) suggest that CBDCs could improve payment efficiency and reduce transaction costs. However, there are concerns about the impact on commercial banks, as CBDCs could lead to disintermediation if people shift their deposits from banks to central bank accounts (Brunnermeier & Niepelt, 2019). Additionally, CBDCs could enhance the transmission of monetary policy by providing central banks with direct tools to influence money supply (Keister & Sanches, 2021; Wang, 2023).

Consumer relevance and progress to date

Previous studies have established the role of CBDCs in monetary policy across different countries. The study by Peneder (2021) highlighted the role of money and digitization as a payment and symbol for the general population. Emerging research by Wang (2021) suggested that governments across the world could increase the stability of the nation's financial system by analyzing big data and the CBDC blockchain (where applicable). Furthermore, studies conducted by Capgemini and Kochering and Yangirova (2019) have demonstrated that central banks will most likely implement a CBDC solution by consolidating assets on their balance sheets and transmitting monetary and credit policies through the CBDC system. It is widely also reported that CBDC has been the core topic of discussion by most major central banks, such as the People's Bank of China and the Federal Reserve of the United States (Wang et al., 2023). Although the role of money is to predominantly act as a unit of measure for value, the governments motivate the adoption of CBDC policies by focusing on the advantages of the efficient improvement of the national monetary system, financial stability, and international use of national currency (Wang et al., 2023). The current body of literature suggests that the successful implementation and sustainability of money depends on two crucial factors of our financial system: 1) the consumers and 2) the central banks, which act as producers (Wang et al., 2023; Peebles, 2021). Recent advancements in the field have revealed the importance of words and communication to support their influence on the financial markets, especially the communicative imperatives that have revolutionized the policies in central banking over the last three or four decades (Holmes, 2014). Thus, a government's goal is to operate successfully the management policies for CBDCs, which should be driven by evaluations of consumer's CBDC data (Wang et al., 2023; Peebles, 2021).

Emerging research indicates that the Central Bank of Sweden has taken crucial steps to establish a new digital currency, such as e-krona. Although Riksbank, Sweden's central bank, revealed quite controversial reports regarding the usage and reasoning behind a national digital currency, it proposed a new report that advocates paper money as lowly and tattered (Peebles, 2021). Therefore, digital currencies have fascinated monetary theorists as a threat and opportunity that must be addressed, considering the consumer and tech side. Peebles (2021) highlighted in his study that consumers would prefer a more appealing form of currency because consumers would prefer to accelerate their cash-lessness preferences. Furthermore, the study by Tornier et al., (2022) examined the influence of privacy concerns and different dimensions of currency-related trust on individual willingness to use CBDC, especially a digital euro. Tornier et al., (2022) through their empirical results found that soft trust factors such as credibility and image influence both privacy concerns and the intention to adopt a digital euro. The results by Tornier et al., (2022) included the German population, so cultural differences could play a role in online privacy issues. Thus, a promising area of research could be to investigate these phenomena by concentrating on the different perceived benefits of a CBDC and the differentiation between trust in the currency, the underlying technology, and the role of stakeholders (Tornier et al., 2022).

On the other hand, the new e-krona proposal could offer citizen-to-citizen, business-to-business, and citizen-to-business payment services, which can undermine the purpose of central banking itself (Peebles, 2021). Meanwhile, most literature has been focused on the technical aspects of CBDCs' operating policies. At the same time, the discourse lacks a comprehensive understanding of consumer problems or consumer adoption of operation management strategies for CBDCs (Wang et al., 2023). While CBDC adoption from a consumer perspective should be customized to each country's economic structure, regulation, and

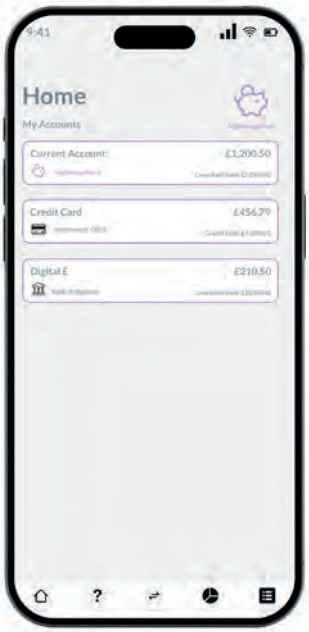
payment landscape, it could be beneficial for governments to learn from successful and unsuccessful payment initiatives worldwide (BIS, 2021). The study by Luu et al. (2022) examined the impact of national culture on adopting digital central bank money, drawing insights into Hofstede's cultural dimensions. Luu et al. (2022) found that countries and cultures with more power distance, motivation towards achievement, and long-term orientation are more eager to adopt a CBDC policy. Conversely, Luu et al. (2022) showed that cultures with a tendency to avoid uncertainty exhibit lower levels of support for adopting a digital central currency.

In addition, previous reviews have shown that the theories of reasoned action and planned behavior (TRA and TPB) are the main and most relevant theories of explaining the individual's adoption behavior in information systems and technology fields (Yang et al., 2012; Ajzen, 1991). Drawing insights from TRA and TPB, Davis (1989) suggested the technology acceptance model (TAM) that has been extended by a large number of empirical studies (Yang et al., 2012; Chau, 1996; Venkatesh & Davis, 2000; Wu & Wang, 2005). TAM is a theoretical model focusing on the mediating role of perceived usefulness and perceived ease of use and their relationships between external variables and the likelihood of information systems implementation (Wu & Wang, 2005). Although the extension of TAM included the social influence into TAM2, it did not examine the social pressures an individual or consumer faces in a free adoption choice context (Lu et al., 2005). Social influences are defined in this study as individuals' perceptions of social pressure to adopt or not to adopt the innovation. Drawing insights from the innovation diffusion literature, it has long been recognized that social influences play a significant role in explaining adoption behavior (Cooper & Zmud, 1990; Karahanna et al., 1999). Previous studies have empirically examined the relationship between social influences and behavior intentions (Lewis et al., 2003; Taylor and Todd, 1995, Venkatesh et al., 2003). In the context of mobile-technology-based services adoption, several studies have adopted social influences into their models and found some empirical support (Hong & Tam, 2006; Lu et al., 2008, Lu et al., 2005). A study by Hong and Tam (2006) found that social influences influence adoption intentions directly and indirectly through perceived usefulness.

Motivation and shaping the research

Our intent in the current as well as future research is to explore theoretical and research contributions from the academic literature such as 'consumer empowerment' – a theoretical concept in business and marketing research (Khenfer et al., 2020; Shaikh et al., 2023) – and see how these can apply to and inform the adoption of CBDCs. Prior research (Krishen, 2019; Wolf et al., 2015) defined consumer empowerment theory as embracing and empowering the consumer through more meaningful information or understanding that helps them choose what they want, when they want it, how they want it, and their preferences. Thus, the internet environment and the mobile agent network can be considered essential for the transition to the central bank-issued digital currencies arena because they facilitate a massive amount of information resources flow and understanding about the product and service to consumers (Shaikh et al., 2023). The primary motivation to focus on the consumer empowerment theory stems from the research (Luna et al., 2018) that presented the theory as a significant driver of the adoption and usage of mobile-based payment systems.

Although our project focuses on central banking digital currencies and consumer adoption, the role played by mobile money agents in empowering consumers is worth investigating (Shaikh et al., 2023). From this perspective, the internet environment is critical due to more information resources as decision aids but it also gives consumers power through greater information or understanding.



Brief note on Methodology

This research explored the new and messy subject of consumer attitudes to CBDC adoption. The sample of approximately 120 University students was a purposive convenience testbed, as previous research identified[18] this type of demographic as potential early CBDC adopters. Assigned facilitators guided participants through a hypothetical service experience of a mobile bank app with CBDC use-cases and explored their perceptions and insights relevant to its use. All discussions were recorded, transcribed and template analysed.

Prior to participating, research participants were briefed that "The digital pound would be like an electronic version of the banknotes issued by the Bank of England. It would be backed by the Bank of England and be supported by your existing bank. You'd be able to spend your digital pounds in the shops and online, using your phone, as well as sending them to friends and family. And you would also still be able to pay with cash or money in your bank."

→ **View simulated app at: marvelapp.com/prototype/1ae4544j**

Below are the uses cases and questions posed to the students, in order to initiate discussion.

Q1 UNDERSTANDING

How do consumers understand a Digital Pound, if implemented in existing banking & payments technology experiences?

Research participants, in focus groups, experienced a hypothetical service experience of a Digital Pound account incorporated into a simulated bank mobile app and were able to move funds instantly between these accounts (singleness of money). Facilitators explored their understanding, including perceptions of a CBDC vs commercial money, cash and crypto currencies. Also, perceptions of the value of a central bank guarantee were considered.

Q2 'PULL' ADOPTION

Will envisaged use cases deliver consumer pull adoption?

Presented with a hypothetical service experience of sending Digital Pound funds to a friend. A person to person (P2P) payment using a proxy lookup (search on their friend's mobile phone number, as a proxy for their bank details) with instant transfer and confirmation. Facilitators explored how participants perceived benefits and comparisons to existing alternatives (e.g. faster payments and on-us like Monzo). Would this use case (as highlighted in EU Kantar research) prompt trial or adoption?

Q3 'PUSH' ADOPTION

Would a public policy push approach drive adoption?

Participants experienced a hypothetical a car road tax renewal as an example of a government digital service, with instant delivery (certificate into mobile wallet) and a discount (10%). Facilitators explored perceptions and potential to trial. Participants views on this service compared to current alternatives (card V/MC, direct debit) and relative importance of the discount (e.g. elasticity 50p vs 10%) or instant digital delivery.

Q4 DATA PRIVACY

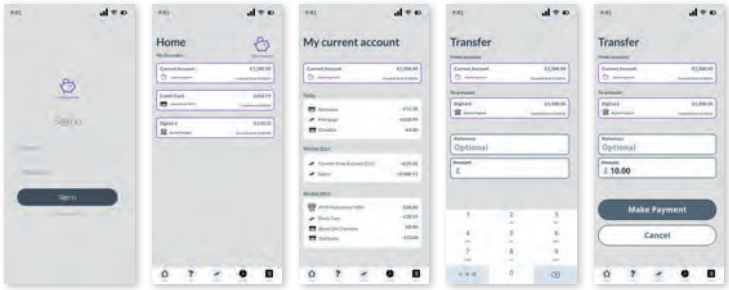
How controversial are potential use cases using personal data?

Given the potential for politicisation of CBDCs, we set up a hypothetical experience of a controversial application of a CBDC to capture personal payment spend data to enable implementation of an individual citizen's carbon budget. Facilitators explored participants concerns and views on government visibility of their personal data and relative privacy in a social media society.

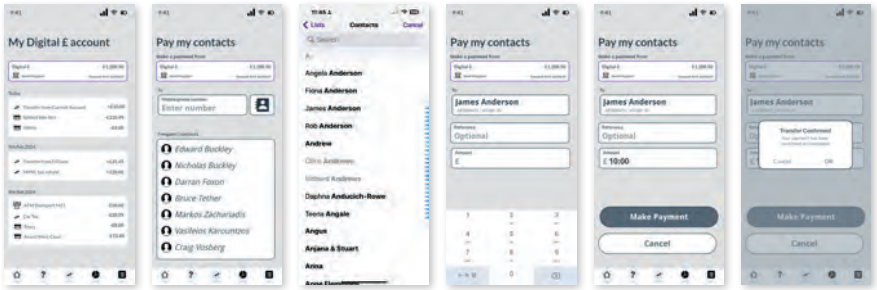
[18] See research conducted by Kantar Public on behalf of the EU: https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230424_1_annex~93abdb80da.en.pdf. R., Junginger, S., & Lockwood, T. (2009). Lindberg, T., Köppen, E., Rauth, I., & Meinel, C. (2012).

Screenshots of the simulated bank app and use-cases.

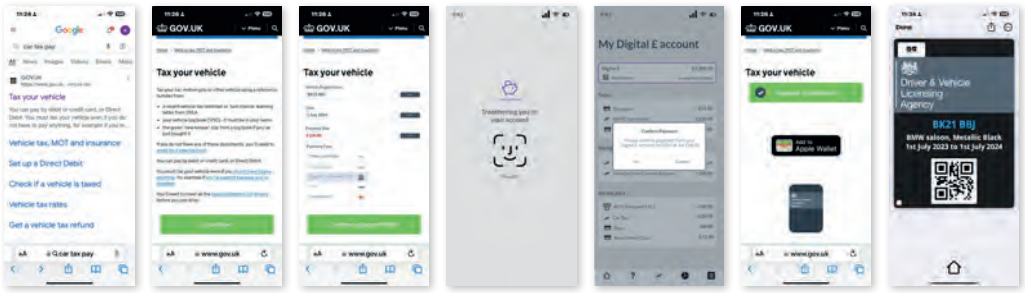
#1 DIGITAL £ ACCOUNT



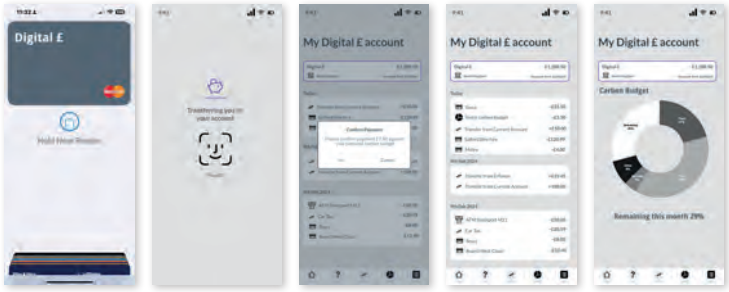
#2 INSTANT P2P WITH PROXY



#3 P2G WITH DIGITAL DELIVERY & DISCOUNT



#4 P2M WITH CARBON BUDGET FROM SPEND DATA



Preliminary research findings

"I don't really get the benefit of the digital currency?"

"it's not like, you're gonna buy your sausages in secret, is it?"

"I mean, if the government decides, and we have no choice, and we'll probably just go for digital currency"

Understanding - participants very quickly understood the concept of a Digital Pound *"yeah, a normal pound but it's digital"* when they experienced it as a new account in a simulation of a typical bank app *"It's kinda another account"*. The embeddedness of the Digital Pound account or wallet into a banking application made the distinction between 'central bank money' and 'commercial bank money' more vivid and a very few participants were able to distinguish between the two, increasing their awareness of the differences *"since it's backed by the Central Bank, some people might see it is more secure"*. This also enhanced their understanding of the potential use *"much more safer than the cash"* as well as inherent risks, etc.

Adoption - despite the demonstration of potential uses cases, participants expressed little appetite to adopt a Digital Pound; *"Why do we need digital currency?"*, *"What's the point?"* and *"if we don't need that much cash in circulation, why are we having digital currency"*. Participants perceived they already had digital money; *"I didn't understand the difference between a digital pound and what we're already got? Because none of us have cash, we're so used to have banking from our phone"*. They argued that existing digital financial services met their current needs, *"I don't really get the benefit of the digital currency. In the sense that you're already using banking apps, right. And using Apple Pay with it. So like, what's the benefit?"*. For example, the person-to-person payment (P2P) use-case (highlighted as consumer need by Kantar research as a potential driver for CBDC adoption) generated little interest from the participants, even when potential benefits such as a proxy (person's account details populated from their mobile phone) and instant receipt were highlighted. Participants argued this need was sufficiently met with existing alternatives (e.g. faster payments through online banking or Neo-Bank 'on-us' transfers); *"it feels the same as online banking"* and *"All my like, my friends are on Monzo. And they're all like in my contacts"*.

Policy push - however the participants were amenable to adoption if incentivised by government policy; *"I don't see a problem paying through digital currency. As long as you're paying tax to government entity. I don't see a problem"* and *"I mean, if the government decides, and we have no choice, and we'll probably just go for digital currency"*. The research use case of provision of digital government services with a financial incentive (vehicle tax payment, with digital certificate and discount) was very positively received; *"otherwise, it would have been delivered by postman...So yes for me it's much more easy"* and *"I think short term money discount, means I'm gonna change right now"*.

Potential for controversy - participant purchase data visibility and it's potential use to enact government policy, did not generate the concern we expected. The reaction was very mixed to the research prompt that simulated a personal carbon budget, that tracked a citizen's spend on carbon intensive products such as meat products and fuel (example from political narrative for Ron DeSantas' recent Florida legislation, prohibiting a Federal USA CBDC). Whilst some participants were very concerned about government access to their data; *"giving them this kind of knowledge"*, *"It feels like ULEZ"* and *"I don't feel very good about it. I mean, why does the government need to know about my spending?"*. A similar proportion of participants, especially given the research use case related to the climate emergency, thought the government access to spend data was more reasonable; *"I really don't care about the government having our data. We don't care. Anyway, you got to trust the government and I think they're gonna get it anyway"* and *"I like the climate change aspects. I think if it was something else, then I'd be very against it. I think climate change makes it a bit better"*. Finally, some participants were less concerned because in a modern society with social media, they felt there was already considerable data transparency; *"You can't be happy to nod along to the T&C's of social media think, oh, everything's rosy. And then think, oh, hang on, the government getting my data. So, for me this is completely normal. I think you can't sit in one camp and not the other"* and *"it's not like, you're gonna go and buy your sausages in secret"*.

Note: *participant quotes in italics*

Conclusions and ongoing/future research

As discussed, this ongoing research note presents some preliminary findings on consumer attitudes towards the adoption of a potential Digital Pound in the United Kingdom. This is a central research question critical to success of a CBDC initiative in the UK, as the considerable investment required from both the Bank of England and industry participants would be difficult to justify without scale consumer adoption.

Our research provides important insights that can influence policy and design for a successful Digital Pound implementation. Whilst our initial findings suggest that consumers may quickly understand the concept of a digital pound, it seems unlikely that the perceived usefulness of new CBDC use cases alone will drive widespread adoption. Instead, successful adoption will likely depend on the perceived ease of use of the Digital Pound, which can be achieved through effective consumer experience design and seamless integration into existing financial ecosystems, encouraged by nuanced government incentivisation policies.

We intend to increase the sample from which we draw insights by repeating such discussions with more participants and getting richer perceptions from future users. An additional online study is currently being developed in the form of "The Big Digital Pound Experiment" that will gather a large amount of useful data from a similar tool presented through a URL address on the Web. This follows the infamous MIT Media Lab's "trolley problem", which engaged millions of people worldwide via an online study, that revealed cultural differences in regards to AI ethics (Hao, 2018)[19].

[19] For more information on the study see here: https://www.technologyreview.com/2018/10/24/139313/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/

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