29 June 2020

Bank of England,
Threadneedle Street,
London,
EC2R 8AH

VIA EMAIL:

CBDC@bankofengland.co.uk

Re: Discussion Paper on Central Bank Digital Currency

To whom it may concern,

Global Digital Finance (GDF) support efforts by global standard setters, national authorities and regulators to consult and work with the nascent global digital/virtual asset industry.

To that end, we are hereby providing input to the Bank of England's discussion paper on central bank digital currency (CBDC).

About GDF

GDF is a not-for-profit industry body that promotes the adoption of best practices for crypto and digital assets, and digital finance technologies through the development of conduct standards, in a shared engagement forum with market participants, policymakers and regulators.

Established in 2018, GDF has convened a broad range of industry participants, with 300+ global community members—including some of the most influential digital asset and token companies, academics and professional services firms supporting the industry. GDF is proud to include Circle, ConsenSys, DLA Piper, Diginex, Hogan Lovells, Huobi and R3 as patron members.

The GDF Code of Conduct (the "Code") is an industry-led initiative driving the creation of global best practices and sound governance policies. GDF is informed by close conversations with regulators and developed through open, inclusive working groups of industry participants, legal, regulatory and compliance experts, financial services incumbents and academia. The principles set out in the Code undergo multiple stages of community peer review and open public consultation prior to ratification.

1. **How could CBDC be designed to support a more resilient payments landscape in the UK?**

GDF notes that most of the main concerns with the current payment system are expense speed, potential for fraud, accessibility and fragmentation. Through using a more secure traceable and transparent technology such as blockchain some of these issues can be resolved.

The nature of a blockchain is that it is run by many node operators, which through distributed design avoids concentration risks. The historical design pattern for resilience was to have two or three locations or one primary physical location which was built for speed and then a second or third location which is disaster recovery. DLT would enable the payments system to spread that record, or at least a piece of that record, amongst 10 to 15 commercial banks. All of these commercial banks have a very high resilience sense and are capable of running a piece of the network or at least a good copy of the network. As such there is the potential to provide a network with increased resilience.

GDF adds that without a central point to attack, a perpetrator must attack 5, 10, and or 15 different places at once in order to compromise the system. By way of example, a modern attack like DDoS, a distributed denial of service attack, attacking one place and taking it down is difficult, attacking 15 places and taking all 15 down is much more difficult. This therefore increases resilience by way of technical design.

GDF would also add that offering a different type of payments infrastructure would increase resilience. At present we have a cards payments networks, however, much of this rides on ageing legacy infrastructure that has been operating in the market for more than 20 to 30 years. The visa outage is evidence that nobody is immune to resilience issues and having something that is by default more modern and more distributed gives the opportunity to have a payments system that is more resilient to shocks.

2. **How could CBDC be designed in a way that improves the efficiency and speed of payments, while also facilitating competition and innovation?**

GDF submits that efficiency and speed in a modern context is an issue of pure data travelling. When it comes to efficiency and speed, the real question is around the economics of a real time gross settlement system and how the economics of it works. GDF notes that there will be a large shift when it comes to layering the payments system. The historic model was to calculate the relative risk of default against each of the participants inside of the real time gross settlement system, and then ask them to collateralise with the central bank, putting up small amounts of collateral. This would cover any risk of default and then manage risk accordingly. With CBDC, there is potentially atomic settlement. This can create a set of claims that the technology can manage itself and have a real quantum held digitally, of the claims from each of the actors in the market or at any one time. Therefore, from a macro prudential and a micro prudential standpoint, not only is it possible to see the quantum of money in the system, it is also possible to see, potentially, any systemic risk and the relative risk of exposure of one market actor against another. This will be visible not just in the financial markets and between the financial institutions, but also potentially with the larger corporates and beyond. This would be possible if a payments system was developed and tiered in such a way and gave access such as a dashboard or such level of transparency.

3. **How could CBDC be designed to meet future payment needs? How might future innovations and evolutions. in technology (e.g. the Internet of Things) change these needs?**

GDF notes that if CBDC is designed in the right way, it allows for devices to have a level of autonomy over transactions. At present, we have this in the payment system to an extent, however, the payment system itself wasn't designed to do it, it was something that has been added over the top of the payment system. GDF highlights that as population growth puts greater strain on city environments, the concept of smart cities will become an essential piece of technology development and the ability for people to move seamlessly whilst logging their value exchanges in an automated manner will become central, therefore the payments system will have to have increased capabilities for this. Using the example of contactless payments, at present if you can have a contactless reader in your car and you drive up to the toll booth, it reads that you have a valid subscription for that road or you have topped up that card to a certain amount, and it deducts that amount from your account, similar to how a contactless turnstile works on the on the London Underground. This sits on top of the current payments system sufficiently, however, what happens when we expand this to interactions between devices? For example, a piece of farming equipment and the land that's being farmed; or a piece of energy equipment and a power station and the amount of output that's been created. How does that interact with a payment system?

GDF notes that the following questions need to be answered for this:

- How can the payment system allow for safe and secure autonomous transactions?
- What limits need to be put into the payment system, if any?
- Should the payment system have API's that implicitly are aware of these use cases?
- What does the payment system need to know about the level of risk in these autonomous transactions?
- Which market actors should have the ability to create the autonomous transactions and how do they create those autonomous transactions?
- What level of regulatory oversight is required for those autonomous transactions?

Therefore, GDF notes that the future payment system requirements must be real time, intelligent, and contextual real time payments can and should settle in real time as much as possible.

GDF acknowledges that there are economic challenges, but for most of the economy the demand for real time settlement is increasing. GDF submits that payments should be intelligent and they should make sensible choices baked right into the payment.

Smart contracts are also part of this. However, it is important to have smart payments / a smart payments system that complements this. There needs to be understanding as to why a payment is being made, what conditions can be set about if the price moves and what conditions can be set for intelligent payments. There needs to be the ability to deal with some basic logic flows, whether that is through the payment system or if that is something that sits above the payment system needs to be decided however, that level of intelligence and in the ability to automate the movement of money is important.

Finally, GDF notes that payments could also have the ability to carry some context. For example, this is a payment for goods and services therefore it is taxed at 20%. This is in fact a capital gains payment so it should be subject to a 35% tax that context about the payment can create the intelligence, in real

time, that would dramatically reduce the cost of payments. This may involve building the layers of the system to add context to the payment as opposed to having the information on the payment itself or having a simple API. This could lead to huge savings for HMRC in running this infrastructure in the long run.

5. **Does CBDC pose other opportunities or challenges with respect to the payments landscape that we have not discussed?**

GDF notes that privacy and data security are the biggest challenges. In theory CBDC is extremely traceable and transparent. However, commercial confidentiality must be assured within this. If there is somebody that has a key for the backdoor, then, inevitably a hacker will find that key to the backdoor as well. As such, there are privacy preserving tools and encryption levels available that can and should be baked in for the long-term resilience to prevent hackers from commercial confidentiality breaches. This is in the interest of the citizen as well. There are a lot of citizens that use cash because they have a right to privacy and they have a reasonable expectation of privacy and therefore they don't wish to use digital payments mechanisms. GDF warns that a payment mechanism that does not cater for privacy risks creating an equal and opposite reaction, which is a push towards a set of payments at which it is harder to manage risk than it is today. GDF submits that whilst all policy or policy professionals would accept that it is impossible to eliminate risk crime or criminality from a system, it is absolutely possible to manage risk and therefore, baking in privacy actually helps to manage that risk rather than prevent it. GDF notes that privacy is a real challenge for CBBC because of the natural temptation to want to see data. There are ways in which you can design the system to be privacy preserving where you may reveal metadata without revealing underlying data companies like Guardtime in Estonia. Guardtime have committed to looking into concepts such as zero knowledge proofs, where you can reveal the answer to an equation, or you can elect people to give it in a distributed system or you can give different actors a piece of the puzzle without revealing all of the underlying transactions to them, and still answer the questions and still be able to put the puzzle back together. Therefore, GDF recognises that privacy is a mission critical challenge for CBDC.

GDF notes that Financial inclusion is a significant challenge and CBDC can help unlock this through enabling FinTechs, especially in the private sector. There has been a real move in FinTech towards being able to exploit cards and payments networks. Recent challenges that wire cards have had really shows the risk to the resilience of payment infrastructure that these card-based approaches take. It has, however, offered opportunities for FinTechs to very quickly and cheaply build financial products that solve consumer and business problems, however, it does create systemic risk. The reaction to this might be a system that is lower cost than the cards and that is operated by many market actors that can be the spine or the backbone to the financial economy. This may be a complement to or in competition with account to account payments done through open banking. On the other hand, this may in fact be account to account payments across open banking, but if it were not to take the opportunity to provide a new underlying technology infrastructure, it would potentially bake in a loss of the existing legacy that exists in the sort of payments systems of today and therefore potentially exacerbate rather than alleviate the risks that happen in happen to exist in the UK payments infrastructure today.

In terms of other opportunities GDF is interested in investigating whether the potential global digital currencies have a positive effect on global inclusion. By this we mean decreasing poverty and access to increased opportunities.

GDF also notes that there is an opportunity for foreign exchange to be near real time. If CBDC were to be developed in conjunction with Australia, Switzerland or Singapore, counties that have a national real time payments infrastructure already, and a significant interest in CBDC, there is an opportunity to demonstrate the value in real time global effects, where there is a level of real time infrastructure or what is needed as a different capability in the markets from not only the banks themselves but from the FinTechs who may be the first early adopters.

One of the biggest risks around FX is the sheer number of intermediaries involved in the spread that creates cost. As such, banks have created much of the overhead and cost in trying to overcome those through the swift network. Having agreements between central banks between currencies could potentially systematically identify and then reduce these risks and make those transfers more efficient. Different countries may have different rules around how CBDC should be managed and how currency should be managed and currency controls in some cases. With this being the case, if CBDC can be used only by parties in the United Kingdom, the UK might be missing an opportunity. Ideally CBDC could be used by non-UK entities much how the euro dollar or the Euro markets work today, any foreign currency held by a non-UK bank, we often call the euro dollar. What about GBP held by a non-UK bank. GDF highlights that this could be an interesting use case for CBDC, in which you need to understand the type of the money flows and the quantum of money that exists in this format, but you also want to have some level of jurisdictional control or insight into.

6. **What factors would determine the level of adoption of CBDC as a means of payment in the UK?**

GDF notes that one of the major factors that would determine the level of adoption is the level of openness to FinTechs and innovators. On one hand, because they would probably be the first to see and exploit the value of a CBDC, instead of the incumbent financial institutions and doing so intentionally would be a primary concern. Therefore, could the UK Government offer APIs into its currency for FinTechs or other actors, whilst also maintaining and managing an appropriate level of risk. Whilst this would be an incentive, there could be a cause for enforcing adoption, with the mainstream banks and setting a deadline for it, this is an obvious but also a relatively effective approach. The third aspect that GDF notes as an effective method of adoption is the inclusion of privacy. This really does display some of the use cases of cash and make it something that can be widely adopted.

Finally, GDF notes that having some form of kitemark will help with confidence levels. WhatsApp has tried many times to develop a set of payments in Brazil. However, the Brazilian government has now pulled back from Facebook being allowed to move money through WhatsApp even though they integrated with a local payments processor, therefore everything they did was in principle to the letter of the law, legal, and compliant. However, there was a real fear about the level of sovereign control that would potentially bleed out to Facebook if people started to adopt that currency. What if Facebook were to adopt something like CBDC - what will that mean for the adoption of peer to peer payments and what would that mean for the card networks? Could the card networks themselves help develop those standards and could they play a useful role. Similarly, from a business perspective, how would one gain confidence that this is useful. And what would be the business case for a business to hold CBDC at a bank and what benefits are there to that versus sort of the liabilities that sit there today. GDF therefore recognise that the business case needs to be thought about and GDF will be more than happy to work with both the Bank of England and the business community on helping to define that as well as the broader FinTech community.

8. **How could CBDC be designed to complement other public and private sector initiatives to improve payments in the UK?**

GDF highlights that CBDC is designed to face three audiences: commercial banks, non-bank financial institutions including FinTechs and the broader economy, including corporates and consumers. This could complement a number of private sector initiatives such as the account to account payments now being rolled out by a number of API aggregators in the United Kingdom. The Bank of England may wish to consider, how might this benefit the ageing legacy infrastructure of the banks that sits between these modern and new API's, and the underlying bank infrastructure, which in turn then has to connect out into the existing payment networks.

GDF notes that there could also be alignment around the real time collection of taxation and other public sector initiatives. There can be great benefits realised in understanding how money is spent in the economy. Where there are privacy concerns on this, there could be broad enough analytics to understand what was happening with the quantum of money.

9. **Could CBDC provide unique benefits, over and above existing initiatives, to improve UK payments?**

GDF notes that a common, unified base for institutional adoption and transformation would be advantageous to multiple competing private options at this scale. Private markets do not naturally provide conditions for this, both being difficult to navigate from a regulatory compliance perspective as well as from a universality one.

23. **How could CBDC be designed to ensure businesses are able to easily accept CBDC payments at the point of sale?**

GDF notes that CBDC acceptance at point of sale has as much to do with consumer confidence and marketing as it does with technology if not more so. Both Visa and MasterCard spend a lot of effort on the concept of acceptance and one could argue that what they really sell is acceptance at points of sale. If you were able to extend their capabilities with CBDC, they could be powerful allies and partners in ensuring the adoption of a point of sale. Alternatively, GDF notes that there are ways in which other payment initiations could be promoted from the commercial banks themselves and from existing sources of funds. However, there is a mature and well-established set of providers in the points of sale acceptance world. There are not just the acquirers, but the terminal manufacturers, the schemes and the brands and the major merchants themselves. The UK has had a deal of success rolling out contactless payments and chip and pin in the past, however both of those had significant support from the likes of Visa and MasterCard. Therefore, deeply articulating and understanding the impact of their businesses and the potential benefits to their business is something that GDF is happy to partner with those organisations and many other organisations on, as well as continue to consult with the Bank of England.

25. **What is the appropriate privacy model for CBDC? Is it necessary, or feasible, to replicate any of the privacy aspects of cash?**

GDF notes there are risks of money laundering and counter-terrorist financing associated with anonymous payment methods, including certain crypto assets. Some tokens have been specifically

designed to preserve the privacy of their holders. Where there is a legitimate market demand for privacy-coins, market solutions will be developed. GDF does not consider it the role of the Bank of England to compete in this market.

Instead of creating a privacy-CBDC, GDF recommends that identifiers be put in place. This may be developed along the lines of:

- Separate (regulated) identity services, which can be established as a competitive but highly regulated market. These service providers are engaged to verify users who want to open wallets to ultimately be able to access CBDC. It is important that these services are systematically separate to the wallet providers/payment providers/entities who have access to payments data. Neutralised identifiers are then assigned to the users. Identifiers can be 'current' and 'expired' if re-verification does not take place at appropriate times.
- Wallet hosts can verify that an identifier is 'genuine' and 'current' with the identity services provider and KYC/AML has been satisfied, without holding any such data themselves, and then can use the identifier to open a user account/wallet. During that process, a user can establish a personalised verification process such as a pin code, biometric etc. for access to the wallet and for the purposes of providing verified instructions, for example for the closure or operation of the wallet. Wallets will be deactivated if an identifier expires.
- Private payments providers such as CBDC intermediaries, who may enable CBDC credits to user accounts and/or process transactions/payments between accounts, can do so using wallet addresses. This data is one more step removed from the personal identifiers, distancing the data connections even further i.e. one 'genuine' and 'current' identifier may open more than one wallet for purposes of transactions.
- The public institution role behind CBDC in this way requires verification only to the point of the intermediaries and thereafter on monitoring compliance with regulations and procedures at other levels of the process, and whilst identity data could be unlocked in the case of criminal activity, for example, through the identity services provider, the normal course of the structure would have implemented designed data separation to ensure appropriate protections for privacy.

GDF notes that data privacy considerations should be at the heart of any design, in compliance with the GDPR and the UK Data Protection Act 2018. GDPR is designed from the principle that data management is centralised within specific entities. This creates some well-versed issues with decentralised blockchain technologies such as e.g. complexity in dealing with the accountability requirements of GDPR, lack of clarity on roles of the parties as controllers /processors; transparency; enforcing data subject rights; and immutability of the record. GDF suggests that the maintenance of personal data in a completely separate verified identifier generation system is likely to assist with some of these issues.

Of course, centralisation and the role of the identity services providers, gives rise to enhanced security concerns and may be more likely to result in risk of failure/breach/attack if mass data is stored in a single system. However, GDF considers that appropriate segregation of data can overcome challenges of trust and uptake if consumers might otherwise fear this is a path towards a surveillance state.

Whichever model is opted for, GDF notes that it is imperative to have privacy by design and default i.e. to ensure that thought is given to the appropriateness of the technology; that appropriate technical and organisational measures are implemented which are designed to safeguard the rights and freedoms of the individuals; and that fundamentally, privacy considerations are built into the

foundations and not as an after-thought. Data minimisation is a key consideration for design and clear thought should be given as to what personal data needs to be processed and by which parties.

A well-constructed, resilient digital identification system for those who want to participate would give banks and other financial institutions in the CBDC ecosystem the ability to comply with their AML obligations as well as improving the respectability, usability and adoption of a CBDC.

34. What dependencies would CBDC have on other innovations, such as digital identity solutions?

GDF notes that CBDC is unquestionably enhanced by a fit and proper working digital identity service. GDF notes within trust, there are a number of external initiatives such as ones by the Sovrin Foundation and the likes of Microsoft ID 2020 and many others who are working to create a privacy assured global digital identity system is DLT in nature and allows the user to retain control of both their data and their identity. Such a system may be worth further investigation and the lack of existence of such a system would not prevent the implementation of CBDC, however, deep understanding of the combination of CBDC and privacy assured identity is worth looking into. GDF encourages the Bank of England to look at the existing initiatives in the private sector, rather than purely only at the Gov.UK verify programme, and the programmes around it.