



Consumer attitudes to CBDC: Considerations for policy-makers



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Foreword

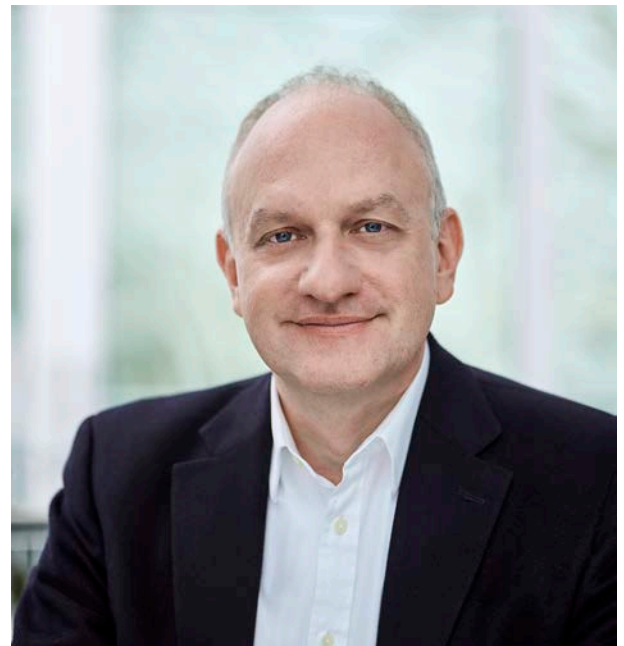
Revolutionising the world of currency

Central bank digital currencies could drive greater innovation, but policy-makers need to address consumer requirements and concerns, writes Wolfram Seidemann, chief executive officer, G+D Currency Technology.

Our payment ecosystem is becoming increasingly diverse, with new payment means and providers constantly emerging. Central bank digital currencies are a revolutionary means of payment, bringing public currencies into the digital age. A complement to cash to ensure freedom of choice, CBDCs promise greater financial inclusion and a future-proof digital payment infrastructure. Yet its success depends on the understanding of user needs and concerns, which is what this study hopes to address. What are the features that are important to the user and what barriers do they see? Some design questions are still open and we must tackle these to ensure adoption.

At the same time, user needs differ depending on where they are and, just as the payment landscape is in flux, we can assume that user requirements and behaviours are set to evolve over time. This calls for a flexible core system for CBDCs, one that can adapt over time.

G+D is pleased for the opportunity to contribute to these efforts. Through our involvement in this report, light is shed on issues that policy-makers need to consider as they formulate their CBDC plans. Additionally, we advise central banks around the world on CBDCs and work closely with them on studies and development projects. We believe our solution, G+D Filia, addresses the key features that a CBDC must have, notably in the provision of outstanding security, universal access and the



ability to truly balance privacy and transparency.

This study looks at the ways in which CBDC as a basic currency infrastructure could be a driver for digital innovation, boost the growth of the digital economy and extend digital financial inclusion. CBDCs present a historic opportunity to create a new form of public money. The research we have conducted with OMFIF highlights the key requirements of consumers that policy-makers need to address to come up with the right design for a retail CBDC. This report is a call to action to intensify the debate on the future of money. •

Executive summary

What consumers want from CBDC

A specially commissioned survey reveals how consumers from Germany, Indonesia, Nigeria and the US feel about central bank digital currency.

THE era of central bank digital currencies is approaching fast. More than 100 central banks around the world are actively considering their plans for CBDCs. Pilot programmes are advancing in many countries.

It is a global trend, spanning from the biggest economies to some of the smallest, and incorporating both developed and developing markets. China and Sweden, for example, are trialing real world implementation. In July, the European Central Bank announced a two-year investigation into the digital euro, which it hopes to launch in 2026.

Different authorities are taking different approaches. At its heart, the concept remains the same: CBDCs will be an electronic form of central bank money that could be used by households and businesses to make payments. They would be an innovation in both the form of money provided to the public and the infrastructure on which payments can be made.

The question facing central banks is an existential one: as the issuer of the safest and most trusted form of money in the economy, should they provide the public with an electronic form of money which serves as a complement to physical banknotes?

While many of the smartest minds in finance and technology debate the design, function and scope of CBDCs, it is vitally important to remember a point that is often forgotten: that for digital currencies to have their desired impact in terms of convenience, low cost and efficiency of payment, and to achieve policy goals such as financial

inclusion, then consumers should not only be aware of this new form of money but also be prepared to use it.

This report seeks to address this key issue: will consumers use digital currencies? At the heart of the research from OMFIF and G+D is a survey of 3,000 consumers across four jurisdictions: 1,000 in each of the US and Germany, and 500 each in Indonesia and Nigeria, conducted by Ipsos MORI. It shines a light on some of the benefits that consumers see in new forms of payment, as well as the potential concerns that many of them may have.

These four countries were chosen to ensure regional representation, as well as to identify differences between developed and developing economies.

The Covid-19 pandemic has reinforced major shifts in payments behaviour: declining cash usage, migration to online commerce and the adoption of instant payments, for example. According to McKinsey's 2021 Global Payments Report, cash payments declined by 16% globally in 2020.

However, it is clear from our research that cash remains, and will remain, a fundamental part of the payments landscape and that – just as in the use of debit and credit cards over the past decades, and payment apps and mobile money in more recent years – CBDCs will be a complement to traditional forms of payments. More than 70% of respondents across the four countries profiled in the survey say cash remains one of their three most frequent forms of payment, and it remains the most frequent in

Germany, Nigeria and Indonesia today.

The findings show that developing markets – where existing infrastructure is less comprehensive – could be ready for a leapfrog event via the introduction of CBDCs compared to more mature markets, where payment rails are already relatively efficient and consumers are less likely to see the need for a revolutionary shift.

Awareness of CBDCs is much higher (more than 40%) in Nigeria and Indonesia compared to the US and Germany (less than 20%). A much smaller share of consumers in Indonesia (4%) and Nigeria (3%) completely rule out the use of CBDCs compared to the US (32%) and Germany (29%). Age is also a factor globally – the younger you are the more likely you are to say you will use CBDCs (61% for under-35s versus 24% for people over 50).

Those consumers aware of CBDCs see a wide range of potential uses, especially in retail. They do have concerns, notably around security and privacy, but also about the ability to use CBDCs, and whether there will be widespread acceptance, especially from merchants.

What consumers seem to want from digital currencies – once they have been educated about them, a core message for both the public and private sectors – is universal acceptance, resilience, privacy, security and ease of use. These are, of course, key characteristics of cash. As central banks explore opportunities in the digital age and develop their CBDC strategies, they would do well to bear the findings of this report in mind. •

Key findings:

Consumers' attachment to cash payments remains strong, despite digital developments and the impact of Covid-19

Consumers in emerging markets are much more likely to view the potential of CBDCs favourably than those in developed markets, and the former could be ready for a 'leapfrog' moment

Safety and availability are the key concerns of consumers overall, although consumers familiar with the concept of CBDCs value security as one of its key benefits

Central banks need to work with the private sector to ensure widespread availability of CBDCs for consumers, and educate them about the benefits in terms of convenience, security and low cost

Consumers who say they would be prepared to use CBDC see a wide range of potential uses, as a complement to payment apps, cards, mobile wallets and cash, as well as a tool for financial inclusion

91%

of consumers in Nigeria...

60%

of consumers in Indonesia...

24%

of consumers in the US...

14%

of consumers in Germany...

say they are likely to use CBDCs

What features of a CBDC would be most important to you? Select three.

% of responses, by country, ■ = greatest share of responses;

Source: Ipsos MORI, OMFIF analysis

	All	Germany	Indonesia	Nigeria	US
You can use a CBDC everywhere	29.1	13.9	40.1	45.2	17.0
Payments using a CBDC remain private	20.7	11.4	38.3	20.7	12.2
CBDCs are 100% secure	33.0	23.1	31.6	51.0	26.2
You can pay with a CBDC using your smartphone and at payment terminals	20.6	7.3	27.2	37.5	10.7
You can store your CBDC on a physical card	9.0	5.9	11.1	9.7	9.1
Paying with a CBDC does not require power or an internet connection	14.4	9.5	17.0	23.7	7.5
A CBDC is simple to use	22.3	13.6	35.1	27.5	13.0
You don't pay fees to use a CBDC	24.7	23.2	25.8	27.9	22.1
Payment with a CBDC takes place instantly	17.1	7.6	17.5	32.1	11.4
None of these - I would not consider using a CBDC	23.3	43.9	7.0	2.7	39.4
Don't know	13.1	17.5	11.8	5.5	17.6

Chapter 1

The changing landscape of consumer payments

Digital developments have the potential to transform payments, but the role of cash remains vital.

ANYONE who has used Apple Pay in the US, ordered groceries through WeChat in China or used contactless payment in Germany is contributing to an accelerating revolution in digital payments.

The trend was underway before the Covid-19 pandemic hit in early 2020. But it was a surge in online commerce and digital payment means over 18 months of lockdowns that has turbocharged the shift towards what many predict will be a cashless society.

The pandemic 'began a trend of consumers being pushed out of their comfort zones to embracing new ways of managing their finances,' Ron Kalifa, a former vice-chairman of payments group Worldpay and author of a recent review of the UK's fintech sector, has written, citing a study by Ernest & Young in July 2020 that 54% of people had used a new form of payment during lockdown and 21% of people tried online shopping for the first time.

Demand for frictionless means of payment is showing no sign of abating. Indeed, global cashless payment volumes are set to increase by more than 80% from 2020-25, to almost 1.9tn transactions from about 1tn, and to almost triple by 2030, according to analysis by PricewaterhouseCoopers and Strategy&, PwC's strategy consulting business.

These developments have prompted demand for new technology to support new payment infrastructures,

whether at point-of-sale or in instant e-commerce solutions for merchants and consumers. That has extended to areas that were hitherto not especially digital where payments were concerned, including healthcare and education.

It is also a global phenomenon, though the pace of development and payment models differ depending on the region. Asia is home to some of the most cutting-edge developments, with mobile and digital technology allowing consumers to leapfrog the card ownership stage and move straight to mobile apps. In China, the pandemic reshaped consumer behaviour, driving many previously non-digital consumers towards apps that combine payment functions with online retail experience in so-called 'super apps', developed by Tencent and Alibaba, the country's two largest tech companies.

That is powering a maturing e-commerce market that is driving its online giants to leverage big data, artificial intelligence and advanced analytics to expand their offline ecosystems. UBS, the Swiss bank, believes that China's payment landscape could even be defined this decade by a migration towards biometric payments as players use innovation to drive down costs and create scale.

Similar developments are taking place in Southeast Asia where, according to research conducted by

Google, Singapore's Temasek Holdings and Bain, the consultancy group, about half of the region's nearly 400m adults lack a bank account. People in Indonesia, the region's largest country by population and size of economy and with a digital economy estimated at \$44bn, face an acute deficit in access to basic banking, with more than 70% of adults unbanked or underbanked, according to the report.

That is providing fertile ground for mobile payments. In Indonesia, GoTo – formed through a merger in May 2021 of ride-hailing provider Gojek and ecommerce giant Tokopedia – is set to raise funds that will help further expand ride-hailing, food delivery, e-commerce and financial services across the region.

In Latin America, disruptive technology and government intervention are powering a payments and e-commerce boom, in a region historically highly dependent on cash. The World Bank has said that only about 55% of Latin American adults have an account at a financial institution, based on a report into digital financial services and inclusion by Mastercard. However, the card company estimates that as much as 17% of the unbanked population was brought into the financial system in a few months thanks to the effect of an emergency pandemic-related subsidy for low-income workers, distributed by the Brazilian state-owned bank Caixa Econômica Federal.

In Africa, where a payments revolution started a decade ago in Kenya with the launch of M-Pesa, a mobile-based money transfer system named after the Swahili word for money, Nigeria is emerging as one of the continent's new payments hubs. Of the country's 200m people, roughly 60m adults lack a bank account. Nigeria has attracted more than \$1bn in venture capital in the past two years from Silicon Valley, China and elsewhere for fintechs, many of them payments-related.

Cash remains the leading means of payment

Nigeria is one of four countries – alongside the US, Germany and Indonesia – studied in depth in this report. Ipsos MORI, on behalf of OMFIF and G+D, surveyed 3,000 consumers in these countries to gauge their current use of payment mechanisms and attitude towards potential developments such as CBDCs.

Despite recent developments in new methods, cash remains the leading form of payment. It is clear that cash will continue to be a vital part of the payments ecosystem in the future. Close to 40% of consumers across the four countries still use cash most frequently, ahead of other formats such as debit cards, credit cards, apps and mobile payments. Cash is also one of the top three most frequently used forms of payment for more than 70% of the consumers surveyed. However, there are clear differences in the jurisdictions.

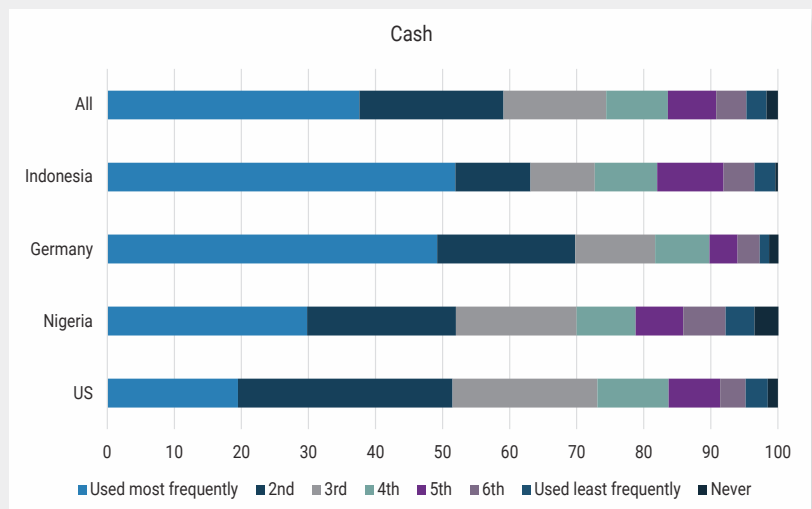
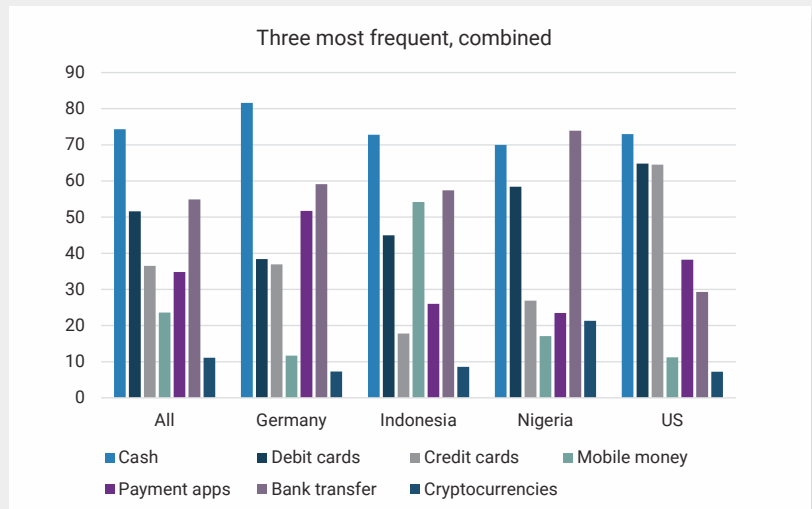
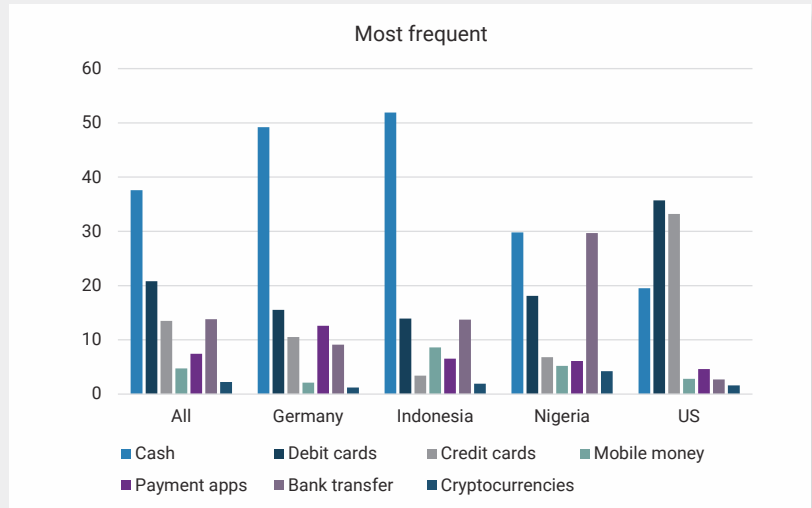
In Germany and Indonesia, around 50% of consumers use cash more than any other payment format. In the US, however, consumers are more likely to use debit and credit cards than cash. In Nigeria, bank transfers are used as often as cash as the leading forms of payment.

Despite the prevalence of new payment apps in many countries, their use remains relatively limited, with only consumers in Germany exceeding 10% in terms of using apps as their preferred form of payment. Across all four countries, however, payment apps are now one of the three most frequent payment methods for more than a third of users, suggesting their

Cash remains the dominant form of payment

What payment method do you use most frequently?

% of responses

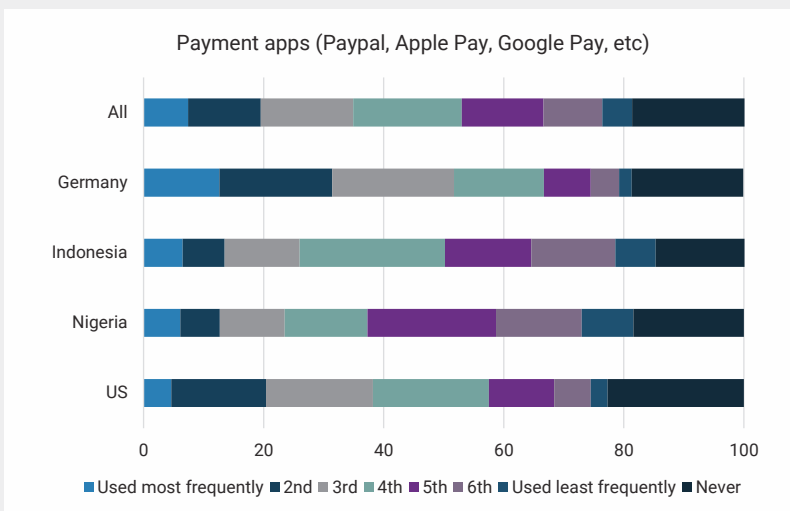
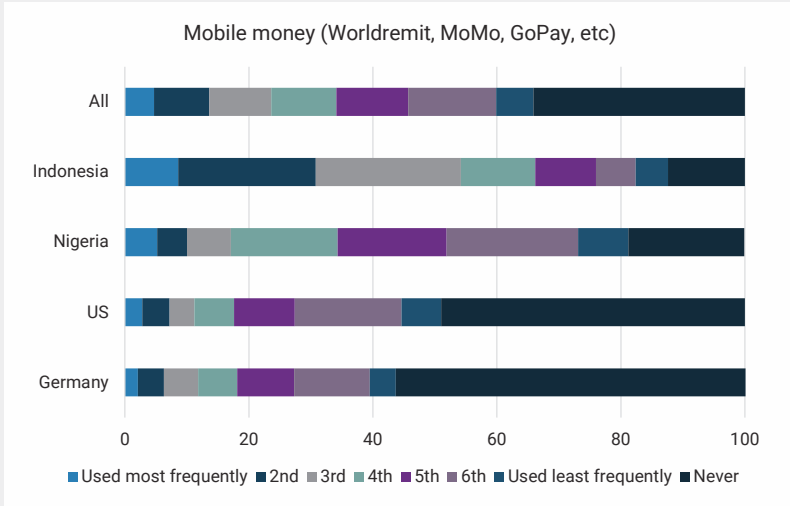


Source: Ipsos MORI, OMFIF analysis

Uptake of new digital forms of payment varies

What payment method do you use most frequently?

% of responses



Source: Ipsos MORI, OMFIF analysis

use will continue to grow. Use of cryptocurrencies is present in all four countries, albeit at very low levels.

Mobile money is among the top three most frequently used forms of payment for more than 50% of consumers only in Indonesia of the countries profiled. It is a top three method for around 10% of consumers in the US and Germany. In both of those countries, more than half of consumers have not used mobile money services from providers such as Worldremit or GoPay.

Conversely, payment apps such as PayPal and Apple Pay are far more popular in developed than emerging

80%

Predicted increase in cashless payment volumes between 2020-25

8,000

Cryptocurrencies launched since the introduction of bitcoin

markets. More than 50% of consumers in Germany and close to 40% of users in the US cite apps as one of their top three most frequently used forms of payment, compared to a little over 20% in both Indonesia and Nigeria.

Uptake of digital forms of payment remains hampered by numerous concerns among consumers in both developed and developing markets. Safety ties with universality as the top concern and is an issue relatively common for all age groups – but young consumers (35 or younger) worry about safety more than middle-aged consumers (35 to 49). In the US, the biggest hurdle is that consumers do not want to sign up to third-party apps (29%).

In emerging markets, other big challenges centre around availability and infrastructure: consumers worry about the ability of merchants to accept digital payments (Nigeria 39%, Indonesia 32%) and that network connections don't work/are not good enough (Indonesia 42%, Nigeria 30%).

Industry trends

Just as many consumers have embraced digital payments, the infrastructure underpinning their ability to do so is also changing, creating new business opportunities.

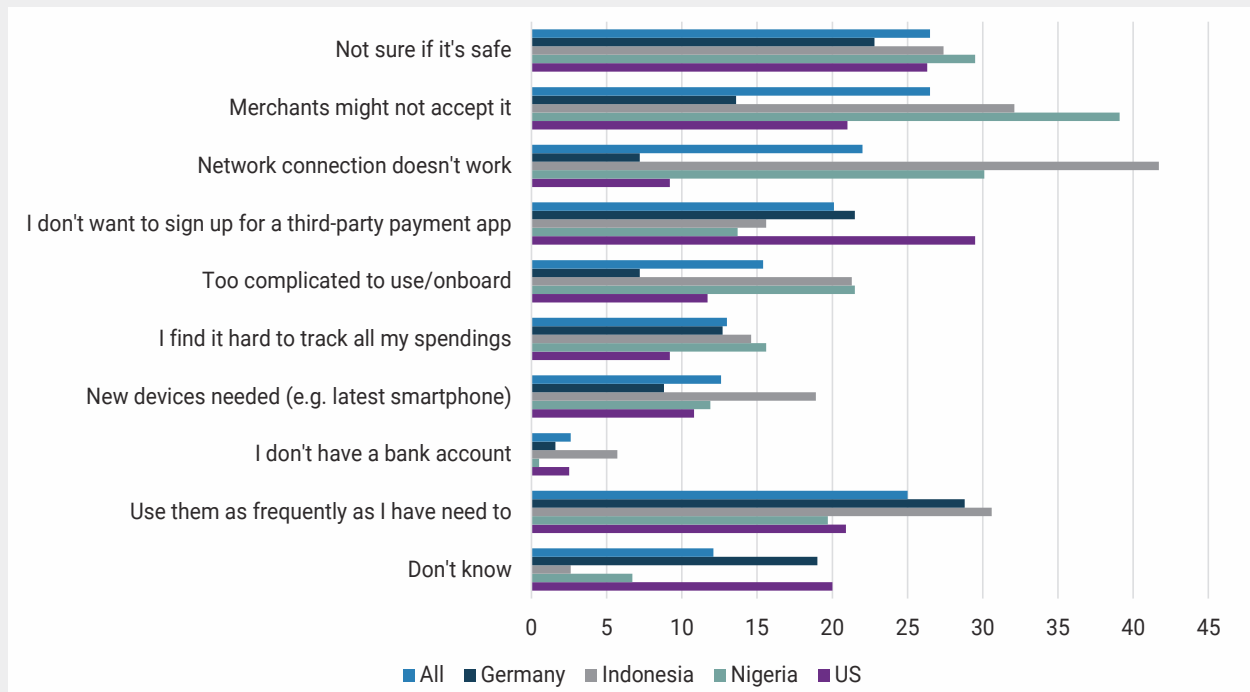
This reshaping of the 'plumbing' of payments is creating entirely new business models and revenue opportunities, tracking two parallel trends identified by consultants at PwC: 'An evolution of the front- and back-end parts of the payment system (instant payments; bill payments and request to pay; and plastic cards and digital wallets) and a revolution involving huge structural changes to the payment mix and ecosystem (emergence of so-called 'buy now, pay later' offerings; cryptocurrencies; and work underway on central bank digital currencies).'

Businesses have moved rapidly to persuade and enable merchants to equip themselves with the digital point-of-sale hardware to take payments from consumers. They include Stripe, founded by two young Irish entrepreneurs in 2010, Netherlands-based Adyen, London-based Checout.com and Square, a US-based payments

Safety and availability lead consumer concerns over digital payments

What challenges have you faced when using digital payments, or reasons not to use them (more frequently)?

% of responses, by country



Source: Ipsos MORI, OMFIF analysis

group led by Twitter Chief Executive Jack Dorsey.

Valuations of such businesses have soared in 2021, rivalling and exceeding those of incumbent banks. Stripe, in March, became the most valuable private company Silicon Valley has produced, after investors struck a deal valuing it at \$95bn.

That is based on rosy projections for the potential of payments as a game-changing business model. McKinsey, in its latest annual Global Payments Report, says that its prediction a year earlier that 2020 payments revenues would decline was overdone and that while such revenues did decline to \$1.9tn, this was only 5% below the 2019 level.

Indicators now point to 'a nominal but geographically uneven rebound' in 2021, bringing revenue back into the range of 2019's record high. From there, McKinsey projects a return to historical mid-single-digit growth rates, generating 2025 global payments revenue of roughly \$2.5tn. 'Overall, the payments industry proved remarkably

resilient to drastic economic changes even as many economies spent significant portions of the year in lockdown,' McKinsey said.

Small wonder that this has been driving an explosion in merger and acquisition activity. According to Payments Dive, a US-based payments newsletter, the sector is set for 2021 to be a record-breaking year as fintech startups and Covid-19 drive business change for large legacy players.

Venture capital directed to fintech companies focused on payments during the second quarter of 2021 also hit a record, at \$8bn invested. This represents a 25% increase over the previous quarter, Payments Dive said, citing a report from CB Insights.

Much of that has been taking place in emerging markets, such as in Latin America and Africa, and has focused on the infrastructure behind payments, such as the networks that connect banks and merchants and card companies.

Some deals highlight the increasing cross-border nature of the business,

such as Stripe's agreement in October 2021 to buy Recko, an Indian software company that automates the accounting process of reconciling payments.

The development of real-time payments has also taken off, with some countries introducing systems to enable instant payments infrastructure, such as PhonePe and Google Pay in India and PayNow in Singapore. The European Payments Initiative is building a unified pan-European payments solution leveraging the Single Euro Payments Area Instant Credit Transfer scheme for point of sale as well as online usage, while in the US, the Federal Reserve's FedNow service is scheduled to launch in 2023.

Central bank payment moves

Running in parallel with these trends, efforts are underway to redefine and reimagine the medium of exchange itself, through the design and issuance of cryptoassets, such as bitcoin, and stablecoins, such as Facebook's Diem

(formerly Libra). Both bypass the banking system and its settlement systems for value to be transferred from one holder to another. A recent study, by Gary Gorton of the Yale School of Management and Jeffery Zhang of the US Federal Reserve, found that innovators have created over 8,000 cryptocurrencies since bitcoin emerged in 2009.

These innovations promise nothing less than a shift in payments, with implications for how citizens think about, value, use and, most importantly, trust a store of value used in the exchange of goods and services.

The concept of trust is at the heart of the debate among central banks about these forms of alternative, privately-run digital money. Much of this reflects concern about the possibility of forms of money that are untethered to the banking system and its underlying clearing and settlement infrastructure – the key element that underpins trust in the system of money as it has historically existed. There are also concerns that new private currencies that are emerging from big tech could undermine central banks' capacity for conducting monetary policy and maintaining price and financial stability.

As Jon Cunliffe, deputy governor, financial stability at the Bank of England, put it in a speech at the OMFIF Digital Monetary Institute: 'Whatever its form or issuer, confidence in the concept of money in society needs to be anchored by the perception of a liquid safe asset that will always be accepted.'

He added: 'Unlike other fundamentals such as electricity and water, money is a social convention that depends on confidence. These risks will need to be very carefully evaluated in any assessment of whether we should be prepared to let generally available, useable public money wither as the digital age progresses or whether the state should issue its own digital currency.'

This is one strand of thinking driving central banks to explore issuing CBDCs. This virtual money, backed and issued by a central bank, provided as a public good, contrasts with private cryptoassets and stablecoins. Another strand relates to the decline of cash

itself. McKinsey notes in its annual payments report that regulators in countries where cash usage has fallen are 'preparing strategies to ensure continued availability of central bank currency and access to resilient and free payments systems for all—including the un- and underbanked'.

But in places where cash usage remains high, CBDCs may be embraced as an extension of existing central bank issued currency. As Wolfram Seidemann, chief executive officer of G+D Currency Technology, notes: 'I hope for a future in which cash continues to play a role but is complemented by an equally valuable central bank-governed digital currency. CBDC is a public good, too: it's universally accepted, free from social and economic barriers, and can be used independently from the issuer, making it a truly democratic and free instrument.'

All these drive heightened interest in CBDCs. Seven countries have already launched a CBDC, notably the Bahamas and Nigeria, while as many as 87 countries (representing over 90% of global gross domestic product) are now exploring the concept, according to a tracker operated by the Atlantic Council, a US-based non-partisan thinktank.

Among G7 economies, the ECB recently launched an 'investigation phase' of a possible digital euro project, while the People's Bank of China is trialling a CBDC with some 24m users and may launch it formally in 2022, bringing roughly a billion retail users online. India will start trials of its CBDC in December 2021.

Financial inclusion

Many consumers today may have difficulty making digital payments for a range of reasons, leaving them financially vulnerable and locked out of the digital economy. The World Economic Forum notes that fewer than one in five people in the least developed countries are connected to the internet and that a large digital divide is locking millions out of access to digital services. In Southeast Asia, home to burgeoning payment unicorns such as GoTo, Grab and Sea, around 150m adults – 31% of the population

'Many consumers today may have difficulty making digital payments for a range of reasons, leaving them financially vulnerable and locked out of the digital economy.'

– are digitally excluded, according to consultancy Roland Berger.

For many commercial actors, this part of society does not represent an economically attractive sector to target as participation in such services requires access to expensive devices such as laptops or smartphones. There is growing research into the idea that CBDCs could engage the financially excluded by providing a means of entry to the digital economy by offering a payment option that can be used anywhere, by anyone. Offline functionality will be a key requirement in the design of CBDCs for developing markets.

'CBDCs can usher in new monetary systems that are more inclusive for people who have been historically excluded and marginalised,' says Nikhil Raghuvveera, joint non-resident fellow at the Atlantic Council's GeoTech and GeoEconomics Centers. He adds that if CBDCs are to contribute to financial inclusion in the post-pandemic world, leaders in the public, private and non-profit sectors must: understand how CBDCs can address the needs of unbanked and underbanked people; identify and address the root causes of financial exclusion that cannot be solved by CBDCs; and establish principles for an inclusive CBDC design that is centred on the financial needs of people rather than institutions.

This is one reason why gauging consumer perspectives on digital currencies and CBDCs takes on such significance. Other issues that arise include whether central banks will focus first on retail or wholesale use cases or emphasise domestic or cross-border applications. These and other questions will be examined in the following chapters, drawing on our survey results in Chapter 3. •

Chapter 2

A digital currency to meet users' needs

Collaboration between the public and private sectors will be critical to successful adoption of CBDCs.

WITH consumers experiencing and demanding faster and more convenient ways to pay for goods and services, a race is on to provide the ideal solution. None has emerged as dominant. Instead, a complex payments matrix is developing across multiple areas. Different models are being tested and applied across regions at different stages of economic development and populations with varying degrees of access to basic tools such as the internet. The only sure thing is the influential role that technology will play.

One part of that matrix is the parallel development of stablecoins, such as Tether, founded in 2014, and Facebook's Diem, which are pegged to real assets, and cryptocurrencies (like bitcoin), both of which hold the prospect of a world of monetary exchange untethered from central bank control.

Debate over the safety and worth of crypto has made headlines alongside the gyrating fortunes of cryptocurrencies themselves, with bitcoin, with an approximate combined market value of \$700bn, soaring or crashing on the basis of a single tweet.

Regulators are watching crypto. The US Securities and Exchange Commission's chairman, Gary Gensler, has cited worries over potential fraud as a concern and wants crypto platforms to be registered. The US crypto industry, which argues that moves to regulate it would stymie innovation, is responding by setting up

lobbying groups.

The concept of decentralisation – and its corollary, centralisation – is one idea that strikes at the heart of a debate that is gripping the financial sector, regulators and central banks globally: what role can and should central banks play in the provision of new means of digital payments? At a time when the retail landscape is digitalising, can and should a central bank digital currency have a role?

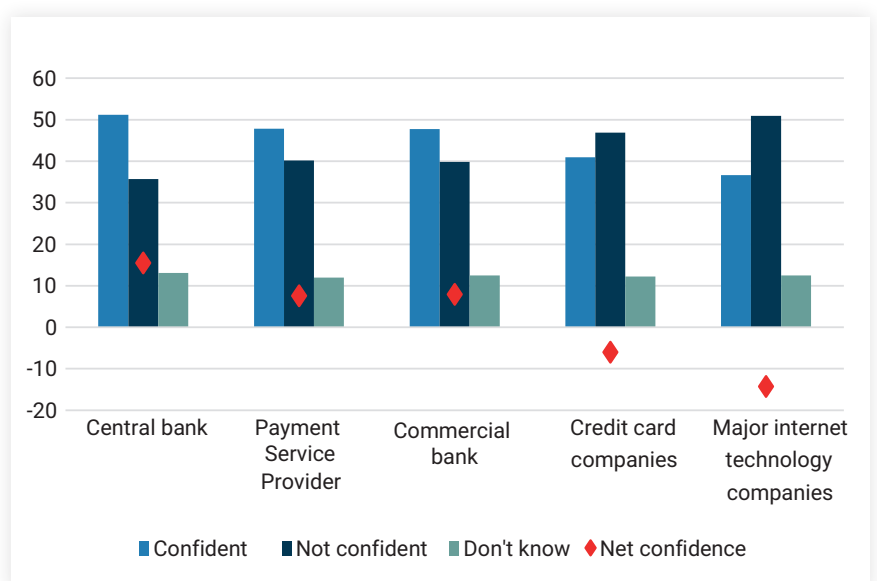
A survey carried out by OMFIF in 2020 (Digital currencies: a question

of trust) showed that the public prefer central banks to play a pivotal role in the development of digital currencies. When asked about their confidence in potential issuers of digital money, 51% of respondents globally said they would trust a digital currency issued by their central banks, clearly ahead of other potential sources such as payments providers, commercial banks and technology companies.

These questions, which also pivot around trust, data privacy and even sovereignty, are highly relevant at a

Central banks garner greatest confidence for digital money issuance

'How much confidence, if at all, would you have in digital money issued by each of the following?', Global average



Source: Ipsos MORI, OMFIF analysis. Note: 'neutral' responses excluded



What are CBDCs?

The Bank for International Settlements defines CBDC as 'central bank-issued digital money denominated in the national unit of account'. It represents a liability of the central bank. CBDC is different from existing forms of cashless payment instruments for consumers such as credit transfers, direct debits, card payments and e-money, as it represents a direct claim on a central bank.

A retail, or general purpose, CBDC is one whose purpose is a digital equivalent of cash for use by households and businesses and is a new option for the general public for holding money. A wholesale CBDC restricts access to financial institutions, intended for the settlement of large interbank payments.

'The future of money is too important a matter to be left entirely to central bankers.'

Ravi Menon, Managing Director, Monetary Authority of Singapore

time when mobile telecommunications technology is driving advances in the digital economy. Technological advances are also building financial inclusion in emerging economies. Consumers value the ability to conduct real time fund transfers around the clock too, a desire turbocharged by the Covid-19 pandemic.

Many central banks are concerned about the prospect that new monetary instruments, built in a decentralised way, could undermine their capacity to conduct monetary policy and maintain price and financial stability. They have been paying close attention to stablecoins and their perceived ability to combine digital asset transfer with the privacy of decentralised finance.

They have also been watching big tech and its ability to roll out payment innovations while leveraging platform scale and gathering data

efficiently, without being subject to the same regulatory guardrails faced by traditional players in payments.

That tension was reflected in a report on the progress of CBDC prepared by the BIS in June 2021. One of the concerns about change in the monetary system was that the technology that allows new money and payment systems 'could encourage either a virtuous circle of equal access, greater competition and innovation, or it could foment a vicious circle of entrenched market power and data concentration'. The idea that the monetary system is a public good that underpins the economy is a thread running through much of the BIS analysis and is echoed in statements by central bankers themselves.

'Central banks seem to have collectively decided very quickly that stablecoin technology could not be

dismissed and could become very disruptive to their monetary control, and so demanded an urgent response,' says John Nugée of Laburnum Consulting and also a faculty member at St Mary's University, London.

A second concern raised in the BIS report is that market concentration could exacerbate the high costs of payment services, which is still a feature of existing systems, especially when it comes to cross-border transactions. It singled out merchant fees – largely invisible to consumers – as a case in point.

A third concern relates to the extent to which digital payment solutions provided by private payment service providers enable – or hinder – universal access to digital payments, particularly for lower-income people and migrants. 'Due in part to market power and low expected margin, private PSPs often do not cater sufficiently to these groups,' the BIS said.

Fourth, data governance looms large. With data comes market power, and also responsibility over privacy and access to that data, requiring appropriate governance guardrails.

Central banks move closer to CBDCs

This is the backdrop to a study that central banks are working on towards the creation of a digital fiat in the form of CBDCs.

The main effort, described by the BIS as providing an opportunity to 'review and reaffirm the public interest case for digital money', is concentrated around a group of central banks – the Bank of Canada, European Central Bank, Bank of Japan, Sveriges Riksbank, Swiss National Bank, Bank of England and the Board of Governors of the Federal Reserve System – together with the BIS. The group published a report in October 2020 setting out the common foundational principles and core features of a CBDC.

The effort is being driven by the over-arching philosophy that the revolution underway in digital payments should work for society as a whole, that the foundation of the monetary system is trust in the currency and that a decentralised

system of money implies a loss of the public good function inherent in a central bank's provision of the ultimate unit of account.

In the increasing number of speeches on CBDCs, these and other themes receive consistent attention and emphasis, indicating a rapidly-coalescing consensus over not only the rationale for CBDCs, but also the way they might be designed, introduced and overseen.

Other multilateral bodies, such as the International Monetary Fund, have joined the debate. As a recent IMF paper puts it: 'Digital money must be designed, regulated and provided so that countries maintain control over monetary policy, financial conditions, capital account openness and foreign exchange regimes. Payment systems must grow increasingly integrated, not fragmented, and must work for all countries to avoid a digital divide'.

In a follow-up set of reports published by the BIS in September 2021, the central banks explored how CBDCs could best meet users' future needs through developing interoperable systems that support private innovation while preserving public trust.

They agreed on three key principles. First, for a CBDC system to be effective it would need 'to involve both public and private actors to ensure interoperability and coexistence with the broader payment system'. Second, involving public and private actors would help a CBDC to 'anticipate the needs of future users and incorporate related innovations'. And third, to help maintain safety and stability, a CBDC would need careful design and implementation, allowing time for the existing financial system to adjust, and flexibility to use safeguards.

All of this is predicated on an acceptance that CBDC design and implementation must involve joint public-private efforts. The central banks contributing to the latest BIS report said they anticipate any that CBDC ecosystem would involve the public and private sectors 'in a balance' in order to meet desired policy outcomes and to enable innovation that meets users' evolving payment needs. Interoperability with other

national payment system would be key to allowing the easy flow of funds to and from different payment systems.

The BIS believes that CBDCs are best designed as part of two-tier system, where the central bank focuses on the core of the system, while most operational tasks and consumer-facing elements are handled by commercial banks and other payment service providers. Fundamentally, however, the belief is that a CBDC can be a more powerful payment medium than private offerings because it can be retrofitted onto, and take advantage of, existing financial market infrastructure such as settlement systems.

In terms of a model for CBDC in this context, the Bank of England has devised a platform model that builds on an earlier 2020 paper that set out some design principles for CBDC, based around the concepts of resilience and security, speed and efficiency and innovation and competition. The basic components would be privately provided payment interfaces, or wallets, that would own the relationship with the customer and provide them with payment services, while the central bank would provide the core ledger, and an application programming interface to provide connectivity between the layers.

All of this will be of particular interest to less developed economies, where central banks in a January 2021 BIS survey considered themselves more likely to issue a general purpose, or retail, CBDC than their advanced economy peers. That's because the concept has the prospect of improving financial inclusion for millions of unbanked populations and providing lower cost access to financial transfers.

Jon Frost, senior economist,

innovation and the digital economy at the BIS, says that while new forms of digital money could pose specific development, macroeconomic and cross-border challenges for less developed economies, 'technological advances built on the existing financial plumbing are already enhancing inclusion and efficiency'.

Much of how this evolves will depend on what relationship a retail CBDC will have with the end-user. G+D, for example, has developed a token-based CBDC solution called G+D Filia. This solution has been designed to be as close to cash as possible. This guarantees the provision of security, high availability and no single point of failure, and the ability to balance privacy and transparency. Additionally, G+D Filia is capable of performing secure consecutive offline payments without any connectivity and comes with a pioneering programmability solution. The aim, says G+D, is to transfer the characteristics of cash into the digital world.

For the moment, further study, refinement and discussion is needed before the final shape of CBDC emerges. Much work remains to be done before the concept emerges at scale, including on the possibility of using CBDC to improve cross-border payments. 'The current state of financial infrastructure in a given country will play a key role in determining the speed and extent of adoption of CBDCs, stablecoins or non-stabilised cryptocurrencies,' notes McKinsey.

Ultimately, consumer acceptance will be key to the next stage of CBDC development. We explore consumer attitudes to the concept in the next chapter. •

'A central bank digital currency offers an opportunity to work with private players to modernise the payments network, embrace innovation and serve the needs of a flourishing digital economy, as well as ensuring citizens never need to worry about the security and reliability of how they pay.'

Ron Kalifa, Lead, UK Fintech Review

Chapter 3

Key findings

Digital currency moving to the mainstream, but still more to do to foster public acceptance

1. Knowledge of CBDCs is higher in developing markets

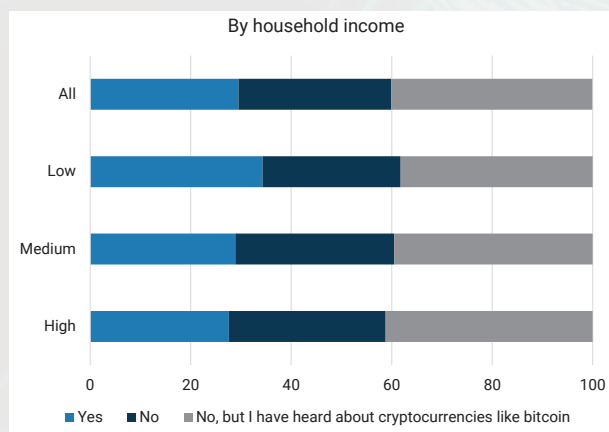
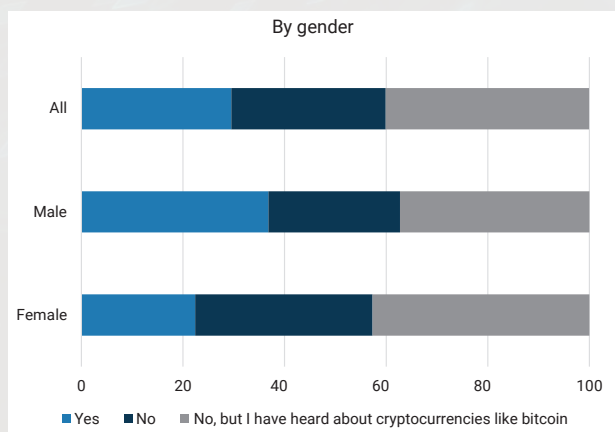
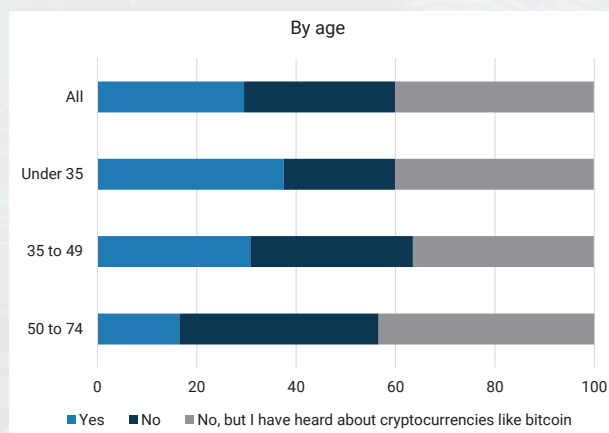
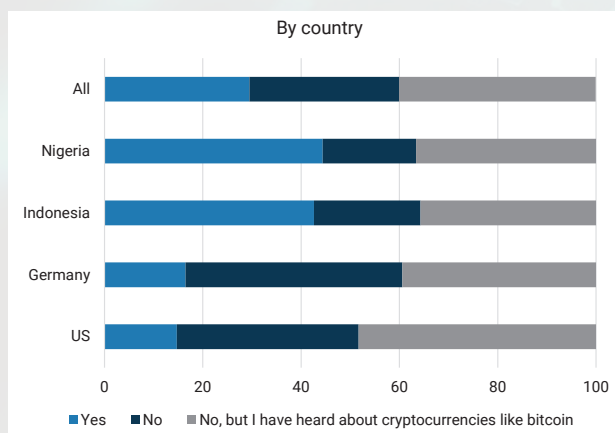
AWARENESS of CBDC is relatively high for a concept which, in the vast majority of countries, does not exist and is not part of widespread popular debate. It is, however, much higher in developing countries than it is in developed markets (more than 40% in Nigeria and Indonesia versus less than 20% in Germany). The concept of CBDC is familiar to just 15% of consumers in the US, where plans for

a digital currency are at a very early stage. However, US citizens are more likely to have heard of bitcoin or other cryptocurrencies than in any other jurisdiction.

Older consumers are also less likely to have heard of digital cash. This is important; the median age in Germany, where awareness is low, is 47. In Nigeria, where the median age is 18, awareness is high.

Have you heard about CBDCs or a digital euro/rupiah/naira/dollar?

% of responses, by country, by gender, by age and by income



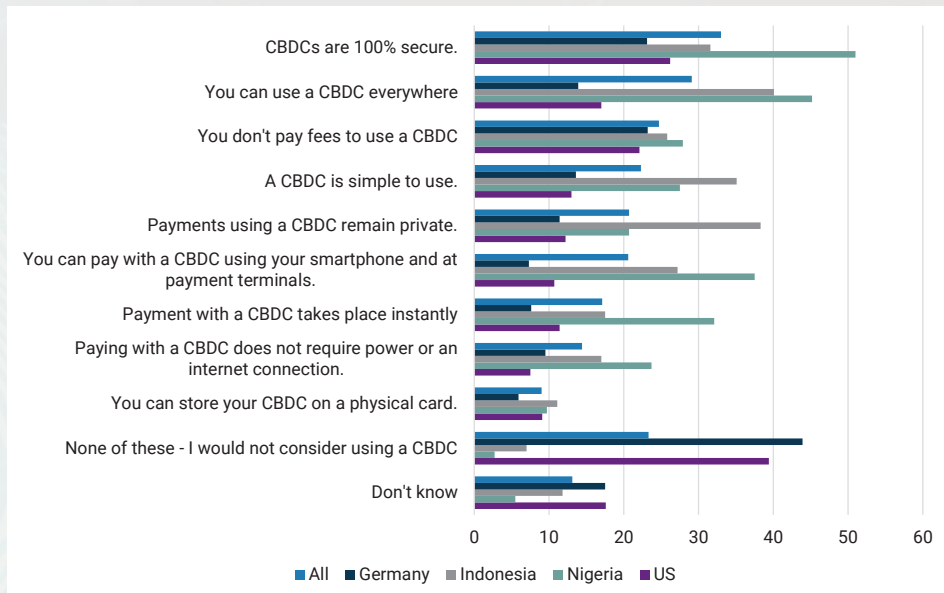
Source: Ipsos MORI, OMFIF analysis. Note: Respondents were shown an introduction to CBDCs before being presented with this question. See p.22

2. Security and universality are major positives for CBDC

SECURITY is the most important feature of a digital currency to consumers. One-third of the 3,000 survey respondents selected the fact that CBDC payments are 100% secure as the feature most important to them. Cost, or the absence of fees, is an issue of relatively equal importance in all countries, but tied with security as the most important factor only in Germany. Ease of use is also important, such as the ability to use a CBDC

everywhere. These factors are more important than speed of use or the ability to store CBDC.

Less than 10% of developing market consumers did not select a feature, rather saying that they would not consider using a CBDC, compared to 40% or more in developed economies. Nigerian consumers were the least likely to select this option. Privacy is twice as important an issue in Indonesia than in any other country.



What features of a CBDC would be most important to you? Select three.

% of responses, by country

Source: Ipsos MORI, OMFIF analysis

What features of a CBDC would be most important to you? Select three.

% of responses, by country,
■ =greatest share of responses;

Source: Ipsos MORI, OMFIF analysis

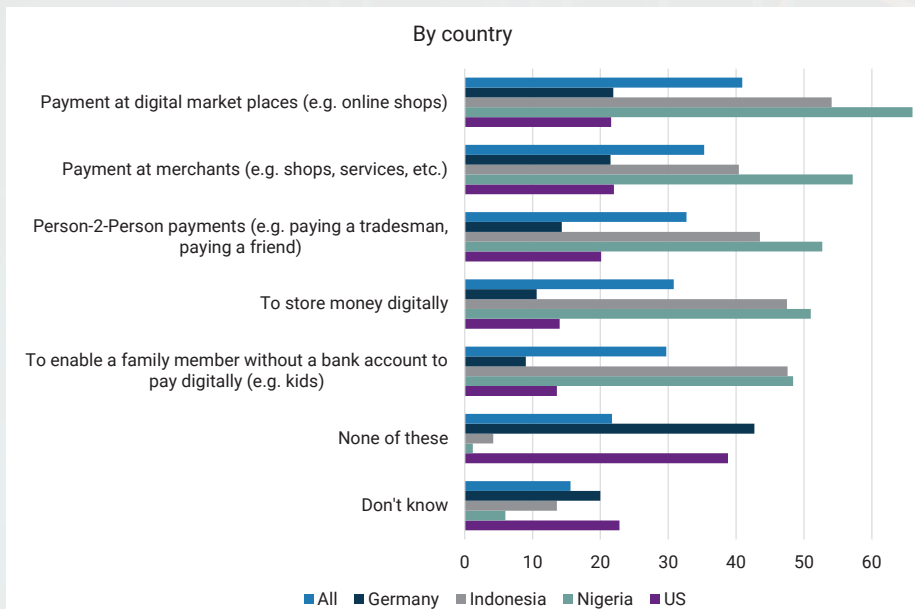
	All	Germany	Indonesia	Nigeria	US
You can use a CBDC everywhere	29.1	13.9	40.1	45.2	17.0
Payments using a CBDC remain private	20.7	11.4	38.3	20.7	12.2
CBDCs are 100% secure	33.0	23.1	31.6	51.0	26.2
You can pay with a CBDC using your smartphone and at payment terminals	20.6	7.3	27.2	37.5	10.7
You can store your CBDC on a physical card	9.0	5.9	11.1	9.7	9.1
Paying with a CBDC does not require power or an internet connection	14.4	9.5	17.0	23.7	7.5
A CBDC is simple to use	22.3	13.6	35.1	27.5	13.0
You don't pay fees to use a CBDC	24.7	23.2	25.8	27.9	22.1
Payment with a CBDC takes place instantly	17.1	7.6	17.5	32.1	11.4
None of these - I would not consider using a CBDC	23.3	43.9	7.0	2.7	39.4
Don't know	13.1	17.5	11.8	5.5	17.6

3. Emerging market consumers are ready for digital payments

EMERGING market consumers see a considerable number of use cases for CBDC, far more so than their counterparts in developed markets. More than 50% of respondents in Nigeria and Indonesia would consider using CBDC as a form of payment in digital marketplaces, and more than 40% would use them for shopping at merchants, peer-to-peer payments, to store money digitally or to allow family members

to pay for items without having a bank account. Only around 40% of consumers in developed markets would be likely to use CBDC for any purpose, most likely shopping or P2P payments.

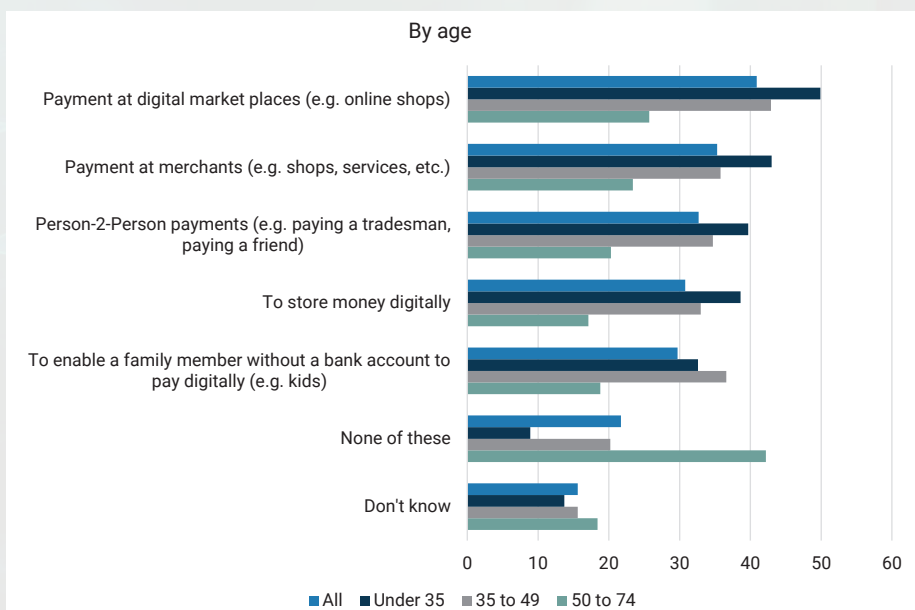
Policy-makers should bear in mind that CBDC should be a platform for innovation – they will need to be used for business models that don't exist today. The design of a CBDC must be future-proofed.



In which of the following situations would you consider using a CBDC?

% of responses, by country and by age

Source: Ipsos MORI, OMFIF analysis

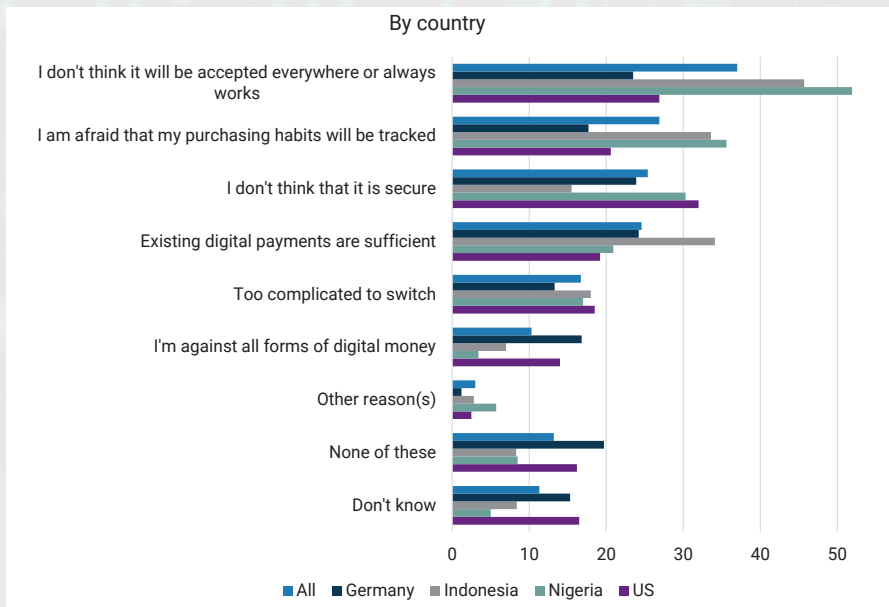


4. CBDC should be as close to cash as possible

CONCERNS that CBDC might not have widespread acceptance is the biggest overall issue consumers have with digital currencies. The fear that spending habits will be tracked is a bigger issue in emerging markets than developed markets. Security is a significant issue in all jurisdictions, but more so in the US and Nigeria. Complexity is not a major concern. German consumers are most adamantly against the

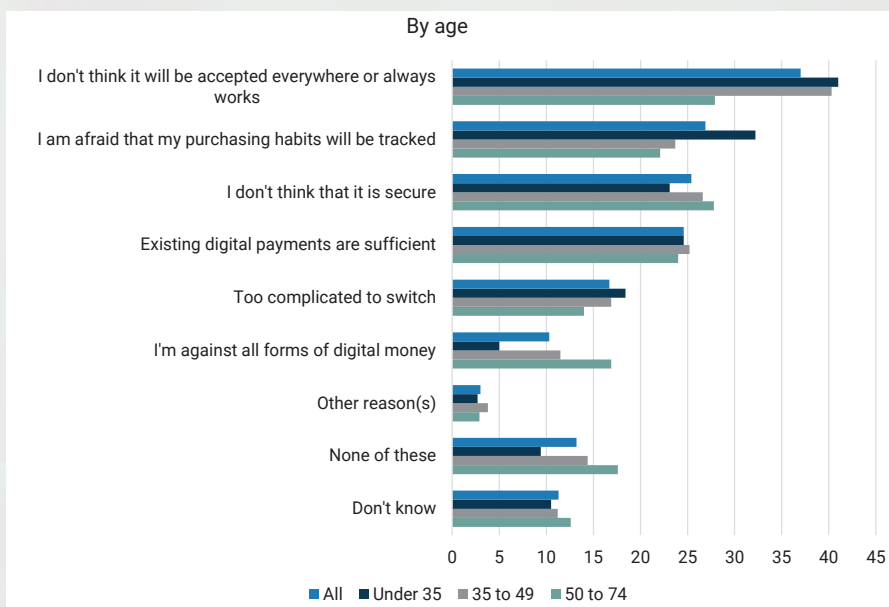
concept of digital money.

The issues raised by consumers around universal acceptance, resilience, privacy, security and ease of use are significant because these are the principal characteristics of cash. Policy-makers should therefore endeavour to make CBDCs as close to cash as possible, especially focusing on widespread acceptance without the disclosure of personal data.



Which of these – if any – are you concerned about for using a CBDC, and which might mean you would not use a CBDC?

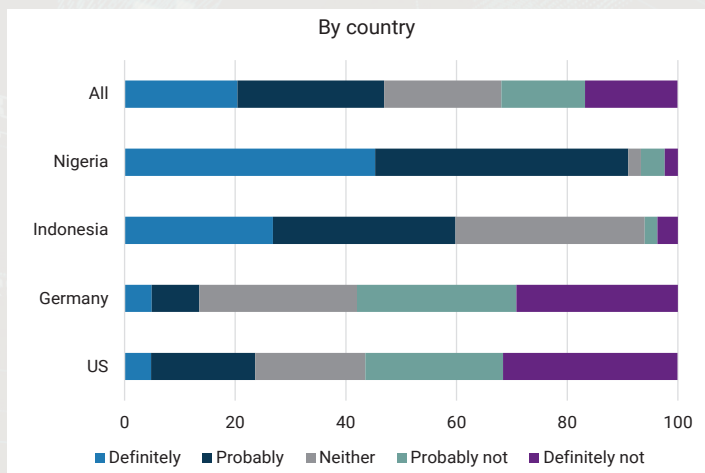
% of responses, by country and by age
Source: Ipsos MORI, OMFIF analysis



5. Developed market consumers remain sceptical about CBDC usage

THE differences in attitudes between developed and developing markets are at their most stark when consumers were asked about their likelihood to use CBDCs. More than 90% of consumers in Nigeria would definitely or probably use a CBDC, while that figure stands at 60% in Indonesia. In both the US and Germany, nearly 60% of respondents say they would be unlikely to use CBDC, and just under one-third rule out using it altogether. Younger people and those from lower-income households are more likely to be open to using a CBDC.

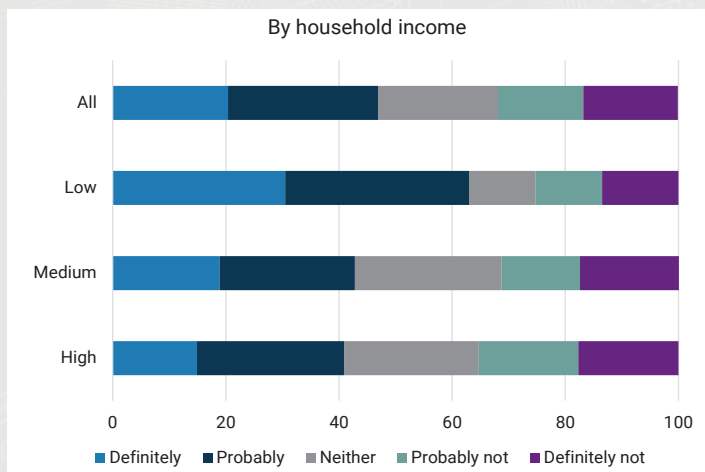
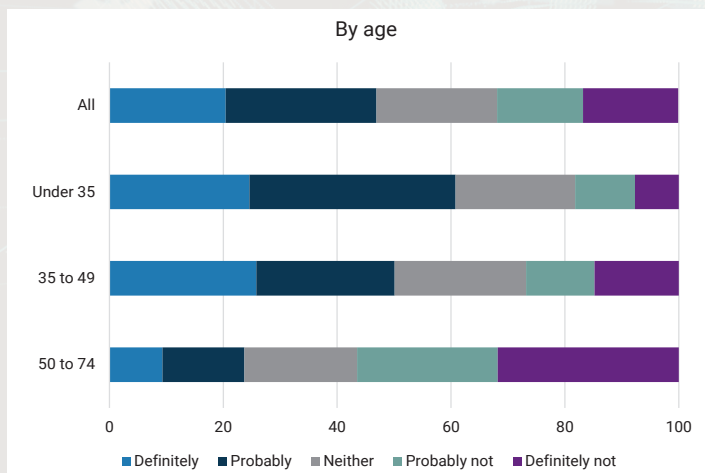
These findings arguably demonstrate that in emerging countries consumers are relatively unhappy with their current access to payments, and welcome a new option, whereas the scepticism of developed market consumers can be at least in part attributed to a degree of comfort about existing payment options. If early adopter countries have positive experiences of CBDCs, then others will likely follow. But there is clearly still a lot of groundwork to be done to make it attractive for consumers. There needs to be more open discussion with the public about the benefits of CBDC.



If there were a CBDC in your country, how likely would you be to use it?

% of responses, by country, by age and by household income

Source: Ipsos MORI, OMFIF analysis

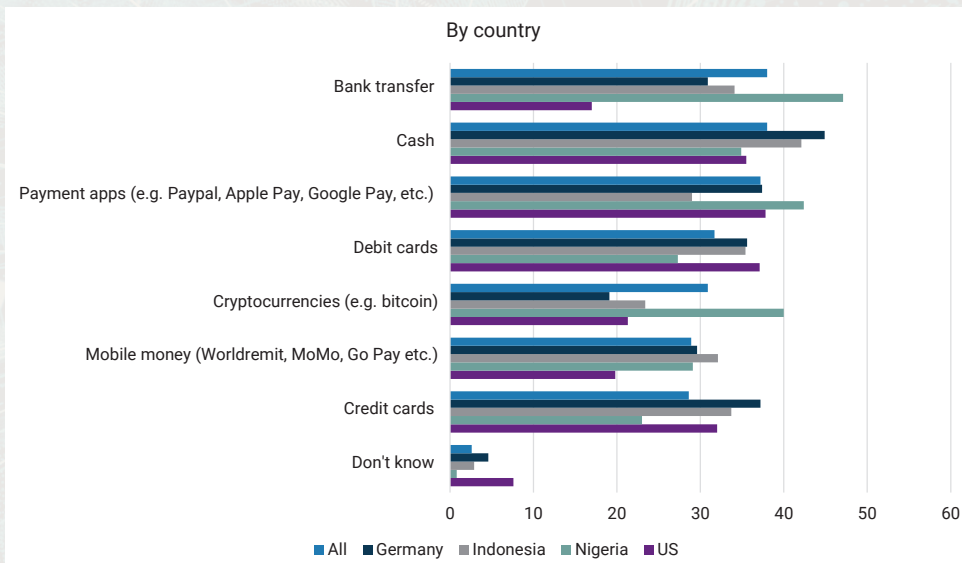


6. CBDC can be a broad complement to existing forms of payments

CONSUMERS who said they would be likely to use CBDCs are relatively consistent about what purposes they would use them for. Digital currencies might act as a replacement for, or more likely a complement to, a wide spectrum of payment types including bank transfers, cash, apps, cards and mobile money. The relatively high (30%) level of consumers across jurisdictions that would replace cryptocurrencies with CBDCs suggests those who would use CBDCs are already using, or more

interested in, digital currencies in general.

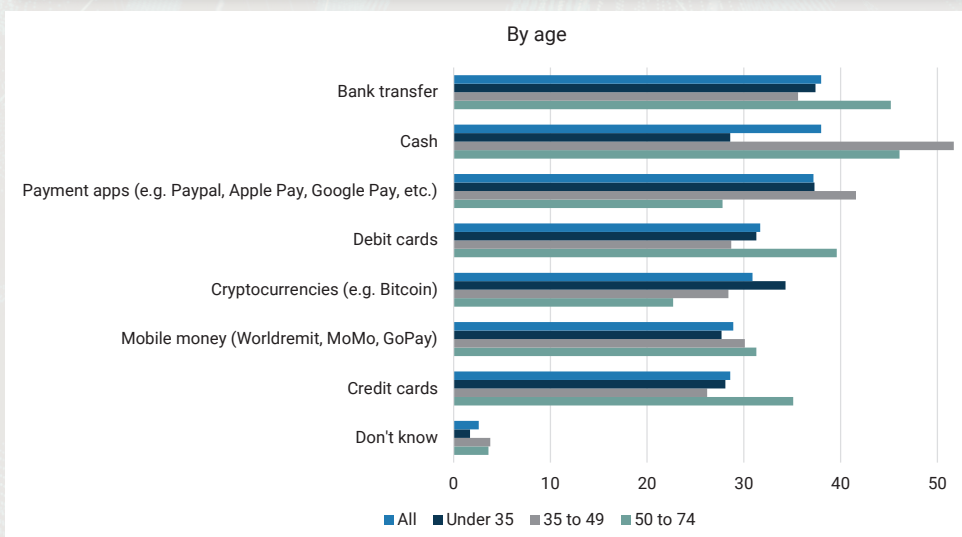
These findings suggest that CBDCs will enhance the payment landscape, and not necessarily replace a certain means of payment. They also reinforce that there is not a one-size-fits-all for CBDCs, and that national and regional variations are not just likely, but essential. What each jurisdiction has in common is that CBDCs will give people freedom of choice and access to cheaper and more efficient payment options.



What payment methods might you use CBDC instead of?

Respondents who say they are likely to use CBDC only, % of responses, by country and by age

Source: Ipsos MORI, OMFIF analysis



Chapter 4

Achieving widespread acceptance

Developing nations are embracing CBDC while established economies remain in the planning phase.

HOW much you know about digital money depends on where you live. In the emerging markets of Nigeria and Indonesia, only 20% of consumers have no awareness of digital currencies, if you combine knowledge of CBDCs and other forms of cryptocurrencies. In Germany and the US, at least twice as many citizens are familiar with bitcoin or other private forms of digital money than they are of CBDCs.

The high level of awareness of CBDCs among Nigerian respondents (44%) could stem from the central bank's progress in developing the eNaira. The first in Africa, Nigeria's CBDC was launched in October. President Muhammadu Buhari noted in his speech how the digital currency benefits Nigerians specifically, including how the eNaira can help move more people and businesses into the formal sector, potentially increasing tax revenue. It can also foster greater financial inclusion, increase remittances and enable the government to deliver welfare support to citizens directly. However, the eNaira still has to prove whether it can live up to the high expectations of consumers.

Even before the eNaira, Nigeria had been developing its digital payments strategy. In 2011, Nigeria launched an interbank instant payments platform. The following year, it introduced a cashless policy that levies charges on cash withdrawals above a certain

threshold. These developments could explain why bank transfers are as popular as cash among the Nigerian survey respondents. Nigeria's experience suggests that policies that actively support the use of certain payment methods will influence consumer behaviour.

In Indonesia, where awareness is nearly as high (43%) as Nigeria, the central bank has said that it is pursuing a CBDC project as part of a wider effort to digitalise the country. 'We are digitalising our payment system. [We] are very, very aggressive because this is the future of Indonesia,' says Perry Warjiyo, the central bank governor.

As in Nigeria, Indonesia's efforts to promote digital payments predate the country's CBDC project. For years, Bank Indonesia has been carrying out a digital financial literacy programme. In 2019, it released a national payments blueprint that maps out its path to digitalise by 2025. Digital infrastructure is a challenge in a large country like Indonesia, but the government recently launched a major broadband satellite communication project. The pandemic prompted Indonesia to accelerate efforts on these fronts.

Regulators in Germany and the US have been more careful in their approach to CBDCs. Statements from both the Deutsche Bundesbank and the Federal Reserve have made a point to emphasise the importance of establishing the value of developing

one and determining how it should be designed.

On more than one occasion, Federal Reserve Board Chair Jay Powell has stated his intention to approach CBDCs carefully. 'The ultimate test we'll apply when assessing a central bank digital currency and other digital innovations is, are there clear and tangible benefits that outweigh any costs and risks? [...] I think it's more important to do this right than to do this fast. We are the world's reserve currency,' he said in a September interview.

Despite the cautious tone, the Federal Reserve is moving along with its own exploration of CBDCs. In partnership with the Massachusetts Institute of Technology, the Federal Reserve Bank of Boston is working on Project Hamilton, an investigation of the technical aspects of developing a digital dollar. Jim Cunha, senior vice-president of secure payments and fintech research for the Boston Fed, says of the project, 'The real primary driver is to position ourselves to act if we should decide to in the future.'

Separately, the Federal Reserve Board is writing a discussion paper that will address policy questions around a possible CBDC. This will be the basis of public consultations that will inform the board's decision to move forward with a digital dollar.

Powell has also pointed to the importance of widespread government buy-in, clarifying that

Country	CBDC type	Status
Germany	Undecided	Investigation phase of digital euro project started in July 2021, with launch expected no earlier than 2026
Indonesia	Wholesale and retail	Research stage
Nigeria	Retail	Launched in October 2021
US	Undecided	Discussion paper to be released in Q4 2021; Project Hamilton ongoing

Source: Atlantic Council, OMFIF analysis

the move to introduce a digital dollar will not rest solely with the Federal Reserve. ‘It would have to have a meeting of minds with the administration and also probably with Congress. We would really like to have broad support for this. It’s a very important innovation and I think we would need that to go ahead,’ he stated.

The Deutsche Bundesbank shares the Federal Reserve’s view that the benefit of a CBDC needs to be obvious. Outgoing President Jens Weidmann said, ‘Of course, CBDCs should only be issued if the perceived benefits outweigh any potential drawbacks or risks. Thus, a digital euro needs to provide a clear value added to euro area citizens.’

In October 2020, the ECB initiated a three-month public consultation on a digital euro. The results were released in April this year, revealing that participants viewed privacy as the most important feature of a CBDC. The consultation was open to citizens of the euro area, as well as finance and technology professionals. Nearly half the sample were German and 87% of euro area citizens participating were male. Despite the sample’s skew towards German participants, the key finding did not quite match the sentiment expressed in the Ipsos MORI survey.

Only 11% of German respondents identified privacy as one of the most important features of a CBDC to

‘Public consultations can raise awareness of the benefits of a CBDC, as well as help ensure that its design matches the public’s needs as well as those of industry stakeholders.’

them. However, this could be a result of 44% of respondents saying that none of the features listed were important to them and that they would not consider using a CBDC. It could also be a case of sample selection bias where citizens more worried about privacy choose to participate in the consultation to voice their concern.

Public consultations can raise awareness of the benefits of a CBDC, as well as help ensure that its design matches the public’s needs as well as those of industry stakeholders. They lay the groundwork for wider acceptance, even though a CBDC project may still be at the research or exploratory stage. The transparency of the research and development process could also boost the credibility of CBDCs and the central bank overall and may influence consumer attitudes in the long-term. Although awareness of CBDCs is low in Germany (17%) and the US (15%), central banks’ efforts to engage with the public as they explore options may bring digital currencies to greater public consciousness over time.

Beyond awareness, the bigger question is whether or not consumers would actually use CBDCs. Likelihood is highest in Nigeria (91%), where it already exists, followed by Indonesia (60%). The much lower figures in the US (24%) and Germany (14%) suggest that consumers are satisfied with existing payment methods. This is consistent with their answers

on questions about most important features of a CBDC and situations where they imagine using it. To each question, around 40% of US and German respondents selected 'none' or that they would not consider using a CBDC.

The apparent lack of enthusiasm implied in these answers does not necessarily mean that consumers in these markets are not ready for a CBDC, or that they would never use it. The fact that their respective CBDC projects are still at early stages means that there is less certainty on what a digital currency could mean for them and their payment habits. The more positive responses in Nigeria and Indonesia also suggest that actively educating consumers and raising awareness of digital payment methods

'The eNaira still has to prove whether it can live up to the high expectations of consumers.'

could affect consumers' disposition towards CBDCs.

It is clear from the findings of OMFIF's research that as digital currency projects progress and awareness of them grows, consumers may move closer to embracing CBDCs. Regulators need to ensure that as they conclude their internal deliberations, they also engage their citizens in the process and harness the influence of the private sector in ensuring availability and understanding of the role that digital currencies can play.

Note: In drafting this chapter of the report, OMFIF consulted central bankers in the four jurisdictions covered by the Ipsos MORI survey. OMFIF wishes to thank them for their assistance in analysing the results of the survey. •

Methodology

THE survey was conducted by Ipsos MORI in four countries through an internet-based questionnaire for the most efficient reach in all countries. Fieldwork dates were 20 August to 3 September 2021. The total sample size consisted of just over 3,000 individual respondents aged 18-74. The sample size was 1,001 in Germany and the US, and 500 in Indonesia and Nigeria. Results have been weighted so that each country counts equally in the total figures. Results have been weighted to reflect equal representation across demographic profiles based on age, gender and household income.

The survey consisted of eight questions, two on digital payments and six on central bank digital currencies. Respondents were provided the following introduction to the questions on CBDCs:

'The remaining questions are about a new form of payment called a "central bank digital currency" or CBDC which is a digital form of central bank money.

Today, central bank money exists in the form of cash, meaning banknotes and coins, issued

by the Federal Reserve/European Central Bank/Central Bank of Nigeria/Bank Indonesia. A CBDC would be a digital version of cash that can be used by all people – even those without a bank account – to pay digitally for goods and services. A CBDC would be considered legal tender or one that must be accepted as payment by all merchants and commercial establishments. It can be used online, in-store or person-to-person even without a network connection.

A CBDC is different from a cryptocurrency, like bitcoin. Unlike cryptocurrencies, a CBDC would be protected and regulated by the central bank that issues it, ensuring it remains stable and is accepted everywhere in the country like banknotes and cash. CBDC would not involve disclosing personal data to third parties.

Instead of going to an ATM or cash machine to withdraw cash, you would be able to access CBDC using your smartphone or other digital devices like a smartwatch or wristband, or a payment card that is similar to a bank card or debit card.'



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