SUMMER 2021

FINANCE21

ANDREW BAILEY TALKS ABOUT THE WORK CENTRAL BANKS HAVE DONE ON CLIMATE CHANGE, AND HOW IT WILL NEED TO EVOLVE

CRYPTOCURRENCIES HAVE FORESHADOWED A DIGITAL FUTURE FOR MONEY. GRAHAM BRIGHT DISCUSSES

LAEL BRAINARD PROVIDES AN UPDATE ON TECHNOLOGY TRANSFORMING THE US PAYMENTS SYSTEM

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Foreword

Welcome to the Summer edition of Finance2I, a *World Commerce Review* supplement. This publication has been prepared in response to readership demand for an overview of the financial sector in these turbulent and unique times.

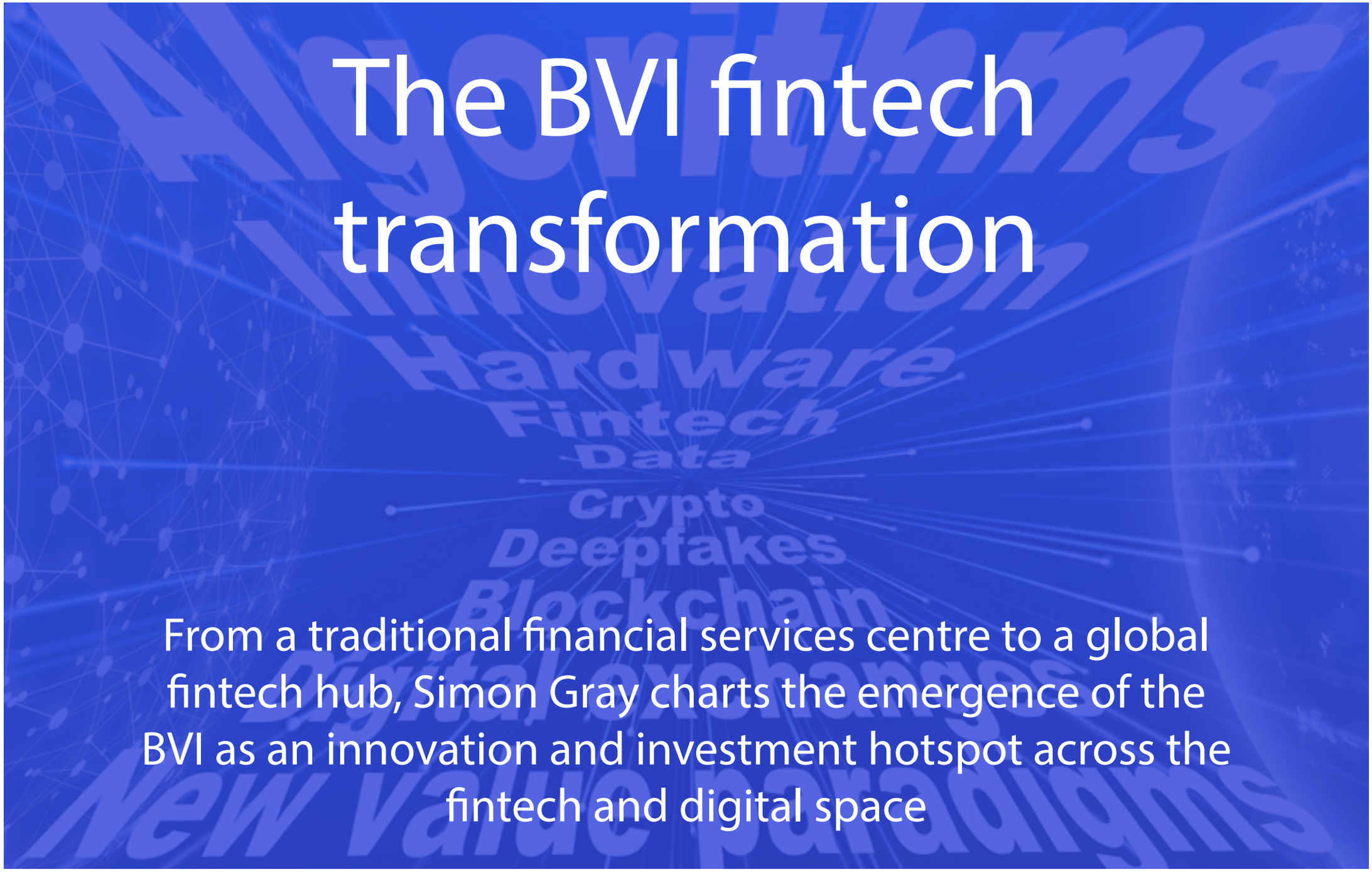
All aspects of the sector are examined, with the most respected authors providing the reader with the most comprehensive information available. Our brief is to provide all the data necessary for the readership to make their own informed decisions. All editorials are independent, and content is unaffected by advertising or other commercial considerations. Authors are not endorsing any commercial or other content within the publication. ■

CONTENTS

CONTENTS

CONTENTS

The BVI fintech transformation



From a traditional financial services centre to a global fintech hub, Simon Gray charts the emergence of the BVI as an innovation and investment hotspot across the fintech and digital space

The British Virgin Islands (BVI) is emerging as a global hub of fintech innovation and investment, evidenced by the arrival of several exciting fintech start-ups and providers over the last few years. Increasingly, businesses in the sector are recognising the advantages of the BVI, attracted by fit-for-purpose regulations, ease of doing business and a growing talent pool across the fintech and digital space.

Regulatory innovation

One of the BVI's most significant regulatory innovations to date is the BVI Fintech Regulatory Sandbox. This initiative was conceived to support fintech innovation while ensuring that digital products and services comply with regulatory standards.

The sandbox was developed in anticipation of the needs of financial services providers and innovators striving to succeed in an increasingly digitised global commercial environment. This regulatory framework facilitates the testing of 'innovative fintech,' which refers to technology that creates, enhances, or promotes financial products or services.

The sandbox tests the operational efficiency of new financial products, detecting problems, and envisioning improvements.

But in tandem with efficiency testing, the sandbox enables the BVI Financial Services Commission (FSC) to assess the product for essential compliance with legal and regulatory requirements. Companies undergoing sandbox testing are afforded 18 months to conduct business in the BVI without a licence.

The regulatory sandbox is currently accessible to BVI financial services providers and start-up businesses. The facility is also intended for a varied and expanding range of financial services and banking applications, as digital banking

and credit sector applications are expected to feature strongly in response to calls for more advanced virtual banking and credit services in the wake of the COVID-19 crisis.

The sandbox represents another future-focused strand of the BVI's innovative regulatory framework. It puts ongoing digitisation of banking and wider financial services at the centre of the jurisdiction's offering.

The support of fintech through the sandbox regulations initiative has contributed to the BVI's reputation as a progressive hub for digital asset centred opportunities. This standing is set to continue through the BVI's culture of evolving regulatory provision by benchmarking with the best.

The position of the British Virgin Island financial services centre as a global hub for financial technology development is only set to grow

Evolving fintech

Examples of future fintech developments extend to the promotion of smart contracts such as the Limited Liability Autonomous Organizations (LAO). A LAO is a digitally organised business – a Decentralized Autonomous Organization (DAO) within a corporate structure – with legal standing invariably structured as a limited liability company.

DAO activities are defined by rules that decide on the actions the organisation will take. The decision making within a DAO is made electronically by a computer code or through the votes of its members.

A key problem with first generation DAOs was rooted in their lack of clear legal basis, which resulted in issues including vulnerability to fraudulent attacks that in turn threw up difficult questions regarding liability for the loss of funds.

To address such problems, the DAO concept has progressed into a next generation form, the Limited Liability Autonomous Organization (LAO), which is essentially a DAO within a corporate wrapper. LAOs represent a model for the next generation of digital disruption in business registration.

Digital assets

The BVI is also focussed on the delivery of quality service provision to the rapidly growing digital assets market. Working hard to position itself as a fintech hub, the BVI became the jurisdiction of choice for token generation.

Tokens are issued through Initial Coin Offerings (ICOs) or Initial Token Offerings (ITOs). The token issuer will raise funds by issuing the coin or tokens on a blockchain network in return for investment in the form of conventional fiat currency or even cryptocurrencies.

The BVI subsequently expanded its offering from token generation into related areas such as token exchanges and investment funds focussed on cryptocurrency and other blockchain-based digital assets.

The BVI has striven to become a force in the new capital raising wave, which has led to increased interest in BVI companies as ICO issuer vehicles. The advantages offered by BVI company registration has seen the jurisdiction become an ICO hub of choice over other financial centres.

The BVI's range of legislative advantages and territorial benefits mean that BVI companies benefit from the corporate flexibility and efficiency enshrined in the modern and commercially minded BVI Business Companies Act (BCA).

In addition, a range of other jurisdictional company laws, the BVI's tax neutrality, the absence of capital control and maintenance rules, low incorporation and annual company maintenance costs, and efficient company maintenance, are among a range of additional benefits.

The BVI instinct for services innovation is demonstrated by the approach taken by the BVI Financial Services Commission (FSC) to the regulation of cryptocurrencies, tokens, and other digital assets. The BVI FSC has chosen a progressive approach as outlined in its Guidance on the Regulation of Virtual Assets in the British Virgin Islands 2020.

Unlike some other jurisdictions where specific regulations in relation to digital assets and related activities have been introduced, the BVI guidance for virtual assets examines each major piece of BVI financial services legislation on a case-by-case basis to assess how it should be applied in relation to tokens, cryptocurrencies, and other digital assets. The FSC will be regulating VASPs soon.

Innovation and support

The BVI's innovative approach to regulation has seen the territory become one of the largest cryptocurrency markets in the world, featuring in the top five geographical markets by US dollar denominated trade volume.

According to figures from PwC, the BVI is now home to one in six of the crypto hedge funds currently in place globally. In 2015, the BVI launched its Incubator and Approved Funds regimes. The BVI Incubator Funds regime proved to be ideal for light-touch, short term crypto vehicles – many of which are also hedge funds.

The regime has become known as the '20-20-20 fund' due to its structure, which takes a maximum of 20 investors, a minimum initial investment of US$20,000, and net assets of up to US$20 million.

This product appeals to the increasing number of pioneer managers who are looking to gain a track record before converting the Incubator Fund to a more sophisticated fund product. It works well for the growing fintech and crypto-asset fund type.

Crypto hedge fund managers are often attracted to this structure as offshore funds are typically subject to significant administration costs and high levels of supervision, whereas the BVI incubator fund minimises initial requirements so as to enable start-up crypto managers to come to market faster and more seamlessly.

The BVI Approved Funds framework facilitates a maximum of 20 investors, an aggregate maximum investment not exceeding US$100 million, requires no minimum subscription, and has an evergreen duration. An approved fund is very flexible and may operate without appointing a custodian, investment manager, or auditor, but unlike an incubator fund will need an administrator.

In 2020, the BVI launched its Private Investment Funds regime, which brought a new regulatory framework for closed-ended funds, including private equity and venture capital funds.

A private investment fund (PIF) is a company, limited partnership, unit trust, or any other body that collects and pools investor funds and issues proportionate interest calculated on the net asset value of the fund. A PIF must be recognised by the BVI Financial Services Commission (FSC) prior to carrying on business.

The popularity of the BVI's innovative funding regimes has helped to secure the jurisdictions position as one of the top global hubs for crypto hedge funds provision.

Adapting to market needs

The BVI financial services centre has nurtured success through diligent attention to the needs of its companies. This focus brought about the establishment of the Bank of Asia in the BVI in 2014, which was launched as a fully digital institution signifying the importance of the Asian market to the jurisdiction.

The bank represents one of the jurisdiction's most direct contributions to the digitisation of global banking, offering essential support to corporate service providers through a cost-effective banking solution for their customers.

Safeguarding growth

The BVI believes that at a time of unprecedented digital proliferation, industry change and opportunity, it is essential to safeguard growth through adherence to international standards.

To this end, the BVI Financial Services Commission follows the regulatory principles of the Basel Committee (Banking), the IAIS (Insurance), IOSCO (Securities, Investments, and Funds), the OECD (Corporate Governance), as

well as adhering to recommendations by the Financial Action Task Force (FATF), to combat money laundering and terrorist financing.

This adherence to standards safeguards investment in innovation, BVI companies, the territory, and wider business markets.

To further demonstrate its commitment to operational transparency and accountability, the BVI created the BVI Beneficial Ownership Secure Search System Act (BOSSs) in 2017.

The Act requires registered agents and financial service firms in the BVI to create a database of beneficial ownership information relating to in-scope entities they represent.

The BOSS system acts as a highly secure depository for essential business data. The BOSS is indicative of the BVI's commitment to legislative and services innovation at a time of exponential digital and fintech growth.

The acceleration in global digitization resulting from the COVID-19 pandemic will make the role of the BVI in global finance as a facilitator for innovation and investment ever more relevant.

Just as important is the BVI's example to other jurisdictions on the essential role of regulation and meeting international standards in safeguarding innovation and growth. Rather than stifle enterprise with unnecessary bureaucracy, smart regulation acts to safeguard success.

The example of the BVI Sandbox underpins this point. The position of the British Virgin Island financial services centre as a global hub for financial technology development is only set to grow. ■

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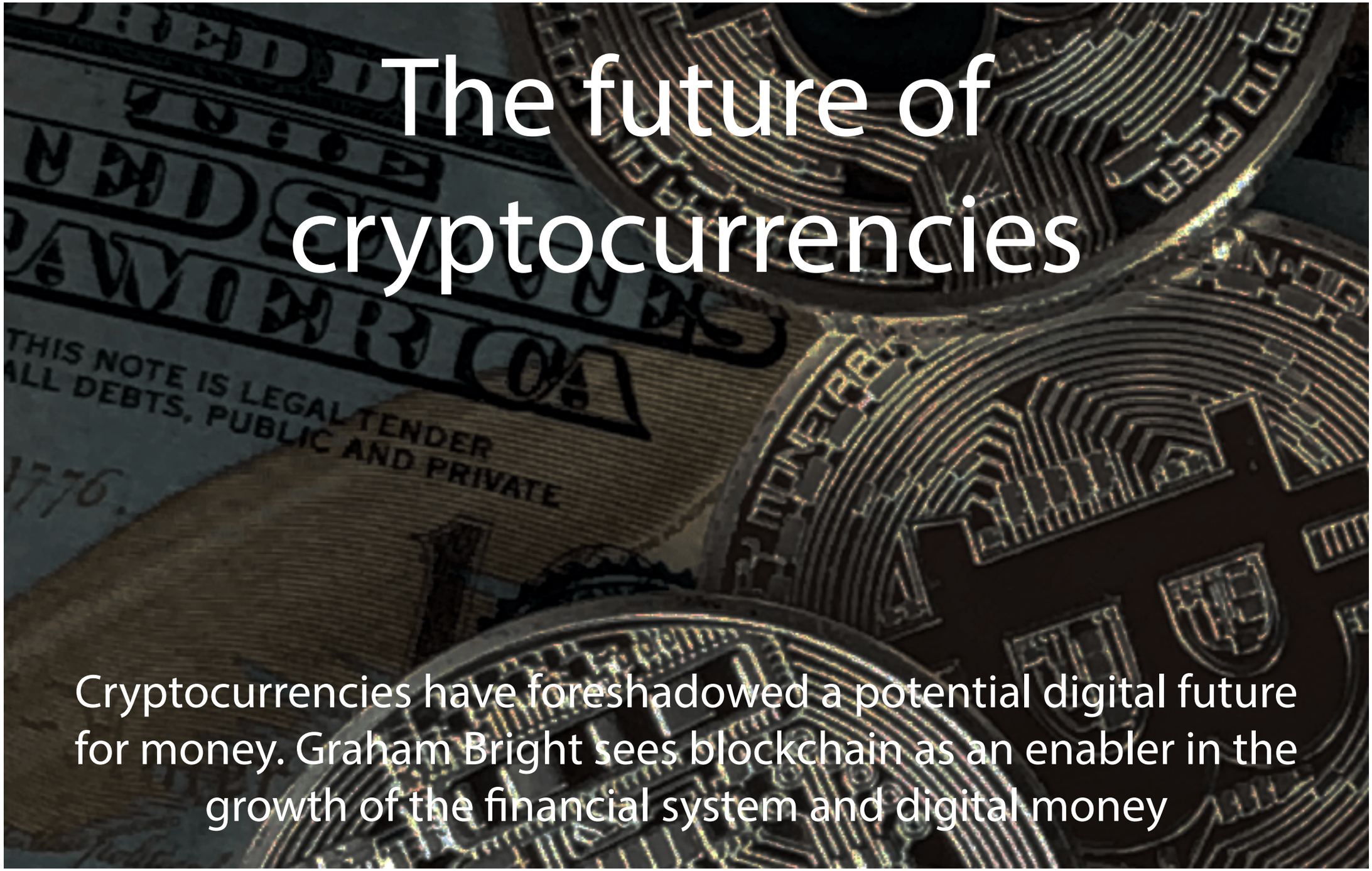
The future of cryptocurrencies



Cryptocurrencies have foreshadowed a potential digital future for money. Graham Bright sees blockchain as an enabler in the growth of the financial system and digital money

From their inception in the early 2010s, until their meteoric rise to fame in 2017 on the back of Bitcoin's astronomical bull market, digital (crypto) currencies were relatively obscure and only for speculators.

Cryptocurrencies such as Bitcoin have foreshadowed a potential digital future for money, though they exist outside the traditional global financial system and aren't legal tender like cash issued by governments.

Despite this, the blockchain technology behind them has robustly demonstrated its potential for use in financial services. As a cryptographically secured decentralized ledger system, it is ideally suited to the transparent and incorruptible recording and facilitation of global financial transactions quickly, cheaply and securely.

In fact, cryptocurrencies and networks such as Ripple[1] and RippleNet[2] have been used as alternative settlement mechanisms for international trade transactions for some time now.

However, rarely have the vagaries, person attitudes, whims and comments of so few radically influenced the fluctuation, value and trust in crypto for so many.

After a few tumultuous weeks, there has been a fundamental shift in perception, value, security and sustainability of crypto currencies.

From the lofty heights of Bitcoin valued recently at nearly $60,000 crashing to $31,000 in a matter of days, it appears that the opinions of a few individuals can spook markets such that any thoughts of crypto being a viable long term stable alternative to fiat currency are clearly suspect.

And one quote captured the sentiment:

"Unless and until Bitcoin can be used to buy a sandwich, or be accepted by your friends when you pay them back for a restaurant meal, then it is likely to remain just a playground for geeks and gamblers."

Just as in the 1990's when George Soros famously influenced market dynamics by shorting sterling, moving the UK government to withdraw from the exchange rate mechanism and requiring the Bank of England to prop up the Pound, so the recent tweets of Elon Musk have had a profound effect.

As cash ceases its grip on day-to-day transactions in favour of plastic, we will see more crypto currencies becoming commonplace

But problems are still apparent, namely a lack of sound legal frameworks with no way to enforce debts and, cryptocurrencies remain very volatile with huge price fluctuations even within a single day; an important component of a reliable currency is a relatively stable value.

Overcoming these two hurdles will put digital currencies firmly on the road to mainstream, and with over 4,000 different cryptocurrencies and tokens in operation, crypto payments are fast, cheap, secure, with easy set-up, enabling global funds transfers in minutes, not days.

Little wonder traditional financial organisations and governments need to take stock.

Why are banks and financial firms embracing crypto?

Since cryptocurrency is a virtual currency accessible via the internet, it is regulated not by a national regulator but by cryptography, giving it complete security and anonymity. It operates outside the analogue preserve of traditional banks, and without active moves to create an operating environment inside a tight regulatory framework, banks will not be competitive versus more agile alternative financial providers in future.

To avoid missing out on potential revenue streams, banks need to be involved, but also need to exercise caution.

The biggest exchanges in the world are in the USA, Japan (and China, before the government banned them), leaving the UK behind with overbearing legislation and basis lack of education on the impact of crypto. Even Ukraine and Malta have a greater understanding and operating infrastructure to compete with and supply crypto services.

The UK needs to up its game to re-establish itself as the crypto financial capital, with the first issue to develop policies to regulate the technology.

As stated by the London Stock Exchange *"the UK government needs to understand cryptocurrencies in order to place City of London and the nation at the centre of a 'reputable and safe' financial market."*

It is all down to control of assets, and banks need to take a pro-active approach to ensuring underlying technology, accessibility and choice are available for all types of investors and clients.

These organisations rely on management and control of fiat currency within a given jurisdiction, with the aim of profit and a charge for additional services, such as cross border transfers.

Key points that will enable banks to participate include assistance with immediate, simple, transparent exchange from crypto to fiat currency stored on a memory card or wallet, using mobile technology, making it easier to exchange into and out of accounts seamlessly.

Secondly, building on a legacy of security, where banks can offer the benefits of cryptography in protecting the asset in a public key infrastructure prohibiting fraud, copy or misappropriation. Also, as transfer does not require correspondent complex international banking arrangements, with the cost and time implications of such services, all transfers are fast, easy and inexpensive.

Positioning is everything, and whilst the role of financial and technology companies becomes increasingly blurred, Bank of America reportedly holds more blockchain-related patents than any other company, even beating tech giant IBM.

Currently payments are expensive, take days and may require multiple hops to achieve delivery.

Ultimately transfers between wallets and much quicker more cost-effective for cross-border transactions, and with banks losing customer loyalty, without immediate action may find their clients looking for alternative applications and cheap payment mechanisms.

What about governments?

The greatest fear for any government is uncontrolled speculation affecting a home currency.

Cryptocurrencies, such as stable coins, pegged to other assets such as the US dollar, can now act as a safer and more trustworthy way of safeguarding people's assets.

Ultimately, governments wish to control money supply and where cash is moving. This is especially the case where high rates of cryptocurrency adoption have also been recorded in developing countries, like Vietnam, Turkey and South Africa. And with these different cultures, acceptance, handling, and regulation of crypto across the globe are quite different.

A primary method to regain control is the power of taxation, always a major weapon in a governments' armoury of revenue-generating measures. By exerting regulation in this area authorities can prevent loss of monetary control and revenue, taxing any fiat money used when buying, selling, or exchanging virtual tokens.

Whilst traders use cryptocurrencies as medium of exchange for basic goods and services in the natural course of commerce, cases are already emerging of the IRS chasing investors over non-reported trades and profits, making it subject to either income or a capital gains tax.

Rather than merely accept the thousands of coins, tokens, and assets in circulation, many of which have no value, governments are looking to introduce their own digital assets. These are totally under their control, backed and pegged to the fiat currency, using underlying blockchain technology, with immediate value, trust, and portability, without the speculative risks.

In China, the digital Yuen backed by deposits held by China's central bank has been tested in shops and used to pay bills and is essentially the first digital currency accepted as legal tender.

Importantly, China has also mandated those exchanges will need to be registered and regulated as ownership of crypto is still permitted, but any non-Yuen cryptocurrency payments are banned along with mining and trading, but possession is not yet affected.

In the authoritarian state of China, digitized programmable money, could easily identify criminal activity, source and destination of funds, spending patterns and facilitate instant fine deductions.

In other countries, take up of crypto is far greater than immediately thought, particularly in jurisdictions not normally associated with speculative assets.

In Nigeria, cryptocurrency use is on the rise in Nigeria, with 33% of Nigerians either using or owning cryptocurrency, primarily using it as a cheaper solution to send expensive FX across borders.

Nigeria has banned banks and financial institutions from providing exchange services and threatens to close bank accounts found using cryptocurrency exchanges. In the Philippines where remittance and transfers companies are common with a large expat community, the Central Bank has approved several crypto exchanges.

However, by imposing draconian measures against the population with the risk of major fines, imprisonment and sanctions, countries can prohibit mining coins they cannot control. And, in some countries, fear of the effects and implications of crypto has led to outright bans on buying, owning, and trading altogether including Algeria, Bolivia, Morocco, Nepal, Pakistan, and Vietnam.

Examples of other country bans include the central bank of Turkey, banning cryptocurrency payments with far tighter restrictions on the cryptocurrency exchanges due to lack of regulation and a central authority for the coins.

The view was taken a) that it is in the public interest to prevent opportunities to fund illegal activities, and b) protecting investors especially where wild fluctuations would affect investors who can't recover any losses and have no legal redress.

In Saudi Arabia, to control foreign exchange, financial institutions have been warned from using Bitcoin although penalties are not yet clear.

With the anticipated introduction by the Indian central bank of the digital rupee, just how far India is prepared to legislate is illustrated by the terms of a proposed bill, which criminalises possession, issuance, mining, trading and transferring crypto assets.

In the UK the FCA banned the offering of crypto derivatives products to retail users due to a number of inherent risks that the regulatory body believes could negatively affect retail customers. Other regulation will come.

Recent events have indicated just how fragile, volatile and erratic the markets can be, with regular rises and falls which would years ago have been classified on exchanges as 'significant' market events.

As a result we expect many more countries to look at introduction of own taxable digital currency assets, and review and place firm restrictions on exchanges, activities, mining and unregulated use of crypto currencies such as Bitcoin.

Are currencies such as Bitcoin a good or bad thing?

Whilst we have seen wild speculation, adverse risk and price fluctuation, the technology is sound and has proved itself; it is convenient, cheap, fast and extremely reliable.

If banks can embrace the technology and provide standardisation, rationalisation and reusability with the same or similar cost schedule and client experience that payments infrastructures should offer, this will be a positive.

The one area where Bitcoin and other cryptocurrencies will always differentiate themselves in the anonymity it provides to the holder. And security is an additional issue and personal responsibility is key.

You may have read about a UK investor who mistakenly threw away a hard drive containing the crypto key enabling access and spending of 7,500 Bitcoins, equating to more than $280 million.

He sought permission to search a council refuse facility, offering a 25% donation if he was able to recover the data. Permission was refused and the potential monies lost. Other cases cite lost or forgotten passwords effectively leaving the unfortunate owners with zero value.

Just remember if the firm or exchange you've used has gone out of business and can't pay your claim, there is no equivalent of a financial services compensation scheme to cover losses, no helpdesk, no legal precedent or legal remedy.

The power game

Much has been written about the amount of energy required to run crypto mining operations. As the primary method of earning coins, miners run powerful arrays of computers that verify blocks of transactions made with cryptocurrencies, all competing in a global, decentralised computer network. This needs considerable resources, with estimates of required power equivalent to the total consumption of Denmark.

And countries which heavily subsidize electricity costs (such as Iran) are hosting facilities for China and other jurisdictions. This is earning large sums for the miners but having a significant impact on pollution and global warming on Iran, with little additional economic benefit for the state.

According to the BBC[3] Bitcoin uses more energy than Argentina, and if Bitcoin was a country, it would be in the top 30 energy users worldwide. Perhaps a carbon tax on CO_2 emission is the next step to controlling or at least monetizing the immense power requirements of mining operations globally.

Conclusion

Love them or loathe them, crypto currencies, coins and tokens, valued in billions of US Dollars, will play an increasing role in complementing and competing with monetary systems globally. Designed to work autonomously and independently of central banks, regulators and governments, they provide an anonymous, secure, low cost, globally accessible, borderless mechanism for payment, underpinned by riskless DLT technology.

We can expect to see increased uptake of crypto in international trade, with the use of barter tokens, promoting financial inclusion with lower points of entry and easier payment exchange, especially in countries with rampant inflation and unstable banking systems.

As cash ceases its grip on day-to-day transactions in favour of plastic, we will see more crypto currencies becoming commonplace.

However, whilst the number of coin offerings, price, value and faith in them will rise and wain, governments and banks will embrace controlled regulated digital assets, the biggest impact on the finance industry and economies as a whole will be through the active technological advancement in global use of what one may classify as a by-product, namely blockchain. ■

Graham Bright is the Head of Compliance and Operations at Euro Exim Bank

Endnotes

1. *https://en.wikipedia.org/wiki/Ripple_(payment_protocol)*
2. *https://ripple.com/ripplenet/*
3. *https://www.bbc.co.uk/news/technology-56012952*

Private money and central bank money as payments go digital

Technology is driving dramatic change in the US payments system. Lael Brainard provides an update on CBDCs and a digital dollar

Technology is driving dramatic change in the US payments system, which is a vital infrastructure that touches everyone[1]. The pandemic accelerated the migration to contactless transactions and highlighted the importance of access to safe, timely, and low-cost payments for all.

With technology platforms introducing digital private money into the US payments system, and foreign authorities exploring the potential for central bank digital currencies (CBDCs) in cross-border payments, the Federal Reserve is stepping up its research and public engagement on CBDCs.

As Chair Powell discussed recently, an important early step on public engagement is a plan to publish a discussion paper this summer to lay out the Federal Reserve Board's current thinking on digital payments, with a particular focus on the benefits and risks associated with CBDC in the US context[2].

Sharpening the focus on CBDCs

Four developments—the growing role of digital private money, the migration to digital payments, plans for the use of foreign CBDCs in cross-border payments, and concerns about financial exclusion—are sharpening the focus on CBDCs.

First, some technology platforms are developing stablecoins for use in payments networks[3]. A stablecoin is a type of digital asset whose value is tied in some way to traditional stores of value, such as government-issued, or fiat, currencies or gold.

Stablecoins vary widely in the assets they are linked to, the ability of users to redeem the stablecoin claims for the reference assets, whether they allow unhosted wallets, and the extent to which a central issuer is liable for making good on redemption rights. Unlike central bank fiat currencies, stablecoins do not have legal tender status.

Depending on underlying arrangements, some may expose consumers and businesses to risk. If widely adopted, stablecoins could serve as the basis of an alternative payments system oriented around new private forms of money.

Given the network externalities associated with achieving scale in payments, there is a risk that the widespread use of private monies for consumer payments could fragment parts of the US payment system in ways that impose burdens and raise costs for households and businesses.

In light of the growing role of digital private money in the broader migration to digital payments ... the Federal Reserve is stepping up its research and public engagement on a digital version of the US dollar

A predominance of private monies may introduce consumer protection and financial stability risks because of their potential volatility and the risk of run-like behaviour.

Indeed, the period in the nineteenth century when there was active competition among issuers of private paper banknotes in the United States is now notorious for inefficiency, fraud, and instability in the payments system[4]. It led to the need for a uniform form of money backed by the national government.

Second, the pandemic accelerated the migration to digital payments. Even before the pandemic, some countries, like Sweden, were seeing a pronounced migration from cash to digital payments[5]. To the extent that digital payments crowd out the use of cash, this raises questions about how to ensure that consumers retain access to a form of safe central bank money.

In the United States, the pandemic led to an acceleration of the migration to digital payments as well as increased demand for cash. While the use of cash spiked at certain times, there was a pronounced shift by consumers and businesses to contactless transactions facilitated by electronic payments[6].

The Federal Reserve remains committed to ensuring that the public has access to safe, reliable, and secure means of payment, including cash. As part of this commitment, we must explore—and try to anticipate—the extent to which households' and businesses' needs and preferences may migrate further to digital payments over time.

Third, some foreign countries have chosen to develop and, in some cases, deploy their own CBDC. Although each country will decide whether to issue a CBDC based on its unique domestic conditions, the issuance of a CBDC in one jurisdiction, along with its prominent use in cross-border payments, could have significant effects across the globe.

Given the potential for CBDCs to gain prominence in cross-border payments and the reserve currency role of the dollar, it is vital for the United States to be at the table in the development of cross-border standards.

Finally, the pandemic underscored the importance of access to timely, safe, efficient, and affordable payments for all Americans and the high cost associated with being unbanked and underbanked.

While the large majority of pandemic relief payments moved quickly via direct deposits to bank accounts, it took weeks to distribute relief payments in the form of prepaid debit cards and checks to households who did not have up-to-date bank account information with the Internal Revenue Service.

The challenges of getting relief payments to these households highlighted the benefits of delivering payments more quickly, cheaply, and seamlessly through digital means.

Policy considerations

In any assessment of a CBDC, it is important to be clear about what benefits a CBDC would offer over and above current and emerging payments options, what costs and risks a CBDC might entail, and how it might affect broader policy objectives. I will briefly discuss several of the most prominent considerations.

Preserve general access to safe central bank money

Central bank money is important for payment systems because it represents a safe settlement asset, allowing users to exchange central bank liabilities without concern about liquidity and credit risk. Consumers and businesses don't generally consider whether the money they are using is a liability of the central bank, as with cash, or of a commercial bank, as with bank deposits.

This is largely because the two are seamlessly interchangeable for most purposes owing to the provision of federal deposit insurance and banking supervision, which provide protection for consumers and businesses alike. It is not obvious that new forms of private money that reference fiat currency, like stablecoins, can carry the same level of protection as bank deposits or fiat currency.

Although various federal and state laws establish protections for users, nonbank issuers of private money are not regulated to the same extent as banks, the value stored in these systems is not insured directly by the Federal Deposit Insurance Corporation, and consumers may be at risk that the issuer will not be able to honour its liabilities.

New forms of private money may introduce counterparty risk into the payments system in new ways that could lead to consumer protection threats or, at large scale, broader financial stability risks.

In contrast, a digital dollar would be a new type of central bank money issued in digital form for use by the general public. By introducing safe central bank money that is accessible to households and businesses in digital payments systems, a CBDC would reduce counterparty risk and the associated consumer protection and financial stability risks.

Improve efficiency

One expected benefit is that a CBDC would reduce or even eliminate operational and financial inefficiencies, or other frictions, in payments, clearing, and settlement. Today, the speed by which consumers and businesses can access the funds following a payment can vary significantly, up to a few days when relying on certain instruments, such as a cheque, to a few seconds in a real-time payments system.

Advances in technology, including the use of distributed ledgers and smart contracts, may have the potential to fundamentally change the way in which payment activities are conducted and the roles of financial intermediaries and infrastructures. The introduction of a CBDC may provide an important foundation for beneficial innovation and competition in retail payments in the United States.

Most immediately, we are taking a critical step to build a strong foundation with the introduction of the FedNow[SM] Service, a new instant payments infrastructure that is scheduled to go into production in two years. The FedNow Service will enable banks of every size and in every community across America to provide safe and efficient instant payment services around the clock, every day of the year.

Through the banks using the service, consumers and businesses will be able to send and receive payments conveniently, such as on a mobile device, and recipients will have full access to funds immediately.

Promote competition and diversity and lower transactions costs

Today, the costs of certain retail payments transactions are high and not always transparent to end users[7]. Competition among a diversity of payment providers and payment types has the potential to increase the choices available to businesses and consumers, reduce transactions costs, and foster innovation in end-user services, although it could also contribute to fragmentation of the current payments system. By providing access to a digital form of safe central bank money, a CBDC could provide an important foundation on which private-sector competition could flourish.

Reduce cross-border frictions

Cross-border payments, such as remittances, represent one of the most compelling use cases for digital currencies. The intermediation chains for cross-border payments are notoriously long, complex, costly, and opaque.

Digitalisation, along with a reduction in the number of intermediaries, holds considerable promise to reduce the cost, opacity, and time required for cross-border payments. While the introduction of CBDCs may be part of the solution, international collaboration on standard setting and protections against illicit activity will be required in order to achieve material improvements in cost, timeliness, and transparency[8].

We are collaborating with international colleagues through the Bank for International Settlements, Committee on Payments and Market Infrastructures, and the G7 to ensure the US stays abreast of developments related to CBDC abroad.

We are engaging in several international efforts to improve the transparency, timeliness, and cost-effectiveness of cross-border payments. It will be important to be engaged at the outset on the development of any international standards that may apply to CBDCs, given the dollar's important role as a reserve currency.

Complement currency and bank deposits

A guiding principle for any payments innovation is that it should improve upon the existing payments system. Consumers have access to reliable money in the forms of private bank accounts and central bank issued currency, which form the underpinnings of the current retail payments system. The design of any CBDC should complement and not replace currency and bank accounts.

Preserve financial stability and monetary policy transmission

The introduction of a CBDC has the potential to have wide-reaching effects, and there are open questions about how CBDC could affect financial stability and monetary policy transmission.

Some research indicates that the introduction of a CBDC might raise the risk of a flight out of deposits at weak banks in favour of CBDC holdings at moments of financial stress[9]. Other research indicates that the increase in competition could result in more attractive terms on transactions accounts and an overall increase in banking system deposits[10].

Banks play a critical role in credit intermediation and monetary policy transmission, as well as in payments. Thus, the design of any CBDC would need to include safeguards to protect against disintermediation of banks and to preserve monetary policy transmission more broadly.

While it is critical to consider the ways in which a CBDC could introduce risks relative to the current payments system, it may increase resilience relative to a payments system where private money is prominent.

Protect privacy and safeguard financial integrity

The design of any CBDC would need to both safeguard the privacy of households' payments transactions and prevent and trace illicit activity to maintain the integrity of the financial system, which will require the digital verification of identities.

There are a variety of approaches to safeguarding the privacy of payments transactions while also identifying and preventing illicit activity and verifying digital identities.

Addressing these critical objectives will require working across government agencies to assign roles and responsibilities for preventing illicit transactions and clearly establishing how consumer financial data would be protected.

Increase financial inclusion

Today 5.4 percent of American households lack access to bank accounts and the associated payment options they offer, and a further 18.7 percent were underbanked as of 2017[11]. The lack of access to bank accounts imposes high burdens on these households, whose financial resilience is often fragile.

At the height of the pandemic, the challenges associated with getting relief payments to hard-to-reach households highlighted that it is important for all households to have transactions accounts. The Federal Reserve's proposals for strengthening the Community Reinvestment Act emphasize the value of banks providing cost-free, low-balance accounts and other banking services targeted to underbanked and unbanked communities[12]. And a core goal of FedNow is to provide ubiquitous access to an instant payments system via depository institutions.

CBDC may be one part of a broader solution to the challenge of achieving ubiquitous account access[13]. Depending on the design, CBDC may have the ability to lower transaction costs and increase access to digital payments. In emergencies, CBDC may offer a mechanism for the swift and direct transfer of funds, providing rapid relief to those most in need.

A broader solution to financial inclusion would also need to address any perceived barriers to maintaining a transaction account, along with the need to maintain up-to-date records on active accounts to reach a large segment of the population[14].

To explore these broader issues, the Federal Reserve is undertaking research on financial inclusion. The Federal Reserve Bank of Atlanta is launching a public–private sector collaboration as a Special Committee on Payments Inclusion to ensure that cash-based and vulnerable populations can safely access and benefit from digital payments[15].

This work is complemented by a new Federal Reserve Bank of Cleveland initiative to explore the prospects for CBDC to increase financial inclusion. The initiative will identify CBDC design features and delivery approaches focused on expanding access to individuals who do not currently use traditional financial services.

Technology considerations

Multidisciplinary teams at the Federal Reserve are investigating the technological and policy issues associated with digital innovations in payments, clearing, and settlement, including the benefits and risks associated with a potential US CBDC.

For example, the TechLab group at the Federal Reserve Board is performing hands-on research and experimentation on potential future states of money, payments, and digital currencies. A second group, the Digital Innovations Policy program, is considering a broad range of policy issues associated with the rise of digital payments, including the potential benefits and risks associated with CBDC.

To deepen our research on the technological design of a CBDC, the Federal Reserve Bank of Boston is partnering with Massachusetts Institute of Technology's (MIT) Digital Currency Initiative on Project Hamilton to build and test a hypothetical digital currency platform using leading edge technology design options[16].

This work aims to research the feasibility of the core processing of a CBDC, while remaining agnostic about a range of policy decisions. MIT and the Boston Fed plan to release a white paper next quarter that will document the ability to meet goals on throughput of geographically dispersed transactions with core processing and create an open-source license for the code.

Subsequent work will explore how addressing additional requirements, including resiliency, privacy, and anti-money-laundering features, will impact core processing performance and design.

Banking activities

Research and experimentation are also occurring at supervised banking institutions to explore new technology to enhance their own operations and in response to demands from their clients for services such as custody of digital assets.

While distributed ledger technology may have the potential to improve efficiencies, increase competition, and lower costs, digital assets pose heightened risks such as those related to Bank Secrecy Act/anti-money laundering, cybersecurity, price volatility, privacy, and consumer compliance.

The Federal Reserve is actively monitoring developments in this area, engaging with the industry and other regulators, and working to identify any regulatory, supervisory, and oversight framework gaps.

Given that decisions at one banking agency can have implications for the other agencies, it is important that regulators work together to develop common approaches to ensure that banks are appropriately identifying, monitoring, and managing risks associated with digital assets.

Public engagement

In light of the growing role of digital private money in the broader migration to digital payments, the potential use of foreign CBDCs in cross-border payments, and the importance of financial inclusion, the Federal Reserve is stepping up its research and public engagement on a digital version of the US dollar. Members of Congress and executive agencies are similarly exploring this important issue.

As noted above, to help inform these efforts, the Federal Reserve plans to issue a discussion paper to solicit public comment on a range of questions related to payments, financial inclusion, data privacy, and information security, with regard to a CBDC in the US context[17].

The Federal Reserve remains committed to ensuring a safe, inclusive, efficient, and innovative payments system that works for all Americans. ■

Lael Brainard is a member of the Board of Governors of the Federal Reserve System

Endnotes

1. I am grateful to Alexandra Fernandez, Sonja Danburg, David Mills, and David Pope of the Federal Reserve Board for their assistance in preparing this text. These are my own views and do not necessarily reflect those of the Federal Reserve Board or the Federal Open Market Committee.

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14. For more information, see the Federal Reserve Community Reinvestment Act Proposed Rulemaking.
15. Federal Reserve Bank of Atlanta, "New Committee to Advance Safe, Efficient, Inclusive Payments,"` news release, May 12, 2021.

16. See Eric Rosengren, "Central Bank Perspectives on Central Bank Digital Currencies," remarks at the panel discussion of the Program on International Financial Systems, Harvard Law School, May 12, 2021, ; Jim S Cunha, "Boston Fed's Digital Dollar Research Project Honors 2 Hamiltons, Alexander and Margaret," Federal Reserve Bank of Boston, February 25, 2021; and Lael Brainard, "An Update on Digital Currencies," remarks at the Federal Reserve Bank of San Francisco Innovation Office Hours, August 13, 2020.
17. See Jerome Powell, "Federal Reserve Chair Jerome H Powell Outlines the Federal Reserve's Response to Technological Advances Driving Rapid Change in the Global Payments Landscape," Board of Governors of the Federal Reserve System news release, May 20, 2021.

This article is based on a speech delivered at the Consensus by CoinDesk 2021 Conference, Washington, DC (via webcast)

The conflict between CBDC goals and design choices

Central banks have a growing interest in digital currencies. Antonio Fatás argues that CBDCs alone will only achieve an inclusive payment system if they ensure competition

There is growing interest by central banks on the launch of digital currencies accessible to everyone. The main goal is to produce a more resilient, efficient and inclusive payment system. This column argues that central bank digital currency alone will not achieve those goals unless central banks are willing to engage in all the steps of the payment system or complement their digital currency with a broad set of regulatory changes to ensure competition and interoperability of payments.

In response to new developments in the area of digital money and payments, an increasing number of central banks are exploring the possibility of creating their own version of digital money, typically referred to as central bank digital currency, or CBDC (Auer *et al*. 2020, Niepelt 2020). The motivations of central banks to launch CBDC are diverse but they start with the principle that we need a public option for payments (Boar *et al*. 2020). In some sense this just means maintaining the status quo.

Currently, physical currency, issued by central banks, runs parallel to private digital payments. But as the role of physical currency is diminishing, we might need a digital replacement controlled by the central bank. In the words of the ECB (2020), CBDC is the *"natural transition from currency"* and it will *"give people more choices about how to pay."*

But what are the economic arguments that justify the need for a public option running in parallel to private systems of payments? Fundamentally, the existence of a public payment option can be seen as central to the trust in the currency and its role as the unit of account (Söderberg 2019).

Today, €10 in a bank account can be redeemed by withdrawing a €10 note. This process creates a connection between the value of the bank account deposit and the unit of account managed by the central bank. In the absence of physical currency, that link would disappear[1].

But beyond trust in the currency most central banks tend to emphasize operational benefits of CBDC such as promoting a resilient, inclusive and efficient payment system (BIS 2020). For example, the ECB sees the value of resilience to *"cushion the impact of extreme events when traditional payment services may no longer function"* (ECB 2020). And the Riksbank specifically brings up both the importance of promoting competition and the need to provide access to individuals struggling with digital payments (Söderberg 2019).

There is no doubt that CBDC could be part of a comprehensive strategy to improve the digital infrastructure of payments, but it cannot be seen as the ultimate solution

In summary, central banks are looking for improved resilience, financial inclusion and increasing competition. But these three goals can only be achieved if CBDC can effectively compete with private versions of digital money. This requires that CBDC offers a competitive payment technology, and it might require that the central bank controls many or all of the steps of the payment system, something that goes beyond the current CBDC designs being discussed.

In order to understand the issue, we first need to recognise that digital money is a lot more complex than cash. With cash the issuance of the asset also represents the creation of the (physical) payment technology. But when it comes to digital money, there is a separation between the asset (the digital repository of value) and the payment technology.

And digital payment technologies are complex and composed of many layers controlled by different private actors. An account at the central bank will always be a digital record of value but this does not guarantee that it will be accepted for payments everywhere of that it will be as efficient as alternative forms of payments. If CBDC is not competitive with private alternatives it will be challenging to achieve the stated goals.

Design of CBDC: it's all in the details

When it comes to the design of CBDC there are three main possibilities being considered (Auer and Böhme 2020):

- Direct CBDC. Accounts are opened directly at the central bank. The central bank controls the ledger and is involved in the execution of retail payments. The central bank acts like a regular bank.

- Hybrid or intermediated CBDC. The accounts also represent a liability on the central bank balance sheet, but private intermediaries handle retail payments (and possibly account opening). The difference between

the hybrid and intermediated model is in whether or not the central bank keeps a central ledger of all transactions.

- Synthetic CBDC. Accounts are not on the balance sheet of central banks and, for this reason, many argue that this is not true CBDC. Intermediaries hold the liability but are required to deposit 100% of the customers' accounts at the central bank[2].

Central banks are mostly focusing on the first two options, where CBDC becomes a liability on their balance sheet. But the success of CBDC depends on the details on how payments will be executed. In fact, in all cases above, even in the case of direct CBDC, private sector intermediaries are likely to be involved in a transaction.

Today when making a payment using a bank account, it is likely that additional intermediaries are part of the process: a credit card company (eg. Visa or Mastercard) or the company managing the infrastructure of payments (eg. Stripe or PayPal).

Central banks are reluctant to become payment providers and, for that reason, current projects (eg. in China, Sweden, and the euro area) are all using a hybrid model. Their reluctance comes from the fact that they do not want to *"provide end user-facing services such as customer identification and support"* and, in addition, *"a parallel infrastructure would also run counter to the aim of issuing a digital euro in order to improve the cost and environmental footprint of payments"* (ECB (020).

But achieving resilience when a large part of the infrastructure is controlled by the private sector will not be obvious. As an example, when the Wirecard scandal broke out in September 2020, the Monetary Authority of

Singapore ordered Wirecard to stop their payment services in Singapore. As a result, many merchants lost their ability to accept regular credit card payments until a new provider was found.

Similarly, how do you achieve financial inclusion if CBDC is not accepted as a means of payment everywhere? Central banks aim for CBDC to be as accepted as cash. But how do you achieve this goal given that today, this is not even the case for existing forms of private digital money?

Finally, and possibly the most important issue, increasing competition requires much more than the existence of CBDC as an asset. In fact, the creation of CBDC could reduce competition in payments. The Diem association (formerly known as Libra) very much welcomes the creation of CBDCs as they could facilitate the launch of its private currency by becoming the digital assets backing the issuance of the Diem currency (Diem Association 2020).

What really matters for competition are issues such as the potential network effects of ecosystems dominated by Big Tech companies or the interoperability of alternative payment systems. One can argue that CBDC can help by streamlining and redesigning the back-office payment infrastructure.

This is correct, but it is also true that many central banks have already been working hard at this with the creation of instant payment technologies and open banking, without the need to create a CBDC.

In summary, achieving the stated CBDC goals requires a lot more than creating an asset at the central bank balance sheet. Issues around acceptance of CBDC as a means of payment, regulation and interoperability of payment systems seem to be much more important.

There is no doubt that CBDC could be part of a comprehensive strategy to improve the digital infrastructure of payments, but it cannot be seen as the ultimate solution. ■

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Endnotes

1. From Söderberg (2019): "There is a risk of basic trust in the Swedish krona and the monetary system being undermined when it is no longer possible for the general public to change their banks deposits into state money".

2. This design is in fact not different from some current forms of private digital money. In China, WeChat pay or Alipay are required to maintain customers' funds at the central bank. The ECB, among other central banks, is clearly against this design arguing that the digital Euro "should be designed in such a way as to preserve the nature of the digital euro as a central bank liability" (ECB 2020)

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Parachute pants and central bank money

There is a global rush to roll out CBDCs. Randal Quarles suggests this is akin to the 1980s parachute pants fad and the fear of missing out

I have been reflecting recently on America's centuries-long enthusiasm for novelty. In the main, it has served us and the world well, by making America the home of so many of the scientific and practical innovations that have transformed life in the 21st century from that of the 19th.

But, especially when coupled with an equally American susceptibility to boosterism and the fear of missing out, it has also sometimes led to a mass suspension of our critical thinking and to occasionally impetuous, deluded crazes or fads.

Sometimes the consequences are in hindsight merely puzzling or embarrassing, like that year in the 1980s when millions of Americans suddenly started wearing parachute pants. But the consequences can also be more serious.

Which brings us to my topic: central bank digital currencies, or CBDCs. In recent months, public interest in a 'digital dollar' has reached fever pitch. A wide range of experts and commenters have suggested that the Federal Reserve should issue—and in fact may need to issue—a CBDC.

But before we get carried away with the novelty, I think we need to subject the promises of a CBDC to a careful critical analysis. In offering my views on this and other issues related to CBDCs, I am speaking for myself as a member of the Board of Governors, and not for the Board itself or any other Fed policymakers.

And, indeed, you will all have seen Chair Powell's recent announcement that we are preparing a comprehensive discussion paper on this issue that will be the first step in a thorough public process to conduct just this sort of critical analysis, which I do not want to prejudge.

But I do want to give some sense of the issues I think we will need to grapple with in this process, how I will be thinking about them, and the high bar that I think any proposal to create a US CBDC must clear.

So, let's begin with a basic question: what problem would a CBDC solve? To answer, we first need to define the term CBDC and assess the current state of the US payment system.

What do we mean by 'CBDC'?

The Bank for International Settlements has defined a CBDC as *"a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank."*[1]

... our work is cut out for us as we proceed to rigorously evaluate the case for developing a Federal Reserve CBDC. Even if other central banks issue successful CBDCs, we cannot assume that the Federal Reserve should issue a CBDC

My first observation is that the general public *already* transacts mostly in digital dollars—by sending and receiving electronic balances in our commercial bank accounts. These digital dollars are not a CBDC, because they are liabilities of commercial banks rather than the Federal Reserve.

Importantly, however, digital dollars at commercial banks are federally insured up to $250,000, which means that for deposits up to that amount—which means for essentially all retail deposits in the United States—they are as sound as a central bank liability.

The Federal Reserve also provides digital dollars directly to commercial banks and certain other financial institutions. Federal law allows these financial institutions to maintain accounts with—and receive payments services from—the Federal Reserve. Balances in Federal Reserve accounts serve a vital financial stability function by providing a safe and liquid settlement asset for the US economy.

To summarize then, the dollar is already highly digitized. The Federal Reserve provides a digital dollar to commercial banks, and commercial banks provide digital dollars and other financial services to consumers and businesses. This arrangement serves the nation and the economy well: the Federal Reserve functions in the public interest by promoting the health of the US economy and the stability of the broader financial system, while commercial banks compete to attract and effectively serve customers.

So, given the existing digitization of the US dollar, how would a CBDC differ from the digital dollars we use today? The key distinction is that, when most commentators speculate about a Federal Reserve CBDC, they assume that it would be available to the general public directly from the central bank.

A CBDC of this nature could take different forms. One is an account-based model, in which the Federal Reserve would provide individual accounts directly to the general public. Like the accounts that the Federal Reserve currently provides to financial institutions, an account holder would send and receive funds by debit or credit to their Federal Reserve account.

A different CBDC model could involve a CBDC that is not maintained in Federal Reserve accounts. This form of CBDC would be closer to a digital equivalent of cash. Like cash, it would represent a claim against the Federal Reserve, but it could potentially be transferred from person to person (like a banknote) or through intermediaries.

I am sceptical that the Federal Reserve has legal authority to pursue either of these CBDC models without legislation. Nevertheless, the recent clamour over CBDCs makes it appropriate to explore the benefits, costs, and practicalities of implementing one in the United States if such legislative authority were granted. Let's start with a look at the current US payment system that a Fed CBDC would fit into.

Current state of the US payment system

The Federal Reserve and private-sector interbank payment services already offer an array of options that facilitate efficient, electronic US dollar payments. A few statistics related to the main large-value payment systems for US dollars are illustrative.

The Federal Reserve's large-value payment service (the Fedwire Funds Service) processes nearly $4 trillion in payments every day[2]. These payments settle instantly in a bank's account at the Federal Reserve. A private-sector entity (The Clearing House) operates a large-value payment system that settles nearly $2 trillion in payments every day[3]. These payments do not settle in Federal Reserve accounts, but they are underpinned by balances on the books of a Federal Reserve Bank.

Smaller-value payments often settle more slowly than large-value payments, but a variety of efforts to speed up settlement have been completed or are underway. For example, The Clearing House has developed an instant payments service that focuses on smaller-value payments.

Similarly, the automated clearinghouse (or ACH) network—a batch-based payment network that first developed in the long-ago 20th century—now enables same-day settlement of ACH payments. And the Federal Reserve is developing an instant payment service—FedNow[SM]—that will soon provide recipients of small-value payments with immediate access to their funds in commercial bank accounts.

The payment system is not perfect—some types of payments should move more quickly and efficiently. Payments across international borders, for example, remain a key area of concern because they often involve high costs, low speed, and insufficient transparency.

The Financial Stability Board, an international group that I chair, produced a roadmap last year that is intended to address these concerns[4]. Additionally, private-sector stablecoins (which I will discuss in more detail in a moment) may facilitate faster and cheaper cross-border payments.

In addition, some types of payments have not fully digitized or are subject to ongoing contention between businesses with competing economic interests. For example, paper cheques remain widely used for certain types of payments (although the interbank check collection process is now almost entirely electronic)[5].

Debit and credit card payments offer a convenient digital platform for consumers and retailers, but there has been considerable controversy between banks and retailers over who will capture the economics surrounding the fees associated with card transactions.

Finally, many more Americans could benefit from digital payments by increasing their use of banking services, which can be promoted by wider use of low-cost, basic bank accounts.

In summary, the US payment system is very good, and although it is not perfect, work is already underway to significantly improve it.

Policy considerations

Yet, proponents of a Federal Reserve CBDC believe that it would solve a number of significant problems. They suggest, for example, that a Federal Reserve CBDC may be necessary to defend the critical role the US dollar plays in the global economy. Others say that a CBDC would overcome longstanding economic inequalities in American society.

As we begin our Fed analysis of these issues, I will have to be convinced that a CBDC is a particularly good tool to address either of these issues, about which I am sceptical, and I will especially have to be convinced that the potential benefits of developing a Federal Reserve CBDC outweigh the potential risks.

Let's examine some of the arguments raised by CBDC supporters. The first argument is that the Federal Reserve should develop a CBDC to defend the US dollar against threats that would be posed by foreign CBDCs, on the one hand, and the continued spread of private digital currencies, on the other.

Taking the threat from foreign CBDC's first, this argument presumes that at least some foreign currencies—all of which are already highly digitized in our current international banking system in the same way the dollar is and yet which do not pose a significant challenge to the international role of the dollar—will suddenly pose a much greater challenge to the dollar if that digitization is accomplished through a direct central bank digital currency instead of

through the current digital payments system. In this view, the US dollar will lose its place in the global economy if the Federal Reserve does not offer a similar product.

I think it's inevitable that, as the global economy and financial system continue to evolve, some foreign currencies (including some foreign CBDCs) will be used more in international transactions than they currently are.

It seems unlikely, however, that the dollar's status as a global reserve currency, or the dollar's role as the dominant currency in international financial transactions, will be threatened by a foreign CBDC.

The dollar's role in the global economy rests on a number of foundations, including the strength and size of the US economy; extensive trade linkages between the United States and the rest of the world; deep financial markets, including for US Treasury securities; the stable value of the dollar over time; the ease of converting US dollars into foreign currencies; the rule of law and strong property rights in the United States; and last but not least, credible US monetary policy.

None of these are likely to be threatened by a foreign currency, and certainly not because that foreign currency is a CBDC.

CBDC supporters also suggest that private digital currencies pose a threat to the US dollar. Private digital currencies come in multiple flavours, but for this purpose I will divide them into two categories: stablecoins and non-stablecoins, or cryptoassets, such as bitcoin.

Let's begin with stablecoins. The value of a stablecoin is tied to one or more other assets, such as a sovereign currency[6]. There are multiple existing and potential stablecoins that are or would be tied in value to the US dollar.

Some commentators argue that the United States must develop a CBDC to compete with US dollar stablecoins. Stablecoins are an important development that raise difficult questions.

For example, how would widespread adoption of stablecoins affect monetary policy or financial stability? How might stablecoins affect the commercial banking system? Do stablecoins represent a fundamental threat to the government's role in money creation?

In my judgment, we do not need to fear stablecoins. The Federal Reserve has traditionally supported responsible private-sector innovation. Consistent with this tradition, I believe that we must take strong account of the potential benefits of stablecoins, including the possibility that a US dollar stablecoin might *support* the role of the dollar in the global economy.

For example, a global US dollar stablecoin network could encourage use of the dollar by making cross-border payments faster and cheaper, and it potentially could be deployed much faster and with fewer downsides than a CBDC.

And the concern that stablecoins represent the unprecedented creation of private money and thus challenge our monetary sovereignty is puzzling, given that our existing system involves—indeed depends on—private firms creating money every day.

We do have a legitimate and strong regulatory interest in how stablecoins are constructed and managed, particularly with respect to financial stability concerns: the pool of assets that acts as the anchor for a stablecoin's value could—if use of the stablecoin became widespread enough—create stability risk if it is invested in multiple currency denominations; if it is a fractional rather than full reserve; if the stablecoin holder does not have a

clear claim on the underlying asset; or if the pool is invested in instruments other than the most liquid possible, principally central bank reserves and short-term sovereign bonds.

All of these factors create 'run risk' —the possibility that some triggering event could cause a large number of stablecoin holders to exchange their coins all at once for other assets and that the stablecoin system would not be able to meet such demands while maintaining a reasonably stable value.

But these concerns are eminently addressable—indeed, some stablecoins have already been structured to address them. When our concerns have been addressed, we should be saying yes to these products, rather than straining to find ways to say no.

Indeed, the combination of imminent improvements in the existing payments system such as various instant payments initiatives combined with the cross-border efficiency of properly structured stablecoins could well make superfluous any effort to develop a CBDC.

In contrast to stablecoins, cryptoassets like bitcoin are not tied to the value of an asset like a sovereign currency. Rather, they seek to create value in the coin through other means, usually some intrinsic mechanism to ensure scarcity, like bitcoin's mining process, or some characteristic of the coin that cannot be matched by the traditional payment system, such as inviolable anonymity.

Some commentators assert that the United States must develop a CBDC to counter the appeal of cryptocurrencies. This seems mistaken. The mechanisms used to create such cryptoassets' value also ensure that this value will be highly volatile—rather similar to the fluctuating value of gold, which, like bitcoin, draws a significant part of its value from its scarcity, and like bitcoin, does not play a significant role in today's payments or monetary system.

Unlike gold, however, which has industrial uses and aesthetic attributes quite apart from its vestigial financial role, bitcoin's principal additional attractions are its novelty and its anonymity. The anonymity will make it appropriately the target for increasingly comprehensive scrutiny from law enforcement and the novelty is a rapidly wasting asset.

Gold will always glitter, but novelty, by definition, fades. Bitcoin and its ilk will, accordingly, almost certainly remain a risky and speculative investment rather than a revolutionary means of payment, and they are therefore highly unlikely to affect the role of the US dollar or require a response with a CBDC.

A second broad argument raised by proponents of CBDCs is that a Federal Reserve CBDC would improve access to digital payments for people who currently do not keep bank accounts because of their expense, a lack of trust in banks, or other reasons. This is a worthwhile goal.

However, I believe we can promote financial inclusion more efficiently by taking steps to make cheap, basic commercial bank accounts more available to people for whom the current cost is burdensome, such as the Bank On accounts developed in collaboration between the Cities for Financial Empowerment Fund and many local coalitions[7].

Between 2011 and 2019, the percentage of households that are unbanked dropped from 8.2 percent to an estimated 5.4 percent[8]. Banks and regulators are working to shrink this percentage further still. I am far from convinced that a CBDC is the best, or even an effective, method to increase financial inclusion[9].

Last, some believe that a Federal Reserve CBDC would spur and facilitate private-sector innovation. This is an interesting issue that merits further study. I am puzzled, however, as to how a Federal Reserve CBDC could promote innovation in a way that a private-sector stablecoin or other new payment mechanism could not.

It seems to me that there has been considerable private-sector innovation in the payments industry without a CBDC, and it is conceivable that a Fed CBDC, or even plans for one, might deter private-sector innovation by effectively 'occupying the field'.

In brief, the potential benefits of a Federal Reserve CBDC are unclear. Conversely, a Federal Reserve CBDC could pose significant and concrete risks. First, a Federal Reserve CBDC could create considerable challenges for the structure of our banking system, which currently relies on deposits to support the credit needs of households and businesses.

An arrangement where the Federal Reserve replaces commercial banks as the dominant provider of money to the general public could constrict the availability of credit, fundamentally alter the economy, and expose the public to a host of unanticipated, and undesirable, consequences[10].

Among other potential problems, a dominant CBDC could undermine the consumer and other economic benefits that accrue when commercial banks compete to attract customers.

A Federal Reserve CBDC could also present an appealing target for cyberattacks and other security threats. Bad actors might try to steal CBDC, compromise the CBDC network, or target non-public information about holders of CBDC. The architecture of a Federal Reserve CBDC would need to be extremely resistant to such threats—and would need to remain resistant as bad actors employ ever-more sophisticated methods and tactics.

Designing appropriate defences for CBDC could be particularly difficult because, compared to the Federal Reserve's existing payment systems, there could be far more entry points to a CBDC network—depending on design choices, anyone in the world could potentially access the network[11].

Critically, we also would need to ensure that a CBDC does not facilitate illicit activity. The Bank Secrecy Act currently requires that commercial banks take steps to guard against money laundering[12].

Policymakers will need to consider whether a similar anti-money-laundering regime would be feasible for a Federal Reserve CBDC, but it may be challenging to design a CBDC that respects individuals' privacy while appropriately minimizing the risk of money laundering.

At one extreme, we could design a CBDC that would require CBDC holders to provide the Federal Reserve detailed information about themselves and their transactions; this approach would minimize money-laundering risks but would raise significant privacy concerns.

At the other extreme, we could design a CBDC that would allow parties to transact on a fully anonymized basis; this approach would address privacy concerns but would raise significant money-laundering risks.

A final risk is that developing a Federal Reserve CBDC could be expensive and difficult for the Federal Reserve to manage. A Federal Reserve CBDC could, in essence, set up the Federal Reserve as a retail bank to the general public. That would mean introducing large-scale, resource-intensive central bank infrastructure.

We will need to consider whether the potential use cases for a CBDC justify such costs and expansion of the Federal Reserve's responsibilities into unfamiliar activities, together with the risk of politicization of the Fed's mandate that would come with such an expansion.

To conclude, I emphasize three points. First, the US dollar payment system is very good, and it is getting better. Second, the potential benefits of a Federal Reserve CBDC are unclear. Third, developing a CBDC could, I believe,

pose considerable risks. So, our work is cut out for us as we proceed to rigorously evaluate the case for developing a Federal Reserve CBDC. Even if other central banks issue successful CBDCs, we cannot assume that the Federal Reserve should issue a CBDC.

The process that Chair Powell recently announced is a genuinely open process without a foregone conclusion, although obviously I think the bar to establishing a US CBDC is a high one. The upcoming discussion paper that constitutes the first step in this process will importantly ask for input from the public.

I look forward to reviewing public input on the discussion paper, which will inform the Federal Reserve's ultimate evaluation of a potential CBDC. ■

Randal K Quarles is Vice Chair for Supervision of the Federal Reserve Board

Endnotes

1. See Central Bank Digital Currencies: Foundational Principles and Core Features (Basel: Bank for International Settlements, October 9, 2020). Return to text

2. "Fedwire Funds Service—Monthly Statistics", Federal Reserve Bank Services, accessed June 27, 2021.

3. See "About CHIPS", The Clearing House, accessed June 27, 2021.

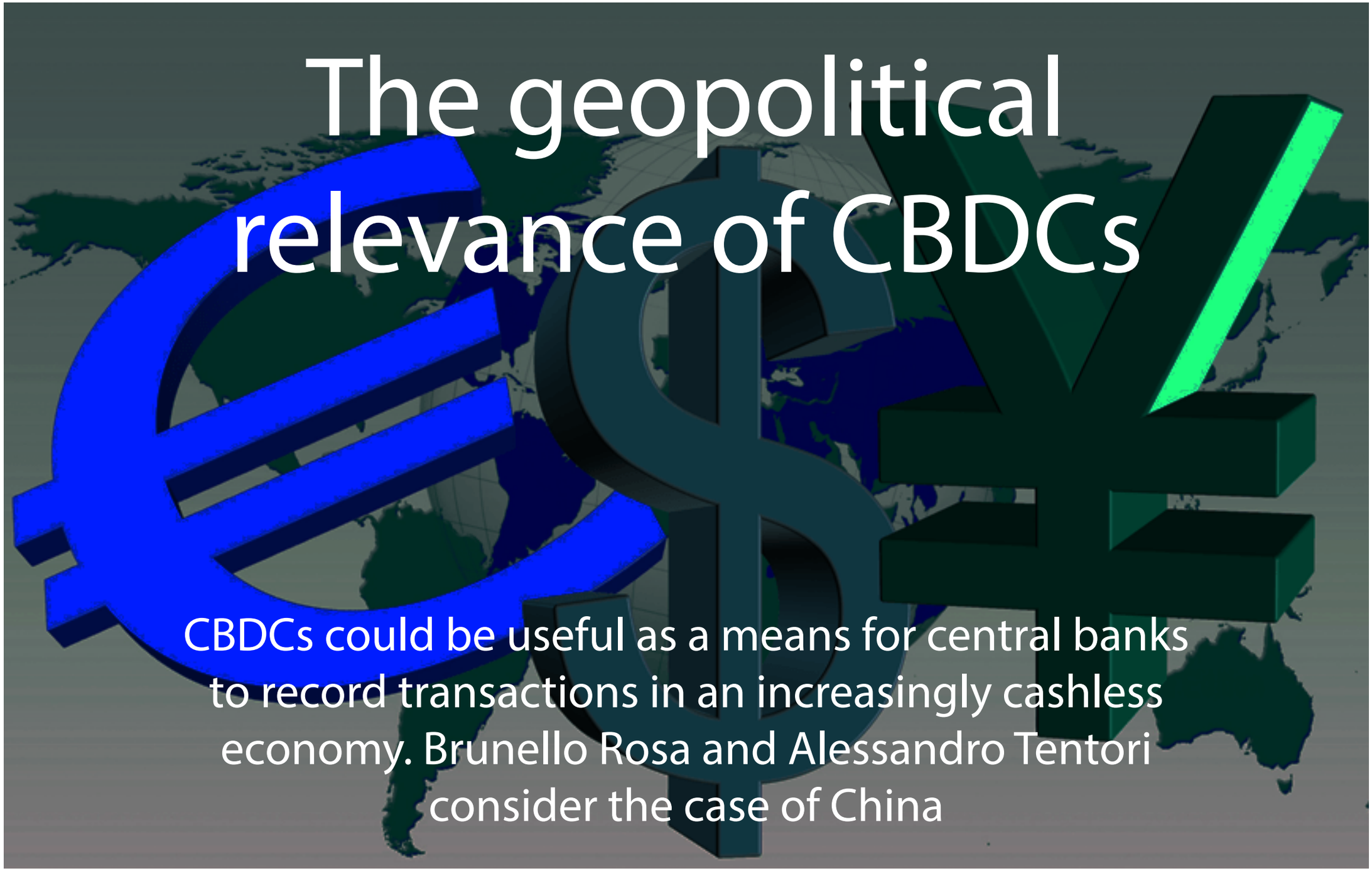
4. Financial Stability Board, "FSB Delivers a Roadmap to Enhance Cross-Border Payments," news release, October 13, 2020.

5. Board of Governors of the Federal Reserve System, 2019 Federal Reserve Payments Study (Washington: Board of Governors, December 2019).

6. Financial Stability Board, Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements (Basel: Financial Stability Board, October 13, 2020).
7. See https://joinbankon.org/
8. "Key Findings from How America Banks: Household Use of Banking and Financial Services", Federal Deposit Insurance Corporation, accessed June 27, 2021.
9. It seems unlikely, for example, that people who avoid bank accounts because of concerns about privacy or trust in the banking system, rather than the cost of such accounts, will greatly prefer having accounts with the Federal Reserve.
10. The Federal Reserve also needs to consider whether private-sector stablecoins could disintermediate deposits out of the banking system, but in general, the risk of disintermediation should be lower for stablecoins compared to a CBDC. Importantly, if a stablecoin is backed by short-term securities, the stablecoin provider must take the funds received in return for the issuance of stablecoins and purchase short-term securities for the stablecoin "anchor" pool. The seller of those securities will then take the funds received and put them back into the banking system.
11. Private-sector stablecoins are also subject to cyber risk, of course, but any individual private stablecoin network would be less systemic than a CBDC for an entire advanced economy, and private companies are frequently better able to make the rapid and constant investment in technology required to keep current with technological security threats.
12. See, eg., 31 U.S.C. § 5318(h).

This article is based on a speech delivered at the 113th Annual Utah Bankers Association Convention, Sun Valley, Idaho, June 28, 2021

The geopolitical relevance of CBDCs



CBDCs could be useful as a means for central banks to record transactions in an increasingly cashless economy. Brunello Rosa and Alessandro Tentori consider the case of China

Digital currencies are becoming increasingly prescient on both research and policy agendas, including for central banks. This column explores the geopolitical role of central bank digital currencies, with a particular focus on China. It argues that such currencies could be useful as a means for central banks to record transactions in an increasingly cashless economy and could help improve central banks' monetary transmission. Nonetheless, the risk of cyber-attacks should not be overlooked.

When it comes to central bank digital currencies (CBDCs), the focus of market participants and regulators is mainly on optimal design and the risk of disruption for the banking sector (Andolfatto 2019, Auer *et al*. 2020, Bindseil and Panetta 2020, Niepelt 2020).

Instead, in this column we concentrate on the geo-strategic implications of central bank digital currencies, including the key business of foreign exchange reserves. As the digital revolution implies the need for countries to develop a new arsenal of strategic assets, such currencies are likely to become a key instrument on the geopolitical chessboard.

Digital reserve currencies: survival of the fittest

The IMF defines foreign exchange reserves as *"official public sector foreign assets that are readily available to and controlled by the monetary authorities"* (IMF 2001). This definition lends itself to be extended to the best practices of reserve management, like prudent liquidity and credit risk management or the generation of a steady cash flow.

Would a digital currency, or more generally a digital asset, qualify as a reserve instrument? So far, only a very limited subset of the existing asset universe enjoys reserve status. According to the IMF, worldwide allocated reserves amounted to $11.9 trillion at the end of 2020, of which roughly 80% were denominated in either US dollars or euros.

To tackle the question about reserve status, it might be worth taking a step back to recall the classic functions of money: means of payment, measure of value, and store of value. Ideally, money is a fungible, durable, portable, and identifiable medium with a stable value.

To put it bluntly: *"money is the most universal and most efficient system of mutual trust ever devised… even people who do not believe in the same god or obey the same king are more than willing to use the same money"* (Harari 2015).

With the digital revolution, money has acquired an additional new function: a store of information. In a cashless society – admittedly an extreme case – any exchange between two counterparties generates information about

... central bank digital currencies might play a key role in a wider portfolio of strategic assets, ready to be deployed on the geopolitical arena

the counterparties themselves, thus implying a tradeoff between the value of privacy/anonymity and the value of a digital marketplace.

As one of us argued in a recent paper (Tentori 2021), central bank digital currencies are a natural evolution of existing forms of money that satisfy all four characteristics of money described above. Furthermore, central bank digital currencies are designed to maximize the store of information function.

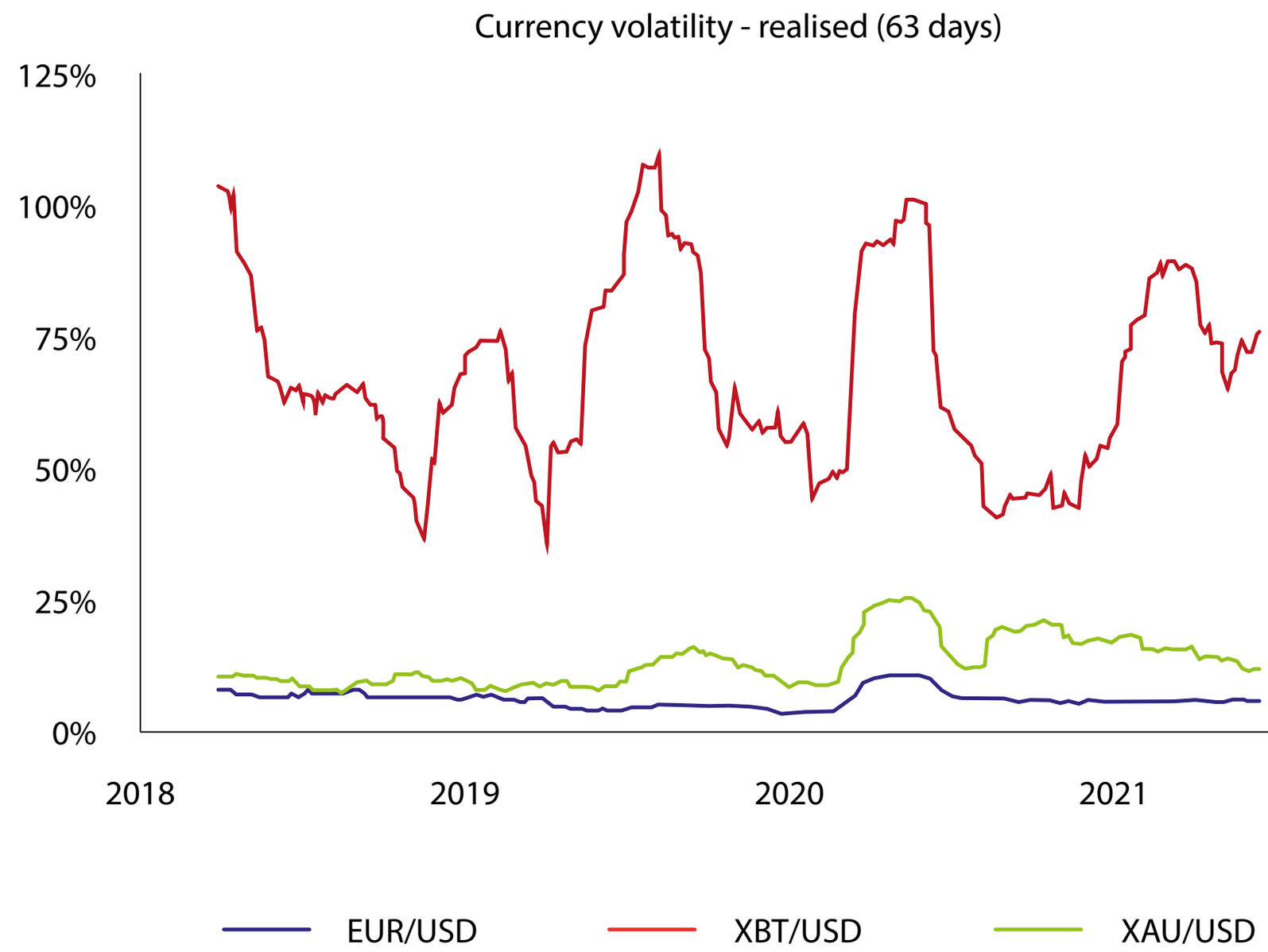
On the other hand, cryptos and private stablecoins might tick some of the boxes as well, but not all (Rosa and Tentori 2021). In particular, these 'private' digital assets are subject to excessive levels of volatility (Figure 1), questioning their function as a store of value (Cœuré, 2019).

Not all digital assets operate with a backstop. The backstop – a digital currency's collateral framework – is key in order to distinguish 'stablecoins' from the broader ecology of digital currencies. It is an essential design feature, one likely to influence the path of adoption of any nascent digital currency.

One could object that after the collapse of the gold standard, the value of traditional currencies is only implicitly backed by the sovereign (eg. via tax revenues or net wealth). Credibility, trust and confidence are therefore essential features of traditional and digital currencies alike.

Following this, we tend to regard central bank digital currency as a superior instrument in the context of (digital) reserves management. We deem other digital solutions at risk of being crowded out by central bank digital currencies.

Figure 1. Bitcoin's excessively volatile compared to gold or the euro



Source: Bloomberg

In this respect, we appreciate the global central banks' efforts to design and test digital liabilities, as monetary policy transitions into the digital realm. At present, 80% of the world's central banks are currently engaging in central bank digital currency research and development (Auer *at al*. 2020), including the ECB, the People's Bank of China, and the Federal Reserve.

Digital sovereignty: central bank digital currencies are a new strategic asset

The concept of sovereignty is often defined as a supreme authority within a territory. Identifiable signs like a flag or a currency typically outline the sovereign's sphere of influence.

Just like issuing and operating a traditional currency is a sign of monetary sovereignty, so is central bank digital currency's issuance a way of reasserting monetary sovereignty over a country's cyberspace.

Unfortunately, the concept of sovereignty is hard to grasp in cyberspace. The meaning of territory and authority is increasingly diluted as data gets stored outside a state's geographical and physical borders. We would argue that in a not-too-distant future governments will be forced to secure ownership of and access to their citizens' strategic data, even when stored via cloud technology.

Rosa (2020) suggests that the armies of the future might include strategic digital assets like cyber divisions, and that *"private-sector companies will play a crucial role, just as private contractors do today in traditional conflicts."*

Without dwelling excessively on the matter of cyber warfare, it seems rather unlikely that central bank digital currencies will be spared from cyberattacks. From the point of view of the information function of money, opening up a central banks' balance sheet to the general public might generate huge privacy costs in case of a data breach.

A cyberattack could represent a violation of both digital and traditional sovereignty akin to a digital-era declaration of war. As a result, we would expect the strategic importance of central bank digital currencies to put pressure on governments to re-shape and adapt their diplomatic framework.

Central bank digital currencies could also become a valuable strategic asset on more traditional macroeconomic grounds. In fact, like in every strategic game – including geopolitics – governments aim to exploit a potential 'first-mover advantage'.

For some central banks, time itself appears to be an existential asset in the digital currency race. In fact, modelling the introduction of a central bank digital currency in an international interest parity environment might partially explain central banks' interest in this policy instrument.

As suggested by Ferrari *et al*. (2020), *"a CBDC increases asymmetries in the international monetary system by reducing monetary policy autonomy in foreign economies, but not domestically, suggests in addition that introducing a CBDC sooner, rather than later, could give rise to a significant first-mover advantage."*

Digital future: China leads the race

Two countries have made the largest progress in the development of central bank digital currencies: China and Sweden. While Sweden does not seem ready to fully roll out its digital currency in the medium term, China's 'DCEP' system was conceived six years ago and is now in its experimentation phase – with local tests being conducted in Shenzhen, Suzhou, Xiongan, and Chengdu. Tests have been conducted in the pubic as well as the private economy (including several international companies).

From the point of view of domestic policy, central bank digital currencies are a valuable asset for two main reasons:

- Information: being able to record every transaction that takes place in a cashless society is an appealing proposition for any government looking to leverage both its fiscal efficiency and its ability to control the population.

- Monetary policy: being able to pass negative interest rates on the household sector is likely to improve a central bank's monetary transmission, albeit not without a potential cost in terms of financial stability (Schilling *et al*. 2020)

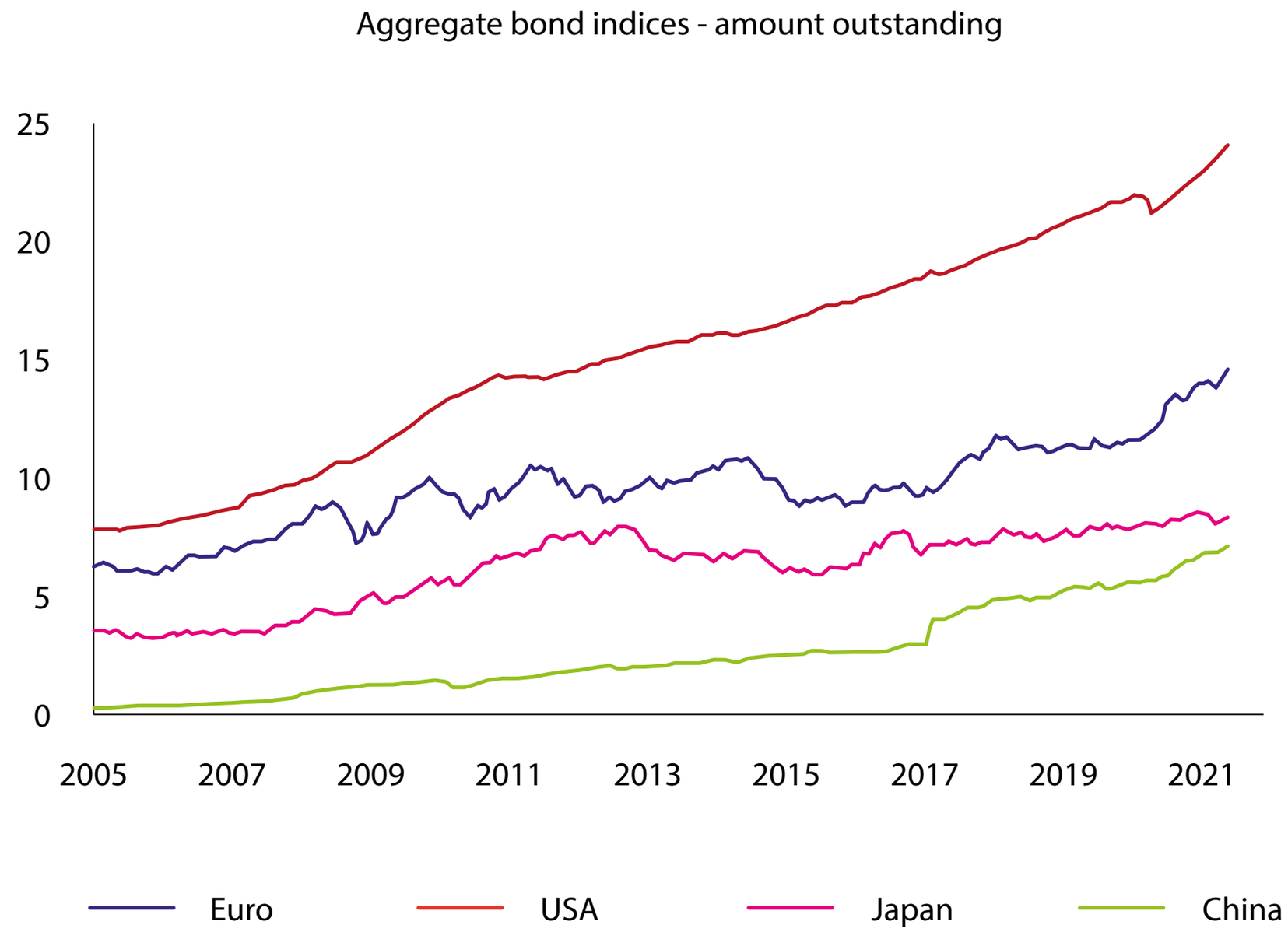
China is also active on the international front – for example, by addressing the issue of cross-border payments using its own central bank digital currency technology. In this respect, Beijing has joined the BIS Innovation Hub and Hong Kong Monetary Authority Bridge initiative and their proof-of-concept prototype for wholesale cross-border payments.

China had already begun a process of internationalisation of its currency way before the digital currency project was conceived. The Chinese financial market is evolving rapidly – its government debt is in the process of being added to major bond indices and it is becoming a serious competitor to established liquid sovereign issuers.

The introduction of China's digital currency will likely represent an acceleration of existing trends. It is relatively straightforward to imagine that China will 'incentivise' the adoption of its own digital currency in countries within the Belt and Road Initiative (BRI) and Asian Infrastructure Investment Bank (AIIB).

Similarly, it will likely offer its digital platform to countries joining the Regional Comprehensive Economic Partnership (RCEP).

Figure 2. China's bond market is systemically relevant



Source: Bloomberg

China is now openly campaigning for the adoption of its own governance model (a mix of state capitalism, freedom of enterprise, and political authoritarianism), especially in South-East Asia – a region that has experimented with democracy, with ambiguous results (Giordani 2021).

In this respect, we anticipate that central bank digital currencies might play a key role in a wider portfolio of strategic assets, ready to be deployed on the geopolitical arena. ■

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Stablecoins: what's old is new again

Christina Segal-Knowles talks about stablecoins. She looks at how they could be regulated if they are used as a form of payment

I'm going to focus on what is sometimes billed as the next big thing in digital payments - stablecoins - digital tokens issued by the private sector which aim to maintain a stable value at all times, primarily in relation to existing national currencies.

And to be clear from the start, I will touch only on those stablecoins that aim to be used widely as means of payments.

Stablecoins and other new forms of innovation in payments potentially offer benefits. They could reduce cost and offer new convenience and functionality. They could increase the resilience of payments – by offering alternative new ways to pay. And there could be potential long term financial stability gains from new forms of digital money. But these opportunities can only be realised if new forms of digital money are safe.

So I am not going to focus on what's new about stablecoins. Instead, I am going to focus on why – even if the technology they are using is new - the basic elements of a stablecoin are very old. In fact, as old as money itself.

This means that as financial regulators, stablecoins are not launching us off into some brave new world. We know what is required to ensure private money[1] is safe for wide-scale use. The key here is to ensure that just because something is packaged in shiny technology we don't somehow treat the risks it poses differently.

Private money: the basics

Before I turn to stablecoins I want to spend a minute on one of the reasons why the idea of private money feels innovative and flashy. Even though most money we use every day is already private money, the vast majority of us don't think about it. Luckily, regulation means we don't have to.

Popular culture often simplifies our ideas around what form our money takes and can reinforce the idea that banks are simply storing our sterling issued by the central bank for us, and that when we pay electronically, what is being moved is central bank-issued money. For example, remember those iconic scenes from *Mary Poppins* and *It's a Wonderful Life* which feature people demanding that banks give them back their money.

But in reality, when you tap your debit card in a shop or pay your friend back via a bank transfer, the money you are paying with isn't sterling issued by the Bank of England with a promise to pay the bearer – it's a bank deposit. Those are just a record of how much a private company – here, the commercial bank - owes its customers. Think of it as an IOU from the bank.

... these opportunities can only be realised if new forms of digital money are safe – which means recognising and properly regulating the elements that are age-old

When we say that we are *"withdrawing our money"* from an ATM - what we are actually doing is converting our IOUs from our bank, ie. commercial bank money, into banknotes issued by the Bank of England.

So even though we don't think about it, we're already using private money all the time. Ninety-five percent of the funds households and businesses hold that are typically used to make payments are now held as commercial bank deposits rather than cash[2]. The pandemic has prompted a further decrease in cash usage, accelerating a longer-term decline that is likely to continue[3].

Private money: why do we care?

Today in the United Kingdom we don't generally pay attention to whether we are using private or public money. We can assume that the value of the money we use will be more or less stable. Shops don't need to scrutinize which bank holds your deposit before you pay – and they are generally as willing to receive private money in the form of card or smartphone wallet payments as they are cash.

The fact that commonly used private money is interchangeable with cash anchors it to national currencies and, as a result, promotes financial stability. The fact that bank deposits can be exchanged for cash on demand guarantees uniformity – ensuring that bank deposits from one bank can be used interchangeably with cash and with bank deposits from another bank.

While banks do fail, regulation and liquidity backstops makes that relatively rare. And deposit protection schemes ensure that transactional balances up to £85,000 remain interchangeable with cash even if that happens. This model is relatively recent. It was not ever thus.

And as we think about new forms of digital payments, it is important that we do not take this for granted.

A large number of financial crises of the last century have featured a loss of confidence in the reliability and safety of the money people rely on for transactions.

Money that is usually considered safe. Money that people normally do not think about very much.

In the emerging market financial crises of the 1990s and early 2000s, people and businesses lost faith in the state's ability to maintain the value of their local currency against the dollar[4].

Other crises have had at their heart a loss of confidence in the ability of private issuers – commercial banks – to fulfil their IOUs with depositors and lenders and maintain the interchangeability and reliability of the money they issued.

Think of the Great Depression-era bank run depicted in *It's a Wonderful Life*. Think of the Northern Rock example – where worries about the Northern Rock's funding led to a crisis of confidence; first from wholesale lenders and then from retail depositors – who suddenly worried that their deposits would no longer be interchangeable with cash or other bank deposits.

Remember the queues outside of branches in 2007, as depositors rushed to exchange their deposits before – they believed – it might be too late[5]. Confidence in the credibility and stability of private money are fundamental components of financial stability.

Innovation

But let us go back to stablecoins and innovation in payments. Stablecoins are digital tokens that aim to maintain a stable value vis-a-vis existing forms of money[6]. Their origin stories generally trace back to the crypto world. Most forms of crypto-assets, like Bitcoin, are too volatile to be attractive as a widespread means of payment.

We have seen time and time again that if money is not reliably stable most people will not want to use or accept it as payment. There is no reason to think this time is different[7].

To solve this, stablecoins have turned to the age-old solution of anchoring their value to national currencies, often with a promise to ensure that the value remains 1 for 1 at all times. Stablecoins therefore could potentially serve as a substitute for a commercial bank deposit.

Both stablecoins and banks are offering a representation of what a private company owes its customers – an IOU - which can be transferred as a means to pay for things. Both are promising (or at least aspiring to) stability against and interchangeability with money issued by central banks.

It is possible in this context that stablecoins could scale up and grow rapidly, and become widely used as a trusted form of sterling-based retail payments. To be clear - I don't know if this will happen. Stablecoins and other new forms of private non-bank money might be the next big thing. Or they might be a flash in the pan.

I don't have a bet here - I am a central banker not a venture capitalist. My job, as a central banker and regulator - in all of this – is to ensure that financial innovations, including new forms of digital money, do not impair the Bank of England's ability to maintain monetary and financial stability.

This shouldn't be confused with preserving the status quo. Financial stability isn't about protecting incumbent banks or other existing firms from competition. Instead financial stability seeks to ensure that people and businesses can rely on essential financial services – like the ability to make a payment or the ability to get a loan - in bad times as well as good.

A regulatory framework

Earlier this week, the Bank of England published a Discussion Paper that examines the implications of stablecoins for its financial and monetary stability mandate. In it we present an illustrative scenario to examine the implications of the emergence of stablecoins and other new forms of digital money.

The discussion paper models what would happen if a large number of households and businesses moved their deposits from banks and into a stablecoin or Central Bank Digital Currency (CBDC). Contrary to some press headlines, even such a dramatic shift does not inherently constitute a financial stability risk as long as it happens in an orderly manner.

In fact findings show that the implications of this in the long term for the ability of households and businesses to get a loan are relatively modest – although there is considerable uncertainty around this result.

As such, while other risks may arise during a transitionary phase, the most significant risk arises from the potential for stablecoins in particular to undermine confidence in money and payments, and hence in the wider financial system.

As we discussed, the risk of a loss of confidence in the credibility and stability of private money is not theoretical. Loss of confidence in private money can be a major threat to financial stability.

But it is equally true that private money can be made acceptable as a widespread means of payment – indeed, as I covered earlier, the vast majority of money held for transactions in the United Kingdom is already private. So, with the right regulation, a stablecoin could potentially be made safe for wide-scale use.

Our existing regulatory framework seeks to ensure that the public is able to trust the reliability and stability of the money it uses every day. Banks are subject to extensive rules and requirements to ensure that consumers can use privately-issued money with confidence and interchangeably with cash.

These core rules and requirements were developed over time – in many cases via trial and error, with new rules introduced following financial crises.

Financial market infrastructure firms are also regulated to ensure that the assets they use for settlement – the underpinnings of our financial transactions, whether we're buying milk or clearing a derivative – are public money issued by a central bank wherever possible. Where that's not possible they are permitted to settle in money deemed to be a close substitute – commercial bank money.

If stablecoins seek to be acceptable widespread substitutes for commercial bank deposits as a means of payment, it stands to reason that stablecoins will need to meet the core elements of our existing regulatory framework for private money which underpins confidence that it is interchangeable with cash[8].

These are:

- A legal claim – to allow for prompt redemption at all times, for the amount initially deposited, and at no cost to the depositor; In other words – the little boy's right in *Mary Poppins* to demand that the bank 'give him back his money.

- Capital requirements – to lower the risk of insolvency, these are calculated based on the nature of the risks

issuers undertake (credit, operational, market risks); they act as a cushion to absorb losses, reducing the chances that a firm fails.

- Liquidity requirements – to ensure redemptions can be met in most circumstances – supported by eligibility for central bank facilities where relevant, to meet firms' liquidity needs in extremis. This ensures that temporary liquidity issues arising from difficulties selling assets backing the value of stablecoins don't result in firm failure; and

- A backstop to compensate depositors – or in this case coinholders – such as the Financial Services Compensation Scheme (FSCS) (or in other countries deposit insurance), in case of failure. This ensures that, even if a firm fails, transactional deposits up to a certain amount remain exchangeable for central bank money. Notably – one of the key responses to the Northern Rock episode was to increase FSCS coverage in the United Kingdom.

This is not to say the regulatory model for stablecoins needs to be identical to banks. It could include different applications of the above features. For example, if stablecoin operators are restricted to backing themselves in high quality liquid assets they won't need regulation to cover credit risk.

If they only back themselves in central bank reserves, which are inherently liquid, they don't need liquidity facilities. Ultimately, the specific requirements may well be different from those applicable to banks, but the outcome will be the same – that systemic stablecoins used as money will offer the same protection to coin holders as commercial bank money.

Conclusion

The title of this article is a cliché: everything that is old is new again. But I am going to end on a different cliché: the definition of insanity (widely – and inaccurately – attributed to Albert Einstein) is doing the same thing over and over again but expecting different results.

As I mentioned earlier, stablecoins may be innovative in the technology they use, but the fundamental questions they pose are not new. We as central bankers and regulators need to look at them as what they propose to be – a new form of private money.

This means that we will hold them to standards similar to those applicable to existing private money. It doesn't matter what type of technology you're using or the legal form of the firm. If a firm is offering private money on a systemic scale then it should be regulated as such.

Our core rules and requirements came through trial and error, often following financial crises. Our work on a regulatory regime for stablecoins builds on this learning process - rather than starting at square one and expecting different results.

I recognise that the themes here sound curmudgeonly. But this is not an anti-innovation message: quite the opposite. Establishing a secure regulatory environment for new forms of digital money to operate within the UK will lay a foundation for sustainable innovation.

As I said at the outset, if new forms of digital money can be made safe, they could potentially contribute to faster, cheaper and more efficient payments with greater functionality. They could increase the resilience of payments. And they could even have long-term benefits for financial stability.

But these opportunities can only be realised if new forms of digital money are safe – which means recognising and properly regulating the elements that are age-old. ■

Christina Segal-Knowles is Executive Director for Financial Markets Infrastructure at the Bank of England

Endnotes

1. Private money mainly takes the form of deposits held in bank accounts. The only form of public money accessible to the general public is cash, in the form of coins and notes.

2. This is based on the amount of cash held by the public as a share of total cash and sight deposits. See Part V of 'A millennium of macroeconomic data', Research dataset, Bank of England.

3. See LINK News and media contact, 'Coronavirus Crisis means cash use down but UK still withdrawing £1 billion from ATMs each week'; See 'Statistics and trends'; See chart A in 'New forms of Digital money' DP, June 2021. Moreover, in practice, the UK authorities remain committed to ensuring access to cash to those that need it. The Bank, HMT, FCA and the PSR have been working together on the Joint Authorities Cash Strategy group to monitor the use of cash, ATM availability, and ensure cash remains available despite the impacts of Covid.

4. See the example of the Corralito in Argentina. (BBC, 02/12/2002: "Argentina lifts cash restrictions").

5. See: "The financial crisis – 10 years on" (Bank of England, 2018)

6. Stablecoins are different from CBDC. While stablecoins are a privately issued form of digital money, CBDCs are a form of digital money issued by the central bank. The Bank of England is exploring the case for a CBDC but has not made a decision yet.

7. In March 2018, the FPC noted: "[Crypto-assets] should be considered as assets rather than currencies. However, as

assets, they establish no claim on any future income streams or collateral. They have no intrinsic value beyond their currently limited potential to be adopted as money in the future, and hence could prove worthless."
8. In December 2019, the FPC noted that: "Where stablecoins are used in systemic payment chains as money-like instruments they should meet standards equivalent to those expected of commercial bank money in relation to stability of value, robustness of legal claim and the ability to redeem at par in fiat."

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Do we need ‘public money’?

The Bank of England has issued banknotes for over 300 years. Jon Cunliffe talks about future of money in the UK in an increasingly digital world

I want to talk about whether we need 'public money'. I should make clear that I am not talking here about public spending but rather about the form of money itself: by 'public money' I mean money issued by the state to its citizens for everyday use. This may seem a rather odd question.

In the UK, the Bank of England – a public institution[1]– has been issuing money to the public for over 300 years. Its banknotes, carrying the famous *"I promise to pay the bearer"* pledge are carried in millions of wallets and purses and used millions of times every day by the public to make transactions[2].

These notes and coins are denominated in Pounds Sterling, the currency of the UK. It is the Bank of England, on behalf of the state, that is charged with ensuring the stable value of the currency by keeping inflation at its 2% target.

Public money for general use in the UK is only available in the form of physical cash. It is highly visible, trusted and, indeed, is probably the image that many people in this country have in their mind when they picture money.

However, the majority of the money held and used by people in the UK today is not physical 'public money', issued by the state, but digital[3] 'private money' issued by commercial banks. Around 95% of the funds people hold that can be used to make payments are now held as bank deposits rather than cash. In everyday use, only 23% of payments pre pandemic were made using public money in the form of cash, down from close to 60% a decade earlier[4].

This private money is not a claim on the state or backed with the resources of the state. It is not covered by that familiar Bank of England promise to 'pay the bearer'. It is not clear to me to what extent the general public understand this distinction between public and private money – or even that for most of the time they are using private money. I am not aware of any surveys or research that address this question.

I have, over the years sometimes asked the question of those I have met. Such an approach is statistically reprehensible of course and one certainly shouldn't base policy on it. But for what it is worth, the answers suggest that people are generally unaware of the distinction between private and public money.

And, outside periods of crisis, the type of money they use, what and who stands behind it, is not something that particularly interests them.

... even without the new, technology enabled forms of money that are on the near horizon we are seeing accelerating changes in the way we live and transact that will greatly reduce and perhaps eventually eliminate the role that public money plays in the economy today

The fact that, unlike in some periods of history, we do not at present think much about these things and that people in the UK have a general confidence in the money they use regardless of its form and issuer is, I think, a good thing.

It is not an accident. It is due to the credibility of the institutional framework governing money in the UK that tethers private money to the public money issued by the state.

This framework has a number of important elements. An independent central bank ensures the stability of the value of the currency/unit of account. Commercial banks that issue money are regulated to ensure they are robust. They hold accounts at the Bank of England, settle transactions electronically between themselves in Bank of England public money and are able to borrow from the Bank to meet liquidity shortfalls including in times of stress. And a deposit guarantee scheme gives holders of commercial bank money the protection of a backstop should the bank fail.

And, crucially, this tethering is also due to the fact that people have the right to exchange their private money, claims on banks, into public money, claims on the state, whenever they wish - as they do every time they go the ATM or pay cash in a bank account, without restriction or loss of value.

We do not have to look that far into the past to see episodes when this confidence in the money used in the UK – public or private – has been shaken. The monetary stability framework is less than 25 years old and followed a period in which the value of all monies, public and private, denominated in sterling was unstable[5].

The current regulatory framework for banks and deposit guarantee scheme originate in an even more recent experience. In the financial crisis only 10 years ago, the government was forced to bailout the banking system at

enormous cost to avoid the millions of citizens losing the money they held in the form of claims on commercial banks – and the general loss of confidence in private money that would have ensued.

To be clear, I think the reforms we have made over the last 10 years have led to a much more robust and resilient commercial banking sector. The experience of the last 12 months has demonstrated the resilience of the banking system to an extreme economic shock.

But these not so distant episodes underline that threats to confidence in money or particular forms of money, is not just something in the history books. Money is in the end a social convention that can be very fragile under stress.

Future trends

Money is not only a social convention, it is a very dynamic one. The forms it can take and the uses to which it can be put have varied materially through history and between societies. Change has often been driven by the interaction of technological innovation that has improved the functionality of money – for example, by making it more secure or more convenient to use.

We have been living through a period of such change for the last few decades.

On the supply side, commercial bank, digital money has become more available to the general public, cheaper and more widely used, especially for lower value transactions.

On the demand side, convenience, especially with regard to e-commerce, has fuelled the public appetite for digital money. As a result the use of public money in the form of physical cash has been declining.

These changes have been very marked in the UK where they have mainly taken the form of the issuance of credit and debit payment cards to the general public[6], the development of a Faster Payments System and the emergence of e-money, a derivative of commercial bank money[7]. Digital forms of payment overtook cash in 2015 and now make up three quarters of all payments, with debit cards alone accounting for 42% of payments.

As the only digital money available to the public is private, commercial bank money, the shift from physical cash to digital payment over recent decades has meant a shift from public to private money.

The pandemic and consequent huge forced experiment in remote living, working and transacting has, at least temporarily, accelerated these trends. A recent Bank of England survey, for example, found that 70% of respondents were using less cash than prior to the pandemic. There has for obvious reasons been greater use of contactless payment[8] and internet transactions[9].

We do not, of course, know how persistent these changes will be when we emerge from the pandemic. I think, however, that it is a relatively safe bet that the experience of the last 12 months will lead to further acceleration of the move from physical to electronic/digital money and with it a shift from public to private money.

Over recent years, the technological innovations that have made digital private money cheaper and more convenient for both e commerce and face to face transactions have been the result of technologies that if not quite 'old hat' are certainly now quite familiar[10].

There are, however, on the near horizon newer technologies and innovations, such as tokenisation and distributed ledger, which may further transform the money we use.

'Stablecoins', a form of crypto-assets are probably the best known of these. Their proponents claim that these have the potential radically to reduce the costs of digital money and to increase its 'functionality', the 'things it can do', embedding money much more deeply into the digital world in ways we can only now imagine[11].

The proponents of these newer forms of money are typically not banks but technology companies including the so called 'Big Tech' internet platforms. Their business models are very different to banks: many have no interest in providing credit but rather seek to integrate new forms of money into their other, data driven services.

This has attracted enormous attention, including from public authorities, like the Bank of England, who are now wrestling with the thorny question of what regulatory framework should apply to non-bank issuers of private money. (I do not propose to wrestle with that question today - the Bank of England will shortly be issuing a discussion paper on the public policy implications of non-commercial bank digital money[12])

Such developments would lead to a further shift away from cash and public money. They may never happen of course. However, having watched the digital transformation of other parts of the economy one would not bet against the next wave of technology leading to further major transformation: we could now, in payments, be in a 'Blackberry' world about to see the introduction of the 'iPhone'.

The Bank of England is committed to making physical cash, banknotes, available as long as there is demand for it and is working with other authorities to support continued access to cash. I do not think that demand for cash will entirely disappear any time soon. Many still rely on it for a number of reasons[13].

But cash, and by extension public money, is becoming an ever smaller fraction of the money we use in the UK and increasingly unusable in a digital world.

We may not be there yet. But it looks probable in the UK that if we want to retain public money capable of general use and available to citizens, the state will need to issue public digital money that can meet the needs of modern day life.

Does it matter?

The question – and it is not just a question for central banks – is: does it matter if the public cannot access public money they can use in their everyday lives?

The current mix of public and private money in the UK is the result of history rather than some informed policy decision and some might argue, generally available public money is becoming an anachronism.

Given we have the credible public authority framework for private money I described earlier, why should the state need to be involved in the issue of money to the public in competition with the private sector? The state does not directly provide electricity or water to the public in the UK anymore? Why should it provide money?

These are important questions that should not be brushed aside. Any decision that the state should issue a new form of digital money to its citizens cannot rest simply on the fact that the role in society of public money is declining. It must rest on an assessment of the benefits of ensuring available and useable public money and the costs and risks of letting it disappear.

Such an assessment has not yet been done in the UK and no decision has been taken to introduce a public digital money – or to use its technical name, a Central Bank Digital Currency or CBDC.

Introduction of a CBDC would be a very major public project which would have material implications for the financial sector, many parts of the economy and for society more broadly.

The Bank of England, like many other central banks, has been exploring these issues in recent years. We published a discussion paper last year with an illustrative model of a general purpose public digital currency. We will shortly publish another discussion paper on some of the public policy issues generated by new forms of digital money.

At this year's UK Fintech Week, the Chancellor announced the establishment of a Task Force, led by the Treasury and the Bank of England to ensure a strategic approach is adopted between the UK authorities, as we collectively explore the issues posed by CBDC[14].

I do not want to anticipate the outcome of this work. But on the basis of the work the Bank has done so far, I can perhaps set out some preliminary views on where some of the benefits might lie and where, conversely, there might be risks in allowing publicly available state money to disappear.

In doing so, I will look to the future as well as to the present and to the possible entrance of non-bank issuers of private money such as the 'Big Tech' platforms. Given the speed of technological development in payments and of the changes we are seeing in the way we transact, any assessment that is not forward looking is very likely to be overtaken by events.

Financial stability

First and foremost are the financial stability implications of the absence of public money for use by the general public. Ensuring confidence in money as a means of payment and store of value is fundamental to financial stability. Does the presence of public money in the hands of citizens play any part in this?

The answers here, I think, lie in two related areas. First, the role that generally available public money plays in ensuring both the perception of uniformity of money in the UK and the reality of the substitutability, of all of the monies used in the economy.

The fact that holders of any private money issued by a commercial bank have the right to convert it into public money –ie. cash - on demand is in my view one key element in the framework that guarantees to users that one form of money in the UK, say claims issued by Bank A can be exchanged for claims on the state or claims on Bank B without any change in value[15]. From the user's point of view, it is all just the same 'money', pounds sterling.

The requirement on banks to be able to exchange, on demand, the money they issue through deposit accounts for Bank of England money also anchors the regulatory framework for banks.

The second area is the role that access to public money may play during times of stress when confidence in the issuers of private money comes under threat.

This is a complex issue. On the one hand during such episodes, easy access to safer, public money may stimulate runs out of private money amplifying the stress. On the other hand, the knowledge that under stress depositors have the option to switch into state money may be important in preventing a more general loss of confidence in money.

Absent access to public money the general public is effectively locked into private money. Deposit protection, in such a world, only enables depositors to exchange the claims on one bank for claims on another.

In a systemic stress, when the robustness of the banking system as a whole is under threat, the perception that there is no route out of private money, that there is no access to safe liquid assets backed by the state, could undermine confidence.

This perhaps hints at something more elusive and yet more fundamental about the role of public money in citizens' perception of money itself: that whatever its form or issuer, confidence in the concept money in society needs anchored by the perception of a liquid safe asset that will always be accepted.

In previous centuries gold has played that role and its symbolism remains powerful to this day. In modern times, in the UK, I suspect the state, in the form of the Bank of England and its 'promise to pay' provides that anchor[16]. It is not at all certain whether the Bank of England could continue to provide that anchor, particularly in times of stress, if the public did not have access to the money it issues.

In thinking about these possible roles of generally available public money it is important to think beyond the status quo in which private money is issued only by tightly regulated commercial banks.

As I set out earlier, there is now the very real prospect of non-banks, including the large technology platforms or 'Big Techs', issuing new forms of digital money, such as 'stablecoins'[17] for general payment purposes. These are likely to have greater functionality and lower transaction costs than the current commercial bank digital money offering and could quickly attract a large number of users.

The role of generally available public money in anchoring both uniformity and confidence is likely to be more important in a world in which there is greater diversity in the issuers and the forms of the money circulating in the economy.

One cannot of course prove that generally available public money plays the role in financial stability that I have sketched out above. I know of only one, relatively small, example of a modern economy in which the general public does not have access to state money[18] and I am not aware of many in the historical record.

It is certainly arguable that that some combination of regulation and backstopping of private money in its current and future forms will be sufficient to provide the necessary anchors both in normal times and in stress.

But there are clearly risks here to confidence in one of the fundamental underpinnings of the economy and society. And 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.

Other public policy objectives

There are other areas in which there may be risks in allowing publicly available state money to disappear and benefits from a CBDC. These concern the wider benefits from a well-functioning money and payments ecosystem for economic activity.

This is an area in which the Bank has a particular interest but where responsibility is shared across a range of public authorities that will be involved in the work of the Task Force. Specifically I am thinking about promoting competition, innovation, inclusion and privacy.

Ensuring competition in the provision of payments services is important for the wider economy. Today, businesses pay substantial fees in order to accept payment from their customers whether directly to private companies[19] or indirectly through the costs of sorting, transporting and securely storing cash. Small business are particularly impacted in both cases. Customers do not see these fees of course, but like other merchant costs, all else equal, they increase the prices that customers pay.

Payments systems are however, by definition, susceptible to network effects. Consumers and retailers prefer to use a payment method when it is already widely used, and so customers gravitate towards large payment platforms. This dynamic makes it very difficult for new payments firms to enter the market, which can in turn insulate incumbents from competitive pressure.

Looking forward, the challenge of delivering competitive outcomes is likely to grow more complex. As the payments business becomes increasingly integrated into the digital economy, the use of data has the potential to deepen the network effects in payments.

For example, if, big tech platforms have a very different, data driven business model to banks. If they are able to better extract value from user data, they may be able to more heavily cross-subsidise their payments business.

Interoperability is key for fostering competition in payments systems. By interoperability I mean the ability of consumers to move funds across systems or providers with little friction and at no substantial cost.

New money and payment innovators, with powerful data advantages could have strong commercial incentives to set themselves up as so called 'walled gardens' – systems that are not interoperable with others and therefore lock in consumers.

Competition acts a spur to innovation. As I observed earlier, we may still be in the 'Blackberry' phase of innovation in payments. The new technology and growth of digital payments is increasingly allowing for specialisation[20] and innovations that are giving new options to consumers over how they pay. Ensuring competition will be key to the conditions in which such innovation can flourish.

Competition and cost control can be ensured by regulation, by access to infrastructure and by common standards. Payment card fees, for example, are capped in the UK and the Payment System Regulator acts as the economic regulator of the main UK payment systems. Other regulation prescribes common standards for non-banks to access bank-based deposit account information. The Bank of England has widened access to its central payments infrastructure to include non-bank payment firms.

However, public digital money could also have an important role in this respect. The option of paying in cash has in the past served to anchor the cost of face-to-face transactions. Looking ahead, as payment options proliferate, the option of using digital public money as an alternative to private money could play an important role in anchoring costs.

Equally important, digital public money and the infrastructure necessary to support it would help ensure the necessary interoperability and common standards between all major payment systems in the future economy. The extent to which digital public money in the form of a central bank digital currency could play these roles would depend on its design - most particularly on its interaction with the private sector.

In its discussion Paper last year, the Bank of England set out as an example a platform model of a central bank digital currency. This illustrated the role private firms might play in delivering interoperability, innovation and competitive outcomes as part of a future payments landscape.

In the model, digital public money would operate alongside private money - as cash does now. The central infrastructure in the model would be operated by the Bank of England. All customer facing services, however, would be provided by private sector firms, banks and non-banks alike, who would be able to plug into the Bank of England infrastructure and integrate digital public money into the services they offered.

There are also some wider social questions about the type of money we use that fall broadly into the category of 'values'. I will briefly highlight a few of these.

The first is inclusion. It is important for social as well as economic reasons that all have access to money in the form they need to make transactions. Physical cash provides a backstop. It requires very little of users - neither identification, nor ownership of a smart phone nor any particular understanding of technology. But it is increasingly a backstop rather than a fully functioning alternative.

Today, there are currently 1.2 million unbanked people in the UK, who by and large rely on cash and cannot access digital payments or can access them only at disproportionate cost.

The experience of the last 12 months has highlighted the risks of digital exclusion generally. As the economy become increasingly digitised, the social consequences of exclusion from digital money will become more severe. This is not simply due to the growing importance of internet transactions. We already see a small but growing number of examples in which cash is not accepted for face-to-face transactions.

As we have seen over many years with the banking system, future private money and payments providers may not have the commercial incentives to provide useable services for the unbanked and other parts of the population. Digital public money, appropriately designed, may therefore have an important role to play in ensuring inclusion.

A second area in this values category is privacy. This is a complex area. There is clearly a trade-off between the need for effective law enforcement to combat illicit activities on the one hand and citizens' right to privacy on the other. The balance will I am sure need to be struck in the same place for digital private and public money alike. It may, however, be considerably easier to implement for public digital money.

There is, however, another important privacy concern – the use of data on individuals' transactions for commercial rather than law enforcement purposes. This is, and will I am sure, continue to be covered by regulation. But as most of us have probably experienced when being asked to give permission to use our data, there is often not an alternative option offering greater privacy available for the service we need. Given the network effects around money and payments, it is not clear that absent public digital money such an alternative would exist.

And finally, and perhaps most simply, should citizens have the right to holding and using the safest form of money, public money, in their usual, everyday lives and in times of uncertainty? It is perhaps no coincidence that the demand for Bank of England money, cash, has gone up during the current pandemic even as the use of it in daily transactions has gone down[21].

Conclusion

When seeking to deliver public goods, such as inclusion and privacy, and similarly for competition, one might look to regulation to achieve desired public policy objectives. And indeed, the same may be true for the public policy objective of financial stability.

But regulation alone is not always the silver bullet for complex, multidimensional public policy objectives. It can be expensive, slow to react and difficult to police. It can also create barriers to competition.

It may be that a consistent regulatory framework across a range of policy areas could mean that it would not matter much if the population at large lost access to useable public money. But it might also be that a well-designed and effective public money alternative in combination with regulation where necessary would provide a more efficient and a more robust answer.

These issues and their implications for the design of any digital public money England will be at the centre of the work of the Treasury/Bank of England task force. We will explore them also in the broader engagement group that has been established.

There are other important questions that I have not covered about the public policy implications of any shift away from commercial bank money into any new forms of non-bank digital money whether public, like CBDC or private, like stablecoins. These will be explored in a Bank of England discussion paper we hope to release in the next few months.

My message, however, is that even without the new, technology enabled forms of money that are on the near horizon we are seeing accelerating changes in the way we live and transact that will greatly reduce and perhaps eventually eliminate the role that public money plays in the economy today.

New technologies and the entrance of new players are likely to reinforce these trends. We should not let this happen by accident. Whatever the outcome, it should be based on a careful and thorough assessment of the implications of such a change and of the alternatives that may be available to us. ■

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Endnotes

1. For much of the Bank's history we have been a quasi-public institution, under private ownership but tasked with the discharge of official functions.

2. The Bank of England is responsible for issuing Banknotes in the UK. Coins are produced by the Royal Mint, by agreement with HM Treasury.

3. This is sometimes also refer to as electronic money, but I will use the term digital money here – which avoids confusion with the narrow development of 'e-money' institutions.

4. UK Finance – UK Payment Market Summary (2020)

5. The UK's experience of high and volatile inflation is well documented. In the ten years before the introduction of the current monetary stability framework, inflation was on average twice as large and twice as volatile as in the following period.

6. Nearly all adults in the UK (97%, some 53 million people) now hold at least one debit card. The proportion of adults with at least one credit or charge card has increased slightly over the past few years with 68% of adults having at least one credit or charge card in 2019.

7. E-money firms are authorised or registered to issue e-money and undertake payment services. They offer electronic money, with client funds held at a commercial bank (and therefore backed at the central bank). However, e-money firms are not subject to many of the same safeguards as retail deposits, most notably deposit insurance.

8. In 2020 just under ninety percent of UK payments in the UK were contactless (Barclays Insights – 'Covid and the rise of the contactless consumer').

9. Online shopping accounted for 28% of UK retail spending in September 2020, compared with 19% a year earlier (Bank of England)

10. For example developments such as the use of 3-D secure protocols, delivered through Access Control Servers (ACS), have enabled the rapid growth of safe online payments and the integration of Near Field Communications (NFR) has enabled contactless card payments and greater adoption of mobile payments.

11. In the Bank of England's 2020 Discussion Paper on CBDC we highlighted emerging functionalities such as programmable money, smart contracts, device to device payments and micropayments. Amazon's 'Just Walk Out' stores give a sense of what is already possible. Advances in payments technology appear likely to accelerate these developments and provide for greater sophistication in the type and complexity of transactions that can be conducted seamlessly.
12. In the December FSR the Bank of England committed to publishing in due course a discussion paper on the potential effects from stablecoins and/or CBDCs on financial stability.
13. These are set out in detail in the 2019 'Access to Cash Review', which draws on a survey of 2,000 consumers.
14. Bank of England statement on Central Bank Digital Currency. The announcement also highlighted the formation of an engagement group for ensuring voices from across business and civil society are able to engage policy makers on these policy debates.
15. Today financial institutions are required, by regulation, to ensure redemption at par in fiat, which has the effect of also anchoring their redemption against other similarly regulated private monies, given the common reference point.
16. The promise to pay is, like all promises, intimately tied to credibility. Users must trust in the ability and integrity of the issuing authority, such that they can have confidence in support for the value of the means of payment. Physical symbolism in establishing this commitment may be significant, that is to say users of money place value on role of possession of a physical object establishing the right to a claim.
17. The Bank of England's Financial Policy Committee has set a clear expectation that where stablecoins are used in systemic payment chains in place of money, they must offer the equivalent protections to stable and reliable money currently used in traditional systemic payment chains, whether central bank money or private commercial bank money.
18. In Hong Kong, banknotes are issued by three commercial banks (under license from the HKMA). A similar arrangement exists in Scotland and Northern Ireland.
19. The Payment System Regulator has estimated the weighted average merchant service charge (the largest, but not only, fee item when accepting digital payments) across UK card transactions to be around 0.6%. This varies by size of business and is higher for smaller firms. For SMEs with lower turnover, the average MSC is three times larger, at around

1.9%.
20. We usually refer to making a payment as one, single, uniform activity – but there are a wide range of types of payments which may lead to distinct technological solutions. Payments vary based on who is making them (eg. business to business, person to person, government to person), their size (buying a house or chocolate bar), complexity (refunds, conditionality, bundling with other services eg. buy now pay later).
21. Despite the decline in the transactional use of cash throughout the pandemic, the value of notes in circulation (NIC) has shown strong growth, as is today nearly 20% higher than immediately before the pandemic. For context, the average growth rate of NIC over the preceding five years was 0.5%. For more detail, see Cash in the time of Covid

The views expressed here are not necessarily those of the Bank of England, the Monetary Policy Committee or the Financial Policy Committee. I would like to thank Shiv Chowla, David Copple, Ben Dovey, Julian Schelle, George Barton, Ridheema Manek, Miranda Hewkin-Smith and Cormac Sullivan for their help in preparing the text. I would like to thank Andrew Bailey, Nicholas Butt, Victoria Cleland, Lee Foulger, Andrew Hauser, Tom Mutton and Christina Segal-Knowles for their comments. This article is based on a speech given at the OMFIF Digital Money Institute, London.

A new template for the European fiscal framework

The European fiscal rules have been suspended to enable member states to combat the COVID crisis. Martin *et al* argue this is an opportunity for ambitious reform of a now clearly outdated fiscal framework

This column, part of the Vox debate on euro area reform, argues that the reactivation of the rules, now foreseen in 2023, should be made contingent on a political agreement on reforming the fiscal framework, and proposes a comprehensive reform in which the new European fiscal framework would prioritise externalities arising from debt sustainability risks and demand spillovers.

Fiscal targets should be differentiated depending on country vulnerabilities and implemented in a more decentralised way.

We propose a comprehensive reform in which the new European fiscal framework would prioritise externalities arising from debt sustainability risks and demand spillovers. Fiscal targets should be differentiated depending on country vulnerabilities and implemented in a more decentralised way. We provide a detailed economic and institutional roadmap for this reform.

We are no longer in the world of Maastricht

Since the Maastricht Treaty, the European fiscal rules have been constantly revised (without significant Treaty changes) but overall, the underlying framework has remained the same. Even before the COVID-19 crisis, many economists and officials were calling for its reform (eg. Bénassy-Quéré *et al*. 2018, Darvas *et al*. 2018, Feld *et al*. 2018, Thygesen *et al*. 2018).

The post-COVID context results in a disconnect between these rules and four new facts: higher public debts, very low or even negative interest rates, limited effectiveness of monetary policy in the vicinity of the effective lower bound, and common debt issuance with the adoption of the European recovery plan in 2020.

In this context, the role of fiscal policy in reducing both temporary and persistent demand deficits must be reassessed. This has strong implications for the euro area, where this role has been codified on a premise that now appears to be obsolete. Echoing Mario Draghi's 2014 call for a *"greater role"* for fiscal policy alongside monetary policy (Draghi 2014),

ECB Executive Board member Isabel Schnabel recently advocated rethinking the relationship between monetary and fiscal policy when interest rates can no longer be reduced, saying that *"effective macroeconomic stabilisation in the vicinity of the lower bound requires both unconventional monetary and fiscal policies"* (Schnabel 2021).

The case for a comprehensive overhaul of the fiscal rules

In a recent French Council of Economic Analysis paper (Martin *et al.* 2021), we argue that to be effective, an overhaul of the rules should address two main fiscal externalities. The first, which was at the heart of the euro area crisis,

is the risk to the area's financial and monetary stability posed by sovereign insolvency and, even more so, by the possible exit that could follow.

The rules should tackle the insolvency risk resulting from excessive debt, not the threats resulting from self-fulfilling expectations, which are and should remained addressed by the ECB (Farhi and Martin 2018).

The second externality, which was largely neglected in the design of the EMU, pertains to aggregate demand. As long as fiscal support to aggregate demand is called for and no central budget exists to take on this role, the impact of national fiscal policies on partner countries must be considered.

This externality was long considered secondary because of opposite spillover effects through the goods and capital markets, yet it is significant when the central bank's policy rate can no longer be reduced due to the effective lower bound.

While the need for reform is increasingly recognised, its nature remains fiercely debated. Blanchard *et al*. (2021) call for replacing budgetary rules by qualitative standards. They propose to get rid of all numerical criteria, to replace them with the sole principle that member states *"ensure that their public debts remain sustainable with a high probability"* and (in the most streamlined version of their proposal) to replace the mechanism of gradual sanctions by the standard EU procedure of action by the Commission before the Court of Justice.

We agree on the focus on sustainability and on removing the multiple numerical criteria that have accumulated in the European fiscal framework. However, we consider a complete break with the Pact as unrealistic.

Country-specific debt targets

We do not propose to rewrite the central provisions of the Treaty on the Functioning of the European Union (TFEU). This applies first of all to Article 126 (*"Member states shall avoid excessive government deficits"*), including the gradual pressure its procedures entail and the possibility – never used – of financial penalties. We regard a gradual peer pressure mechanism as appropriate in a context where excessive public debt may have adverse effects on partner countries.

Similarly, we do not propose to eliminate the central provision of Article 121 (*"Member states shall regard their economic policies as a matter of common concern and shall coordinate them within the Council"*) on which the preventive arm of the Stability Pact was built. Neither the spirit nor the letter of this article prejudges the nature of externalities or the desirable direction of national policies.

However, we believe it is essential to at least de facto (and in time de jure) remove the uniform numerical thresholds for the debt (60% of GDP) and the deficit (3% of GDP) indicated in the Protocol 12 annexed to the TFEU. The debt threshold sets a target that is too far removed from reality and lacks analytical foundations.

Uniform numerical criteria are misplaced because debt sustainability depends fundamentally on the differential between the interest rate and the growth rate and on a state's capacity to maintain a sufficient primary surplus. These determinants of debt sustainability are all very much country-specific.

We therefore propose that each government sets a medium-term debt target, the appropriateness of which would be first assessed by the domestic independent fiscal institution (IFI) on the basis of a common methodology, monitored by the EFB, and second endorsed (or rejected) by the EU.

This target should be explicitly based on estimates of the maximum primary balance and the risks to the interest rate–growth rate differential.

Once debt targets have been set, they should serve as anchors for expenditure rules. The path for primary nominal expenditure net of new discretionary tax measures (and excluding automatic stabilisers on the expenditure side) would be determined accordingly.

Our proposal would change the hierarchy of objectives. So far, the deficit criterion has in most cases been given priority over the debt criterion. We would instead give priority to a country-specific debt target and de-emphasise the primacy of the deficit criterion.

Legally speaking, the reference value for public debt mentioned in Article 126 would need to be interpreted as country-specific rather than uniform. Ultimately, this would require amending Protocol 12, which can be done by unanimous agreement.

We do not favour introducing a golden rule that would treat investment expenditures differently from other public expenditures, as the distinction between investment expenditures and other growth-enhancing expenditures would raise endless discussions.

Nevertheless, it will be the role of the IFIs and of the EU to take into account the impact on potential output of public investment in a broad sense. The assessment of public finance sustainability should also consider the time profile of climate investments in order to ensure they are not postponed.

Space for discretionary policy

Because discretionary fiscal policy has an important role to play in a regime of low interest rates and as long as the sustainability objective is not at risk, the fiscal framework should leave room for active demand management. A possibility would be to apply a common flexibility factor to national expenditure rules. However, this would not prevent member states from running excessively tight fiscal policies in a slump.

The Recovery and Resilience Facility (RRF), introduced in 2021 to respond to the pandemic shock, could serve as a template for a new European fiscal instrument. It would not be a budget, and the stabilisation of business cycles would continue to rely on monetary policy and on the member states' fiscal policies.

Nevertheless, the experience with the RRF could serve as a basis for taking joint fiscal initiatives in response to crises leading to prolonged demand shortfalls or to a structural lack in public investment. This could take the form of a European instrument to finance specific public investment programmes by means of mutualised debt.

A new institutional framework

We propose a redefinition of responsibilities of both the IFIs and of the European Fiscal Board (EFB). We recommend strengthening the resources, independence and surveillance capacities of the national IFIs, in order to further anchor the culture of fiscal responsibility in domestic institutions. We propose that:

- the EFB defines a common methodology to assess national fiscal sustainability, and controls its implementation by the IFIs;

- each government sets a debt target and expenditure rule over a five-year horizon;

- the IFI assesses whether the government's debt target is compatible with the EU sustainability standards, and its detailed assessment is made public;

- the Commission recommends to the Council whether or not to endorse the national debt target and expenditure rule;

- the Council (in euro format) endorses or rejects the member state's fiscal targets; and

- the Commission monitors the implementation of the country-specific fiscal rule.

A detailed map of the institutional geography is given in Figure 1.

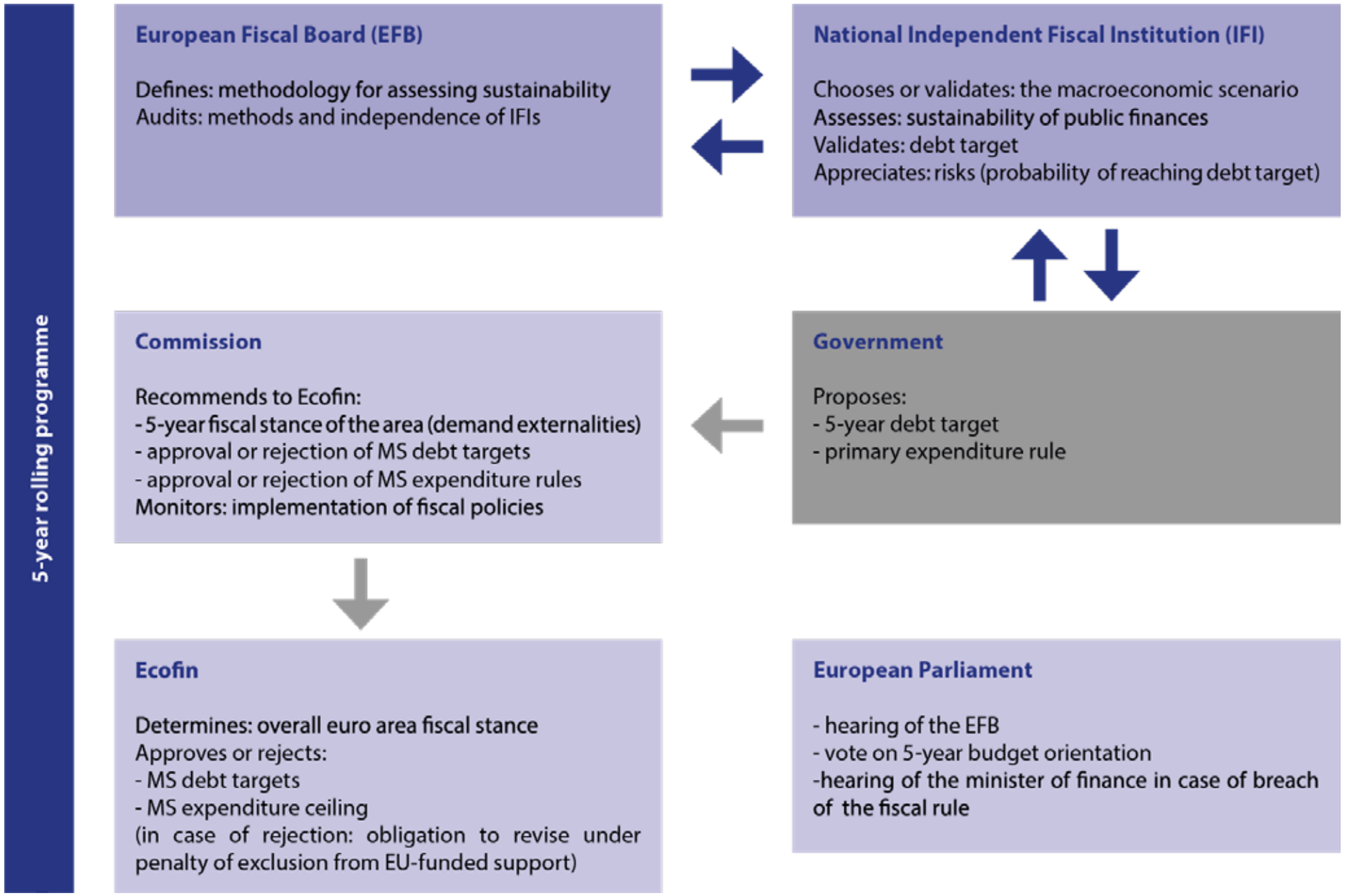
Enforcement

To remain effective, a more adaptable oversight system must rely on credible sanctions for violation of the sustainability requirement. On top of the approval of the debt target and the expenditure rule by the Council, we propose the excessive deficit procedure be triggered by a manifest violation of the country-specific expenditure rule.

Moreover, if the Commission assesses that the budget for the following year risks materially violating the expenditure rule, it should refer it to the Eurogroup, which would make its opinion public.

Finally, an adjustment account should be introduced that would keep the memory of past spending slippages (or past under-spending) and contain or permit future spending overruns.

Figure 1



On top of being legally powerful, analyses and pronouncements by the IFIs, the Commission and the Council will carry weight because these informed judgements on potential risks to debt sustainability would have financial consequences through impacting borrowing costs.

For the management of demand externalities, we propose that the Commission make a recommendation to the Council on the overall fiscal stance of the euro area, both at a one-year and five-year horizon, and that it recommend the reorientation of a fiscal policy (be it too restrictive or too expansionary) of a member state that would aggravate current account imbalances within the zone.

The Commission should also be entrusted with the responsibility of proposing the activation of exceptional support through the to-be-constructed common fiscal instrument.

Conclusion

The reforms we propose are substantial but compatible with the essential provisions of the European treaties. They aim to avoid policies that would endanger the stability of the euro area, whether through excessive debt or lack of fiscal support.

We believe that the European economic policy system must learn all the lessons of the new economic and financial environment. The reforms of the fiscal framework that we are proposing aim to make states both more autonomous in their fiscal choices, and more responsible. ■

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This article is based on the lead commentary in the VoxEU debate on euro area reform

Central banks in a shifting world

Philipp Hartmann and Glenn Schepens provide selected takeaways from the ECB's Sintra Forum, including whether globalisation is reversing and the role of fiscal policy for the post-COVID recovery

The 2020 ECB Forum on Central Banking addressed some key issues from the ongoing monetary policy strategy review and embedded them in discussions of major structural changes in advanced economies and the post-COVID recovery. In this column, two of the organisers highlight some of the main points from the papers and debates, including whether globalisation is reversing, implications of climate change, options for formulating the ECB's inflation aim, challenges with informal monetary policy communication, relationships between financial stability and monetary policy, how to make a monetary policy framework robust to deflation or inflation traps and the role of fiscal policy for the recovery from the pandemic.

The 2020 ECB Forum was one of the 'ECB listens' events through which the ECB collects the views of relevant outside parties on its monetary policy framework. Policymakers, academics and market economists debated the implications of selected key structural changes that have a bearing for how monetary policy works in the euro area, combined with discussions on core topics featuring in the strategy review.

We group some of the main issues debated in five sections below. All papers, discussions and speeches can be found in the conference e-book (ECB 2021). Video recordings of all sessions are available on the ECB website.

Fundamental structural changes in the world economy: 'slowbalisation' and climate change

One of the key structural changes in the world economy over the last decades was globalisation. But since the Global Financial Crisis and with the rise of populism, the issue has emerged as to whether this process is reversing to 'de-globalisation'.

Pol Antras (in Antras 2021) argues that international trade and supply chains have slowed but not reversed ('slowbalisation') and may be regarded as not likely to turn to de-globalisation. The backward-looking part is

illustrated in Figure 1, which shows that after a period of very fast 'hyperglobalisation' between the mid-1980s and 2008, the share of world trade in world GDP has stayed roughly constant.

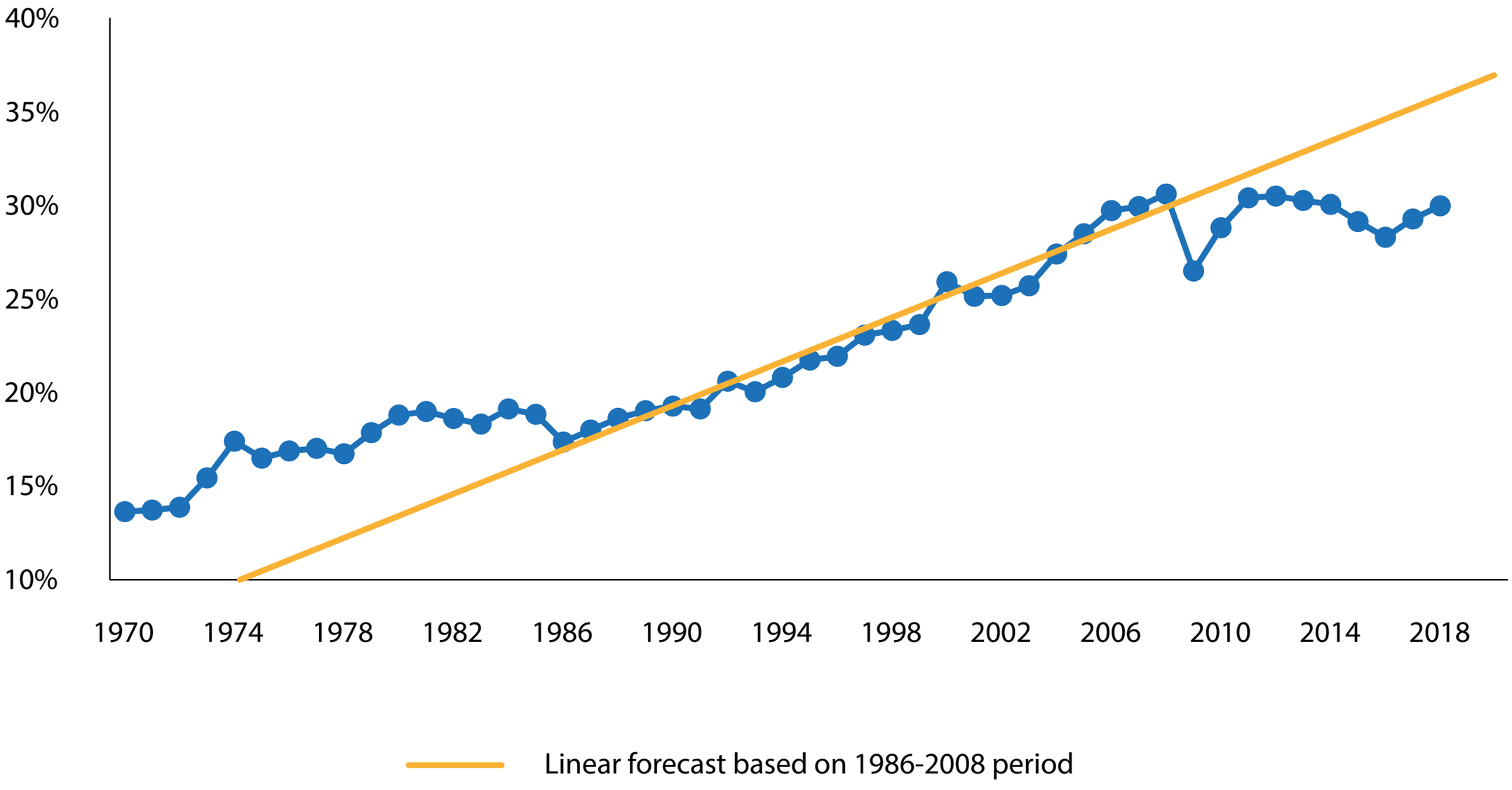
Looking forward, Antras argues that two out of three main factors that explained 'hyperglobalisation' are unlikely to reverse. First, new technologies will continue to foster trade, because those substituting (foreign) labour (such as robotisation or 3D printing) still generate increased demand for traded goods (such as machines or IT parts).

Second, the high sunk costs of establishing global supply chains make them resilient to temporary shocks and re-shoring only attractive for very persistent shocks.

The only hyperglobalisation factor risking to reverse is multilateral trade liberalisation. To the extent that agents perceive the COVID-19 pandemic as temporary, it is unlikely to become a persistent de-globalisation force.

All in all, the right policy mix requires that fiscal policy remains at the centre of the stabilisation effort

Figure 1. World trade relative to world GDP (1970-2018)



Note: Trade is defined as the sum of exports and imports of goods and services.
Source: Antras (2021), based on World Bank's World Development Indicators

Susan Lund added that China rotating from exports to domestic consumption and building domestic supply chains can account for most of the global trade slowdown over the last decade (Lund 2021). As both reflect economic development, it may be regarded as a positive story, one other emerging economies may also go through in the future.

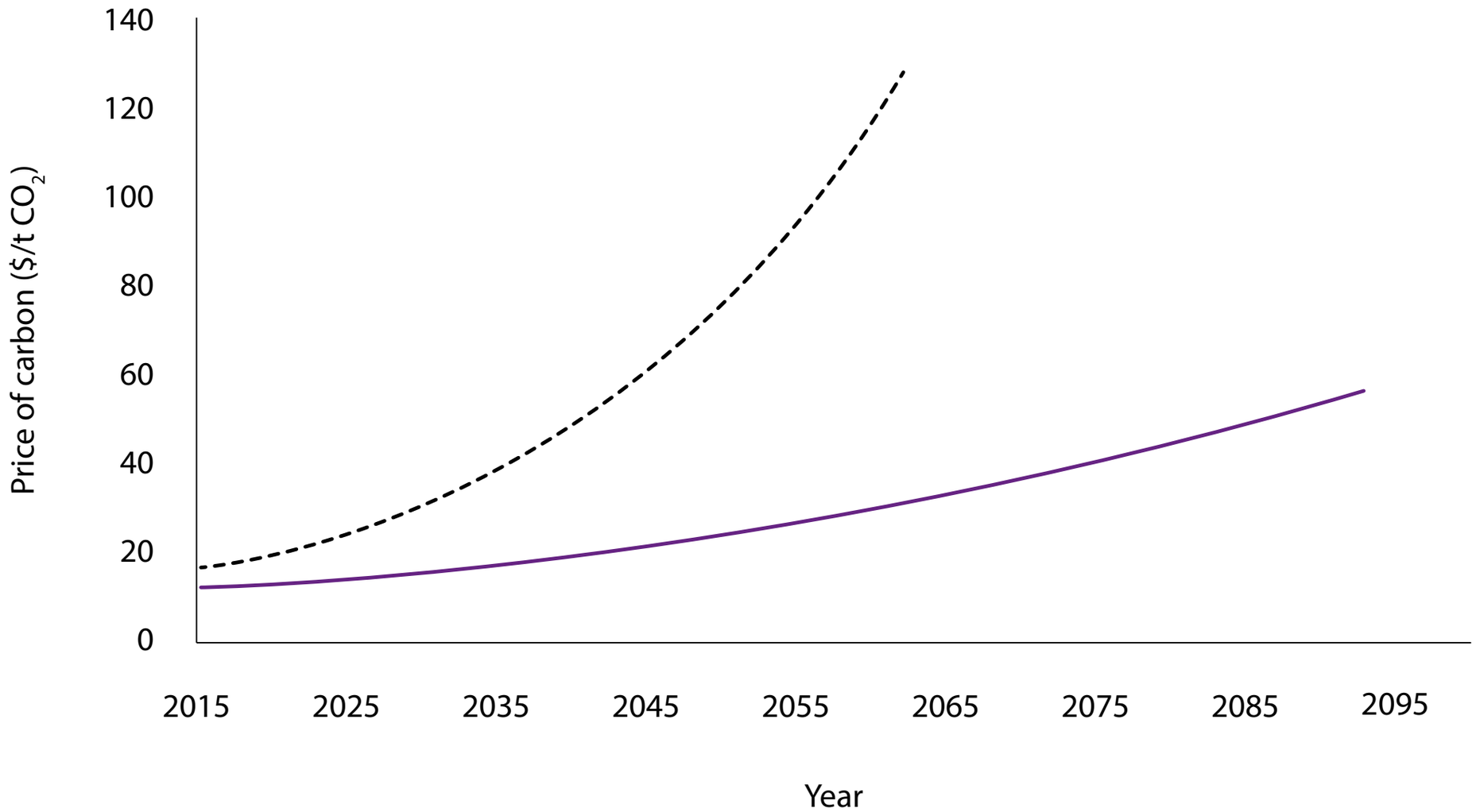
Climate change is likely to set in motion another set of major structural changes in the world economy. But Frederick van der Ploeg strongly warns of the great risk that policy responses will be too timid and too late, implying an unsmooth carbon transition with stranded assets and financial instability (van der Ploeg 2021).

A sudden shift in climate policy or a technological breakthrough can lead to sudden changes in the market valuation of firms (so-called tipping events). Figure 2 (taken from van der Ploeg 2018) illustrates that the route of a cap to global warming taken by the Intergovernmental Panel on Climate Change (dotted line) would increase the carbon price (and therefore reduce carbon emissions and increase renewables) much faster than economists' preferred approach of pricing carbon at its estimated social costs (solid line).

The reason is that economists' 'Pigouvian' approach does not take peak temperature constraints into account, and thus prices do not have to rise so fiercely under it.

Van der Ploeg (2021) calls for climate policies to be delegated to a politically independent emissions authority (a 'carbon central bank'), for the carbon price to start relatively high and then grow moderately but steadily (avoiding paradoxical emission increases due to the anticipation of future policy tightening), and for revenues to be used to compensate low-income households and to support firms at risk from carbon-intensive imports as well as for financial stability risks to be kept under control with climate stress tests.

Figure 2. Evolution of the carbon price implied by the Pigouvian versus the carbon budget approach to climate policy



Note: The solid line represents the necessary evolution of the calibrated optimal carbon price, as derived from a simplified Dynamic Integrated Climate-Economy (DICE, see eg. Nordhaus 1993) model that sets the optimal price equal to the social cost of carbon ('Pigouvian approach'). The social cost is defined as the present discounted value of all future production losses stemming from emitting one ton of carbon today. The dotted line not only takes into account the social cost of carbon but also the need to keep peak global warming below 2 °C (relative to global temperature in the pre-industrial era; 'carbon budget approach'). This is in line with the route taken by the IPCC.
Source: van der Ploeg (2018, 2021).

Francois Villeroy de Galhau suggested that central banks look at whether climate risks are adequately reflected in their collateral frameworks. Krogstrup (2021) concluded that fiscal policy should be first in line for a cost-efficient carbon transition, but central banks will address their stake in it.

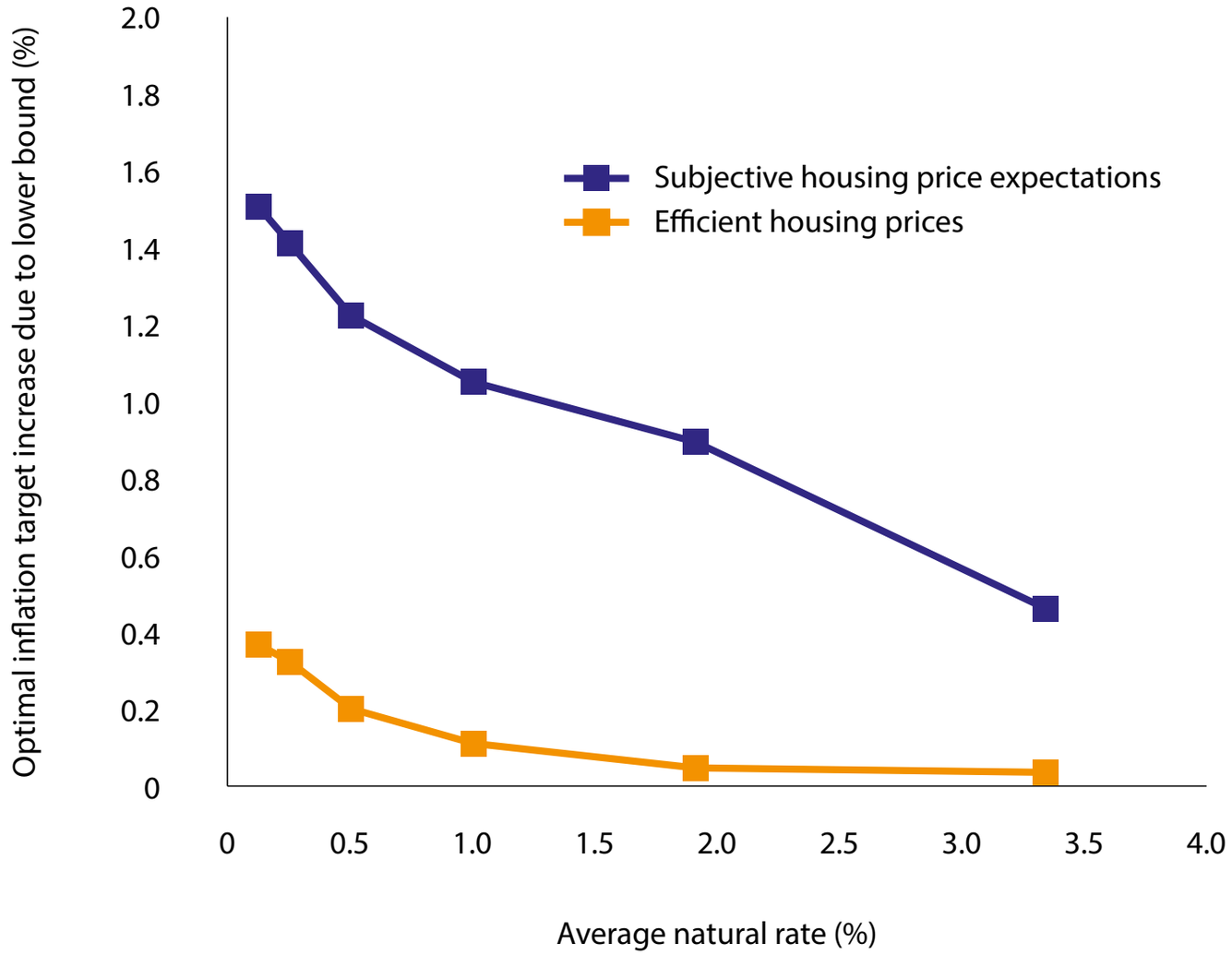
Formulations of central banks' inflation aim close to the effective lower bound of nominal interest rates
One of the key challenges for monetary policy in our times is the sustained downward trend in natural interest rates that can be estimated for the past decades (Laubach and Williams 2003, Brand *et al*. 2018). The low estimates of natural rates imply that central banks' conventional interest rate policy may not be able to provide sufficient stimulus in the presence of negative shocks, as policy rates cannot be reduced low enough below the natural rate.

Klaus Adam argued that an increase in the inflation target could be a solution, because – if the increase is credible – the inflation expectations that it would induce would stimulate the economy through lower real interest rates (Adam 2021).

His research suggests that the declining natural rate also influences asset price volatility and that the efficiency of financial markets therefore has a bearing on the extent to which the target should be increased and whether monetary policy should react to longer run asset price fluctuations.

More precisely, the New Keynesian model developed in Adam *et al*. (2020) suggests that, with rational expectations in financial markets, the optimal increase in the target to compensate for the constrained policy rate is relatively small (red line in Figure 3). The inflation target needs to be increased by much more when subjective price expectations create procyclical asset price fluctuations (blue line in Figure 3), as the effective lower bound (ELB) on monetary policy rates is hit more often.

Figure 3. Relationships between the optimal inflation target, the natural rate of interest and expectation formation in housing markets due to the effective lower bound on nominal rates



Note: This chart illustrates the optimal inflation target, ie. the average inflation outcome under optimal conduct of monetary policy. For each considered level of the average natural rate (on the x-axis), the chart reports the optimal inflation target (on the y-axis) in an economy with an effective lower bound constraint, relative to the target that would be optimal in the absence of a lower-bound constraint. The blue line shows the optimal inflation target in an economy where house prices are efficient (ie. driven by fundamentals only). The red line reports the optimal inflation target for the case where housing prices are driven – at least partly – by fluctuations in subjective housing price expectations. Numbers are based on a New Keynesian sticky price model from Adam, Pfaeuti and Reinelt (2020), calibrated to US data. In the absence of a lower bound constraint, the optimal inflation target is zero, because the model abstracts from other forces that make targeting positive average rates of inflation optimal.
Source: Adam (2021)

Interestingly, in this model the central bank finds 'leaning' against inefficient asset price fluctuations optimal, undershooting the inflation target in upturns and overshooting it in downturns. The reason is that inefficiently high asset price volatility has too high a welfare cost in terms of capital misallocation towards appreciating assets.

Argia Sbordone argued that, in Adam's model, the increased incidence of the lower bound constraint does not imply that optimal policy raises the long-term inflation target (Sbordone 2021). Instead, it increases the time for which the central bank should temporarily target higher future inflation than its stated long-term inflation target.

This de facto would be similar to average inflation targeting (AIT), the policy announced by the US Federal Reserve in 2020. In Sbordone's view, such a policy is preferable because it faces a lower risk of permanently higher inflation when ELB incidences turn out to be infrequent. Alan Blinder made the point, however, that the vague formulation by the Fed risked undermining the basic idea of AIT.

Jordi Galí (Galí 2021: Figure 1) showed a similar negative relationship as Adam between the natural rate and the central bank's optimal inflation target, based on a New Keynesian model calibrated to euro area data (Andrade *et al*. 2021).

It suggests that while a target between 1.5% and 2% would be optimal for a higher real interest rate, for the lower levels estimated nowadays the target could easily increase to around 3%.

However, for increasingly aggressive monetary policy rules embodying an AIT with a long enough averaging window, the optimal target could be reduced to close to 2%. Aggressive countercyclical fiscal policy rules would have a similar effect in the model. Galí concluded that rather than deciding in favour of one of the three options, policymakers may want to pursue all the three at the same time.

Volker Wieland regarded raising the ECB's inflation aim at a time when inflation is very low as problematic, as the distance between the two is very large in such a situation and further policy easing may be difficult to achieve (Wieland 2021).

Hence, the desired inflation expectations effect may not materialise and the central bank's credibility may be eroded. Vítor Constâncio and Ignazio Visco argued the other way around, worrying that too little ambition could contribute to de-anchoring inflation expectations, making convergence to the desirable levels of inflation more difficult.

Moreover, as Wieland saw a significant part of low inflation in the euro area as being caused by import prices and the headline HICP inflation index does not cover faster-rising owner-occupied housing prices, he recommended that the ECB uses a wider range of inflation measures.

Based on a model in Wieland (2020), he also wondered whether uncertainty about the effectiveness of quantitative easing and some unintended side effects would not justify slower rather than faster convergence towards the inflation aim.

Undesirable informal monetary policy communication

Annette Vissing-Jorgensen opened the topic of monetary policy communication (Vissing-Jorgensen 2021). One of her main points was that unattributed individual communication, such as 'sources stories' in the media driven by disagreements among policy makers, are subject to a prisoner's dilemma-type problem and unambiguously detrimental.

She illustrated this point with a game-theoretic model of individual policymakers trying to 'spin' market expectations towards their preferred choices (Vissing-Jorgensen 2020). While asset prices may not be distorted

on average as victories and defeats cancel out over time, the policy space of the decision-making body will still be constrained as central banks have to worry about material deviations between market expectations and ultimate decisions.

Vissing-Jorgensen recommended consensus-building in monetary policy committees, as it would naturally reduce incentives for engaging in such individual informal communications.

Monetary policy, the allocation of risk, and central bank independence

Lucrezia Reichlin spelled out a conceptual framework for the relationships between monetary policy, risk, and financial stability in the new world of unconventional instruments (Reichlin 2021). She stressed the multi-dimensional nature of unconventional monetary policy 'packages', which control the entire yield curve and create complex interactions between macroeconomic and financial risks.

These policies can only be effective in supporting the macroeconomy if they induce the creation of new assets climbing up the risk spectrum. If these new assets finance productive activities, then the additional risks are 'good'. But prudential policy would need to prevent the creation of 'bad' risks.

Delayed, partial, or incoherent use of the range of instruments would undermine effectiveness; and so too would neglecting interactions and coordination with fiscal policy.

Hyun Shin complemented this by emphasising the importance of 'elastic nodes' in the financial system, which need to help accommodate the much-increased demand for money in situations of stress (Shin 2021). The first line of defence should be well-capitalised and resilient commercial banks; an example being how US banks allowed companies to draw on their credit lines during the 'dash for cash' in March 2020 (at the start of the COVID crisis).

In fact, several Forum speakers – such as Jerome Powell and Bank of England Governor Andrew Bailey – confirmed that banks generally stood up to this first major test of the reforms introduced after the Global Financial Crisis.

Markus Brunnermeier broadened the discussion with a proposal about how a monetary policy strategy can be made more robust against the risk of a central bank getting trapped in high inflation or deflation (Brunnermeier 2021). In the post-COVID recovery, an 'inflation whipsaw' could emerge whereby pent-up demand, government commitments or capital re-allocation create a reversal from low to high inflation (Brunnermeier *et al*. 2020).

In other words, it is necessary that the central bank can 'put the brakes on' later, in order to be able to confidently stimulate the economy with force in the low-inflation context.

But if during the downturn government debt becomes too high, a situation of fiscal dominance could occur, as the central bank would not be able to raise interest rates in the upturn without destabilising the budgets.

Similarly, if the banking sector was to not maintain its resilience and if the government was unwilling or unable to recapitalise the banks, the central bank may be forced to stabilise them with monetary policy redistributing risk – a situation of financial dominance.

Brunnermeier suggested that the relevant tail risks would be considered in a re-oriented second pillar in the ECB's monetary policy strategy. This would institutionalise heterogeneous thinking and go against the reliance on a uniform class of economic models.

The role of fiscal policy in the post-COVID recovery

Evi Pappa made a strong plea for discretionary fiscal policy taking a prominent role in the recovery from the COVID

pandemic (Pappa 2021). The theoretical case relies on higher fiscal multipliers in a situation in which conventional monetary policy is close to the ELB, as the central bank would not tighten in response to inflation expectations ensuing from the fiscal stimulus.

In line with this, Christine Lagarde argued in her introductory speech to the Forum that monetary policy should minimise any crowding-out effects on private investment that may emerge from rising market interest rates that the fiscal expansion could induce (Lagarde 2021).

Based on the experiences with EU structural funds for member states and regions over the last 30 years, Pappa particularly supported public investment spending funded by the Next Generation EU recovery programme. Her estimations in Table 1 (Canova and Pappa 2020) suggest that grants provided by the European Regional Development Fund have sizeable short-term effects.

Measurable effects of grants by the European Social Fund take more time to materialise. At the same time, Pappa cautioned that the literature suggests that the size of fiscal multipliers can depend on many factors.

Vítor Gaspar added that while national fiscal support packages increased euro area public debt by about 17 percentage points during 2020 to above 100% of GDP, the primary risk at the time of the Forum was the premature withdrawal of fiscal support (Gaspar 2021).

Moreover, he joined Evi Pappa in supporting public investment, emphasising the IMF's assessment that fiscal multipliers are particularly elevated in periods of high uncertainty (see Figure 4, based on IMF 2020), such as the case during the COVID pandemic (eg. Barrero and Bloom 2020).

Table 1. Average cumulative multipliers from grants under the European Regional Development Fund (ERDF) and the European Social Fund (ESF)

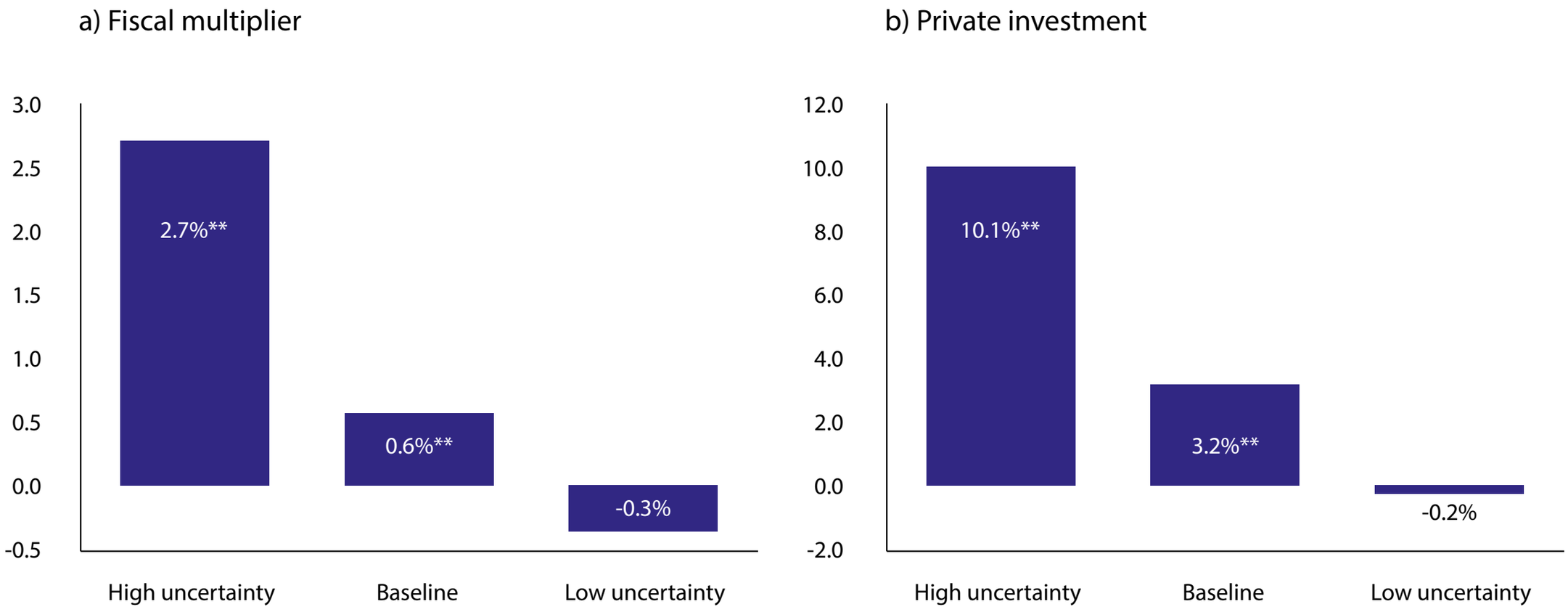
Macroeconomic variables	ERDF funds			ESF funds		
	1 year	2 years	3 years	1 year	2 years	3 years
Gross value added	2.42 (0.19)	1.56 (0.32)	0.56 (0.32)	-0.14 (0.63)	2.70 (0.79)	5.05 (0.82)
Employment	0.86 (0.15)	-0.03 (0.27)	-0.42 (0.29)	-0.33 (0.23)	-0.62 (0.34)	0.96 (0.36)
Investment	8.07 (1.71)	0.53 (2.68)	-1.40 (2.69)	2.13 (1.65)	2.75 (1.63)	3.58 (1.88)
Labour productivity	3.66 (0.37)	-3.65 (0.78)	-4.45 (0.75)	4.09 (0.70)	0.22 (0.83)	3.26 (0.85)
Real compensation	3.85 (0.36)	-2.62 (0.85)	-4.50 (0.84)	2.95 (0.32)	-1.54 (0.62)	4.54 (0.69)

Notes: This table examines the dynamic effects of ERDF and ESF grants on regional (NUTS3-level) macroeconomic variables in European Union countries, using local projections. The main regression specification is as follows: $\gamma_{i,t,h=}\alpha_{i,h}+b_{i,h}\gamma_{i,t-1,h}+c_{i,h}x_{i,t,h}+e_{i,t,h}$*, where* $\gamma_{i,t,h}$ *is the cumulative growth of the macroeconomic variable of interest in region i and year t over the time-horizon h (either 1,2 or 3 years, see columns) and* $x_{i,t,h}$ *is the cumulative change in the relevant grant (scaled by regional gross-value added). The estimated coefficients displayed in the table correspond to* $c_{i,h}$ *and standard errors are in parentheses. The coefficients can therefore be interpreted as the cumulative fiscal multipliers of the fund grants (euro change per euro of grants), or put differently as elasticities measured in per cent, at each horizon h. Given the potential endogeneity of structural funds to EU economic conditions, the authors instrument actual grants with their "innovations". To this effect they run the following auxiliary regression:* $x_{i,t,h}=\alpha_{i,h}+\beta_{i,h}w_{t,h}+\mu_{i,t,h}$*, where* $w_{t,h}$ *represents a set of four aggregate euro area variables: GDP, employment, the GDP deflator, the nominal interest rate, and the nominal effective exchange rate. They then use the "innovation"* $\mu_{i,t,h}$ *as an instrument for* $x_{i,t,h}$ *in the main equation*

Source: Canova and Pappa (2020)

Figure 4. Public investment multipliers and private investment 'crowd-in' for different levels of economic uncertainty

Cumulative two-year-ahead macroeconomic effects of a one-percent-of-GDP unexpected increase of public investment



Note: Effects on the vertical axes are measured in percentage changes over two years. Results are based on local projection estimations using the model $y_{i,t+k}-y_{i,t}=\alpha_i+\gamma_t+\beta_1 G(zi,t)FE+i,t+\beta 2(1-G(z_{i,t}))FE^{+}_{i,t}+\theta M_{i,t}+\varepsilon_{i,t}$ *where* $y_{i,t}$ *is the log of the macroeconomic variable of interest (real GDP for panel a) and private investment for panel b) for country i in year t,* $FE^{+}_{i,t}$ *is a positive unexpected shock to public investment spending (as share of GDP), in deviation from IMF forecasts, z is an indicator of the degree of uncertainty, and* $G(z_{i,t})$ *is the corresponding smooth transition function between different levels of uncertainty.* $M_{i,t}$ *includes lagged GDP growth and lagged shocks. Uncertainty is measured by the standard deviation of GDP growth rate forecasts across professional forecasters as published by Consensus Economics, using for each year the spring vintage of the forecasts. Data covers 72 advanced and emerging markets; the sample period is 1994-2019.*
Source: Gaspar (2021) and the IMF Fiscal Monitor (October 2020)

According to Gaspar, this happens because public support for investment in green and digital technologies would facilitate and give confidence to private firms to invest, in part because public investments signal governments' commitment to sustainable growth.

Lagarde (2021) contributed that in a pandemic emergency, when interest rates are already very low, private demand is constrained by health containment measures and levels of economic uncertainty are very high, fiscal policy can be particularly effective for at least two more reasons.

First, it can support the sectors most affected in a more targeted way than monetary policy (Woodford 2020). Second, as fiscal policy determines about half of total spending in the euro area, it can help coordinate the other half, breaking 'paradox of thrift' dynamics in the private sector and thereby also reinvigorating the transmission of monetary policy.

All in all, the right policy mix requires that fiscal policy remains at the centre of the stabilisation effort. ■

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Authors' note: All views expressed are summarised to the best of our understanding from the various Sintra participants' Forum contributions and should not be interpreted as the views of the ECB or the Eurosystem. This article was first published on VoxEU.org

Tackling climate for real: progress and next steps

Andrew Bailey talks about the work central banks have done on climate change, and how it will need to evolve

Over recent decades, our global economic system has faced multiple shocks or swan events, ranging from the COVID-19 pandemic to the global financial crisis of 2007/08.

But if we turn our eye to the future, we can see another swan lurking in the reeds, and it's green. That green swan is why we are here today, the threat posed to our economies and our financial system by climate change.

Central banks, regulators and policymakers came together in the aftermath of the financial crisis to reform the system so that it could better weather future shocks. Like before, we must come together again to address the threat of climate change. But unlike before, we cannot wait until the aftermath to do so.

I spoke recently about the role central banks have to play on climate change and that, far from representing an entirely new objective, the Bank of England's work in this space sits firmly within the bounds of our mission to maintain monetary and financial stability[1].

We have an important role to play, but it is governments, businesses, investors, and individuals that have the most difficult and impactful decisions to make in driving the transition to a net-zero economy. I want to build on those remarks to reflect on central banks' climate-related work to date and to consider how it will need to evolve if we are going to continue to meet our remit.

I will address this by talking about three main areas of our work: firstly, improving the understanding of climate-related financial risks across the financial system and macroeconomy; secondly, developing and embedding climate risk management in the financial firms that we regulate; and finally, seeking to achieve best practice through our operations as a central bank.

I will begin with our work to understand climate risks across the broader financial system and the macroeconomy. The Network for Greening the Financial System (NGFS) has continued its pioneering work in this space, through the publication of climate scenarios that provide a common starting point for analysing risks to the system[2], and the latest version of these scenarios is due to be published soon.

The scenarios bring together the financial and economic impacts of different temperature and climate policy pathways – a critical input for firms and policymakers to understand the future impact of the decisions they are making today.

The coming year will be critical for all of us on this journey – in allowing us to better convert climate change risks into something that we can tackle for real

Scenario analysis makes questions like how resilient is this business, this financial system, or this set of policies, to each climate scenario possible to address. Accordingly, the Bank continues to be a strong advocate of the NGFS' work and in 2019 announced our intention to assess the resilience of individual banks, insurers, and the wider UK financial system to different climate scenarios through a Climate Biennial Exploratory Scenario exercise (CBES).

The CBES will involve the UK's largest banks and insurers and explore three different climate scenarios, testing different combinations of physical and transition risks over a 30-year period. It is an important tool to size the financial exposures, to understand how different bank and insurance business models will be affected and how they might respond, and finally as a way of improving firms' risk management practices through the process of carrying out the exercise.

Firms should use the design of the CBES and the underlying NGFS scenarios to inform their own scenario analysis, build their understanding of the climate risks they face, and enhance their climate risk management capabilities.

I hope it will act as a catalyst, increasing firms' knowledge of the risks they face, and incentivising them to take steps to address these risks.

In turn, this will require firms' clients in the real economy to improve their understanding of how climate change and the transition to a net-zero economy could impact their businesses and operations.

Lessons learned from the CBES will also be shared with the NGFS as part of the collaborative approach taken by central banks, and on that note, I want to commend the ACPR's recent publication of its own ambitious scenario exercise for the French financial system[3].

Through both its scenario work in the NGFS, and its internal analysis, the Bank has developed a clearer understanding of where climate knowledge gaps persist and what these might mean for our objectives. For example, there is particular value in the deepening of our understanding of the macroeconomic implications of climate change and the pathways to net-zero.

It is for governments to set out a pathway to net-zero and the policy levers that will be used to deliver it. But as central banks, we will need to understand any implications of the transition for the economic outlook and our potential policy responses.

The NGFS have started to explore this, but more work will be needed as the impacts of climate change and the transition to net-zero start to come into sharper relief. At the Bank, the Monetary Policy Committee (MPC) recently had its first informal discussion on the macroeconomics of climate change, and climate is an increasingly important part of G7 discussions between central banks and finance ministries.

But more work and discussion is needed. Specifically, there is particular value in: (1) further integrating climate and macro modelling; (2) understanding and sizing related transmission channels; (3) going beyond the aggregate impacts to understand sectoral implications; and (4) assessing how the transition might affect the demand and supply sides of the economy.

What is increasingly clear is that the effects of climate change and the transition to a net-zero economy will manifest over time - so analysis needs to span the short, medium and long-term to capture fully these effects.

Let me now turn to how we are embedding climate risk management in the financial firms that we regulate.

We have worked to deepen our understanding of risks to the financial system and build resilience to climate change both at the macro and micro prudential level.

At the micro-prudential level, the good progress regulators have made through climate-focused fora such as the NGFS and Sustainable Insurance Forum (SIF) has catalysed work across international standard setting bodies and other authorities including the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB).

On that note, I welcome the FSB taking a more strategic and central role on climate-related financial risks across the wider financial system.

In the UK, the Prudential Regulation Authority (PRA) set out supervisory expectations for banks and insurers on the management of the financial risks from climate change in April 2019[4]. We have provided further guidance for firms on these expectations and have set a deadline for firms ambitiously to embed them by the end of this year[5].

Of all the building blocks required to manage effectively climate-related risks, climate disclosure is among the most essential - not only for transparency and for risk management purposes, but to facilitate the flow of capital towards investments that are consistent with an orderly economy-wide transition to net-zero. Consequently, it is also integral to the UK's legislative commitment to reach net-zero emissions by 2050.

For these reasons, the Bank has long supported the FSB's Task Force on Climate-related Financial Disclosures (TCFD)[6] and has worked with the UK Government and regulators to progress further and implement mandatory disclosures requirements across the UK economy by 2025[7].

Yet climate change is a global issue, which no nation can solve alone. Elon Musk aside - we cannot diversify away from our exposure to the planet. Therefore, information disclosed by firms across jurisdictions needs to be consistent and comparable to be useful in driving decisions.

That points to the need for further international collaboration on consistent approaches to disclosures requirements, for example the work of the IFRS's proposed International Sustainability Standards Board can serve as a useful minimum baseline.

Looking ahead, we need to ensure these initiatives are not only delivered but built on. To illustrate this, I believe there are some key areas of work we will all need to address over the coming period. For example, the quantitative mapping of the carbon intensity of firms or activities to financial risks and losses remains relatively unexplored.

This is understandable – it is a complex area as data remain scarce, scenario analysis is still in its infancy, and worldwide, government climate policies do not yet fully internalise the cost of emissions.

As I noted previously, the biggest component of the journey to net-zero is the delivery of clear sector-level climate policy pathways by governments. Central banks cannot and should not try to fill any gaps in that space through their micro and macro-prudential actions - for example, we are not here to deliver carbon pricing.

However, we should use these tools to fulfil our role over important areas such as those I am raising today. The final area I want to explore is the importance of central banks practicing what we preach by seeking to achieve best practice through our own operations.

We hold ourselves to the same high standards that we expect of the firms we regulate. Consequently, we need to ensure that, wherever possible, our own financial operations, such as financial asset portfolios we hold, and our own physical operations, such as emissions from our buildings and printing banknotes, conform to best practice in the measurement, management and mitigation of climate risks.

In line with this, I can confirm today that the Bank is committing to reduce emissions from our physical operations so they will be consistent with net-zero by 2050 at the latest.

In the spirit of transparency, last year we published a TCFD aligned climate-related financial disclosure[8]. The most challenging aspect of this report was the inclusion of analysis of the emissions associated with a monetary policy portfolio, a first for a central bank.

In our forthcoming report for 2021, which will be published shortly, we have sought to build on last year's content to provide additional context and analysis.

In March last year I outlined our intention to assess ways that our holdings of corporate bonds could be adjusted to take the climate impact of issuers into account whilst still meeting our monetary policy objectives[9]. Last month we set out in a Discussion Paper our proposals for 'greening' our Corporate Bond Purchase Scheme (CBPS)[10].

There is no template for a comprehensive framework for greening an asset portfolio held for monetary policy purposes. We know that outreach and engagement is critical in getting this right, and so are currently seeking feedback on our proposed framework. We are keen to hear from a range of experts and stakeholders to inform our next steps.

The need for us to act in this space was clear and unambiguous. First, there is increasingly persuasive evidence that emissions, and so climate risks, are systematically underpriced in financial markets.

This means that continuing to replicate the structure of the sterling corporate bond market, without taking explicit account of the climate impact of bond issuers, is no longer in fact a truly 'market neutral' approach.

And second, the remit of the MPC was updated in March this year to clarify that, subject to achieving price stability, the Committee should support the transition to net-zero as part of the government's economic strategy[11].

The CBPS will remain a monetary policy tool, with its overall target stock of assets set by the MPC in order to achieve its primary inflation objective. However, from Q4 this year we intend to modify our approach to the composition of assets we buy, in order to take account of climate considerations.

Our approach will be guided by three principles.

- First, we will look to incentivise companies to take decisive actions which contribute to an orderly transition of the overall UK economy to net-zero.

- Second, given the relatively small scale of the CBPS in the context of capital markets, we will seek to influence the thinking of other, larger investors, as well as learning from them.

- Thirdly, our requirements of firms will become more demanding over time, including as improvements in data and metrics allows us more precisely to monitor climate behaviour, and further to sharpen the incentives we set.

The Discussion Paper sets out how we intend to operationalise these principles and incentivise firms to put in place, and abide by, credible plans to reduce emissions over time.

Conclusion

As I have outlined, we have come far, but have further to go. When it comes to climate change, we cannot stand still. We need to continue to be bold and learn from our work so far to deepen our understanding and inform future actions.

Greater ambition and cooperation is still needed, including wider adoption of best practices. For this reason, as well as evolving our domestic work, we also need to evolve our collective approaches.

This year presents central banks, regulators and policymakers with a unique opportunity to do this, and I have been encouraged by the progress we have made in the G7 and G20 in the build up to COP26. Under the UK's Presidency, the G7 has started meaningful discussions on the role of finance ministries and central banks in the transition to net-zero.

Under Italy's Presidency, the G20, through the Sustainable Finance Working Group and the FSB, is developing climate-focused roadmaps to coordinate and galvanise international work. These fora allow us to share experiences and develop common best practice. Listening and learning how others are thinking about the potential macroeconomic, macroprudential and microprudential implications will be important to that.

In addition, this year COP26 has an ambitious agenda that spans all of the areas that I have spoken about today – in particular establishing a better understanding of best practice, and fostering greater technical cooperation.

The Glasgow Financial Alliance for Net Zero (GFANZ)[12] initiative will do this by bringing together over 160 firms (responsible for assets in excess of $70 trillion) for the first time.

Such technical collaboration and cooperation is no less important among central banks and supervisors. The NGFS with the scope of its membership is key to that exchange of knowledge.

The Bank has widely shared what we have learnt and we will continue to do so[13]. The creation of the Central Banks' and Supervisors' Climate Training Alliance (CTA) will also further support technical cooperation and assistance on climate risks.

Let me conclude. In spite of the COVID-19 pandemic, central banks have continued to make progress in responding to climate change, but we know there is still work to be done. The next stage of our journey will require us to deepen our analysis, evolve our approaches and further our collaboration.

The coming year will be critical for all of us on this journey – in allowing us to better convert climate change risks into something that we can tackle for real. ■

Andrew Bailey is Governor of the Bank of England

Endnotes

1. See 'Tackling climate for real: the role of central banks' speech by Andrew Bailey, June 2021

2. NGFS climate scenarios

3. See A first assessment of financial risks stemming from climate change: The main results of the 2020 climate pilot exercise, ACPR, May 2021

4. See Enhancing banks' and insurers' approaches to managing the financial risks from climate change, April 2019

5. See Letter from Sam Woods 'Managing climate-related financial risk – thematic feedback from the PRA's review of firms' SS3/19 plans and clarifications of expectations', July 2020

6. Task Force on Climate-related Financial Disclosures

7. See UK joint regulator and government TCFD Taskforce: Interim Report and Roadmap, November 2020

8. See The Bank of England's climate-related financial disclosure 2020, Bank of England, June 2020

9. See Appointment of Andrew Bailey as Governor of the Bank of England, March 2020

10. See 'It's not easy being green – but that shouldn't stop us: how central banks can use their monetary policy portfolios to support orderly transition to net zero' speech by Andrew Hauser and Options for greening the Bank of England's Corporate Bond Purchase Scheme, Bank of England, May 2021

11. See MPC Remit statement and letter and FPC Remit letter, March 2021

12. See New Financial Alliance for Net Zero Emissions Launches, UNFCCC, April 2021

13. See Centre for Central Banking Studies, Bank of England

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Towards a green capital markets union

Christine Lagarde considers the European Union's transition towards a sustainable economy that will be backed by the growth of sustainable finance

When technology and finance unite around a common purpose, the consequences for monetary unions can be far-reaching. Let me borrow an example from US history. The economic and financial integration of the United States in the late 19th century owed a great deal to the new technology of railroads.

With a fragmented local banking system, the huge amount of financing needed for this project could only be mobilised via capital markets, notably in the form of railroad bonds. This, in turn, laid the foundations for the development of the US-wide financial system[1]. The railroads ended up linking not only the far-flung corners of the union, but also its capital markets.

If you allow me the analogy, I see some parallels between this period of US history and the EU's transition today towards a sustainable economy, backed by the growth of sustainable finance.

The shift to net zero emissions, together with an adequate digital backbone, will require major investments across Europe in technology, infrastructure and networks. Fragmentation between national financial markets might constrain our ability to finance future investments. But if green finance continues to emerge to fund this transition, the consequences for Europe's financial system could be sweeping.

In fact, I believe that the green transition offers us a unique opportunity to build a truly European capital market that transcends national borders – or what I would call green capital markets union (CMU).

And, like the railroads in the past, this could have ramifications for our monetary union that reverberate more widely. Integrating green capital markets could play a part in addressing two of the wider challenges we face today.

First, we face the challenge of making our monetary union more resilient to cyclical shocks. To achieve this, we must do better at reducing risks, and also at sharing risks across countries.

And second, we need to transform our economies as structural changes speed up around us. We must redirect activity towards the green and digital sectors as quickly as possible, which will help raise Europe's growth potential[2].

Addressing these challenges is important for the ECB, as they affect the transmission of our monetary policy across the euro area. They require parallel efforts on many different fronts. But a common thread is the need to enhance

Green CMU not only gives us a tremendous opportunity to craft something genuinely European and with immediate impact, but it also has the potential to transform the EU as a whole

the contribution of the financial sector, in particular by taking significant steps towards a capital markets union in Europe.

Integrated capital markets are at the heart of building resilience, because they encourage Europeans to invest in debt and equity irrespective of home country considerations. That, in turn, helps share the costs of local recessions, because financial losses in one part of the Union can be offset by gains in another. Scale and depth matter, as does a common regulatory framework.

At present, however, financial markets are less integrated in the euro area than in other large economies. Only around 20% of shocks in the euro area were mitigated through cross-border debt and equity holdings between 1999 and 2016, compared with at least 60% in the United States[3].

Capital markets are also vital to fund the transformation of our economies. We need to see investment of around €330 billion every year by 2030 to achieve Europe's climate and energy targets[4], and around €125 billion every year to carry out the digital transformation[5].

While banks can and should provide a good share of this funding, capital markets can provide innovative tools to close the investment gap. Capital markets are better suited to financing projects with a defined purpose, directly linking investors to the impact they intend to achieve. And they are also better at drawing retail investors towards supporting transformative activities[6].

Although we are making progress, thanks to the work of the Commission, completing a fully-fledged CMU will take time. Capital markets have developed nationally, so we first have to open them up and harmonise those markets in order to integrate them further.

This begs the question: how do we deepen capital markets faster? Are there market segments where fewer obstacles exist and where we can achieve high levels of integration quickly, but that also encourage the funding of future-oriented projects?

Developing European green capital markets

To my mind, Europe's green capital markets meet all these criteria. Green capital markets are dynamic and growing in Europe, and they are already relatively well integrated. This means that as they deepen further, so will Europe's resilience.

Europe is established as the location of choice for green bond issuance, with around 60% of all green senior unsecured bonds issued globally in 2020 originating here. And the market is growing rapidly – the outstanding volume of green bonds issued in the EU has grown almost eight-fold since 2015.

Environmental, social and corporate governance (ESG) investment is also concentrated in Europe. The assets under management of investment funds with ESG mandates have almost tripled since 2015, and over half of bond funds are domiciled in the euro area[7].

In addition, the euro has taken the lead as the global currency of green finance. Last year, around half of the green bonds issued worldwide were in euro. There is immense potential for this role to grow once the green transition takes off worldwide and we see a generational transfer of wealth to millennials who are bound to be concerned about the future.

Crucially, the green bond market has already achieved greater pan-European scale. Holdings of green bonds within the EU have, on average, half the home bias of conventional bonds.

And this means deepening the market is a different type of challenge. We do not need to undo the past – we need to create a new framework that did not exist before. So we have a real opportunity to build a genuinely European capital market from the outset.

Green capital markets could also act as a catalyst for the overall structural transformation of Europe, ensuring that it happens both quickly and evenly across EU countries.

These capital markets would not just add debt into the green finance mix, they would also add equity, which – as ECB research demonstrates – typically leads to more green innovation and a faster reduction in carbon emissions[8].

And they could spark the take-up of digital technologies such as smart urban mobility, precision agriculture and sustainable supply chains, which are crucial to the green transition[9].

With their pan-European reach, green markets could also help all countries to access the capital they need to finance economic transformation – not only those with the most sophisticated financial markets. That would support convergence within Europe, enabling capital to flow to regions that are currently lagging behind in the transition to a more sustainable economy.

In order to build momentum, the 'public sector dimension' should be part of the picture. The issuance of green bonds by governments will be key to funding major infrastructure projects, which in turn helps create a pipeline of projects for the private sector to invest in. As part of the Next Generation EU fund, the European Commission will shortly be placing €225 billion of green bonds, making it by far the world's largest issuer.

Towards Green CMU

I must stress, however, that the continued growth of green capital markets will not happen by itself. We will at some point hit the same limits that now restrict the integration of our broader capital markets – missing cross-border infrastructures and national constraints.

If the EU cannot provide the services that foreign investors and issuers are looking for, they will go elsewhere. In fact, we know from history that deep and liquid capital markets are key to a currency gaining global status. If others move faster than we do, the euro's advantage as the global green currency could fade and be lost. The euro would miss an opportunity to strengthen its international role.

So in my view we should reinforce the CMU agenda by supporting the development of Green CMU. Specific initiatives under the CMU action plan should be fast-tracked – even if they are applied only to sustainable finance for now.

A key element is indeed the Commission's proposal on corporate sustainability disclosures. I strongly welcome this proposal and believe it can finally address the main data gaps currently afflicting the EU's sustainable finance landscape.

It will also be a key pillar of the Commission's forthcoming proposal for a European single access point. By integrating sustainability disclosures with financial data, we would create a 'one-stop shop' for all critical information about a company, including its green credentials, which would be immensely useful for investors. But more fundamental reforms will also be necessary.

We need proper European supervision of green financial products with official EU seals such as the forthcoming EU Green Bond Standard[10]. This is key to ensuring compliance and to identifying systemic links and associated risks within the cross-border market.

We also need harmonised tax treatment of investments in sustainable finance products, so as to prevent fragmentation of green investments along national lines. And we need further convergence in the efficiency of national insolvency frameworks, even carving out special procedures for green investments.

These initiatives can be seen as an engine for the CMU project generally, testing and putting in place some of the measures that are needed to advance wider capital market integration. If we succeed, there will be very positive knock-on effects for European capital markets.

In short, Green CMU not only gives us a tremendous opportunity to craft something genuinely European and with immediate impact, but it also has the potential to transform the EU as a whole.

It would allow us to make our economy more resilient to shocks and fit for the future, all while avoiding the worst scenarios for climate change. To my mind, that is too good an opportunity to pass up. ■

Christine Lagarde is the President of the ECB

Endnotes

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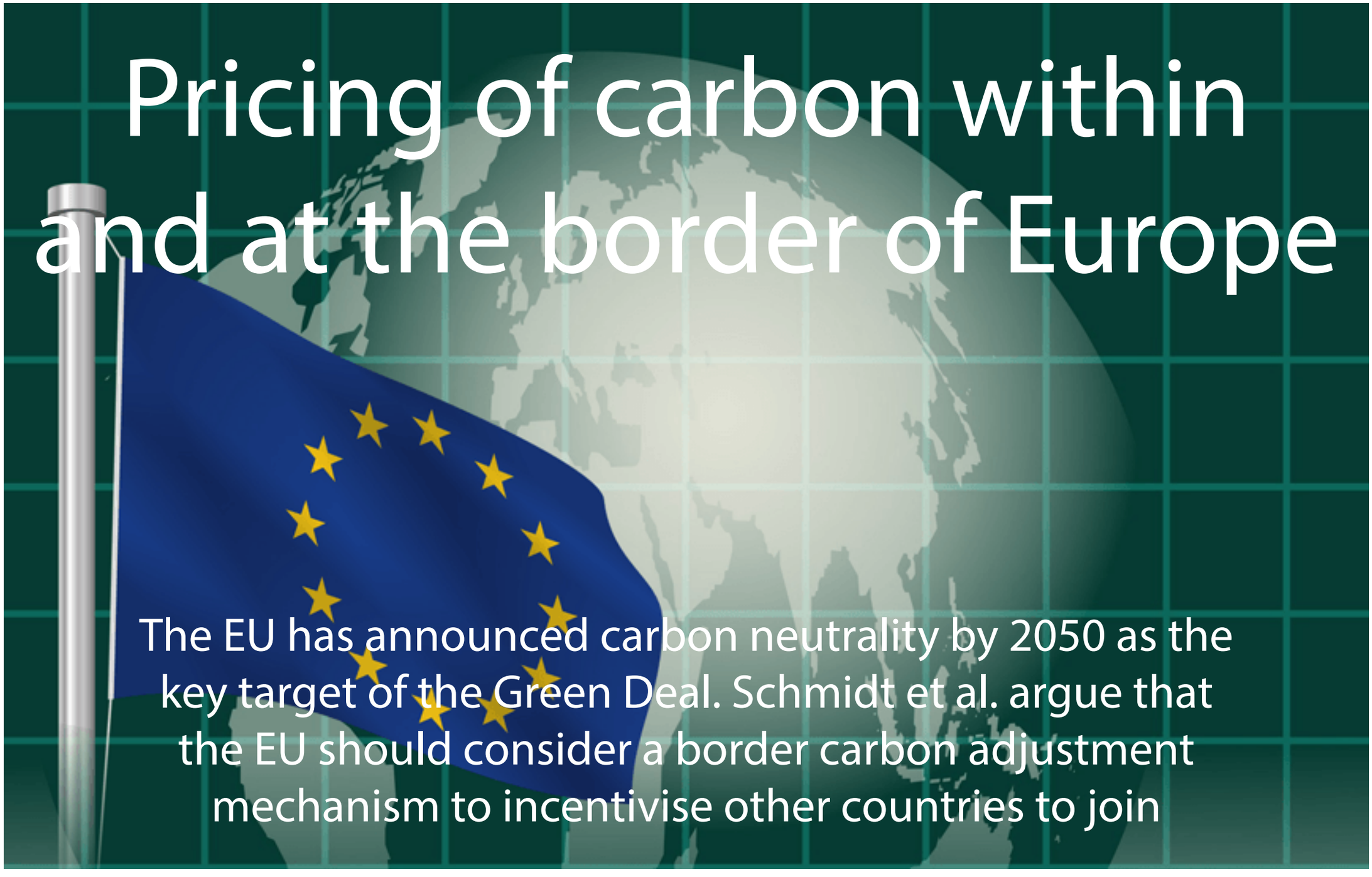
This article is based on a speech delivered at the European Commission's high-level conference on the proposal for a Corporate Sustainability Reporting Directive, Frankfurt am Main, 6 May 2021

Pricing of carbon within and at the border of Europe



The EU has announced carbon neutrality by 2050 as the key target of the Green Deal. Schmidt et al. argue that the EU should consider a border carbon adjustment mechanism to incentivise other countries to join

The EU has announced reaching carbon neutrality by 2050 as the key target of its Green Deal strategy. The best coordination signal in this endeavour would be a uniform and encompassing price on carbon. To ascertain that all goods consumed in the EU face the same carbon price, it would be sensible to credibly prepare the implementation of border carbon adjustments applied to imported goods.

This column argues, however, that the EU should refrain from exempting exports from carbon pricing, and should consider a border carbon adjustment mechanism only after having established a credible uniform carbon-pricing mechanism within its jurisdiction. This could provide incentives to other countries to join a far-reaching international alliance for carbon pricing.

The EU can become the world leader in the energy transition. It should be the explicit aim of this effort to provide the path towards an effective global approach to climate policy. To tap into a fruitful division of labour, research and investment projects entailing high European value added and policy instruments for setting incentives for the greening of the European economy should be coordinated at the European level.

Previous work by the French Council of Economic Analysis (CAE) and the German Council of Economic Experts (GCEE) (GCEE 2019, CAE and GCEE 2019), as well as the interdisciplinary work of the German national academies of science (acatech *et al*. 2020), advocated the pricing of carbon as the leading instrument of European climate policy.

Uniform carbon pricing: a cornerstone of European climate policy

As explained, for example, by Schlögl and Schmidt (2020), in the diverse and decentralised economic system that characterises the EU, the best coordination signal corresponding to this principle would be a uniform price on carbon that encompasses all actors, sectors, regions, and technologies. Separate pricing systems for different sectors or for different countries can only be interim solutions.

Correspondingly, while separate target values for sectors and member states can serve as important gauges of actual developments, it is not advisable to interpret them as binding restrictions. Voluntary participation by all member states in the uniform pricing mechanism might require financial transfers to member states whose energy systems still rely more heavily on fossil resources.

In principle, several pricing mechanisms could be employed to implement a uniform European carbon price – both price (taxes or surcharges) or quantity (emission certificates) schemes. As this already provides a functional and effective system, the best strategy would be widening the scope of the European Emissions Trading System (EU-ETS).

The EU can become the world leader in the energy transition. It should be the explicit aim of this effort to provide the path towards an effective global approach to climate policy

Currently, the EU-ETS only covers the industry and energy sectors, and it is pursuing a joint European reduction target for these sectors. For other sectors, the burden-sharing agreement instead stipulates a set of national target values for 2030. With this compartmentalised approach, the EU is foregoing any possibility to enact the principle of division of labour in emissions reduction.

It might be sensible to fortify the EU-ETS with a minimum price floor over an extended time horizon, and also to engage in an extensive reform of national energy taxes and surcharges to support the uniform carbon pricing.

In practice, it will take time to integrate EU-ETS and non-EU-ETS sectors; the aim should be to form an integrated EU-ETS well before 2030 and, in parallel with this, to dismantle the multiple national climate policies. The longer the implementation of a uniform coordination signal by a fully integrated EU-ETS takes, leaving the coordination of transformation efforts in the non-EU-ETS sectors to separate (national) pricing schemes, the higher the overall cost of transition.

As long as carbon prices remain too low and limited in scope[1] the EU should regularly estimate and make public the shadow price of carbon that supports its climate ambition[2].

It should be used in the cost-benefit analyses that need to be conducted on its portfolio of existing non-price climate policies, such as bans, norms, standards, and subsidies. By providing additional public revenue, moving to carbon pricing will also help alleviate the regressivity inherent in climate policy.

This is a national responsibility of the member states (CAE and GCEE 2019), and this revenue would enable member states to fund redistribution schemes[3], energy price reforms and infrastructure investments, according to their individual preferences and institutions.

Arguably, Europe will only be able to contribute to the objective of reaching global climate neutrality if it manages to design its own transition path in a way that combines climate neutrality with unimpeded prosperity growth.

Taking action unilaterally is endangering the international competitiveness of energy-intensive European firms, which are facing serious competition from outside the realm of European climate policy ('carbon leakage').

So far, the EU-ETS has not led to serious carbon leakage problems, but the carbon prices emitters hitherto had to pay were moderate (aus dem Moore *et al*. 2019). It seems likely that this innocuous result will change at the higher carbon prices that will correspond to the ambitions of the Green Deal.

Climate neutrality and the European Green Deal: great ambitions

In December 2019, the European Commission proclaimed the European Green Deal as its principal growth strategy, announcing as its key target reaching carbon neutrality for the EU by 2050 (European Commission 2019).

This ambitious long-term objective has important repercussions for the EU's climate target for 2030; Europe is set to pledge to cut emissions by some 55% compared with their 1990 levels, a substantial accentuation of the previous target of 40%. The Green Deal comprises a wide range of measures to cut emissions in areas such as energy systems, mobility, heating, and agriculture. Most importantly, the Commission is considering the implementation of an encompassing carbon-pricing mechanism covering all relevant sectors.

To implement uniform carbon pricing, the Commission announced its intention to widen the scope of the EU-ETS by 2021 to beyond the industry and energy sectors (European Commission 2020a). The ensuing uniform carbon price would serve as the desperately needed principal coordination signal for the massive public investment and, to an even larger extent, private investment needed to meet the more ambitious European climate targets by 2030.

Arguably, carbon prices will have to rise steeply over time in order to meet these targets (Gollier 2021). Moreover, their effect in incentivising investments today already stands and falls with the credibility of their installation as an unalterable coordinating signal.

Until a fully integrated EU-ETS is implemented, reducing emissions in the non-EU-ETS sectors will remain a national affair. France and Germany, in particular, have so far not pursued a joint strategy for the non-EU-ETS sectors.

In previous years, with less ambitious transition objectives, the losses in terms of prosperity from disregarding possible efficiency gains were limited. With the announcement of the European Green Deal, however, the setting has changed dramatically: member states will have to increase their efforts to reduce emissions in the non-EU-ETS sectors.

To avoid these efforts being prohibitively costly, it is highly advisable to speed up the process of integrating national pricing schemes into the EU-ETS.

Steeply increasing (shadow) prices of carbon will endanger the competitiveness of European companies vis-à-vis their competitors that do not fall under the realm of the EU's ambitious climate policy. As the costs of those emissions-intensive domestic producers who are trading on global markets increase ever further, they might relocate increasing shares of their production to sites outside of Europe.

This carbon leakage would be harmful to European jobs and economic prosperity, and it would also hurt the overall cause of climate change mitigation, countervailing the EU's ambitions. The issue of how to incentivise other countries to adopt ambitious carbon emissions reduction targets through carbon pricing is therefore of utmost importance.

Under the EU-ETS, the international competitiveness of domestic producers has so far been protected quite successfully by the free allocation of certificates to emissions-intensive firms facing international competition in, for example, the steel, cement and chemical industries, based on a benchmarking system.

Yet, with increasing carbon prices this might change. Outsourcing decisions motivated by rising cost differentials would be difficult to reverse ex post, due to the long investment cycles in the industry sector. Thus, the aim should be to avoid these decisions ex ante. A promising alternative to the cost-free allocation of certificates may be the installation of a border carbon adjustment (BCA) mechanism.

New challenges: towards reducing carbon emissions from imports

The principal idea behind the BCA mechanism would be to levy a charge on imported goods equivalent to the carbon payment of the same domestically produced good.

Ideally, all goods consumed in the EU would face the same carbon price, irrespective of globally diverging climate policies. As it seems far too complicated to impose the BCA on all imported goods, the system could instead be restricted to very energy-intensive and very tradable goods.

Limiting the BCA to applying only to imports would, however, not address the distortion caused by less stringent climate policies outside the EU to the competitiveness of EU companies in external markets and, accordingly, would induce the risk of carbon leakage.

Alternatively, the EU might opt to implement a full-fledged symmetric variant of the BCA, in which exporters would receive a corresponding remuneration. Consequently, goods consumed abroad would face the carbon price

determined by the country where they are consumed. The system would then be reminiscent of a value-added tax, where imports are taxed and exports are exempt.

This is not the route to take: by implementing a symmetric BCA, the EU would contradict its own communication and forfeit control over the extent of carbon emissions generated in the region, since EU carbon pricing would only curb emissions caused by the production of goods and services actually consumed in Europe.

To preserve the EU's self-conception of taking responsibility for the global climate, it will be necessary to present the BCA not as a trade, competition or industrial policy, but as an environmental policy. Its proclaimed ultimate objective should therefore be reducing global carbon emissions, not increasing the competitiveness of European industry.

Thus, it should be restricted to applying only to imported goods. This fundamental dilemma between climate protection and preserving competitiveness would be less prevalent if the international alliance for carbon pricing were to grow, obviating the need to impose a BCA on products being imported from (and exported to) other members of this 'carbon club'.

Following the initiative of the French and German governments, the European Council has not only emphasised a BCA mechanism as an instrument to prevent carbon leakage, in contrast to our appraisal, but also announced in the conclusions of its meeting in July 2020 that starting from 2023, a BCA could be used as a source of revenue for the EU budget.

The explicit objective of the BCA should, however, be to induce a reduction of carbon emissions, not to serve as an instrument to raise public revenues. Contrary to a popular view, such a tax on imports would not be paid by foreign

producers; due to a high pass-through of import taxes, it is European consumers who would bear the majority of the burden.

While the principal idea of a BCA is reminiscent of the well-established concept of value-added taxes, a sizeable number of technical, regulatory, and legal challenges would have to be overcome (Mehling *et al*. 2019). Accurately measuring the carbon content of individual goods is far from easy (Droege and Fischer 2020), since one would have to capture all of the carbon emissions caused throughout the good's entire value chain.

This is costly, since for the same good there are many possible production processes with varying carbon intensities. Simply applying the benchmarks employed for the cost-free allocation of EU-ETS emission certificates is precluded, since those only measure the direct carbon emissions caused during the production process.

A related issue concerns the question of possible exceptions. Which exporting countries will be subject to the BCA – all countries outside the regulated area, or just countries with no 'equivalent' climate policy? If the EU opted to take the latter approach, it would have to make up its mind on how to define an equivalent climate policy.

While, in principle, this could be a policy inducing at least a shadow carbon price of similar magnitude as in the EU, in a real-world application it is very difficult to estimate the underlying carbon value of the wide range of implemented regulatory measures. It will therefore be difficult to prevent countries subject to the tax considering it as a political choice, and therefore contesting it.

Furthermore, if the EU would not only be levying charges on imported goods but also offering rebates to exporters, this might also endanger conformity with GATT rules and lead to protracted trade disputes. This risk would be all

the more grave the more openly the EU views the BCA scheme as a device to ascertain economic competitiveness, instead of for global climate protection (Droege *et al*. 2018)[4].

Irrespective of the sophistication with which any legal obstacle might be circumnavigated, EU trading partners might interpret any unilaterally introduced BCA as a protectionist measure anyway (GCEE 2020). Nevertheless, it could be possible to implement a BCA mechanism that is compatible with the existing body of law (European Commission (2020b).

The chances of avoiding a severe trade conflict would likely rise substantially if the EU, instead of introducing the BCA unilaterally, were to take this action in a joint effort with other trading partners, especially the US.

However, the EU should consider a BCA mechanism only after having established a clear and credible uniform carbon pricing mechanism within its jurisdiction. This credibility is key to provide incentives to other countries, the US and China in particular, to join a far-reaching international alliance for carbon pricing (Nordhaus 2015).

Most specifically, trade partners could be invited to join the EU-ETS mechanism. The chances of a successful courtship will increase as the number of countries pricing carbon grows. ■

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Endnotes

1. This may be due to social acceptability issues in Europe, as shown by Oswald and Nowakowski (2020).

2. A shadow price associated to a collective constraint is defined as the price signal necessary to satisfy the constraint. It would have to be estimated by employing an integrated assessment model.

3. See, for example, the proposals by Dominique Bureau, Fanny Henriet and Katheline Schubert in CAE (2019).

4. Jakob et al. (2014) argue, however, that the climate impact of a BCA mechanism is itself rather uncertain, as it depends on its difficult-to-assess effects on global production and consumption patterns.

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