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FINANCE 2.1

DIGITAL ASSETS AND AFRICA. ELISE DONOVAN EXAMINES THE ENORMOUS POTENTIAL AND OPPORTUNITIES

AGUSTÍN CARSTENS LOOKS AT THE IMPLICATIONS FOR THE MONETARY SYSTEM OF DIGITAL CURRENCIES

THE COMPLETION OF BREXIT POST-COVID IS DISCUSSED BY PATRICK MINFORD

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Foreword

Welcome to the Spring 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. ■

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Time to reset?

Giovanni Tria and Angelo Federico Arcelli ask is a renewed Bretton Woods agreement a concrete option to favour a new economic expansion phase in the post-pandemic world?

The long depression after the 1929 crisis had already shaken from the very foundations the multilateral scheme based on gold exchange standard, but, after it was suspended in the years of World War II, it became evident that the aftermath would have required a new world economic order.

It was then during wartime, in 1944, that the conference held at the Mount Washington Hotel in Bretton Woods (New Hampshire, United States) paved the way for a new architecture of the monetary system to come. British economist John Maynard Keynes proposed a new global, supranational, reserve currency (the 'Bancor'), but this idea never got momentum.

Rather, leveraging the new balance of powers amongst allies, the US representative, Harry Dexter White, pushed for the return to a gold exchange standard scheme, based on a central role for the US dollar, as the main international reserve currency. Given the new role of the US as leading economy in the World, such idea was adopted, and this new system resisted for over 25 years.

It would have rather proven his flaws and limits in the following two decades, as trade imbalances caused tensions on the other currencies parities against the US dollar, forcing twice (1963, 1968) a realignment, and, finally, the generalized abandoning of the system by 1973, after the US de-pledged their currency from gold (August 13th,1971).

This was mainly caused by the growing pressure on the US Fed to return gold against dollars to compensate for continuing trade unbalances, allowed by the system that had enabled the US to maintain permanent current account deficits for long time (but finally arriving to a non-sustainable point, as Robert Triffin's analysis of the 'dilemma' pointed out).

In 1965, Jacques Rueff, president De Gaulle's economic adviser, criticized the Bretton Woods international monetary system with the famous allegory of the tailor: he imagined a customer who had an agreement with his tailor that whatever money he would pay him, the tailor will return it to him, on the very same day, as a loan; such customer would have continued ordering suits from his tailor indefinitely.

On this example, Rueff based his argument that the Bretton Woods system hindered commercial disequilibrium adjustments, as the country supplying the currency convertible into gold, the US, could finance its trade deficits without limits.

We now need to rethink a new scheme for the years to come, which entails a new Bretton Woods initiative

Differing from the gold standard, which Rueff supported, the gold exchange standard allowed the central banks of countries with a current account surplus to increase money supply on the basis of reserves held in gold, dollar and dollar-denominated assets.

As a consequence, because countries with a current account surplus that purchased dollar-denominated assets maintained their own reserves in the US central bank as dollars, the outflow of dollars from the US, caused by its trade deficit, did not actually determine - at least until the point when the credibility of the issuer became at stake - an outflow of gold.

Nevertheless, also after 1971, the US dollar remained the main international currency, also as a consequence of the US-Saudi Arabia deal on oil to be traded exclusively in US dollars, and even gained a broader role, as the 'exorbitant privilege' for the Fed being the issuer of the international reserve currency without any pledge or constraint and, rather, full freedom of managing an independent monetary policy.

This role lasted unchallenged until current days and has never been put seriously at stake neither by new 'strong' currencies (the euro), nor by the emerging relevance of new powers (China).

Whilst Western European countries were also forced to give up the gold convertibility of their currencies, and exchange rates started to float freely, in Europe, exposed to financial stability risks in the 70s, also due to oil crises, the reaction was oriented to find a new stability mechanism, based on price stability and with the D-mark as its centre (given Bundesbank pledge on inflation as a economic policy goal).

This path main landmark points are the 'Werner plan' (1973), the EMS scheme (1979) - developing also a new figurative currency, the ECU - the Delors plan, until, despite the crisis of September 1992, the creation of the euro (1998 and 2001 as a paper currency).

After the accession of China to the WTO in 2001, there has been talks about a 'renewed' or 'second' Bretton Woods, with some of the principal Asian currencies, in particular the Chinese renminbi, in addition to Latin America's currencies, pegged to the dollar alongside with controls on international capital flows between these countries and the US.

The story of this 'second' Bretton Woods, and the global imbalances associated to it, is instructive. The rapid Chinese economic growth coincided with its accelerated integration in the global economy. Its double-digit growth in trade with foreign countries, compared with the overall growth in global trade, generated increased and persistent trade balance and current account surpluses.

Until 2005, by maintaining a fixed exchange rate with the dollar and controls on financial capital outflows, China had, for many years, avoided adjusting its trade imbalances, also by accumulating official foreign reserves, which in 2011 accounted for 25% of registered central banks' global foreign reserves.

The illusion about a new stable system and of a potential for continuing economic growth worldwide had a sudden end in the wake of the 2008 crisis. Given the failure of monetary response (QE) in the following years and given the global response to the current pandemic crisis in terms of a new, semi-unlimited monetary expansion, a debate about the adequacy of the international monetary system has gained momentum.

Current continuing trade imbalances (particularly amongst China and US) are leading to a permanent tension on the monetary system. But, notwithstanding all this, the US dollars remains even today – and the 2008 crisis has demonstrated it - the main 'safe asset' for international relations and represents three quarters of the currency reserves of all central banks.

The Chinese central banks' governor, Zhou Xiaochuan, published on March 23rd 2009, a paper on the journal of the Bank for International Settlements, evidencing the problem of the impossibility to deal with global macroeconomic imbalances and assure financial stability without confronting the unsolved issue of the international monetary system, namely the absence of an international reserve currency pegged to a stable value.

Zhou reintroduced Triffin's arguments on the flaws of a system where a national currency serves, de facto, as a global reserve currency and declares himself in favour to a supranational international reserve currency, explicitly recalling the 'Bancor', the international currency unit, proposed in 1944 at Bretton Woods by Keynes.

Zhou's proposal was to immediately reconsider the Special Drawing Rights (SDRs) role, which, created by the IMF in 1969, were intended to be an asset held in foreign exchange reserves under the Bretton Woods system of fixed exchange rates.

In particular, it was proposed to foster the use of the SDRs as a medium of exchange not only between the commercial and financial transactions of governments and financial institutions. Moreover, part of every country's official reserves should have been managed and held by the IMF so that market stability would be strengthened.

On 17th and 18th July 2019, the finance ministers and central bank governors of the G7 countries, meeting in Chantilly, France, discussed with ill-concealed concern the Facebook plan to launch the Libra, a stablecoin presented as a simple means of payment but pegged to a basket of stable currencies.

The topic was not underestimated. Not because of any danger in the specific project, as its probability of success was low, but because it was immediately understood as representing the first real potential challenge launched at what remains of the international monetary system established at Bretton Woods (and, what is more, such challenge was to be launched by a pool of private companies).

Presented as a mere cross border means of payment directed on drastically cutting the cost and time of transnational payments and to include large sectors of the population that, especially in developing countries, are effectively excluded from payment methods based on banking systems, this new cryptocurrency project with global ambitions paved the way for a larger challenge.

The only efficiency gains, given by the transition to digital currencies, do not appear huge today if we consider that new technologies have already activated widespread payment systems tied to private platforms without the need to adopt, as a unit of account or store of value, a cryptocurrency.

After one month, one of the participants of the G7 meeting in July, the governor of the Bank of England Mark Carney, speaking in front of an audience made up of bankers and economists at the Jackson Hole annual meeting in Wyoming, suggested that the world dependence on the US dollar is not sustainable anymore and invited the IMF to take the lead on designing a new international monetary and financial system based on multiple currencies.

Carney pointed out that currently global growth is strongly affected by the impact of economic events and by US monetary policies, leaving countries exposed to the volatility of the dollar. Mark Carney's conclusion, as that of other economists, is that this multipolar system could be based either on several international currencies or a single global currency, which could take the form of a global electronic currency.

However, the transition to a new international reserve currency is a complex issue that follows not only an economic decline of the issuer country, but also the diffusion of the new currency as a medium of exchange, which, therefore, must be efficient and convenient in the international payments.

Technology can help on this by, using Mark Carney's definition, creating an 'hegemonic synthetic currency' through a network of central bank's digital currencies. But behind this digital scheme one needs a credible group of states.

Those who argue against a new global currency recall data showing evidence about the persistent dominant role of the dollar, demonstrating that the strength of the dollar as a safe asset does not simply result from the current network effect. As recently claimed by Henry M Paulson Jr, Secretary of the Treasury during the George Bush administration, *"the privilege conferred on the US Dollar as the global reserve currency was hardly preordained."*

The globalization process as we saw in the last years has arrived at a landmark moment. The pandemic crisis has suddenly put an obstacle to a seemingly unstoppable process, which led to growing production and financial hyper-connectivity for practically all countries around the world, and also brought to the fast movement, not only of goods and persons, but, increasingly, of ideas, knowledge, uncertainties and fears. But, today, 'globalization' is challenged as a long-lasting process.

The economic consequences of the COVID-19 will depend on the expansion and the length of this pandemic event, and by the subsequent length of the interruption of the productive and consumption chains that the measures, motivated by the need to halt the epidemic, have determined.

Over seventy-five years after the debate amongst John M Keynes and Harry D White about the eventual need for the international system of a global and supranational reserve currency (not controlled by any state), it may be the moment to reconsider a new international deal to ensure stability and prosperity to the international economy.

The task is not to rebuild an international order from the ground up: many prevailing institutional structures are sound. But do they all meet twenty-first century needs? Past examples, such as the interwar period, demonstrate how instability can have a lasting impact on the international monetary system.

Only a coordinated effort about the reconstruction, in a new deal, of the monetary system worldwide, could be the way to avoid a very costly 'financial war'.

We now need to rethink a new scheme for the years to come, which entails a new Bretton Woods initiative, jointly promoted by all main economies, including the new emerging ones. Possibly, the first step should be a renewed EU-US Transatlantic pact. ■

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A longer version of this piece has been published by the Centre for International Governance Innovation.

The case for an open financial system

Andrew Bailey looks at the benefits of a global financial system and talks about the UK's current and future role in it. He argues that global cooperation is needed to ensure a safe and strong financial system

As we look forward – and for so many reasons we must look forward – it is important to focus on the future of financial services, and the important role they play in our economy and internationally. This will be my focus today. I am going to look forward with the benefit of history and context and set out why open financial markets are in the interests of all – home and abroad – and something we should always strive for. I want to start with the Bretton Woods agreement towards the end of the Second World War.

This was a fundamental and decisive commitment to an open world economy. This commitment did not come free at the time – the adjustment was hard for this country – and of course the more formal Bretton Woods system broke down in the 1970s. But that breakdown did not compromise the commitment shared broadly across nations to an open world economy. There have been times when the commitment has been sorely tested, but it has not been abandoned.

What followed the breakdown was a shift of emphasis, not a free for all. The shift was towards managing the consequences of greater openness with much more emphasis on the stability of the financial system and its ability otherwise to do harm, both domestically and internationally. What was needed was not just openness, but safe openness.

This emphasis was never more evident than during and after the global financial crisis. There was a moment at the height of the financial crisis when it might have been natural to consider forfeiting the commitment to an open financial system in the face of damaging international linkages.

That did not happen to our great relief – the G20 nations stood firm to the principles of Bretton Woods and committed to significantly reforming the international financial system and its regulation, by raising global standards for regulating the system and reinforcing the institutional structure.

The COVID crisis has been the first big test of those reforms – and it has been a big test. The scorecard to date is encouraging – by no means perfect, but the core of the system has stood up well, which is needless to say a huge relief.

In order to preserve this public good of an open world economy and now also an open financial system, has required a commitment to institution building both internationally and domestically. Bretton Woods created the IMF and World Bank, and slightly less directly the GATT and then WTO.

We have an opportunity to move forward and rebuild our economies, post COVID, supported by our financial systems. Now is not the time to have a regional argument

Out of the financial crisis came the importance of the global Financial Stability Board with a mandate to promote international financial stability underpinned by strong regulation, supervisory and other financial sector policies, reinforcing thereby the importance of G20 nations.

The FSB works closely with, and is supported by, the four standard setting bodies of the international financial system – the Basel Committee for banks, IOSCO for markets, the IAIS for insurance, and the CPMI for payment and markets infrastructure.

And, just to underline the importance we see in these bodies, it is with pride that I can say that the Bank of England chairs two of the four – Jon Cunliffe for CPMI and Victoria Saporta for IAIS.

These bodies are where the critical standards for governing the financial system get hammered out, where safe openness is put into practice. They are very clearly global in reach, necessarily so. They are not regional, they are global. We cannot participate in these bodies, and they cannot function as they do, unless we are all prepared to enter into the process and listen to and accept ideas from others.

It requires us to give up some control over our standards and rules, because the alternative of a narrow domestic control is illusory – it would jeopardise achieving the very things we want, safe open markets, and likewise open economies. Above all, these bodies enable us to build the trust that enable our financial systems to stay open.

But, we do not for a moment believe that we can maintain the arrangements we have without change. As the world around us changes, so too do we have to adapt how we achieve these public goods. Also, we do not participate in these global institutions with the intention to water them down, misguidedly because we think this would preserve some notion of our competitiveness as a nation. The UK could not be a global financial centre for long if we did.

Let me reiterate again, the public goods of open economies, an open financial system and the stability of that system are global, not regional, in nature. The UK is one of the world's largest global financial centres, and its financial stability – as the IMF have reminded us – is therefore a global public good.

We are deeply committed to financial stability and given that the success of our financial centre. That is not because we are mercantilist in our outlook.

As the City's long history shows, that has never been the outlook of people in the City; rather it has been to trade freely and compete and grow new markets, to face outwards. We see that today for instance in the embrace of fintech.

The UK's financial markets and its financial system are therefore open for trade to all who will abide by our laws and act consistent with our public policy objectives. The question then arises of what sorts of safeguards and rules should apply to that trade?

I mentioned earlier that one of the offspring of Bretton Woods was the GATT, subsequently the WTO. The focus of activity was for some considerable time on trade in goods, not trade in services. Both goods and services trade depend on robust standards and the regulation of those standards, but trade in services is almost entirely about such standards.

This trade has been substantially supported by the global standards to which I referred earlier, and which has allowed countries to defer to each other in terms of the prevailing rules and regulations.

This means deferring to the rules of others to protect our citizens or firms when they choose to do business there. There is no doubt in my mind that the work done on global standards since the financial crisis has made this process easier to support and safer and improved the level of trust we have in each other.

The European Union has pursued the approach of so-called equivalence, which on the face of it allows for deferring to other authorities where appropriate. The EU's framework of equivalence in financial services is a patchwork across many different pieces of financial services legislation, taking different forms in different sub-sectors, and in some not present at all. Nor do the equivalence measures prescribe how the judgement should be made.

As is well known, the post-Brexit equivalence process between the UK and EU has not been straightforward. It is, of course, two distinct processes – one for the UK to recognise the EU as equivalent to the UK, and one for vice versa. The UK has granted equivalence to the EU in some areas, but the EU has not done likewise to the UK.

In a few areas – involving central clearing and settlement – there has been agreement by the EU to extend temporary equivalence to the UK, recognising, I think, the clear risks to financial stability that would have arisen had this not been done at the outset.

It would be reasonable to think that a common framework of global standards combined with the common basis of the rules – since the UK transposed EU rules from the outset – would be enough to base equivalence on global standards.

Less than this was enough when Canada, the US, Australia, Hong Kong and Brazil were all deemed equivalent. Continuing with the example of central clearing, the EU has recently made the US SEC equivalent for CCPs, subject to certain conditions.

These conditions are already met by UK CCPs as they are a legal requirement in the onshored legislation, but equivalence beyond the temporary extension remains uncertain.

The EU has argued it must better understand how the UK intends to amend or alter the rules going forwards. This is a standard that the EU holds no other country to and would, I suspect, not agree to be held to itself. It is hard to see beyond one of two ways of interpreting this statement, neither of which stands up to much scrutiny.

The first interpretation is that the rules should not change in the future, and to do so would be unwelcome. This is unrealistic, dangerous and inconsistent with practice. As the world around us changes, so must the rules to accommodate these changes.

As evidence of this, look at what the authorities have had to do in response to COVID and the shock that created for financial markets. The EU is almost constantly revising, or contemplating revising its own rules, and that's a good thing. So, I dismiss this argument.

The second argument is that UK rules should not change independently of those in the EU. I am being careful to phrase this point. It's not that UK rules might change independently – the equivalence process provides for re-assessment of such decisions, so this should not be a problem.

So, it must be the stronger form that they should not change independently. But that is rule-taking pure and simple. It is not acceptable when UK rules govern a system 10 times the size of the UK GDP and is not the test up to now to assess equivalence.

It's worth considering why we would choose to change the rules. First, it would be rare to say the least if such rules turn out always to work perfectly first time and thus need no amendment. As an example of this, the EU itself is looking to amend MiFID2 to iron out areas that need further work.

Second, as the world moves on, so the rules need to adapt. If they do not, we will be heading for trouble. The key point here is that good practice means that authorities should be transparent at the time in explaining rule changes, and those changes should be consistent with international standards where appropriate.

Let me give three examples of areas of rule changes we in the UK are looking at, two involving banks and one life insurance. First, the Basel regime for banks has, from the outset in the 1980s, applied to so-called 'internationally active banks'. The EU has chosen to apply it to all banks and relevant deposit takers. That was a matter of choice.

But the Basel regime is heavy duty and complicated when applied to small banks (I know many big banks will say the same, but sorry that's life). So, we want to see if we can apply a strong but simple framework of rules for small banks that are not internationally active. This is a sensible step in my view and not out of line with the principles and practice of equivalence.

Indeed, there are other countries, such as the US and Switzerland, that have regimes for small banks and have been determined equivalent to the EU in many areas.

Second, the EU changes its rules in December to allow software assets to count as bank capital. The Basel Standards do not include intangible assets in bank capital, which would include software assets in the UK. We have not identified any evidence to support the notion that software assets have value in stress.

On that basis, including them in bank capital would give a false picture of a bank's loss absorbing capacity. We are therefore intending to consult on plans to amend this on-shored EU rule in order to maintain the previous requirements of excluding software assets from bank capital. This is in line with global standards and will enhance the safety and soundness of UK firms.

The insurance case rests on a different argument. Solvency 2 is an all-embracing rulebook covering both general/non-life and life insurance. In practice, it probably works better for the non-life world, because the risks and activities are more common across different national markets. Non-life insurance is a broad and diverse sector, but each GI product occurs in different national markets in a more similar form.

But, I have never been convinced that the EU had a commonality of forms of life insurance across its national markets. They are in some cases at least quite distinct markets and products. Certainly that is the case in the UK, where annuity business is a quite specific activity.

Some specific elements of Solvency 2 have not proved to work for that market as well as hoped, so it is right that we should review it. There may also be reason to make changes that span both life and non-life, but that is not the point I want to emphasise here.

Let me be clear, none of this means that the UK should or will create a low regulation, high risk, anything goes financial centre and system. We have an overwhelming body of evidence that such an approach is not in our own interests, let alone anyone else's.

That said, I believe we have a very bright future competing in global financial markets underpinned by strong and effective common global regulatory standards.

I want to finish with one further important area, that is, how the rules are applied – supervision as we call it – and how we can be sure that this application of rules is effective across borders, and particularly between the UK and the EU. It is of course critical that rules are applied effectively, and that there is co-operation between the authorities in different countries.

With this in mind, we already have 36 MoUs agreed between the Bank of England/PRA and supervisors across Europe. They ensure supervisory co-operation will be deeply engrained in the relationship. And let me welcome the content of the joint declaration on financial services that was contained in the UK-EU trade agreement.

It provides for structural regulatory co-operation on financial services, with the aim of establishing a durable and stable relationship between autonomous jurisdictions based on a shared comment to preserve financial stability, market integrity and the protection of investors and consumers.

This co-operation will be supported by a Memorandum of Understanding to be agreed by March, and this will enable discussions on how to move forwards on equivalence determinations *"without prejudice to the unilateral and autonomous decision-making process of each side."*

To conclude, there is no doubt in my mind that an open world economy supported by an open financial system that respects the public interest objective of financial stability will bring the greatest benefits all round. It needs to be supported by effective institutions and strong international standards. But this must be a global, not a regional, regime to be effective.

And that is why we spend so much time and effort on the work of the global standard setting and oversight bodies. What follows from that is much more a matter of implementation and how we each put these standards into

practice consistently. We have an opportunity to move forward and rebuild our economies, post COVID, supported by our financial systems. Now is not the time to have a regional argument. ■

Andrew Bailey is Governor of the Bank of England

This article is based on a speech delivered at the Financial and Professional Services Address, Mansion House

What the British government needs to do to get Brexit done post-COVID

Patrick Minford considers the options available to the UK government to ensure a successful Brexit

The chorus of ex-Remainers who dominate the UK civil service and its outriders like the Office of Budget Responsibility (OBR) has begun its ululations over the need for the upcoming Budget to 'pay off the COVID debt'; and in so doing, abort the recovery process. Their damaging advice must be resisted.

Of course it is true that the COVID debt is immense. In 2020 government spending related to the coronavirus crisis rose by a mouth-watering £280 billion, 17% of GDP, pushing the ratio of spending (excluding debt interest) to a falling GDP up to 56% from the normal 38% that had prevailed in 2019.

Government receipts were also badly hit, falling to 37% of GDP again from a normal 38% in 2019; with GDP itself falling 11% in 2020, this meant that receipts fell by about 14%, or about £106 billion. The PSBR consequently soared from £43 billion in 2019-20 to a probable £400 billion approximately in 2020-21- a huge, unprecedented number.

But of course it was an unprecedented shock and we should not be marched into ill-judged policy reactions; the UK's situation is not unlike that of the US and other developed economies, and so it is of some general interest to look at the UK's figures close up.

The starting point for analysing future public budgets must be a judgement on how spending and taxes will behave as the effects of the virus and the associated temporary measures fall away.

There is still uncertainty about the speed with which this will happen; the most recent report from the Bank of England forecasts that the economy will be back to pre-pandemic levels by the end of 2021, given the rapid rollout of the vaccine. This seems to be a reasonable current assessment.

Then we can expect catching-up with two years lost normal growth of (jobs and) GDP of say 5% over the course of 2022 and 2023, on top of what would have occurred anyway.

These developments should mean that by financial year 2022/23 the economy should have returned to normal spending and receipts relative to GDP. Excluding debt interest that would mean spending of 38% of GDP; and a very similar revenue/GDP ratio. This situation of 'primary balance' in net spending ('primary' meaning 'with the exclusion of debt interest) was what prevailed before the COVID crisis in 2019.

... the government has considerable fiscal flexibility owing to very low interest rates. It can without any threat to its solvency both cut tax rates and raise spending to support growth, trade opening and deregulation post-Brexit/COVID

This seems to be a reasonable 'normal base case' assumption, bearing in mind that the COVID recession drove not only GDP but also the spending and tax reaction to it. Withdraw that recession created by the disease and especially the lockdown reaction to it, and the best estimate of the restored situation is the previous one.

However, the OBR projects future spending (excluding debt interest) by 2022 at 41% of GDP. It is hard to see where this comes from. It appears to have simply pushed up its estimates of departmental spending. In fact it says (para 372, November Report) that spending plans have been lowered but as a % of GDP have gone up as GDP has fallen:

> *"From 2022–23 to 2025–25, TME [total spending] is materially lower than we forecast in March — by £18 billion a year on average — a difference that is more than explained by departmental spending being cut relative to March totals and by much lower debt interest spending. But thanks to the weaker outlook for nominal GDP, despite lower cash spending, the ratio of TME to GDP is actually higher than we forecast in March, settling at around 42%."*

However, this logic really implies that as GDP picks up rapidly, as now looks likely, the ratio of spending to GDP will fall back. So it is that, in the absence of government commitments at this point to such a high spending ratio to GDP, we assume a return to normality. From that we can judge the scope for higher spending growth or tax cuts.

So just as the fall in GDP produced the huge rise in spending and fall in tax, so its reversal should reverse those two variables as well. In my Liverpool Group's forecast we follow the Bank in its latest much stronger recovery projection, and on spending we project a return to the normal spending ratio.

Our projections of the PSBR on this basis give us £18 billion in 2023/4, 0.7% of GDP. The debt ratio by 2024/5 would be about 90% of GDP, down from around 100% today; debt before the crisis was £1.7 trillion, and the extra debt by then would be another £0.7 trillion, making £2.4 trillion in all, or against GDP by then of £2.7 trillion, 88% of GDP.

With nominal GDP growth of 5% pa, and the PSBR running below 1% of GDP, the debt to GDP ratio would reach 60% in a decade from then. But the important point is that the UK is in a totally solvent situation.

Long-term solvency is consistent with a bold fiscal policy pursuing supply-side reform while supporting demand
The key issue is that of long-term solvency; solvency is or should be the objective of any fiscal rules the UK's HM Treasury should pursue after such a major shock as COVID, which has forced a massive fiscal response.

Facile talk of short run rules of thumb such as balancing the current account or only financing investment spending by borrowing, do not face up to the long-term issue of how best to deal with the large COVID-created debt without wrecking the economy. Let us spell out how this arithmetic works.

Solvency implies that the Treasury will always be able to obtain sufficient tax revenues to pay for its spending plans and also pay the promised interest on its debt. This is equivalent to saying that the market value of the debt is equal to the present discounted value of future taxes minus that of future spending excluding debt interest; in other words the present value of future primary surpluses is 'backing the debt' in much the same way that the market value of a company's equity is backed by and equal to the present value of its future profits.

A rough and ready way of checking this is to project the finances forwards, as we have done in Table 1, and check that in the long term there are primary surpluses, as indeed is implied by our projections for the PSBR from 2024, which is by then below debt interest payments.

As long as there are continuing surpluses indefinitely in excess of interest payments, it is implied that future taxes will pay for both spending and debt interest and then also pay off debt steadily, so ensuring that the Treasury could if it wished pay off all its debts in the long run.

Table 1. Summary of Forecast by Liverpool Macro Research

	2018	2019	2020	2021	2022	2023	2024
GDP Growth[1]	1.3	1.4	-11.2	5.2	11.0	5.1	4.0
Inflation CPI	2.4	1.8	0.9	1.6	2.1	2.0	2.0
Wage growth	3.0	3.5	1.0	2.6	2.7	3.3	3.2
Survey unemployment	4.1	3.8	4.6	6.8	5.8	3.9	2.8
Exchange rate[2]	78.6	78.3	78.0	78.3	78.4	78.5	78.6
3 month interest rate	0.4	0.8	0.2	0.1	1.5	4.5	5.0
5 year interest rate	1.0	0.6	0.2	0.4	1.7	4.7	5.0
Current balance (£ billion)	-82.9	89.1	-42.6	-48.4	-42.3	-37.6	-14.4
PSBR (£ billion)	39.3	49.1	351.8	177.3	84.8	57.6	17.5

1. Expenditure estimate at factor cost
2. Sterling effective exchange rate, Bank of England Index (2005 = 100)

However, of course this very fact also that it does not need to, and can simply roll it over in the market at going market prices based on its assumed solvency.

In considering solvency it is necessary to ask how tax and spending respond to prices and output, or nominal GDP. On the one hand spending is negotiated by the Treasury with departments in nominal terms, so that rising GDP should have little effect on them; their present value is this nominal commitment discounted by the interest rate.

On the other hand, tax revenues respond more than proportionally to nominal GDP because they are progressive. In principle the tax bands are indexed to prices, but this can be and often is in practice overridden or delayed so that this reaction then applies to prices as well as real GDP.

This implies that when the long run interest rate is low as now (it is around 1% pa) and nominal GDP growth is resurgent as now, the projected growth in revenues is bigger than the discount factor, implying that the present value of revenues becomes infinite.

This situation is one where 'the solvency constraint does not bind', in the sense that there is a projected (indefinite) excess of future taxes to pay for interest and spending.

This is the situation HM Treasury finds itself in today; and this explains why it has great freedom of action in dealing with the economy's critical re-entry into the post- COVID and post-Brexit world. It is vital that every means is used to support the economy both on the demand and supply side to ensure solid growth continuing and strengthening beyond the immediate recovery period.

Enormous policy opportunities are opened up by Brexit, as reviewed below; and it is vital that they are not neglected owing to irrational short run penny-pinching accountancy.

It is not simply that taxes can be cut and spending raised without endangering solvency, given the outlook for recovering GDP. Given the long lists of spending needs and the dangers to business confidence from tax threats, the government will need to spend more, and lower key tax rates that damage business incentives, as a minimum response to the situation.

It can afford to do so anyway. But the further key strategic point is that policies that boost growth further loosen the solvency condition. The solvency constraint depends on growth. 1% pa higher growth implies that consistent with today's debt the tax rate (t) can fall by 10% of GDP with the same spending rate (e), or spending rise by 14% of GDP with the same tax rate.

This effect becomes bigger with yet more growth; thus 2% more growth pa produces a further potential fall in taxes of 20% of GDP, with spending constant at today's level.

What this means is that if tax cuts or spending increases can raise growth, they are consistent with solvency. While they are financed they create more debt but this is offset by the higher net revenues created.

The situation is illustrated in Figure 1. It shows in the 'Solvency' line that as growth rises e-t (net primary spending/ GDP) can rise consistently with long run solvency because growth raises net revenues; then both rising e and falling t cause growth to rise, as shown in their two lines, with tax cuts having the bigger impact as they rise, compared with spending whose beneficial effects face diminishing returns. Fiscal policy needs to move to the optimum where tax cuts are generating maximum growth.

What this means is that bold reform policies that cost money in the short run and raise growth in the long run are eminently affordable.

This applies to tax reforms aiming to reduce marginal tax rates to boost incentives for entrepreneurs, to collaborative government spending aimed at innovation such as the COVID-vaccine government-pharma collaboration, and generally across spending or tax changes that raise growth but cost short run money.

These can be financed by borrowing with no threat to solvency. What we find from our research on growth is that both national and northern growth are boosted by tax cuts through their effects on incentives and competitiveness, while the effect of extra spending on eg. infrastructure is limited by the size of the (eg. Northern) economy.

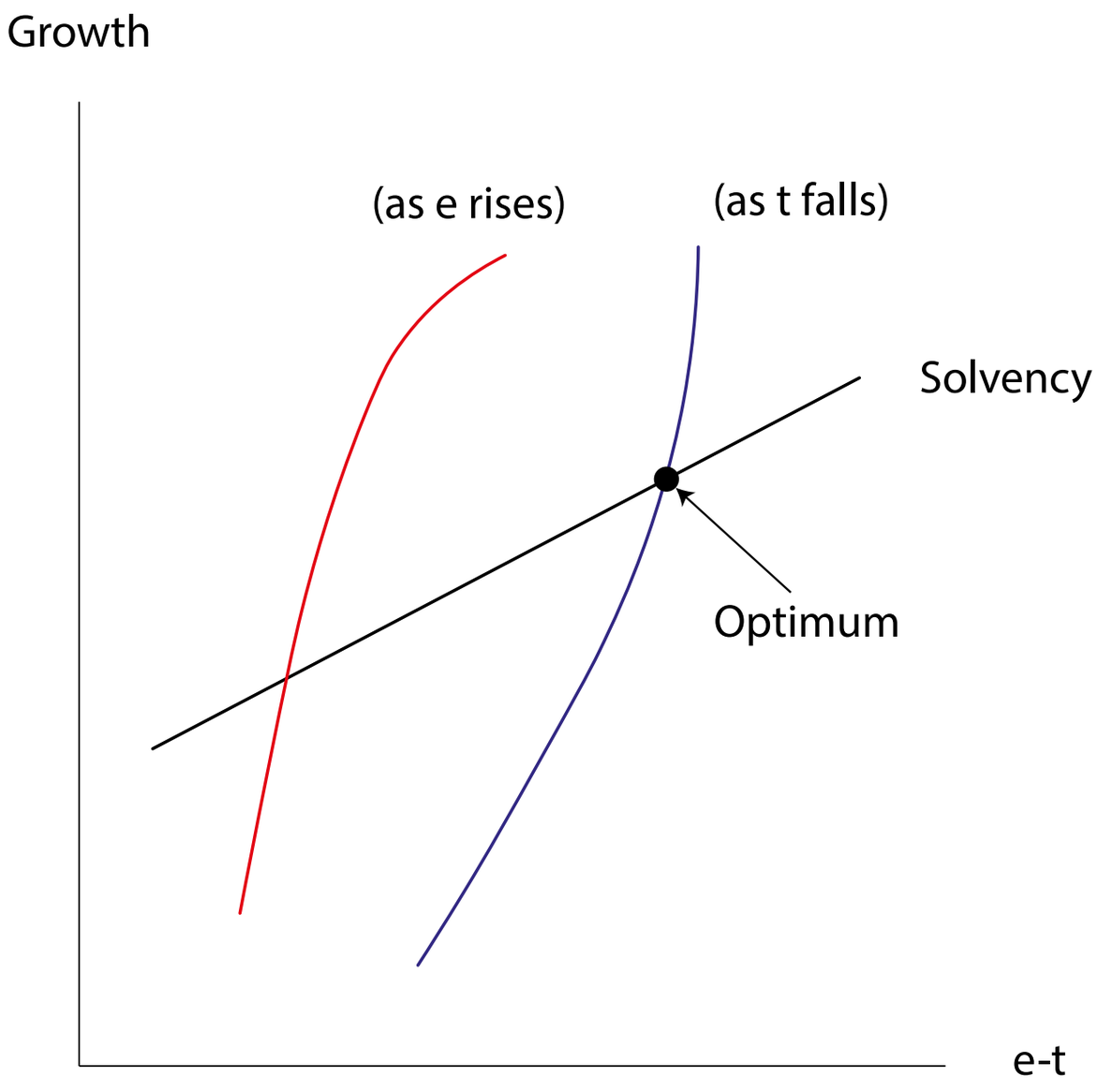
Hence once spending reaches a certain level its effectiveness on growth declines compared with extra tax cuts. So while growth permits rising net spending consistently with solvency, it is most beneficial to cut taxes after initially higher spending, as illustrated in Figure 1. In what follows we look at key areas where action is needed.

Key supply-side policy changes in the new era and their fiscal implications[1] - trade, regulation and tax reform

Fiscal policy is bound up with all aspects of supply-side policy, for a very simple reason: in order to gain consent to policies that free up markets and put pressures on vested interests, the government often must grease the process with transitional help to those interested parties: that comes at fiscal cost.

We live in a democracy where veto power is widespread; to overcome it people and firms often need help to make the transitions required. Indeed, many of the economic distortions in the EU come from it having no fiscal power to raise taxes and spend money at will in this way.

Figure 1. Illustration of growth possibilities



Instead, the course of least resistance to vested interest demands is to award protection, either through trade barriers or through regulation. The EU environment is heavily encrusted with such distortions as a result.

Trade after Brexit

At the heart of the powers the EU wielded over the UK as a member was the control of commercial policy, that is tariffs and non-tariff barriers, including standards set so as to exclude supplies from certain other countries, notably the US, also anti-dumping duties and quotas on supplies from particular countries.

EU commercial policy is designed to create large trade barriers against non-EU competitors, both in agriculture and manufacturing. In services such as financial, which are not such important EU industries, EU commercial policy is fairly liberal, though national governments

remain highly restrictive of foreign competition, including from the rest of the EU; it is only recently that the single EU market has been extended to some services, so restraining national protection against the rest of the EU.

UK service industries operate worldwide and so are little affected by this mainly national protectionism. UK service prices are therefore set by international competition at world prices; this has not changed now we have left the EU.

However, UK goods prices are still currently dominated by EU prices, which are higher than world prices by the percentage of trade barriers, which are estimated in our research and elsewhere at around 20% for both food and manufactures.

Now we have left the EU, we need to negotiate wide Free Trade Agreements (FTAs) with non-EU suppliers so that they gain free access to our markets. This will bring UK prices down 20% to world levels- equivalent in these effects to unilateral free trade.

According to the GTAP model from Purdue University, Indiana, now used by the Treasury for its calculations, this will bring gains of 4% of GDP, through better prices to consumers and competition-led rises in productivity by UK producers.

According to Cardiff research the gain would be double, while simply abolishing half the EU protection would bring in the same gain. Notice however, that any reduction of barriers will meet a hailstorm of business opposition, which largely accounts for the near-total opposition of UK business to Brexit.

The government will need to meet this hailstorm with offers of transitional help, smoothing the business path to higher productivity. A well-known example is electric cars, where the government has pledged support.

Regulation

Regulation is the second major area controlled by the EU, through its powers to regulate the Single Market. It exercises these powers according to a 'social market' philosophy. A nation state has the power to tax/subsidise, and it can use this power to redistribute income to the less well-off.

However, as already noted, the EU has no tax powers because national governments have been unwilling to pass them over to it, even partially. Therefore, to achieve social objectives of a redistributive nature the EU uses regulation; examples are labour market 'rights' which are essentially subsidies to workers paid for by implicit employment taxes on firms.

Then in order to compensate firms, it awards them protection either through trade barriers or favourable product regulation of standards- effectively creating non-tariff barriers against world producers who meet wider international standards. Thus one finds that labour market regulation is a series of subsidies to workers and trade unions, paid for by firms. The effects on the economy can be assessed according to the labour tax equivalent, plus the direct implied transfer to worker-households.

It was largely to carry out this assessment that my research team built the 'Liverpool Model' of the UK economy; this was the first macro-model of the UK to have a full 'supply-side', designed to compute the effects of tax and regulation on the economy's potential output.

The EU's regulation extends beyond the labour market, to three main other areas. The first is general product market standard setting, which as we have seen is related to setting non-tariff trade barriers. The general aim of standards is to benefit the main producer industries of the EU.

Thus, these industry lobbies essentially have had the power to legislate what suited them. As Adam Smith noted centuries ago, such power in the hands of business is likely to be anti-competitive; one notices that the EU Competition Directorate takes its most stringent actions against foreign, often US, companies - such as Apple, Google and Facebook.

One can in principle assess this producer regulation as the equivalent of endowed monopoly power, like a consumer tax. In practice, estimates of this are hard to make, other than via the direct effect of the trade barrier; this barrier also puts an effective limit on the extent to which home industries can raise prices. So we have not estimated any additional effect of regulation as such via this route.

The second area beyond labour is finance, a service where the EU has shown a strong desire to control activity, though, or perhaps because the biggest EU finance industry has been in the UK. It has intervened with highly prescriptive regulations in this major UK industry, in a way extremely unpopular among its practitioners- supposedly to protect consumers.

These regulations have given rise to an army of 'compliance' executives; but while this has raised costs substantially, gains to consumers have been unclear; in other major markets, such as the US, similar interventionism has been avoided.

We can leave on one side here the new regulations on banks associated with the financial crisis, which relate to monetary policy and in the UK were mostly self-inflicted.

Finally, there is the rest of the economy; the environment and climate where the EU has regulated strongly to force the adoption of non-fossil-based energy; and the regulation of technology, especially in agriculture and

pharmaceuticals, where the EU has given primacy to the precautionary principle, and held back technological innovation.

The main effect in the first has been to raise energy costs substantially, instead of primarily focusing on developing new technology, which would be most effective in the long term and least costly in the short term. In technology, EU regulation has held back innovation.

In all these areas we have proposed estimates of the cost to the UK economy. Overall, we suggest a cost of 6% of GDP, of which we suggest 2% can be rolled back now we have left. In a parallel piece of analysis of the Thatcher reform programme we find comparable gains, suggesting this order of magnitude is indeed feasible.

Bringing in this deregulative agenda will not be costless to the Treasury since the beneficiaries of regulation, including middle-class consumers, are vocal defenders of it. To help get agreement there may well need to be transitional subsidies.

Tax reform

The UK needs a tax system for the 21st century, that delivers large and stable revenues without penalising either savings or incentives for successful people. This can be done by rebasing the income tax system on consumption, and cutting marginal tax rates in the process.

Such a reform has been endlessly put off, because it requires a largescale legislative effort, and could also have involved difficulties of EU agreement through its invocation of state aid rules. Post-Brexit, and the need to improve UK competitiveness to maximise growth and recovery, there is a strong case for going ahead.

A good tax system is one that creates the minimum damage to everyone's incentives to work and save– the 'Ramsey Principle' – consistently with financing government spending and achieving the necessary income redistribution.

This is achieved by taxes that are 'flat' (ie. the same proportional rate) across people of all incomes (the popularly known 'flat tax'); that are flat across commodities of all sorts ('tax neutrality'); and that are flat across time. This last means that the tax rate is constant over present and future consumption; it implies both that tax should be levied on consumption and that the tax rate should be planned to be constant under forecast conditions ('tax smoothing').

Taxes can be cut without being balanced by simultaneous cuts in spending because extra work and less avoidance create an offsetting recovery in revenue (the Laffer effects); and because higher growth generates more future revenue, as we saw above. This is an important implication of tax smoothing.

A UK flat tax on consumption would bring the imputed rent on owner-occupied housing into the tax base and would allow the standard rate of income tax to be cut cautiously to a 15% flat tax rate on consumption, thereafter being cut further in stages as the growth effect rolled in.

Such tax reforms can be brought in with no losers, no cutback in public spending programmes and the key gains from higher growth. From a political economy viewpoint there is therefore a strong case for pressing ahead now, after many years of deferral.

Conclusions: the way ahead for UK policy

Translating all this into practical politics, we can summarise the situation as one in which the government has considerable fiscal flexibility owing to very low interest rates. It can without any threat to its solvency both cut tax rates and raise spending to support growth, trade opening and deregulation post-Brexit/COVID.

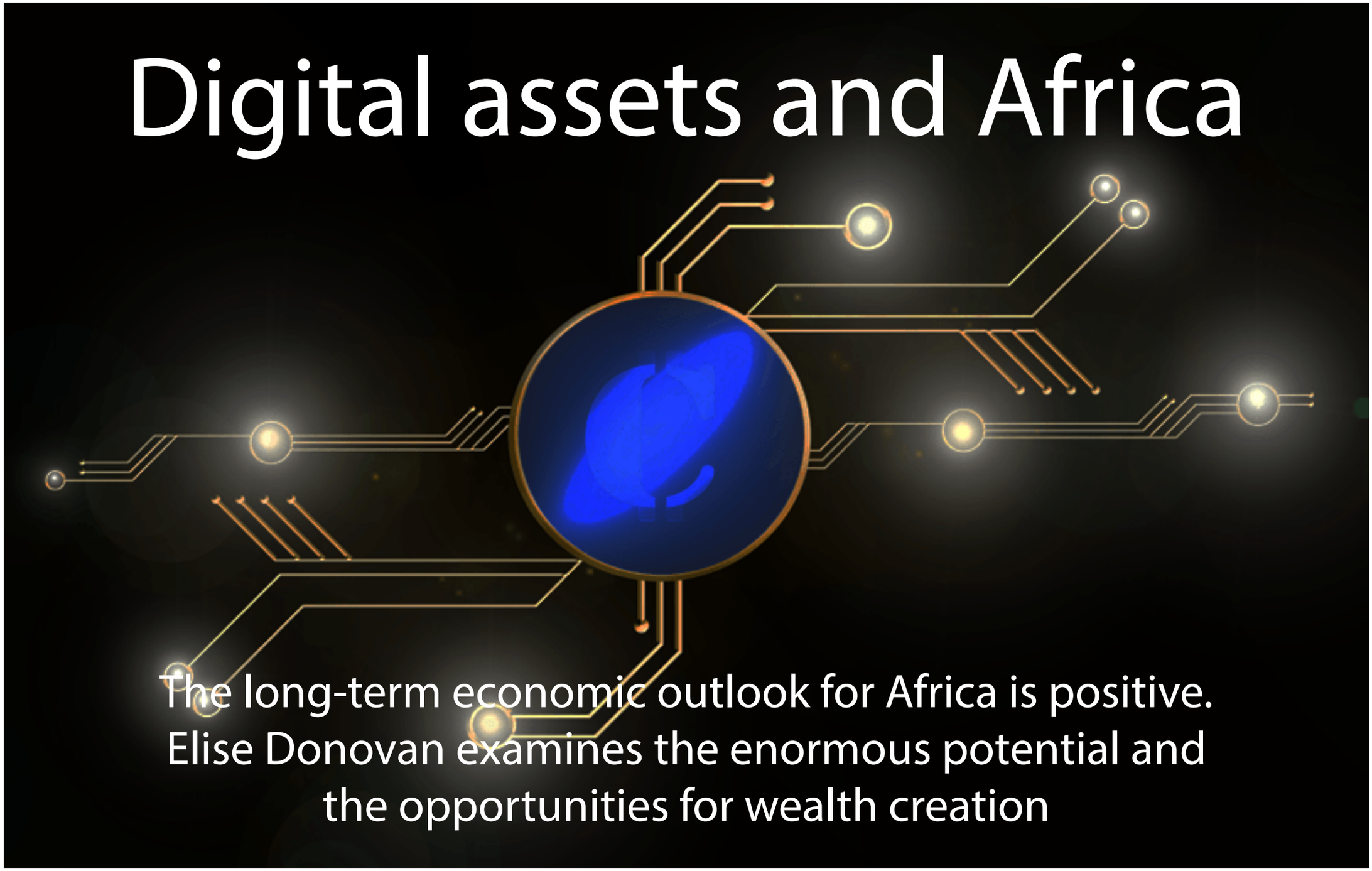
The key priority is therefore to boost growth through effective supply-side policy. Fiscal policy should also support demand at the same time as this supply-side policy, both to keep the recovery going and to push interest rates up towards monetary normality. ■

Patrick Minford is Professor of Applied Economics at Cardiff University

Endnote

1. These issues are discussed at greater length in Patrick Minford (with David Meenagh)' After Brexit- what next? Trade Regulation, and economic growth'- Edward Elgar, December 2020

Digital assets and Africa



The long-term economic outlook for Africa is positive. Elise Donovan examines the enormous potential and the opportunities for wealth creation

The African continent's impressive economic growth in the last decade is well documented with countries like Ethiopia, Nigeria and Kenya consistently ranking among the world's fastest growing economies. According to World Bank estimates, sub-Saharan Africa had a collective GDP of just over $1.7 trillion in 2019, which is expected to rise in the coming years.

COVID-19 has disrupted export markets, supply chains, tourism and remittances, nevertheless, the long-term economic outlook for the region is positive and there are compelling opportunities to capitalise on the enormous potential across the continent.

A key opportunity is the rise of digital assets which is transforming the continent and is set to impact the global economy. This does not come as a surprise. We have seen first-hand how the region has effectively leapfrogged the world in mobile money adoption, with 481 million registered mobile money accounts according to industry experts GSMA, which estimated that mobile money processed almost $6.1 billion in international remittances in Africa in 2020.

As well as expanding financial access to previously unbanked communities and fostering inclusive economic growth, the sector is also creating employment opportunities.

For example, Safaricom's M-Pesa was introduced in Kenya in 2007 as a digital system to settle payments, but has since expanded to neighbouring countries and rapidly evolved to include other services. This includes facilitating savings and helping users to build a credit history and access loans.

Elsewhere, other sophisticated platforms are springing up, including Kuda, a Nigerian mobile finance platform, which last year raised $10 million in a seed round.

Digital assets

The region is a well-known key hub for fintech innovations and these are radically transforming the delivery of financial services. Now, key markets in Africa are making major inroads in embracing digital assets, which, as defined by the Financial Action Task Force (FATF), are *"a digital representation of value that can be digitally traded or transferred and can be used for payment or investment purposes."*

Appetite for this technology is growing with a recent survey by statistics firm Statista showing that in 2020 Nigeria was the leading country per capita for bitcoin and cryptocurrency adoption. According to their research nearly one in three survey respondents said they used or owned crypto assets last year.

In the coming years, the digital asset space will only mature, growing in sophistication, backed by secure technological hardware and integrating with mainstream financial institutions

The appeal of digital assets is obvious. They have all the advantages of regular assets but also benefit from being fully digital and hosted on blockchain or other distributed ledger technologies. These have the potential to facilitate trade both peer-to-peer but also across borders, quickly and securely without incurring high fees.

Although some digital assets like bitcoin are volatile, there are alternatives like asset-backed digital tokens or stable coin which are pegged to other currencies like the euro or the dollar and provide more stability. The demand and uptake of these innovative technologies has been high and in the absence of legacy systems, innovations, entrepreneurialism, and adoption of fintech has been high in the region.

Family offices

The rising wealth in Africa has also swelled the ranks of an increasingly affluent middle class as well as high net worth individuals, leading to the creation of a robust family office sector, where digital assets present an opportunity to transform business models.

Whether it is to consolidate wealth or diversify into a new asset class, digital assets present an attractive alternative to fiat currencies, offering lower transaction costs as well as more stability especially in regions vulnerable to economic shocks or sharp inflation.

Family offices can access this market through industry specialists who have the expertise and track record to mitigate risk. International financial centres, like the BVI, have emerged as leaders in this space, with a network of specialists, robust digital capabilities and bespoke corporate vehicles well-suited for crypto assets.

For example, as well as a number of digital asset exchanges, the BVI's anti-money laundering rules have been amended and now permit digital ID verification and the receipt of electronic copies of documents, so businesses

are able to use a blockchain provider to double check identities. Furthermore, the BVI, along with other key financial centres, is a jurisdiction of choice for Initial Coin Offerings globally.

Aside from this, the BVI's status as a stable jurisdiction with progressive corporate laws provide important advantages. Factors such expert professional services, robust common law, arbitration and – perhaps crucially – compliance with international law enforcement authorities makes it an ideal destination for family offices.

Structuring investment vehicles in established jurisdictions like the BVI provides stability as well as economic incentives. This was recently highlighted in a report by the Overseas Development Institute (ODI), on international financial centres and development finance, which looked at the valuable role IFCs play in development finance and found that offshore centres like the BVI are excellent conduits for foreign direct investment into emerging markets.

The road ahead

As widely noted, fintech regulation has not always followed the same pace of rapid change and evolution as digital assets. This has led to legitimate concerns that customers may be exposed to risk or that crypto assets are especially vulnerable to money laundering and financial crime.

After all, a system with total anonymity and lack of regulation are not exactly ideal combinations. For some this is understandably a barrier for mainstream adoption. The Central Bank of Nigeria's (CNB) recent decision to close all accounts with cryptocurrency links is one such example.

Given that the country has the biggest digital currency market in Africa with millions of people who rely on it, the CNB's decision illustrates just how urgent it is to develop robust regulations and create a system that is financially competitive while providing consumer protection and satisfying law enforcement.

In the coming years, the digital asset space will only mature, growing in sophistication, backed by secure technological hardware and integrating with mainstream financial institutions.

In order to capitalise on this and fully benefit from the opportunities it presents, it is essential that key stakeholders from across the board collaborate to help set international standards.

In the BVI, we are taking a prudent approach focused on upskilling and building deep expertise in the area and working closely with our private sector to assess new technologies for benefits and the right way to regulate them. ■

Elise Donovan is Chief Executive Officer at BVI Finance

Will 2021 in CEECs look better than 2020?

Mehmet Burak Turgut is optimistic about CEE growth in 2021 following the successful development of COVID vaccines

Introduction

The COVID-19 outbreak in the early 2020 has dramatically affected societies and economies all over the globe. It has already claimed two million lives worldwide and lead to an unprecedented contraction of the world's economies. The successful development of the vaccines in late 2020 and the expected ease of the containment measures coming ahead give rise to optimistic projections for the economic rebound in 2021.

2020 in a nutshell

As the International Monetary Fund (IMF) projections show, it is expected that the global economy shrunk significantly in 2020 with an estimated 4.4% negative GDP growth rate. The EU economy was not an exception as economic activity almost halted and real GDP fell at double-digit rates in the first half of 2020.

European Commission forecasts predict a negative real GDP growth of 7.4% for 2020. Employment has also suffered from a continuous drop in economic activity, with the unemployment rate in the EU set to hit 7.7% in 2020, an increase of one percentage point over 2019.

Central and Eastern European (CEE) countries

The downturn of economic activity in 2020 is expected to be slightly less pronounced in the CEE countries. The recent CASE projections show that the fall of annual real GDP in any CEE country will not reach the EU average.

The Czech Republic and Slovakia will suffer the most from the negative impact of COVID-19 on the regional economy, with an expected 6.8% contraction in GDP. Poland and Lithuania, on the other hand, are the two economies forecast to decline at a relatively low pace with negative growth rates of 1.9% and 3.5%, respectively.

A sharp decline in economic activity could also be observed in the labour markets as the unemployment rates are expected to range from 2.7% to 8.6%, the lowest in the Czech Republic and the largest in Latvia and Lithuania.

The measures undertaken by the Czech government, the pre-crisis tight labour market, and low share of temporary employment contracts are the main contributing factors to the lowest expected unemployment rates in the Czech Republic.

... it is crucial that the economies in the region succeed in containing infection rates and effectively implement national recovery strategies

The governments of CEE countries responded to the COVID-19 pandemic through various fiscal measures such as social security contributions, wage subsidies, increased loan guarantees for medium and large companies, additional loans from micro firms, increased unemployment benefits, interest rate subsidies, and public investment supports.

These measures are expected to increase government expenditures by on average 4.8% y/y in 2020. Along with decreased tax revenues, elevated expenditures will likely lead to large gaps in government financing.

Poland in the spotlight

The year 2020 is set to mark the worst performance of the Polish economy in nearly three decades. In response to the COVID-19 pandemic and restrictions imposed on economic activity, Polish GDP went down by nearly 9% q/q in the second quarter of 2020 with respective 10.5% and 9% q/q decline in private consumption and fixed investment.

In the third quarter of 2020, with the ease of containment restrictions, the Polish economy sharply rebounded, and the GDP soared by 7.9% q/q. The surge in new infections and reintroduction of containment measures were expected to bring a halt to the recovery of the economy in the last quarter of 2020, with the expected annual real GDP growth at negative 3.5% and unemployment rate at 3.8% for 2020.

Thanks to the emergency support measures the increase in the unemployment rate following the pandemic did not go one-to-one with the decrease in the economic growth. The main employment-related measures included subsidies for employee remuneration costs and social security contributions for companies that experienced sharp decline in their turnover.

As of March 2020, the Polish Parliament started adopting legislation packages titled 'Anti-Crisis Shields' that, as of January 2021, have already amounted to PLN 312 billion support in a form of credit guarantees, micro loans, and liquidity programs for the businesses. Coupled with the dropdown in economic activity, these measures are expected to significantly deteriorate Polish public finances.

CASE projects that the budget balance will reach -9.2% of the GDP in 2020, which could be the largest deficit among the CEE countries. The budget deficit will also push up the public debt in Poland. As a result, the public debt-to-GDP ratio is expected to hit 58.4% in 2020, whereas in 2019 it stood at 45.7%.

2021 outlook

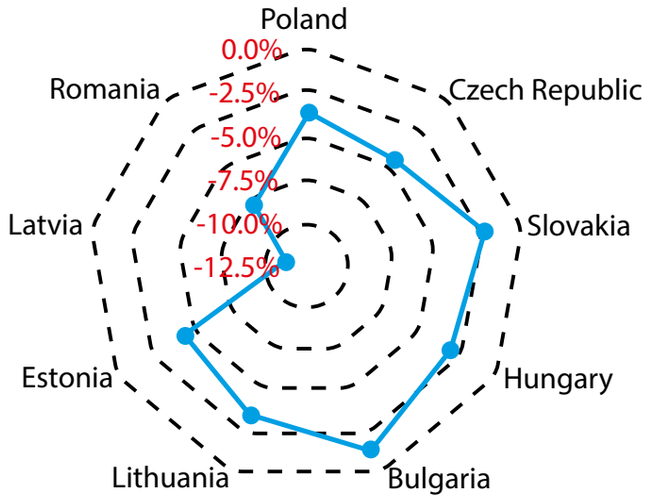
CEE

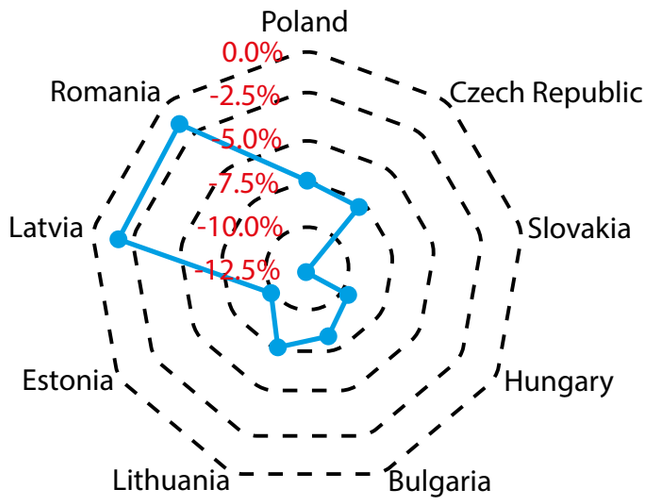
The 2021 GDP in real terms is projected to remain below the levels observed in 2019 with the full recovery of the CEE economies being expected no earlier than 2022.

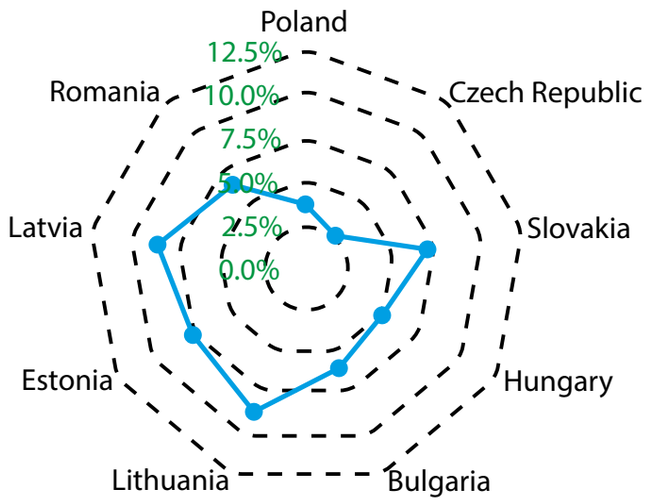
Among the CEE economies, the highest GDP growth in 2021 is projected for Slovakia – at 5.4% y/y. As Slovakia ranks first in terms of trade openness in the region, the anticipated restoring of international trade in 2021 is expected to support the recovery. In addition, the forecast 10.9% y/y growth in fixed investment – the highest among the nine CEE countries – will be the main engine of 2021 growth in Slovakia.

Poland, Hungary, and Latvia are the other economies expected to grow at a fast pace of over 4% y/y in 2021. The rebound will mostly be driven by private consumption that is expected to increase by 5.7%, 4.5%, and 4.2% y/y in Latvia, Poland, and Hungary, respectively.

Figure 1. CEE economies forecast for the year 2020

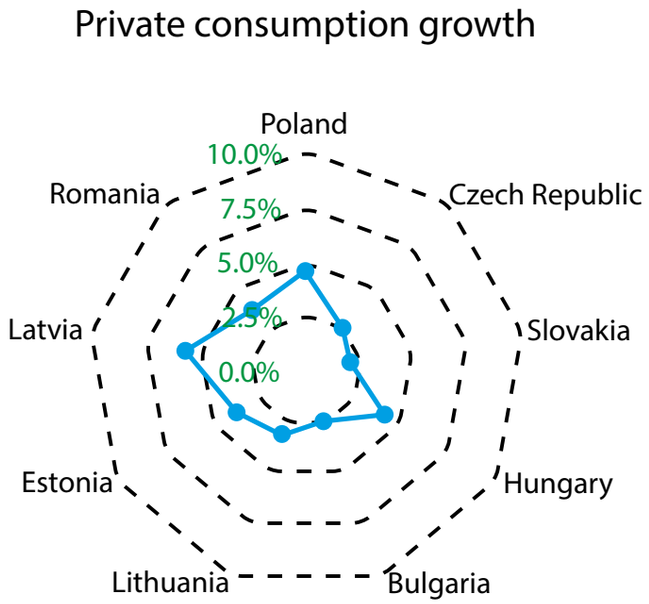


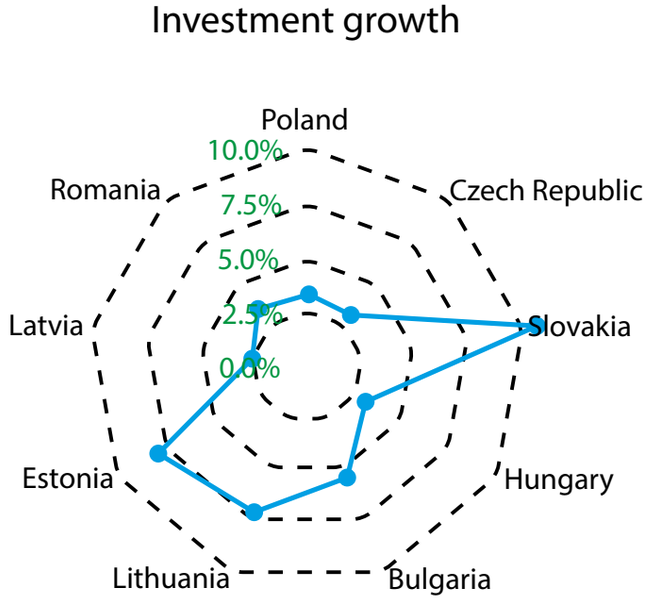


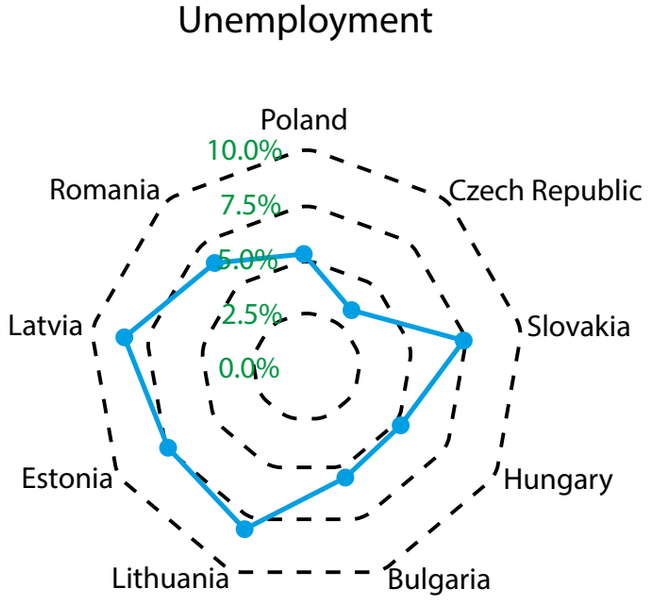


Source: Own elaborations based on the CASE projections

Figure 2. CEE economies forecast for the year 2021







Source: Own elaborations based on the CASE projections.

On the other hand, the growth of fixed investment is anticipated to be relatively slow in these countries with a projected rate of around 3% y/y.

The other factors that contribute to the GDP growth in Hungary and Latvia diverge. The anticipated recovery in international trade coupled with the recent depreciation in the forint will support Hungary's positive trade balance which will contribute the 2021 GDP growth.

However, the opposite is true for Latvia – an expected negative trade balance will constrain the GDP growth, while the projected positive growth in public consumption is expected to stimulate the 2021 recovery of the Latvian economy. In the case of Hungary, an expected cut in public spending will have negative impact on growth.

The growth rates of the other countries in the region are expected to fluctuate between 3% and 4% y/y. Estonia will lead this group with an estimated 3.7% y/y GDP growth, mostly driven by the prospect of the solid fixed investment performance expected to grow by 7.9% y/y in 2021.

Although the Czech Republic is expected to have the lowest unemployment rate in the region (3.5%), the anticipation of modest increases in private consumption (2.7% y/y) and fixed investment (3.2%) will help the Czech Republic to have a 3.5.% y/y GDP growth in 2021.

Lithuania is forecast to have the lowest GDP growth among the CEE countries in 2021 – at 3.1% y/y. Although the projections for private consumption and fixed investment are not the lowest in the region (3.0% and 7.0% y/y, respectively), the expected negative trade balance in 2021 will pull down the GDP growth rate.

The Romanian economy will also follow a similar path with private consumption and fixed investment growth at 3.8% and 3.5% y/y, respectively, yet only 3.3% y/y GDP growth due to the expected negative trade balance and cuts in public consumption.

Poland in the spotlight

The assumed easing of the COVID-19 restrictions not only in Poland but also in the rest of the EU is expected to help Polish economy to recover in 2021. The annual GDP growth for the years 2021 and 2022 is thus forecast at 4.1% and 4.0%, respectively. These figures are approaching the average annual growth rates enjoyed throughout 2014-2019 (ie. 4.2%); hence, even in the short-term recovery, the Polish economy is expected to restore its pre-crisis growth trend levels.

Considering the current dynamics, it appears that the 2021-2022 economic rebound in Poland will be primarily fuelled by private consumption which is expected to increase by 4.5% y/y (supported by the build-up of savings and positive consumer moods). The government consumption, fixed investment, and trade balance are also expected to have a positive contribution to the growth in the next two years, albeit at a lower extent.

The government consumption is forecast to grow at a decreasing rate – 3.1% in 2021 and 2.8% in 2022, which, nonetheless, is set to be compensated by the increase in fixed investment – from a 7.4% decline in 2020 to a projected 3.3% and 6.5% growth in 2021 and 2022, respectively.

Conclusions

The forecasts for 2021 are made under the assumption of easing containment restrictions. Thus, for the positive forecasts to be realised it is crucial that the economies in the region succeed in containing infection rates and effectively implement national recovery strategies.

In the case of a high rate of active cases that would require an extension of the containment restrictions, economic activity risks to drop further which may once again pull down consumer and business confidence and exacerbate the pressure.

In a closer look, the additional downside risks for the Polish economy in 2021 are the phasing-out of support measures that may put downside risk on unemployment, a generous social policy stance that would put pressure on public finances, as well as potential low interest rates and disputes with the European Commission that may stagnate private investment. ■

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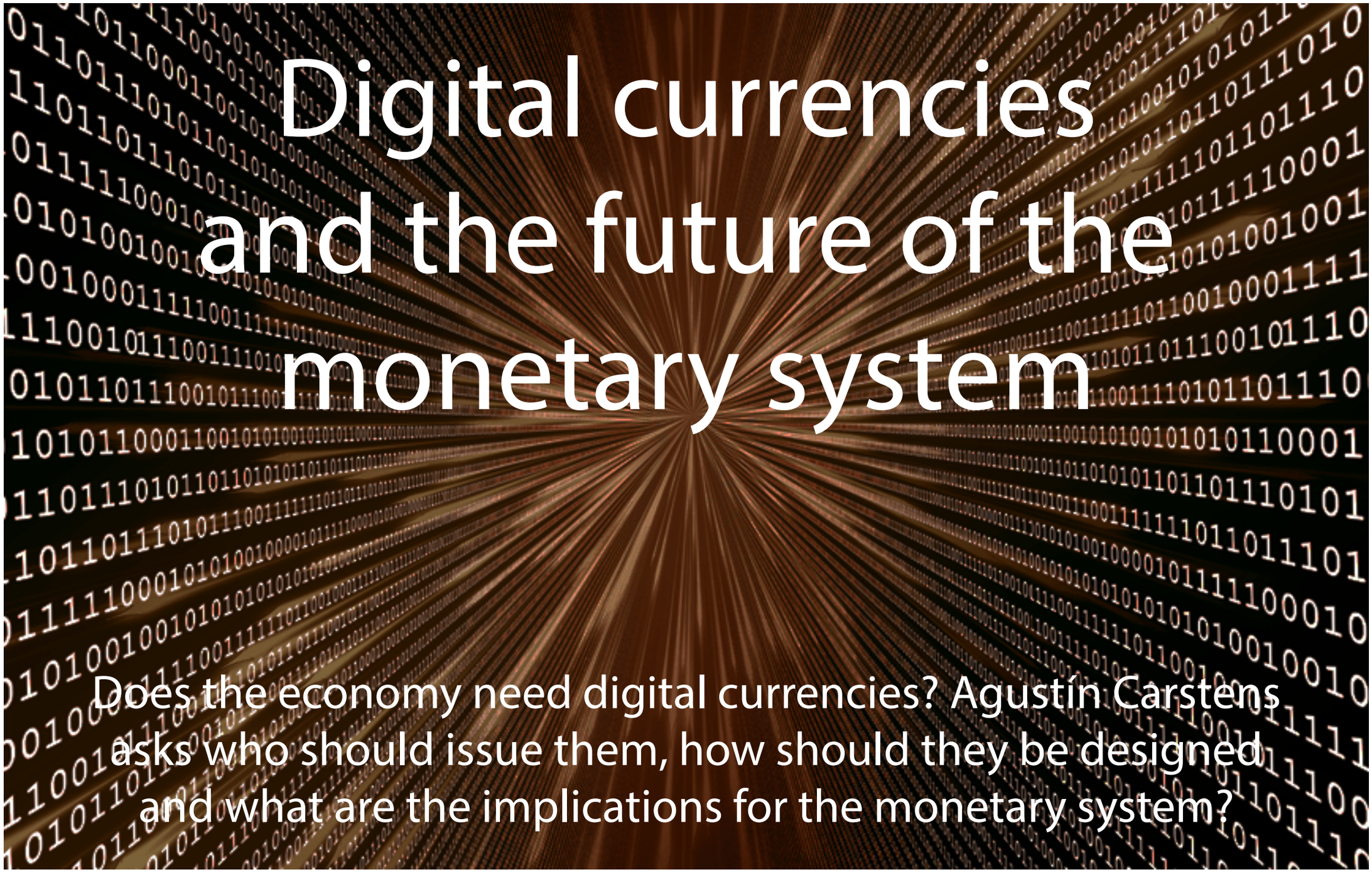
Digital currencies and the future of the monetary system



Does the economy need digital currencies? Agustín Carstens asks who should issue them, how should they be designed and what are the implications for the monetary system?

Introduction

In my remarks I will address the digitisation of money[1]. Does the economy need digital currencies? Digital money itself is not new. Commercial bank money has been digital for decades, and we already use digital means of payment on a daily basis. Central banks already provide wholesale digital money to banks.

I would like to discuss new forms of digital currencies or 'digital cash' that have been in the news lately, including central bank digital currencies, or CBDCs. If we need digital currencies of these new kinds, who should issue them, and how should they be designed? What are the implications of digital currencies for the monetary system?

These are weighty issues that are much on the minds of central bankers, scholars and the general public. I hope to clarify the concepts and sketch a path for the way forward.

Do we need new digital currencies? If so, who should issue them?

Let's start with whether the economy needs digital currencies, and from whom.

It is stating the obvious that our economy is in the middle of a technological revolution[2]. A combination of new digital technologies and greater online activity allows huge volumes of data to be collected, managed and telecommunicated. This has dramatically lowered the costs of many tasks[3]. It has resulted in powerful, hyper-scalable applications that have disrupted entire industries – everything from taxis to print media.

New players have entered the digital economy to provide these services. While advances in information technology and communications have been under way for many decades, the past decade has ushered in truly far-reaching changes. The COVID-19 pandemic may have further accelerated the pace of digital change[4].

The technological revolution has also reached the financial system – and even the design of money itself. Just to name one example, on primary foreign exchange (FX) venues, market-makers can now access real-time prices at five-millisecond time intervals. Project Rio, a new application for monitoring fast-paced markets developed at the BIS Innovation Hub, allows the entire market order book to be monitored every 100 milliseconds, or 36,000 times every hour[5].

Sound money is central to our market economy, and it is central banks that are uniquely placed to provide this. If digital currencies are needed, central banks should be the ones to issue them. If they do, CBDCs could also play a catalytic role in innovation, spurring competition and efficiency in payments

The first point of entry into finance is the market for payment services, which are foundational to all economic activity[6]. Payments are attractive for digital disrupters because they are relatively less capital- intensive than other financial services, and the information they generate is highly valuable for cross- selling. Perhaps it is no surprise that we've seen a burst of digital innovation in payments, including new digital payment offerings by fintech startups, big techs and incumbents[7].

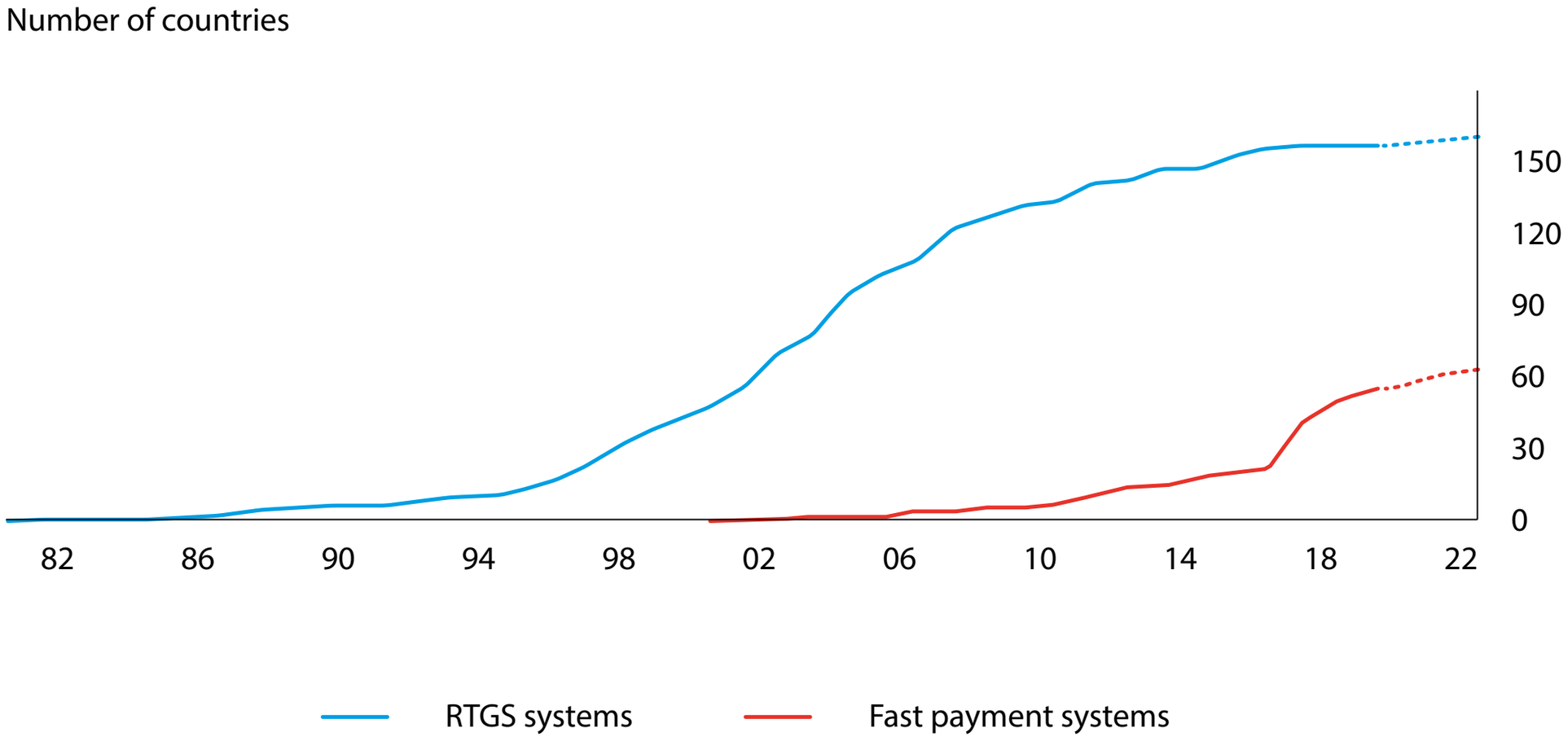
Many payment innovations build on improvements to underlying infrastructures that have been many years in the making. For instance, harnessing technological progress, central banks around the world have instituted real-time gross settlement (RTGS) systems over the past decades.

Meanwhile, operating hours of these systems have continued to lengthen around the globe, and in several countries are already operating almost 24/7. Also on the retail side, innovation is rampant, and a growing number of economies – 51 by our last count – have fast retail payment systems, which allow 24/7 instant settlement of payments between households and businesses (Graph 1).

These include systems like the Unified Payment Interface (UPI) in India, CoDi in Mexico, PIX in Brazil and the FedNow proposal in the US. Together, these innovations have shown that the existing system can adapt, providing good examples of how innovation in public- private partnerships is working.

Yet no one is compelled to choose the path of the existing monetary system. In addition to improvements to existing systems, many attempts to innovate in less traditional fields have been unleashed. One example is digital currencies – which could transcend both traditional account-based money and physical cash.

Graph 1. Diffusion of retail fast payment systems*



** The dotted part of the lines corresponds to projected implementation.*
Source: BIS, "Central banks and payments in the digital era", Annual Economic Report 2020, June 2020, Chapter III.

As already mentioned, account-based money has been digital for decades, as electronic deposits on a digital ledger. Yet there have been calls and attempts to digitise all money, including cash[8]. In my view, fully replacing either bank accounts or cash is neither desirable nor realistic, but let us discuss what a further digitisation of money could look like.

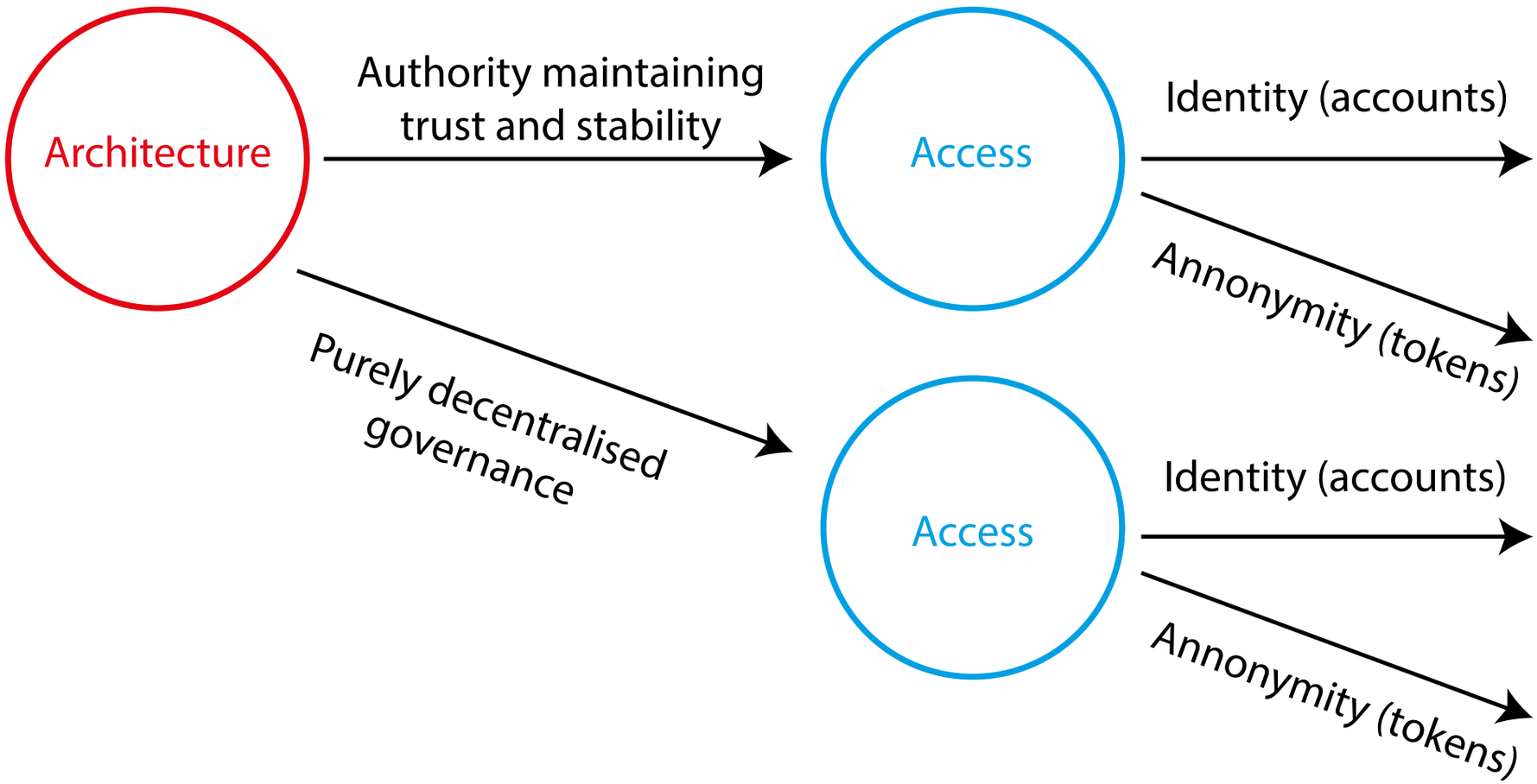
Narayana Kocherlakota – one of the world's leading monetary theorists, former president of the Federal Reserve Bank of Minneapolis and a former Stanford professor – argued in a famous 1998 paper that *"money is memory."* By substituting for an otherwise complex web of bilateral IOUs, money is a substitute for a publicly available and freely accessible device that records who owes what to whom[9].

The idea that money is the economy's memory leads us to two forks in the road for the design of digital money (Graph 2). At these junctions, decisions about architecture and access need to be taken. First, it needs to be ensured that the memory is always and everywhere correct. In payments parlance, this means ensuring the integrity and safety of the payment system, as well as the finality of payments. How to do this relates to the role of a central intermediary versus a decentralised governance system.

And second, rules to guide who has access to this information, and under what circumstances, need to be determined, with appropriate safeguards in place to protect privacy. In other words, we need to establish both proper identification and privacy in the payment system. Let me discuss these in turn.

If societies want digital money, the first fork in the road is the choice of operational architecture. Should the payment system rely on a trusted central authority (such as the central bank) to ensure integrity and finality? Or could it be based on a decentralised governance system, where the validity of a payment depends on achieving consensus among network participants on what counts as valid payments?

Graph 2. Two forks in the road for digital currencies



Source: Adapted from R Auer and R Böhme, "The technology of retail central bank digital currency", BIS Quarterly Review, March 2020, pp 85– 100.

This is the concept behind Bitcoin. Satoshi Nakamoto's protocol envisions a decentralised consensus, with no need for a central intermediary. Yet in practice, it is clear that Bitcoin is more of a speculative asset than money.

One contact recently told me that like Bitcoin is *"Tesla without the cars"* – observers are fascinated by it, but the actual value backing is lacking. Perhaps the Bitcoin network should be seen more like a community of online gamers, who exchange real money for items that only exist in cyber space.

Bitcoin poses as its own unit of account, but fluctuations in value mean it is unrealistic to set prices in bitcoin. This also undermines its usefulness as a means of exchange, and makes it a poor store of value. The structure of the Bitcoin market is decidedly concentrated and opaque, and there is research evidence on price manipulation[10].

Above all, investors must be cognisant that Bitcoin may well break down altogether[11]. Scarcity and cryptography alone do not suffice to guarantee exchange. Bitcoin needs a hugely energy-intensive protocol, called 'proof of work', to safely process transactions.

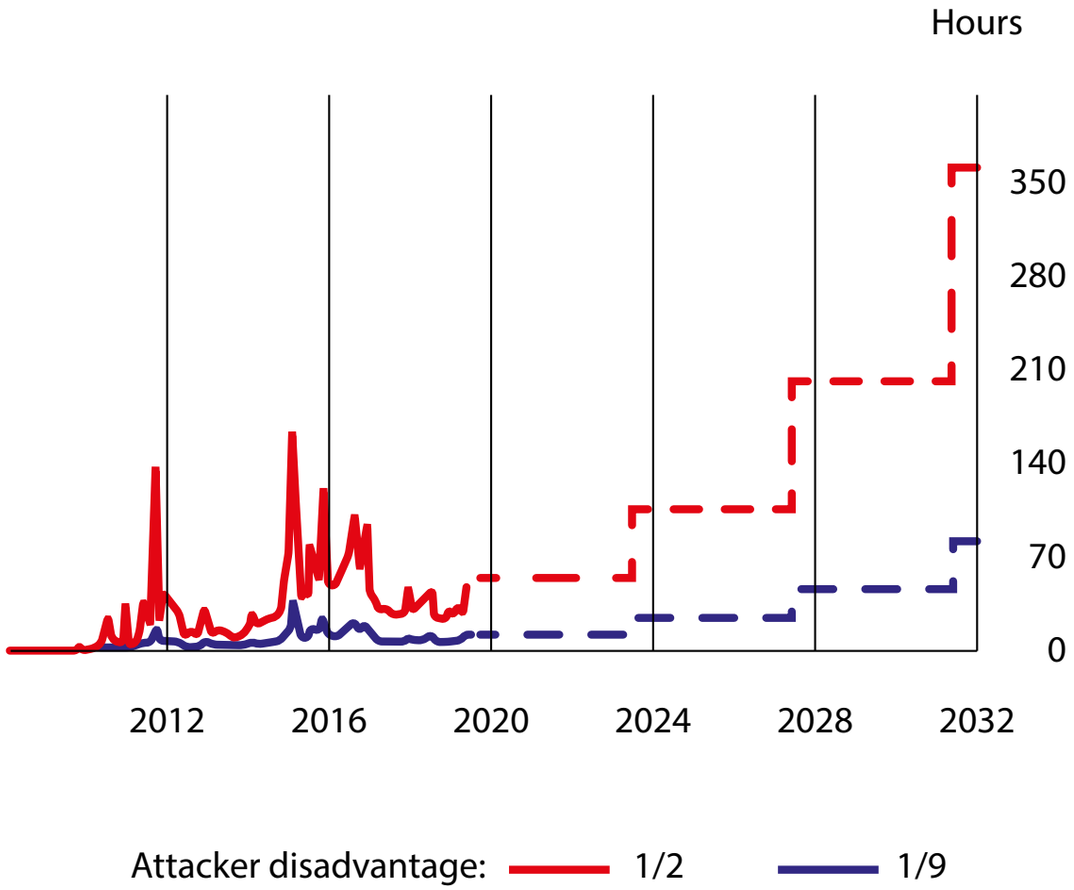
Currently, so-called miners sustain the system's security, and are rewarded with newly minted coins. A sad side effect is that the system uses more electricity than all of Switzerland.

In the future, as Bitcoin approaches its maximum supply of 21 million coins, the 'seigniorage' to miners will decline. As a result, wait times will increase (Graph 3, left-hand panel) and the system will be increasingly vulnerable to the 'majority attacks' that are already plaguing smaller cryptocurrencies (right-hand panel)[12].

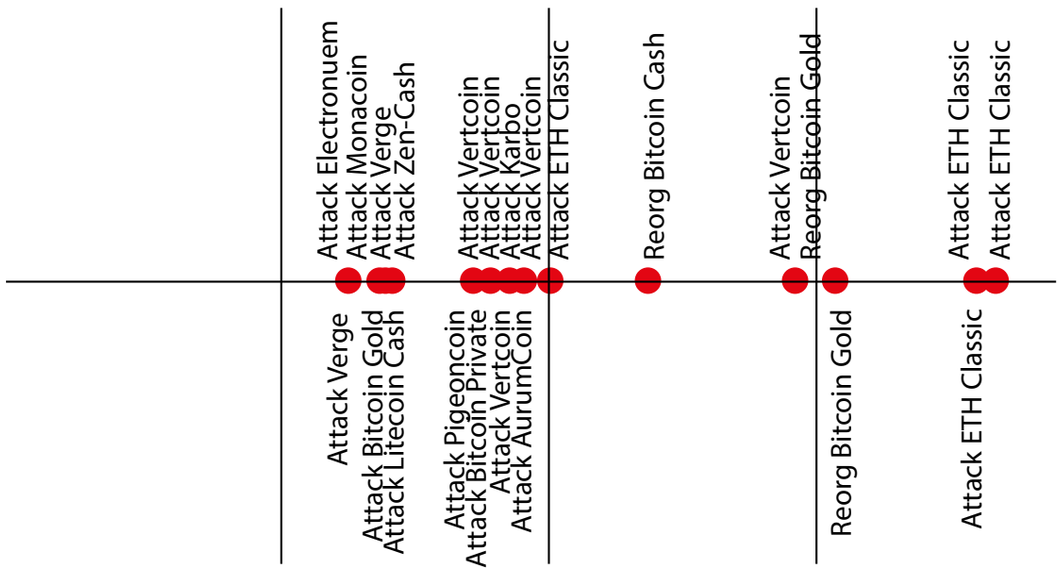
What then of so-called stablecoins – cryptocurrencies that seek to stabilise their value against sovereign fiat currencies or another safe asset? Facebook's Libra – recently renamed Diem – was initially marketed as a 'simple

Graph 3. Bitcoin is increasingly vulnerable; others already have been 'majority attacked'

Substantially longer waiting time results when block reward declines[1]



A timeline of cryptocurrency majority attacks since 2017



1. The lines show the implied waiting time (number of block confirmations before merchants can safely assume that a payment is irreversible) required to make an economic attack unprofitable: the attacker rents mining equipment on a short-term basis and executes a change-of- history attack. The dashed pattern indicates predicted values (see Auer (2019) for calculations).

Sources: R Auer, "Beyond the doomsday economics of 'proof-of-work' in cryptocurrencies", BIS Working Papers, no 765, January 2019; S Shanaev, A Shuraeva, M Vasenin and M Kuznetsov, "Cryptocurrency value and 51% attacks: evidence from event studies", The Journal of Alternative Investments, Winter, 2020; blocksdecoded.com; bravenewcoin.com; btc-manager.com; coinbase.com; Coindesk.com; deribit.com; github.com; medium.com.

currency for billions'. It would import credibility by being pegged to a basket of stable currencies like the US dollar and euro.

More recent incarnations of Diem would be denominated in individual sovereign currencies, looking more like so-called e-money or other digital payment services. This is certainly more credible than Bitcoin. But there are still serious governance concerns if a private entity issues its own currency and is responsible for maintaining its asset backing.

Historical examples show us that there may be strong incentives to deviate from an appropriate asset backing, such as pressure to invest in riskier assets to achieve higher returns[13].

Overall, private stablecoins cannot serve as the basis for a sound monetary system. There may yet be meaningful specific use cases for stablecoins. But to remain credible, they need to be heavily regulated and supervised. They need to build on the foundations and trust provided by existing central banks, and thus to be part of the existing financial system[14].

I side here with Milton Friedman, who argued, *"Something like a moderately stable monetary framework seems an essential prerequisite for the effective operation of a private market economy. It is dubious that the market can by itself provide such a framework. Hence, the function of providing one is an essential governmental function on a par with the provision of a stable legal framework."*[15] This idea remains as relevant as ever in the digital age.

So, clearly, if digital money is to exist, the central bank must play a pivotal role, guaranteeing the stability of value, ensuring the elasticity of the aggregate supply of such money, and overseeing the overall security of the system. Such a system must not fail and cannot tolerate any serious mistakes.

The second fork in the road is the question of how access should be arranged. There are many nuances, but the main choice is whether access should be around verification of identity as in bank accounts (sometimes called 'account-based access') or around validity of the object being traded as with physical cash, for instance with cryptography ('token-based access')[16]. In other words, is it *"I am, therefore I own"* or *"I know, therefore I own"* (Graph 4)?

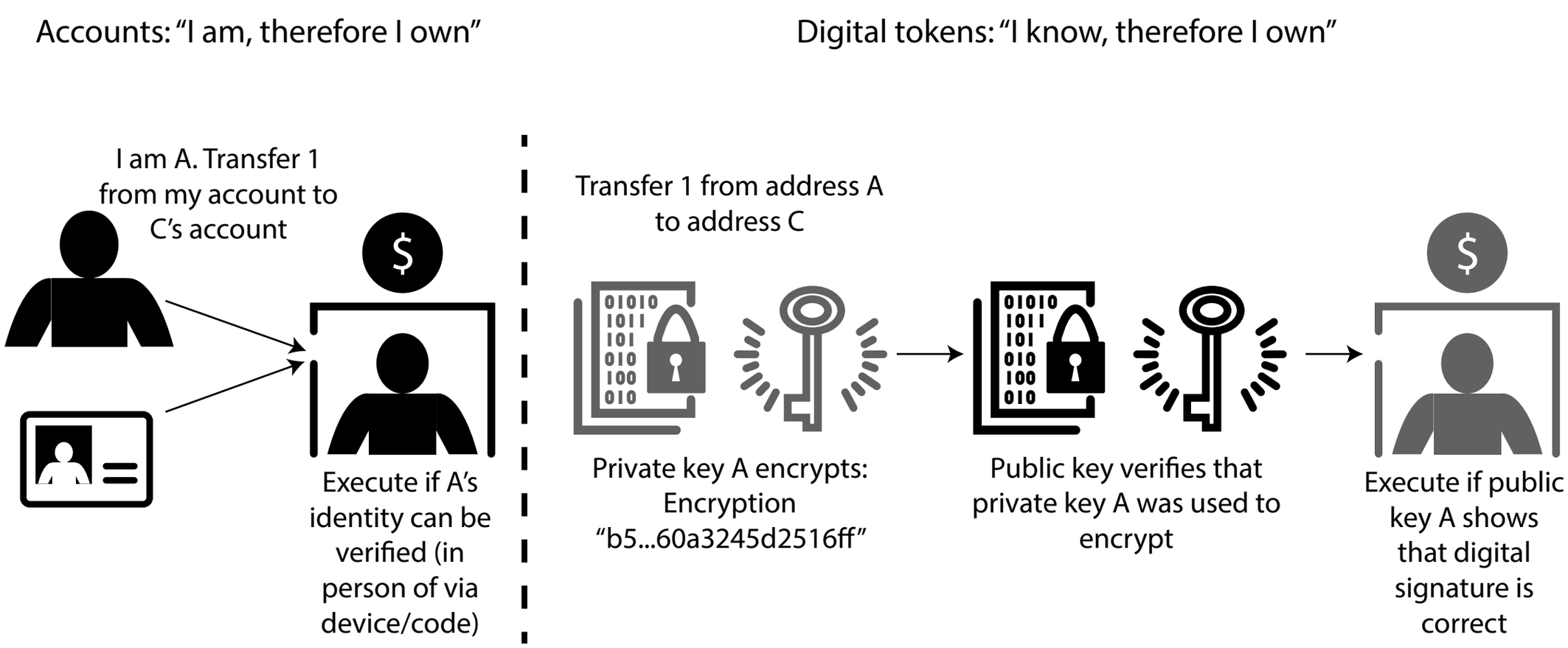
Again, this harks back to the notion of money as the memory of society's economic interactions and the need for identification in it. Just as our memories are tied to experiences we have in specific relationships, money does not exist in a vacuum that is separate from economic relationships.

Economic transactions weave a web of long-term relationships between suppliers, intermediaries and customers, as well as between borrowers and lenders. Such a web of trading creates – and rests on – a reservoir of relationship-specific capital that sustains financial relationships[17]. This capital is built up with the identification of all counterparties, as well as some degree of traceability of the underlying transactions.

Historical examples show that identification has been critical to allow commerce to flourish. For instance, in 18th century Europe merchants used so-called bills of exchange to solve the lack of trust between physically remote lenders and borrowers. Instead of extending loans directly to borrowers in distant cities, merchants could make arrangements with others whom they personally knew, creating a web connecting far-flung parties together.

Another example are the Maghreb traders of the 11th century. As Avner Greif – also of Stanford – famously showed, it was identity and traceability that allowed these traders to sustain trade, even over long distances and in the presence of great uncertainty[18].

Graph 4. Account-based access compared with token-based access



In an account-based CBDC (left-hand side), ownership is tied to an identity, and transactions are authorised via identification. In a CBDC based on digital tokens (right-hand side), claims are honoured based solely on demonstrated knowledge, such as a digital signature.
Source: R Auer and R Böhme, "The technology of retail central bank digital currency", BIS Quarterly Review, March 2020, pp 85–100.

This is even more the case today: your virtual ID is key to government benefits like pensions and cash transfers. Some form of identification is crucial for the safety of the payment system, preventing fraud, and supporting anti-money laundering and combating the financing of terrorism (AML/CFT).

There are trade-offs between access and traceability. Socially, there are many benefits to having more information, for example to prevent money laundering or tax evasion. Good identification can help here, giving law enforcement authorities new tools to fulfil their mandate.

So overall, my sense is that a purely anonymous system will not work. And the vast majority of users would accept for basic information to be kept with a trusted institution – be that their bank or public authorities.

The idea of complete anonymity is hence a chimera. Users have to leave a trace and share information today with financial intermediaries. This makes it easier for them to work online and prevent losses. To recount one recent anecdote, the user who lost his hard drive with $220 million of bitcoin would have probably liked to have a backup[19].

So if we take the path I have laid out just now, where do we end up? I argue that we end up with central bank digital currencies with some element of identification – that is, with primarily account-based access.

Today we have the possibility to produce a technologically superior representation of central bank money. This can combine novel digital technologies with the tried-and-true characteristics of central banks – such as trust, transparency, legal backing and finality – that others would need to either rely on or create for themselves from the ground up.

Designing CBDCs for the benefit of societies

Let me turn now to CBDC design. There are two types of central bank digital currencies. The first is in the wholesale realm, for payments between financial institutions and large commercial parties.

In the last few years, there has been a lot of activity around both private and central bank-issued wholesale digital currencies[20]. These efforts could introduce efficiency gains, for instance by allowing faster settlement and delivery versus payment[21].

Yet they may not be all that disruptive. Again, digital central bank money for wholesale purposes already exists, in the form of central bank reserves. Notably, privately issued wholesale digital currencies, also called utility tokens or wholesale stablecoins, are not separate currencies per se.

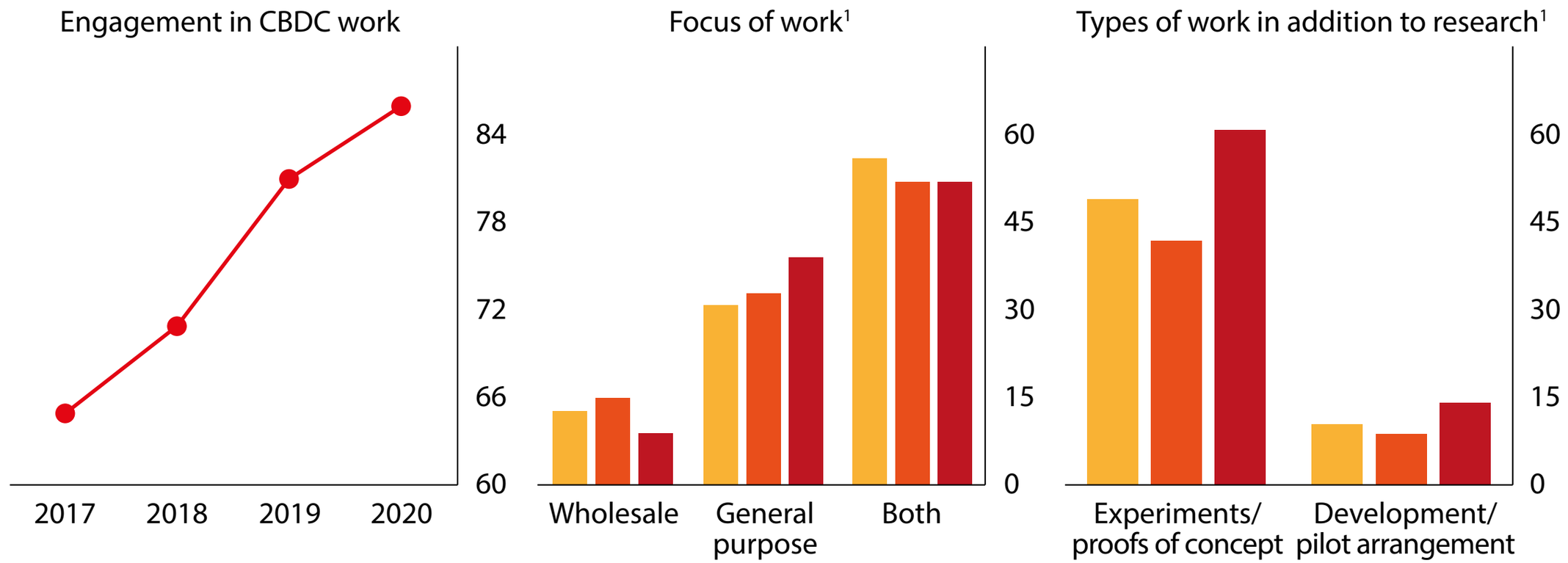
They still depend on central banks for the finality of clearing and settlement. Like the stablecoins I discussed before, they still have an 'umbilical cord' connecting them to the existing financial system.

The second type of digital currency is in the retail space, and it is here where the real disruption lies. Retail digital currencies could be used in daily transactions by households and businesses, and depending on their design, they could upend our existing financial system.

The BIS has surveyed central banks around the world on their engagement with CBDCs. In a new BIS Paper[22], we see that a full 86% of 65 respondent central banks are now doing some kind of research or experimentation (Graph 5, left-hand panel). Some are working primarily on the wholesale side, and some primarily on retail, but the largest number are looking into both (centre panel).

Graph 5. Central bank engagement on CBDCs is rising

Share of respondents



1. Share of respondents conducting work on CBDC.

Source: C Boar and A Wehrli, "Ready, steady, go? Results of the third BIS survey on central bank digital currency ", BIS Papers, no 114, January 2021.

Increasingly, we see central banks moving beyond research towards actual pilots (right-hand panel). Since 2020, there has been a live CBDC, with the Sand Dollar project in the Bahamas. The People's Bank of China is performing large-scale pilots across China. And the Boston Fed is working with the MIT Digital Currency Initiative on retail CBDC research that will be open source, for all to review[23].

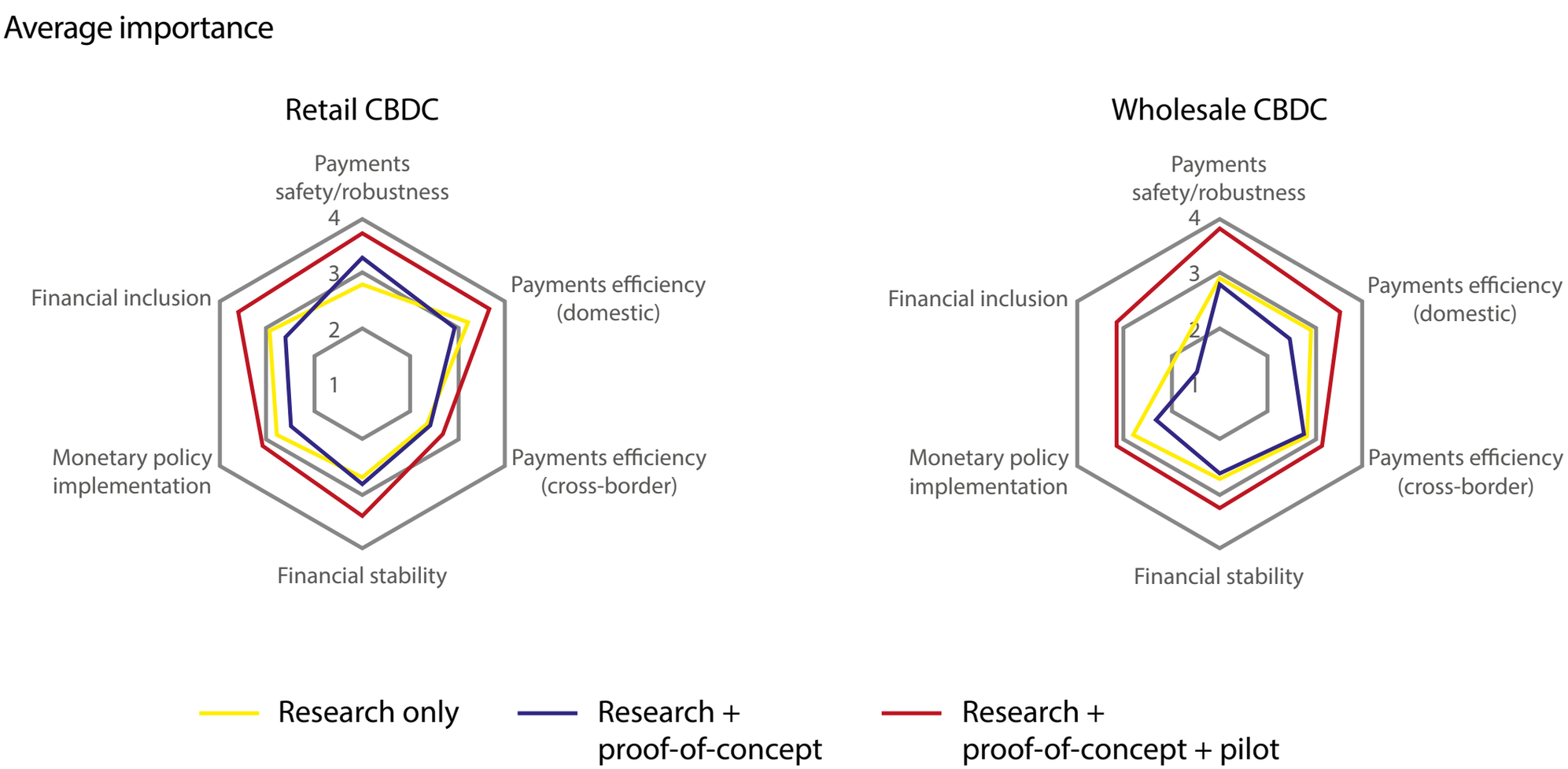
The motivations for central banks engaging in CBDC work vary across central banks, and across retail versus wholesale projects (Graph 6). But it is striking that in both cases, and particularly for those central banks that have moved beyond research toward proofs of concept or pilots, safety and robustness are highlighted as being a key requirement.

In the context of declining cash use and a lack of universal access to the banking system, many central banks see CBDC as a means to ensure that the public maintains access to a safe, publicly issued payment option to complement cash.

Notably, central banks see opportunities in digital technologies, not least to enhance payments efficiency and promote financial inclusion. Thus, the question here is not so much *"Do we need digital currencies?"* but *"Can central banks grasp the opportunity for what could be a technologically superior representation of central bank money?"*

The work on CBDCs does not imply replacing private sector initiatives. Of course, we need to take advantage of private sector innovation, and in many research projects and pilots the private sector is a key partner. The CBDC work shows that while disruptive innovation can be a threat, it can also be an opportunity. Thus, even with CBDC, central banks are sticking to what money has always been: a social convention that involves a role both for the private sector and for the central bank or other public authorities. In this sense, money is an instance of a public-private partnership.

Graph 6. Main motivations of CBDC work by stage



1 = "Not so important"; 2 = "Somewhat important"; 3 = "Important"; 4 = "Very important."

Source: C Boar and A Wehrli, "Ready, steady, go? Results of the third BIS survey on central bank digital currency ", BIS Papers, no 114, January 2021.

Thus, CBDCs can and must also be designed to preserve the two-tiered financial system, as a public-private partnership. In terms of involvement by the private sector, we should not think only about models where the central bank provides retail services directly (such as the FedAccounts idea)[24].

From a user perspective, a successful retail CBDC would need to provide a resilient and inclusive digital complement to physical cash – but that does not preclude an important role for the private sector.

Research at the BIS scopes out how two-tier 'Hybrid' and 'Intermediated' CBDC architectures can involve the private sector as the default operator of payments, with the central bank optionally operating a back-up infrastructure to provide additional resilience (Graph 7).

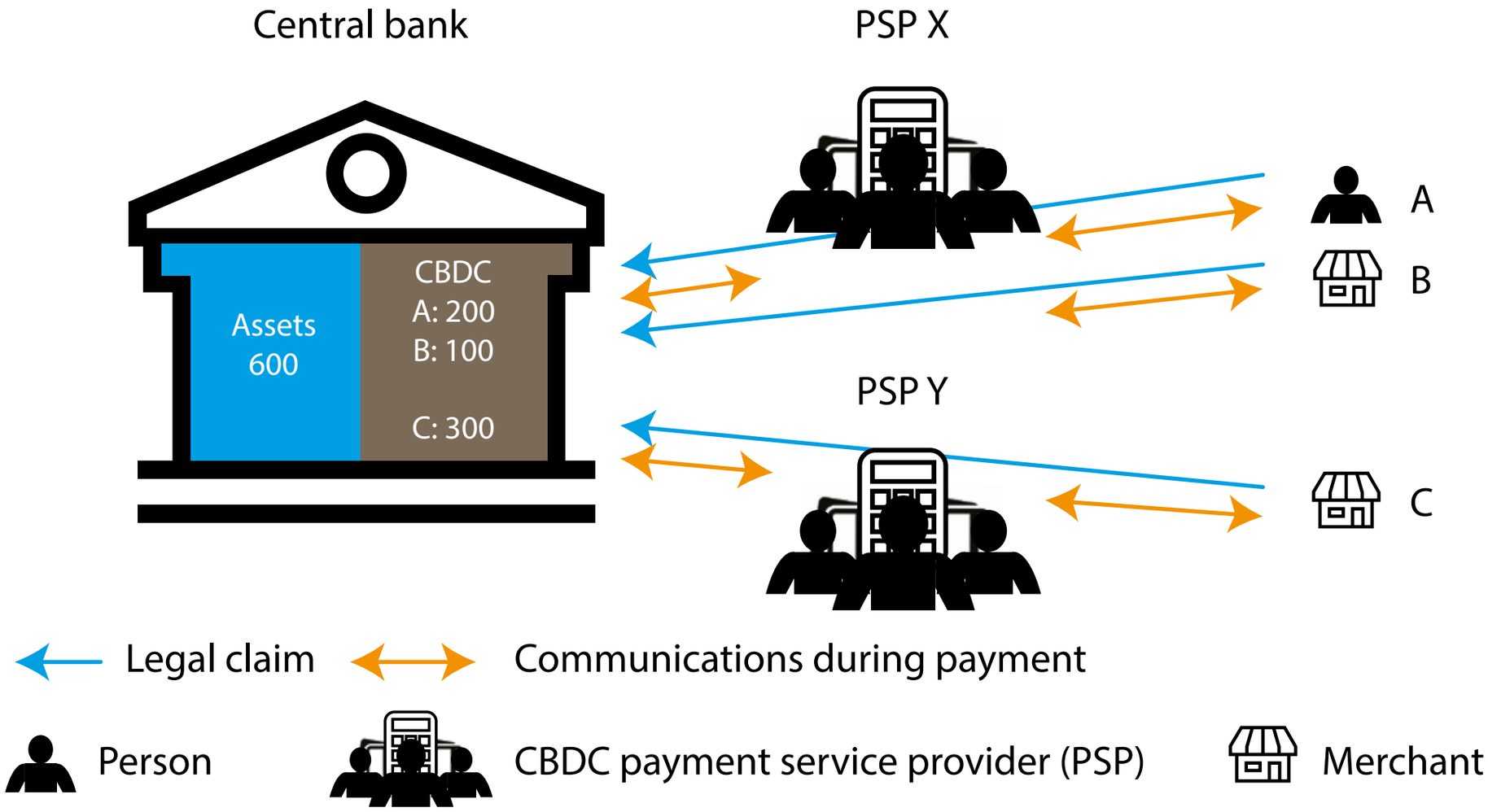
Users could pay with a CBDC just as today, with a debit card, online banking tool or smartphone-based app, all operated by a bank or other private sector payment provider.

However, instead of these intermediaries booking transactions on their own balance sheets as is the case today, they would simply update the record of who owns which CBDC balance. The CBDC itself would be a cash-like claim on the central bank.

In this way, the central bank avoids the operational tasks of opening accounts and administering payments for users, as private sector intermediaries would continue to perform retail payment services. The benefit is that there are no balance sheet concerns with private sector intermediaries.

Further, these architectures also allow the central bank to operate backup systems in case the private sector runs into technical outages.

Graph 7. Hybrid CBDC architectures allow for public-private partnership in payments



Sources: R Auer and R Böhme, "The technology of retail central bank digital currency", BIS Quarterly Review, March 2020, pp 85–100; R Auer and R Böhme, "Central bank digital currency: the quest for minimally invasive technology", BIS Working Papers, forthcoming.

A system that in many ways resembles today's system could run successfully on distributed ledger technology (DLT), as a BIS working paper that we are releasing today shows[25]. This paper finds that despite all the limitations with Bitcoin and other permissionless cryptocurrencies, greater economic promise lies with the 'permissioned' variant of DLT.

In permissioned DLT, a known network of validators replaces the traditional model with one central validator. The BIS Innovation Hub has already demonstrated that this works in a lab environment, in a proof of concept that involved the settlement of tokenised assets in central bank money using a DLT-based software[26].

Going beyond the lab environment, the working paper shows that the technology may have economic potential primarily in niche markets. It shows that while the permissioned version of DLT holds more promise than the permissionless one, a trusted central intermediary fares even better. DLT hence can improve upon the traditional model of centralised exchange only where trust in, and enforcement of, the rule of law is limited.

In addition to the governance of the system itself, the governance rule of how participants can access it also warrants attention. What about the role of identification, and of the transaction data that digital currencies will generate?

Here, we need to compare different governance rules and analyse the role of the public and the private sector in guarding data. Of course, the danger of data breaches or abuse by public authorities warrants a careful approach. But there are designs where some level of individual privacy can be preserved – a CBDC does not have to entail an Orwellian Big Brother, where the central bank sees each and every transaction.

Private sector intermediaries have a role to play in this, too, as settlement agents in a competitive payment system. In particular, private intermediaries could (temporarily) record and guard users' data. Yet decisions on data privacy are very important. This is not just a technical issue, but an important policy issue that transcends the financial sphere.

Central banks will need to listen to societies in this respect. Moreover, public sector supervision and clear frameworks for the governance of data will still be needed. If multiple parties are involved in collecting, transferring and storing data, it must be ensured that one institution is ultimately responsible to the user.

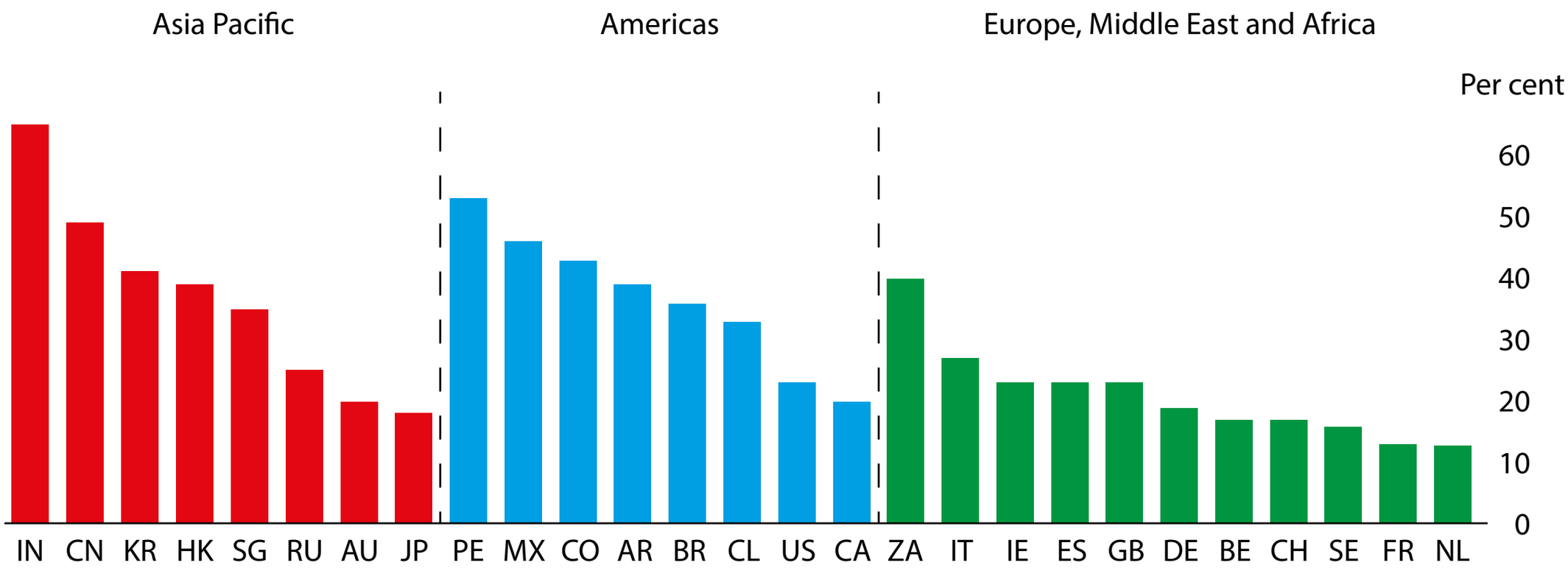
If this is done successfully, such a system could help maintain privacy while allowing access to law enforcement under clearly defined rules, much like today's system.

Moreover, it could put competitive pressure on today's intermediaries, pushing for more efficiency, lower costs and better service in payment markets[27].

Again, different jurisdictions may pursue different avenues. This relates in part to different preferences regarding data privacy across different societies. In China and India, for instance, users are much more comfortable with their data being securely shared (Graph 8).

And in China, the approach of the People's Bank of China in its CBDC, the e-CNY, is to periodically record all user data from private intermediaries. In Europe and the United States, users report in surveys being more worried about their privacy. For these cases, there are also technical designs that allow the central bank to be shielded from knowing identities, or even from having access to retail transaction data, recognising that it may not want this information[28].

Graph 8. Preferences regarding privacy vary across countries



* Agree or strongly agree to the data

** The question in the survey reads, "I would be comfortable with my main bank securely sharing my financial data with other organisations if it meant that I received better offers from other financial intermediaries"; for Belgium, the figure covers Belgium and Luxembourg.*
Source: S Chen, S Doerr, J Frost, L Gambacorta and HS Shin, "The fintech gender gap", BIS Working Papers, forthcoming; EY, Global FinTech Adoption Index 2019, June 2019.

Above all, the discussion of identification in CBDC needs to be considered in the wider context of digital ID. The use of personal data is necessary to improve the provision of financial services. Financial inclusion is about overcoming inequality, in particular by reducing information asymmetries.

CBDCs can be the entry point for financial services, but they need to be linked to an ID. By offering the unbanked access to a digital ID, authentication can help to support inclusion in the long term and to formalise the informal economy. While this appears to create trade-offs, as citizens also value their privacy and enjoy the anonymity of cash, there can be long-term gains from overcoming this.

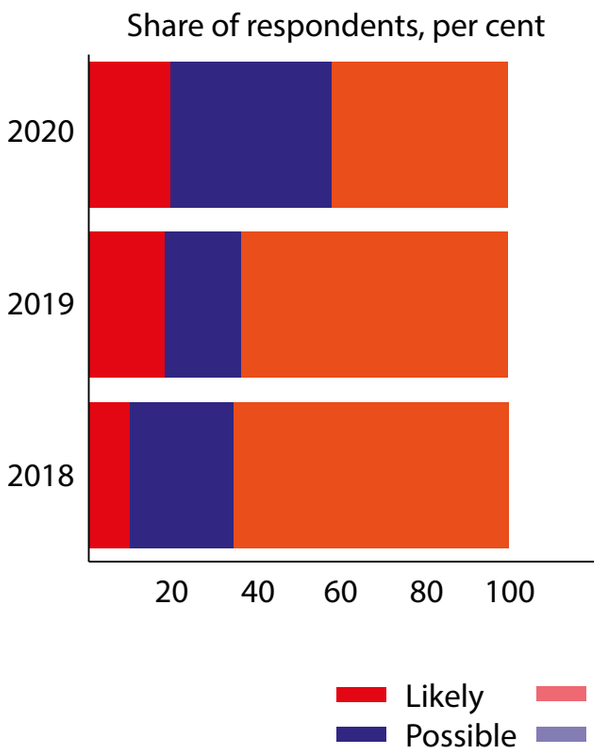
Again, this seems to be the direction in which central banks are moving. As central banks report being more likely to issue CBDCs in the medium term (Graph 9, left-hand and centre panel), CBDCs tied to an identity scheme ('primarily account-based CBDCs') are also relatively more common (right-hand panel). These can serve as the basis for well-functioning payments with good law enforcement[29].

The idea that CBDCs will be like $100 bills floating around is a mischaracterisation of what CBDC would look like in practice. My own view is that CBDCs without identity (purely token-based CBDCs) will not fly.

First, they would open up big concerns around money laundering, the financing of terrorism and tax evasion. Second, they may undermine efforts to enhance financial inclusion, which are based on good identification and building up an information trail for access to other financial services. Third, they could have destabilising cross-border effects, allowing large and sudden shifts of funds between economies. For these reasons, we need some form of identity in digital payments.

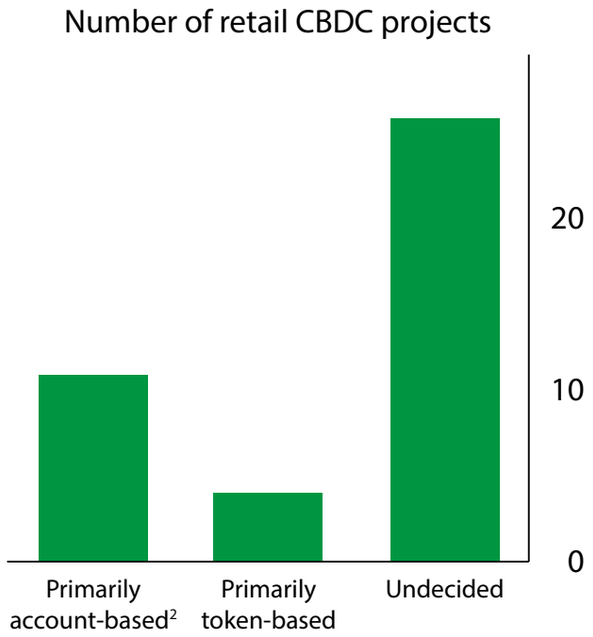
Graph 9. Likelihood of CBDC issuance is increasing, with account-based access preferred

Responses on likelihood of retail CBDC issuance in the medium term[1]



Responses on likelihood of wholesale CBDC issuance in the medium term[1]

Relatively more central banks are leaning toward account-based access



1. Medium term: 1-6 years. Likely combines "very likely" and "somewhat likely." "Unlikely" combines "very unlikely" and "somewhat unlikely."
2. Includes models with token-based access for small transactions.

Sources: C Boar and A Wehrli, "Ready, steady, go? Results of the third BIS survey on central bank digital currency ", BIS Papers, no 114, 2021; R Auer, G Cornelli and J Frost, "Rise of the central bank digital currencies: drivers, technologies and approaches", BIS Working Paper, no 880, August 2020.

Implications for the monetary system

Let me move now to the implications for the monetary system. If they are properly designed and widely adopted, CBDCs could become a complementary means of payment that addresses specific use cases and market failures. They could act as a catalyst for continued innovation and competition in payments, finance and commerce at large.

But if that happens, how will it affect national financial systems beyond payments? And what are the international repercussions of CBDC issuance?

Let me discuss these considerations through the lens of the core principles for CBDC issuance, as laid out in a recent report of the BIS, the Board of Governors of the Federal Reserve System and six other major central banks. This report laid out a Hippocratic Oath for CBDC design, the premise to 'first, do no harm'[30].

First and foremost, this oath implies that a precondition for CBDC issuance is that its design will not disintermediate commercial banks, nor lead to heightened volatility of their funding sources. Central banks do not dismiss these risks. But there are tools to address digital runs and the potential for disintermediation, like caps on the size of CBDC holdings, or variable interest rates that discourage very large holdings by users[31].

If depositors did temporarily move funds from bank deposits to CBDCs during financial turmoil, central banks could also quickly re-channel liquidity back to commercial banks, much as they do now with open market operations.

Structurally, I do not anticipate the central bank becoming a major player in intermediating savings in the economy. While such risks do need to be managed, CBDCs do not need to threaten the stability of bank funding or lending to the real economy[32].

Second, as long as CBDC is supplied in response to transactional demand for it, this oath means that the impact on monetary policy and its transmission will be limited. Naturally, the monetary policy implications have received ample attention.

In theory, retail CBDCs could be interest-bearing, influencing monetary policy transmission and, in today's context, for some advanced economies, allowing for more negative policy rates.

However, one has to keep in mind that since CBDC would complement cash rather than replace it, and since another policy objective is to limit the central bank's systemic footprint, these monetary policy effects might be contained in practice.

Much as cash holdings and even total central bank assets are currently moderate in relation to bank deposits (Graph 10), I expect that CBDC holdings will not become very large. This could also mean that the central bank toolkit will remain largely unaffected.

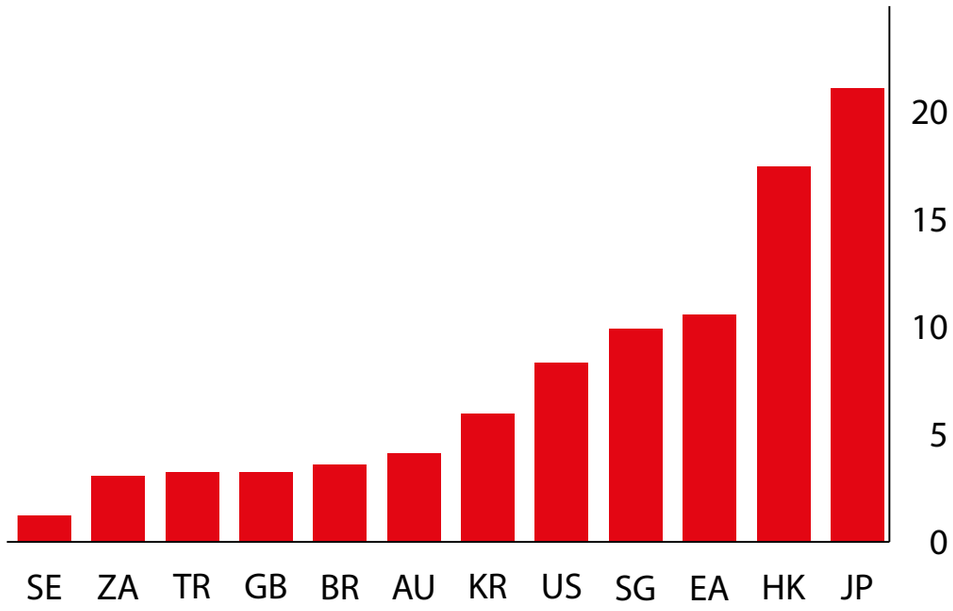
Third is the international aspect and the threat of international currency competition[33]. Payment system design is a domestic choice, but it has important international implications.

Wherever there are macroeconomic or institutional reasons for dollarisation today, foreign CBDC issuance may aggravate this threat, by making it even easier for users to adopt a foreign (digital) alternative. Some have argued that an e-CNY or digital euro could even challenge the dominance of the US dollar as a global reserve currency[34].

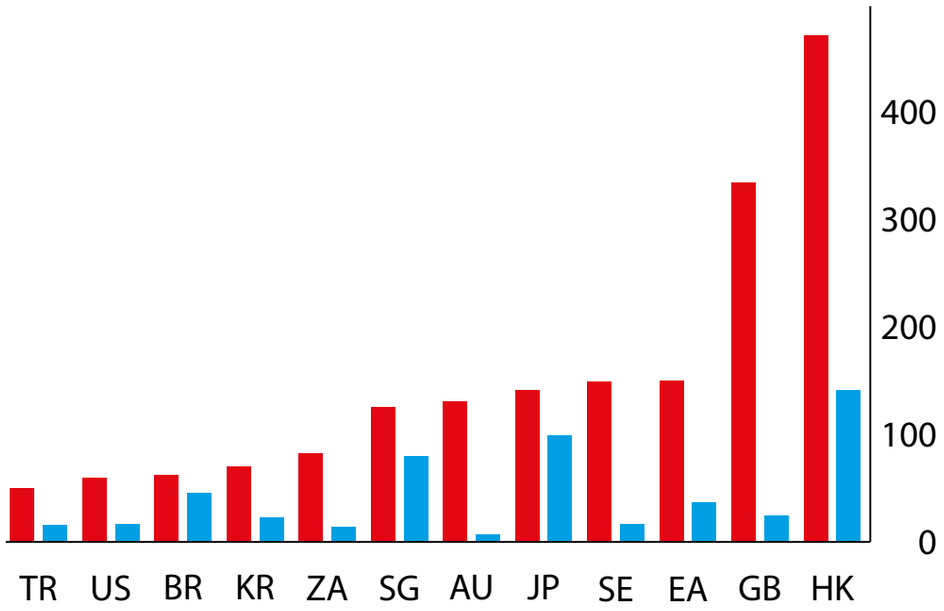
But here, I doubt that CBDCs alone will tip the balance – especially if they are account-based. Indeed, the main reasons why a reserve currency is attractive are related to the macroeconomy. The dollar is the world's premier

Graph 10. CBDCs can be designed to have a limited systemic footprint – like cash today

Cash holdings are moderate...[1]



... and consumers' sight deposits vastly exceed central bank balance sheet sizes[1,2]



Cash in circulation

Bank deposits

Central bank assets

1. Data for 2018.
2. Closest alternative where data is not available.

Source: R Auer and R Böhme, "Central bank digital currency: the quest for minimally invasive technology", BIS Working Paper, forthcoming.

reserve currency because it has a stable value (low inflation), a large supply of safe assets and the credibility of the US economic and legal system.

Investors can also easily access the US's deep and efficient capital markets, without worrying about capital controls. These factors are likely to remain the primary drivers of global reserve currency status.

Yet beyond currency competition, there are opportunities from CBDCs to enhance the efficiency of cross-border payments. Multi-CBDC arrangements (Graph 11) could tackle frictions in today's correspondent banking system, such as differences in opening hours, varying communication standards and a lack of clarity around exchange rates or fees[35].

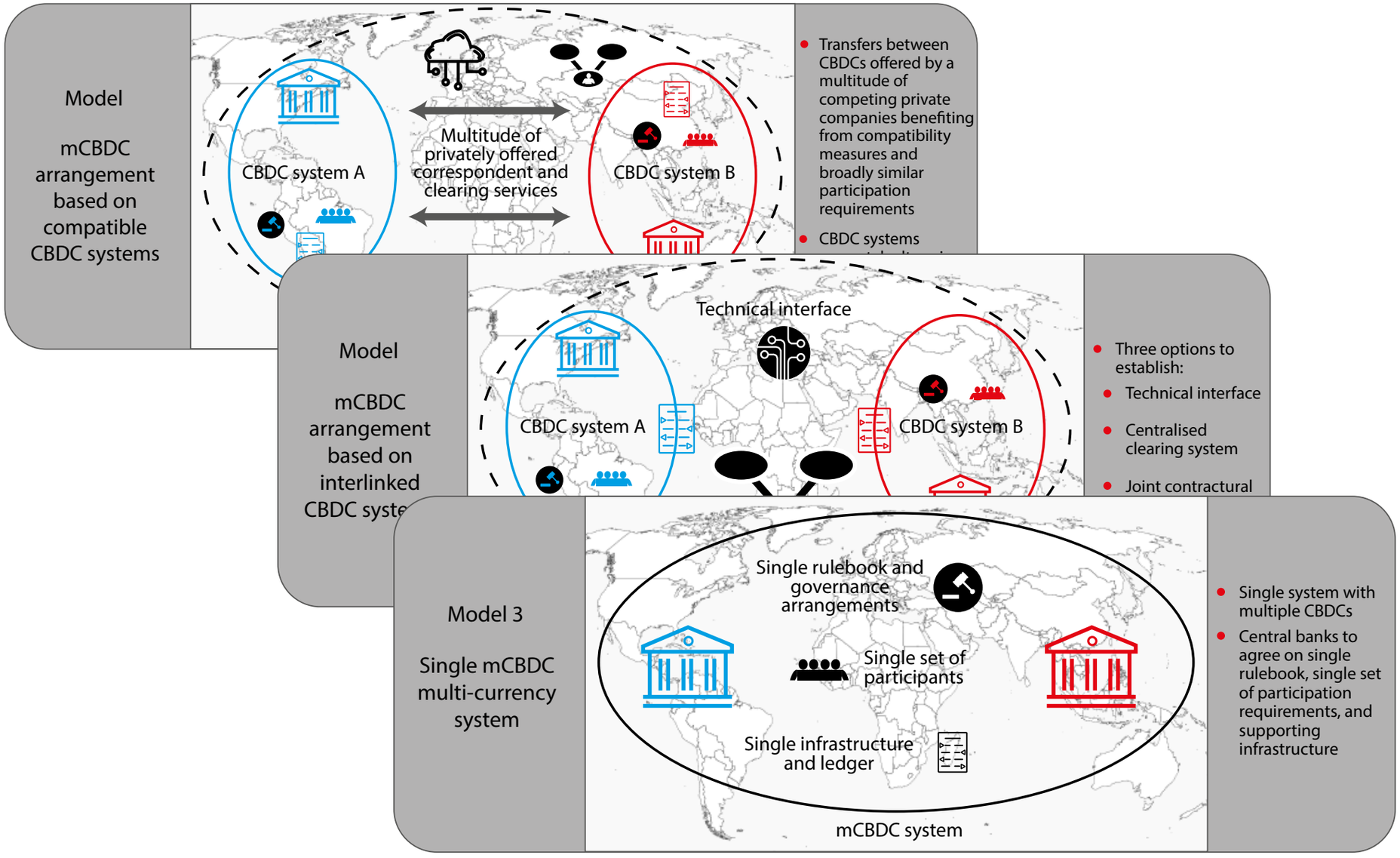
Conclusion

Sound money is central to our market economy, and it is central banks that are uniquely placed to provide this. If digital currencies are needed, central banks should be the ones to issue them. If they do, CBDCs could also play a catalytic role in innovation, spurring competition and efficiency in payments.

In this light, even as they fight the fires related to the COVID-19 pandemic, central banks around the world have stepped up their CBDC design efforts (Graph 12). This should not be seen primarily as a reaction to the emergence of cryptocurrencies or the announcement of corporate stablecoin projects.

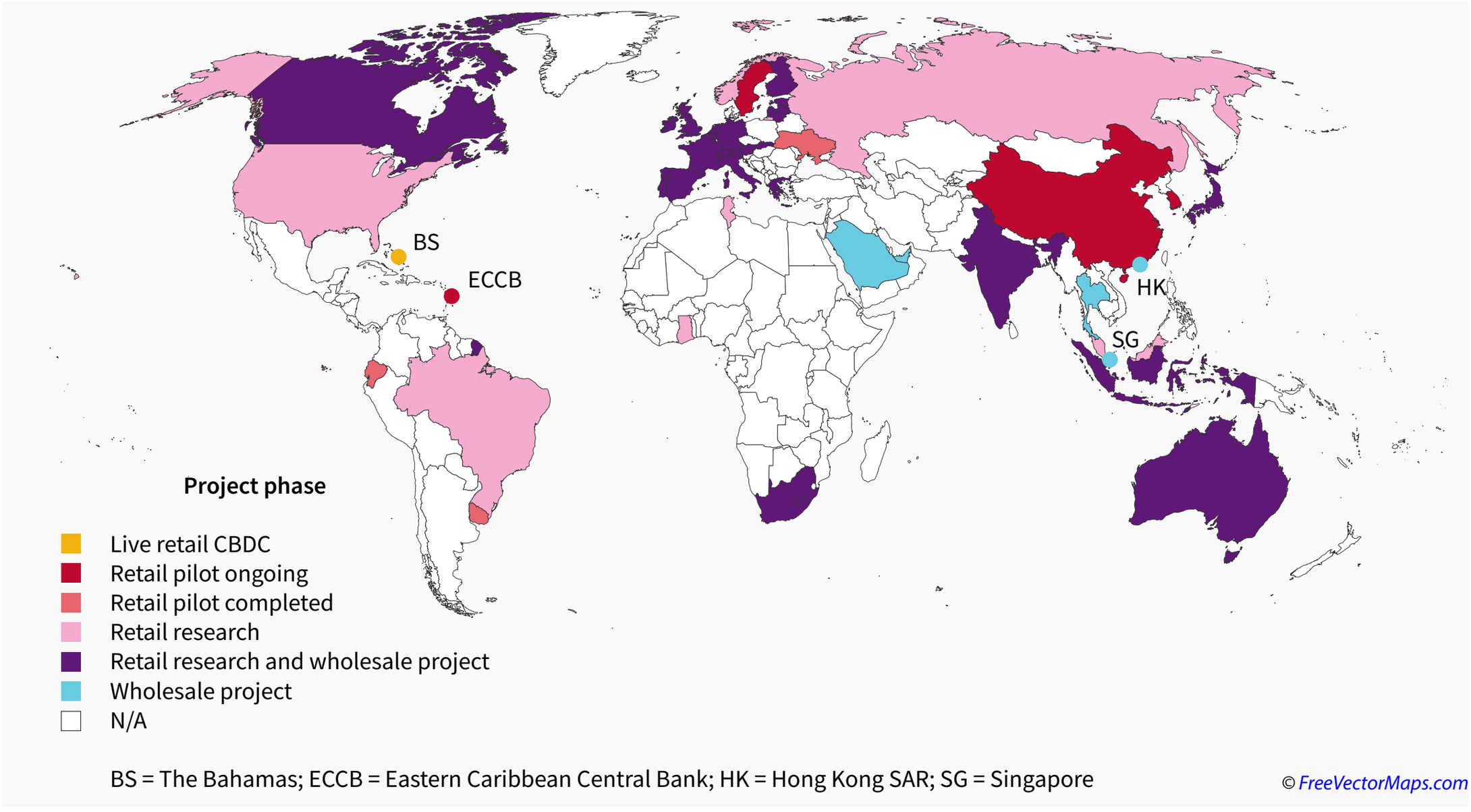
Rather, they are proactively researching a new form of money and how it could improve retail payments in the digital area, in line with central bank mandates.

Graph 11. Potential models for multi-CBDC arrangements



Source: R Auer, P Haene and H Holden, "Multi-CBDC arrangements and the future of cross-border payments", forthcoming.

Graph 12. CBDCs research and pilots around the globe



The use of this map does not constitute, and should not be construed as constituting, an expression of a position by the BIS regarding the legal status of, or sovereignty of, any territory or its authorities, to the delimitation of international frontiers and boundaries and/or to the name and designation of any territory, city or area.
Source: R Auer, G Cornelli and J Frost, "Rise of the central bank digital currencies: drivers, approaches and technologies", BIS Working Paper, no 880, August 2020.

However, developing CBDC comes with a host of technological, legal and economic issues that warrant careful examination before issuance. Central banks – the guardians of stability – will proceed carefully, methodically and in line with their mandates. Issuing a CBDC is a national choice.

Wherever issued, CBDCs will be an additional payment option that coexists with private sector electronic payment systems and cash. Careful design – such as the architecture defining the roles of the central bank and private intermediaries – would ensure that they preserve the two-tiered financial system, and that monetary policy implementation and financial stability will not be jeopardised.

In all this, the need for international coordination cannot be overstated. It is up to individual jurisdictions to decide whether they issue CBDCs or not. But if they do, issues such as 'digital dollarisation' and the potential role of CBDCs in enhancing cross-border payments need to be addressed in multilateral forums.

The BIS is supporting this international discussion, ensuring that central banks can continue learning from one another and can cooperate on key issues in design. In this way, central banks can work together to support digital money ready for the economy of the future. ■

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Endnotes

1. "Digitisation" refers to the process of changing information from analogue to digital form. In the context of money, this refers to creating a digital representation of money, or moving it to digital form. "Digitalisation", meanwhile, refers to the use of digital technologies to change a business model and provide new revenue and value-producing opportunities, or the process of moving to a digital business. See Gartner, Gartner Glossary, 2021, accessed 15 January 2021.

2. F Caselli, "Technological revolutions", American Economic Review, vol 89, no 1, 1999 defines a technological revolution simply as "the introduction of a new type of machines" that are "more productive than machines of the pre-existing type". T Kuhn, The structure of scientific revolutions, University of Chicago Press, 1962 discusses the related notion of scientific revolutions, when, in the accumulation of new knowledge, anomalies lead to a sudden "paradigm shift" or change in beliefs. K Schwab, "The fourth industrial revolution: what it means, how to respond", Foreign Affairs, December 2015 discusses the unique features of the fourth industrial revolution, which involves "a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres".

3. For an overview, see A Goldfarb and C Tucker, "Digital economics", Journal of Economic Literature, vol 57, no 1, 2019.

4. To name just one example, the pandemic has led to a surge in e-commerce, particularly in countries with stricter lockdown measures and where e-commerce was previously less developed. See V Alfonso, C Boar, J Frost, L Gambacorta and J Liu, "E-commerce in the pandemic and beyond", BIS Bulletin, no 36, 2021.

5. Project Rio is being developed in the BIS Innovation Hub's Switzerland Centre, together with the Swiss National Bank. See BIS, "BIS Innovation Hub sets out annual work programme and launches Innovation Network", press release, 22 January 2021; and A Carstens, "Central bank innovation – from Switzerland to the world", speech at the founding ceremony of the BIS Innovation Hub Swiss Centre, Zurich, 8 October 2019.

6. See BIS, "Central banks and payments in the digital era", Annual Economic Report 2020, June 2020, Chapter III.

7. See M Bech and J Hancock, "Innovations in payments", BIS Quarterly Review, March 2020.

8. For instance, see K Rogoff, "The case against cash", Project Syndicate, 5 September 2016; and K Rogoff, "Will Covid make countries drop cash and adopt digital currencies?", The Guardian, 6 August 2020.

9. See N Kocherlakota, "Money is memory", Journal of Economic Theory, vol 81, issue 2, 1998.
10. See J Griffin and A Shams, "Is Bitcoin really untethered?", The Journal of Finance, vol 74, no 4, 2020.
11. On the outlook for Bitcoin, see R Auer: "Beyond the doomsday economics of 'proof-of-work' in cryptocurrencies", BIS Working Papers, no 765, January 2019.
12. See A Carstens, "Money in the digital age: what role for central banks?", speech, 6 February 2018; and BIS, "Cryptocurrencies: looking beyond the hype", Annual Economic Report 2018, 2018, Chapter V.
13. For one such example, see J Frost, HS Shin and P Wierts, "An early stablecoin? The Bank of Amsterdam and the governance of money", BIS Working Papers, no 905, November 2020.
14. See Libra Association, White Paper v 2.0, 16 April 2020; D Arner, R Auer and J Frost, "Stablecoins: risks, potential and regulation", Bank of Spain Financial Stability Review, no 39, 2020.
15. M Friedman, A program for monetary stability, Fordham University Press, 1960.
16. Importantly, this definition of token versus accounts must not be confused with the one used in the field of computer science. Here the distinction between accounts and tokens is the identification requirements: "In a token-based system, the thing that must be identified for the payee to be satisfied with the validity of the payment is the 'thing' being transferred – 'is this thing counterfeit or legitimate?' In an account-based system, however, the identification is of the customer – 'Is this person who she says she is? Does she really have an account with us?'" (C Kahn, "How are payment accounts special? Payments innovation" symposium, Federal Reserve Bank of Chicago, 2016).
17. This is also true in today's credit or trade finance relationships, but the roots go back much further. See I Schnabel and H S Shin, "Liquidity and contagion: the crisis of 1763", Journal of the European Economic Association, vol 2, no 6, 2004.
18. See A Greif, "Reputation and coalitions in medieval trade: evidence on the Maghribi traders", The Journal of Economic History, vol 49, no 4, 1989.
19. See N Popper, "Lost passwords lock millionaires out of their Bitcoin fortunes", New York Times, 12 January 2021.
20. For instance, on private digital tokens, see Committee on Payments and Market Infrastructures, Wholesale digital tokens, December 2019. For various models for wholesale CBDCs, see Bank of Canada, Monetary Authority of Singapore,

Bank of England and HSBC, Cross-border interbank payments and settlements: emerging opportunities for digital transformation, 15 November 2018.
21. See eg. BIS, Project Helvetia: settling tokenised assets in central bank money, December 2020.
22. See C Boar and T Wehrli, "Ready, steady, go? Results of the third BIS survey on central bank digital currency", BIS Papers, no 114, January 2020.
23. See Federal Reserve Bank of Boston, "The Federal Reserve Bank of Boston announces collaboration with MIT to research digital currency", press release, 13 August 2020.
24. See M Ricks, J Crawford and L Menand, "FedAccounts: digital dollars", George Washington Law Review, 2018.
25. See R Auer, C Monnet and HS Shin, "Permissioned distributed ledgers and the governance of money", BIS Working Papers, no 924, January 2021.
26. See BIS (2020), op cit.
27. For one take on these points, see J Cochrane, "The digital euro is a threat to banks and governments. And that's OK", Il Sole 24 Ore, 23 December 2020.
28. This approach has been hinted at by Jay Powell, who noted the data privacy and information security issues associated with the central bank keeping a running record of all payments data. See J Powell, "Letter to Congressman French Hill", 19 November 2019.
29. See R Auer, G Cornelli and J Frost, "Rise of the central bank digital currencies: drivers, approaches and technologies", BIS Working Papers, no 880, 2020. The authors also document that that all central banks that are developing CBDCs have also promised to keep cash around. So, also in the digital era, central banks will continue to offer a fully anonymous means of payment – cash.
30. See Group of Central Banks, "Central bank digital currencies: foundational principles and core features", joint report no 1, October 2020.
31. See U Bindseil, "Tiered CBDC and the financial system", ECB Working Paper no 2351, 2020.
32. See D Andolfatto, "Assessing the impact of central bank digital currency on private banks", The Economic Journal,

September 2020.

33. This relates to the broader debate on the denationalisation of money and digital currency areas. For the classic appeal to allow international competition between currencies, see F Hayek, The Denationalization of Money, Institute of Economic Affairs, 1976. For a rebuttal, see M Friedman and A Schwartz, "Has government any role in money?" in A Schwartz (ed), Money in Historical Perspective, University of Chicago Press, 1987. For the discussion of digital currency areas, see M Brunnermeier, H James and J-P Landau, "The digitalization of money", NBER Working Paper no 26300, 2019.

34. For an argument in this direction, see A Kumar and E Rosenbach, "Could China's digital currency unseat the dollar?", Foreign Affairs, May 2020. For a more nuanced take, see M Chorzempa, "China, the United States, and central bank digital currencies: how important is it to be first?", China Economic Journal, 2021.

35. See R Auer, P Haene and H Holden, "Multi-CBDC arrangements and the future of cross-border payments", BIS Papers, forthcoming for an examination of the potential of CBDC in cross-border payments, as well as Committee on Payments and Market Infrastructures, Enhancing cross-border payments: building blocks of a global roadmap, July 2020 for a discussion of how these could feature in global efforts to improve cross-border payments. M Ferrari, M Mehl and L Stracca, "Central bank digital currency in an open economy", ECB Working Paper no 2488, 2020, and International Monetary Fund, "Digital money across borders: macro-financial implications", IMF Policy Papers, no 2020/050, 2020 analyse the international ramifications of the digitisation of money.

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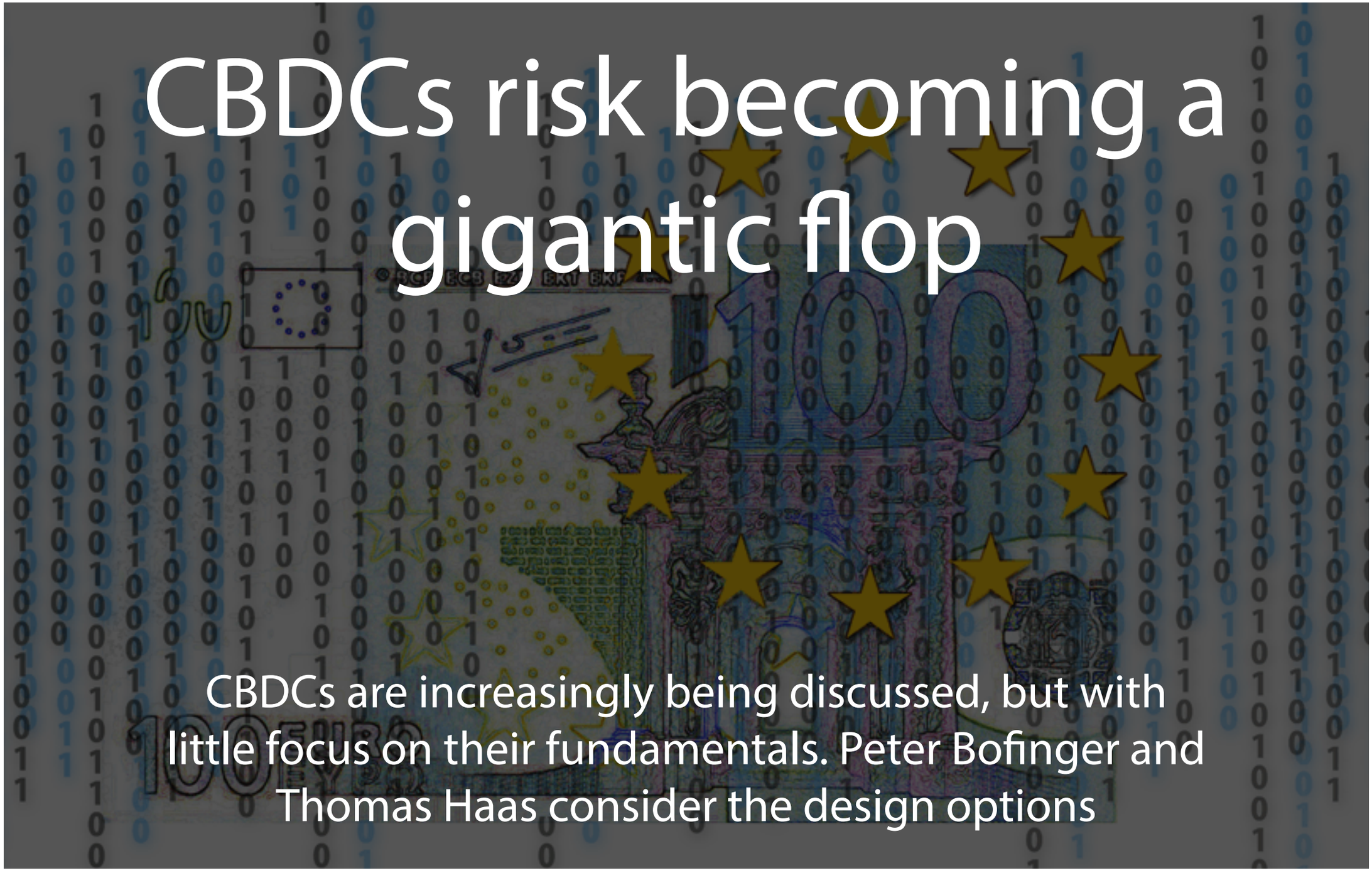
CBDCs risk becoming a gigantic flop



CBDCs are increasingly being discussed, but with little focus on their fundamentals. Peter Bofinger and Thomas Haas consider the design options

Central bank digital currencies are increasingly being discussed, mainly in relation to monetary policy and financial stability, but with less focus on their fundamentals. This column provides a comprehensive taxonomy for categorising central bank digital currency design options, and evaluates these options based on their allocative efficiency and attractiveness for users.

The analysis shows that digital cash substitutes cannot be justified from either perspective. Instead, there is huge potential for central bank digital currencies in a retail payment system organised by the central bank, but without a new, independent payment object.

The discussion about central bank digital currency (CBDC) has gained an impressive momentum. Auer *et al*. (2020) report that many central banks have published retail or wholesale CBDC work and that in speeches of central bank governors and board members about CBDC there have now been more speeches with a positive than a negative stance. The ECB has recently published a comprehensive report on 'a digital euro' (ECB 2020).

These activities have led to a growing literature, with a focus on the macroeconomic dimensions of CBDCs. Key topics are the effects of CBDCs on commercial banks, especially the risk of disintermediation, and on monetary policy and financial stability (Carapella and Flemming 2020, Brunnermeier and Niepelt 2019, Fernández-Villaverde *et al*. 2020, Andolfatto 2018).

In contrast, the microeconomic aspects of CBDCs have received relatively little attention. Our study (Bofinger and Haas 2020) provides a microeconomic analysis of CBDC, which in our view is of central importance for a comprehensive discussion of CBDCs. Specifically, two questions are at stake:

- What is the market failure that would justify central banks entering business areas that have so far been operated by commercial banks and private retail payment system providers?

- Are the options discussed so far by central banks attractive enough for CBDCs to compete successfully with the products offered by private providers?

Finally, the microeconomic analysis shows that there is no such thing as a CBDC per se, but rather a variety of different design options. Therefore, a macroeconomic analysis can only make sense if we have first clarified what we mean by CBDC.

If central banks stick to their current approach, the risk is high that CBDCs will become a gigantic flop. This would be anything but beneficial for the reputation of central banks

CBDC design options

A systemic perspective is required for a comprehensive taxonomy of CBDC design options. From the systemic perspective, CBDC concepts can be presented in two separate but interrelated ways. CBDCs can be discussed from the perspective of:

- New payment or settlement objects made available by central banks, and/or
- New payment infrastructures or systems operated by central banks.

A CBDC can thus be understood as a purely monetary object, ie. a deposit with the central bank that is used within the framework of existing real-time gross settlement (RTGS) payment systems.

However, it can also be understood as an independent payment system that operates in parallel to the existing system using deposits held with the central bank.

Table 1. Options for digital central bank projects

		New payment system operated by central banks	
		No	Yes
New central bank payment options	No	Status quo	Central bank digital retail payment system
	Yes	eg. Bindseil (2020)	Eg. e-krona (Kumhof and Noone 2018)

Table 2. Options for CBDC objects

		Retail CBDCs	**Wholesale CBDCs** (Large companies and payment service providers)
Token based CBDCs (Peer-to-peer payments)		Money cards ('e-money'), digital wallets	-
Account based CBDCs	Means of payment	All purpose CBDCs (direct CBDC)	All purpose CBDCs
	Store of value	Store of value CBDCs ('safe assets')	Indirect CBDCs (narrow banks), synthetic CBDCs

The systemic perspective also opens the view for solutions where central banks create new retail payment systems which would not necessarily require deposits that are held with central banks.

A further differentiation arises in the case of CBDC objects. Here, a distinction must be made between account-based and token-based CBDCs. In addition, one can also differentiate between central bank balances, which can be used primarily as a means of payment, and balances which can be used primarily as a store of value.

Finally, one can differentiate between retail CBDCs designed for private households and wholesale CBDCs designed for firms or for payment service providers.

Evaluation

For our microeconomic evaluation of CBDC design options we use two criteria:

- Allocative efficiency: any government interference with the market process requires the diagnosis of market failure (Carletti *et al*. 2020). The burden of proof lies with the central banks. They have to show that the objectives which they pursue with CBDCs are currently not satisfactorily met by the private providers.

  And even if public goods like financial stability or stability of the payment system are not optimally met, it is not obvious that CBDC is the adequate solution.

- Attractiveness for users: if CBDCs are designed as new payment objects that are used within existing payment systems, the user perspective implies that CBDCs must compete with existing payment objects (above all cash and traditional bank deposits). If CBDCs constitute new payment systems, their acceptance by private users must be analysed within the context of the existing payments ecosystem.

  For the reputation and credibility of central banks, it is important that any CBDC solution is attractive enough for potential users to adopt it.

A narrow CBDC approach is the provision of CBDC objects as means of payment that are used within the existing payment systems, above all the real-time gross settlement systems operated by central banks. As the model by Bindseil (2020) shows, account-based CBDCs can be designed in a way that they are mainly suitable as a payment object.

But from the allocative perspective there is no obvious market failure that could justify the provision of an ordinary bank deposit by a central bank. From a user perspective, having a direct account with the central bank could be attractive because of its absolute safety. But as bank deposits below €100,000 are protected by the deposit insurance schemes, holding smaller amounts of CBDCs – Bindseil (2020) speaks of a limit of €3,000 – is not an obvious reason to switch from a traditional bank account to a central bank account.

In addition, it is unlikely that central banks would be able to offer the same spectrum of services that are associated with a private bank account. And if they decided to do so, this interference with private banks could hardly be justified by a market failure.

The case for a token-based CBDC that could serve as a digital substitute for cash is also not obvious. While the allocative perspective could justify that central banks provide a digital substitute for cash for which they already have a monopoly, the need to comply with anti-money laundering (AML) regulations sets rigid quantitative limitations for such products.

Accordingly, from a user perspective the demand for a token CBDC will be very low as they would only provide an imperfect substitute for cash, which today is especially attractive for payments in the shadow economy and as a store value in periods of financial instability.

An option that has received little attention so far is a CBDC that is designed solely as a store of value. Such a CBDC could only be used for payments to and from the commercial bank account of its holder.

From the allocative perspective, the supply of such a CBDC could be justified by the need of (nominally) safe assets which can only be provided by central banks. The demand for a store-of-value CBDC would come from firms

and large investors with bank deposits of more than €100,000, which would be bailed-in in the case of a bank restructuring. From the user perspective, this demand would depend on the interest rate for such deposits.

Central banks could auction store-of-value deposits which would give them a perfect control over their amount. While there could be a high demand for such a CBDC, central banks do not seem to be interested in this option, as they fear that this could lead to a strong disintermediation of the banking system (Bindseil 2020).

Store-of-value CBDCs could also be designed as collateral for large payment service providers. In China, Alipay is required to hold deposits with the central bank. Libra/Diem (2020, p.11) has expressed the *"hope (…) that as central banks develop central bank digital currencies (CBDCs), these CBDCs could be directly integrated with the Libra network, removing the need for Libra Networks to manage the associated Reserves (…)."*

This approach would prevent the Libra/Diem system from getting disconnected from central banks and their control over the monetary system. From an allocative perspective, such central bank intervention can be justified as it would de facto include payment service providers under the umbrella of the central bank's reserve requirements and hence improve financial stability.

More ambitious CBDC models, like the Swedish e-krona (Sveriges Riksbank 2018), envisage a stand-alone payment system within which new CBDC objects can be transferred. For the attractiveness of CBDC bank deposits this is not necessarily an advantage. Without a specific payment system, CBDC deposits could be used like a commercial bank deposit. With a stand-alone payment system, CBDC deposits could only be used for payments to other CBDC accounts.

The lack of interoperability constitutes a major drawback of such CBDC solutions. Especially in a small country like Sweden, the domestic focus is another major disadvantage.

Therefore, if central banks want to develop a serious answer to the dynamic activities of global payment service providers, they must rethink their whole approach to CBDCs. The benchmark is set by PayPal which is the 'elephant in the room' of global payments.

It shows that instead of national schemes that can only operate with the national currency and can only make transactions with system-specific accounts, the solution must be supranational with a multicurrency operability and an openness to payment objects that are not system-specific.

But even if central banks realise that their task is not to develop a digital substitute for cash but a digital alternative for global payment systems, it will not be easy to achieve the high level of sophistication and the broad spectrum of services, especially for e-commerce, of such payment systems.

But in contrast to narrow CBDC models, from an allocative point of view there would be an obvious justification for supranational retail payment networks operated by central banks.

In sum, we argue that there is no obvious justification for digital cash substitutes from the point of view of allocative efficiency. In addition, from a user perspective, the narrow solutions that are discussed by central banks so far do not seem attractive enough to compete successfully with private bank deposits and private retail payment systems like PayPal.

The key advantage of CBDC, its absolute safety, is irrelevant for retail payments. These findings mainly concern advanced countries with a large share of the population having access to bank accounts. For emerging and developing economies, such CBDC solutions could be a suitable tool to approach the problem of a large share of people without access to bank accounts.

However, there is a huge potential for CBDCs as a store of value for retail payment service providers, like Libra/Diem. Astonishingly, central banks have so far not discussed this option, although it would help them to maintain control over private retail payment networks outside the existing bank-based payment system that relies on central bank reserves and the existing central bank settlement systems.

Finally, a clear market failure can be identified for global retail payment networks which are based on monopolistic or oligopolistic structures. However, the central banks' response would then have to be supranational rather than national.

Moreover, successful networks such as PayPal show that such systems are not tied to a system-specific currency or system-specific payment objects.

Thus, if central banks stick to their current approach, the risk is high that CBDCs will become a gigantic flop. This would be anything but beneficial for the reputation of central banks. ■

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The Brexit dust begins to settle

The phase of greatest Brexit-related uncertainty for the European financial sector ended on 1 January. Nicolas Véron believes it is increasingly apparent that London will be less dominant than before

The Brexit story has entered a new phase. The United Kingdom's exit from the European single market on 1 January was orderly in the financial sector, despite significant shifts of liquidity in shares and derivatives, and unlike the shift in trade for goods. In contrast to the past five years of radical uncertainty, the near-future policy framework is now fairly predictable, with the EU and UK taking separate regulatory paths.

The resulting financial 'decoupling' has left the City of London on the back foot, whereas the prospects for EU financial services will depend greatly on whether EU policy supports further financial market integration. The structural consequences of this new state of affairs will take years to unfold.

As with the Year 2000 problem, the orderliness of the transition was not to be taken for granted. That it went smoothly was down to a number of factors. First, financial firms on both sides of the Channel (and of the Irish Sea) worked hard and were able to pre-empt most of the operational challenges.

Second, despite all the recurring high-stakes drama between the UK government and the European Commission, the technical cooperation between the authorities actually in charge of financial stability, primarily the Bank of England and the European Central Bank (ECB), appears to have run smoothly.

Third, the aptly designed phasing of the Brexit discussions helped reduce uncertainty. The *Brexit Withdrawal Agreement* ensured that the UK government would meet its financial obligations to the European Union, avoiding a scenario that would have been akin to selective default. It also kept the UK in the single market beyond the country's formal exit from the European Union.

The decision by the UK not to extend that transition period allowed for six months of effective preparation from July, ahead of the exit from the single market. The fraught final stages at the end of 2020 of the talks on the Trade

and Co-operation Agreement (TCA) mattered comparatively little for financial services, since trade agreements typically barely cover them.

By one count, the TCA that was eventually approved (albeit still unratified on the EU side) contains only six pages relevant for the financial sector, or less than 0.5% of 1,259 pages.

Now, the City is an onshore centre only for the UK, and has become offshore for the rest of the European Union. That implies a different, in all likelihood less powerful, set of synergies across financial activities

Pause for breath

Now, the new legal environment is unlikely to change much any time soon. Contrary to occasional portrayals in the UK, there is no ongoing bilateral negotiation on financial services, except for a non-binding memorandum of understanding expected before the end of March.

The UK is now a third country and consequently UK-registered financial firms have lost the right, or passport, to seamlessly offer their services anywhere in the EU single market. They now have no better access to that market than their peers in other third countries such as Japan, Singapore, or the United States.

In some (though far from all) segments of the financial sector, firms from these other third countries currently have better single market access than British ones. This is because these market segments are covered by a category known in EU law as equivalence decisions, by which the European Commission allows direct service provision by firms in the third country whose regulatory framework of the market segment it deems 'equivalent'.

Equivalence decisions are at the Commission's discretion. Unlike the single market passport, equivalence is a privilege not a right, and can also be revoked at short notice. So far the Commission has not granted the UK any such segment-specific equivalence, except in a time-limited manner for securities depositories until mid-2021 and clearing services until mid-2022. For the moment the Commission appears to lean against making the latter permanent, but it is too early to be sure.

In most other market segments, it appears improbable that the Commission will grant equivalence to the UK in the foreseeable future. Although this may appear counterintuitive, since almost all current UK regulations stem from the existing EU body of law, the expectation is the UK authorities will diverge as they (not least the Bank of England) have declined to make commitments to the contrary.

Moreover, it would be understandable for the Commission to aim at reducing the EU's dependence on the City of London. There has been no comparable dependence on an offshore financial centre anywhere in recent financial history.

Keeping that level of dependence would entail financial stability risk, because in some crisis scenarios, the aims of UK authorities would not necessarily be aligned with EU aims.

Think of the Icelandic crisis of 2008, when Reykjavik protected the failing banks' domestic depositors but not foreign ones. An aim to reduce that concentrated risk is therefore defensible, even if – as appears to have happened with derivatives – some of the activity migrates to the United States or other third countries as a consequence.

Conversely, the economic case for the European Union to keep pooling its liquidity in London is made harder to support by the Union's own vast size. In addition, mercantilist impulses to gain activity from London unquestionably play a role, even though they generally do not make economic sense.

Altogether, there is no compelling policy incentive at this juncture for the European Commission to move towards more equivalence decisions. If it does, it will most probably be for high-level political motives that are not apparent right now.

Differentiated decoupling

The likely trend in the near future, then, is of EU-UK financial decoupling, albeit highly differentiated across market segments which respond to different dynamics and patterns of interests.

The corresponding regulatory competition may become a 'race to the bottom' or 'to the top', depending on particular circumstances, keeping in mind that such labels are somewhat more judgmental in financial regulation than in, say, tax competition.

As a point of comparison, the European Union is more demanding than the United States on some aspects of financial regulation, for example curbs on bankers' remuneration, but less in others, for example aspects of securities law enforcement or capital requirements for banks.

Similarly, differences between the EU and the UK will probably not follow a uniform pattern. In such an environment, it is implausible that UK financial regulatory decisions, no matter how agile, could offset the negative impact of the loss of single market passport on the bilateral financial relationship.

As a result, the medium-term outlook for the City of London appears unpromising, even though the COVID-19 disruption blurs all the signals. Until end-2020, thanks to the magic of the European single market, the City was an onshore financial centre for the entire single market, and a competitive offshore centre for the rest of the world.

Now, the City is an onshore centre only for the UK, and has become offshore for the rest of the European Union. That implies a different, in all likelihood less powerful, set of synergies across financial activities.

Relevant quantitative data is still hard to come by, but what is available is consistent with a bleak view. Job offerings in British finance, as tracked by consultancy Morgan McKinley, have followed an alarming downward course since the 2016 Brexit referendum.

Meanwhile, relevant licensing agencies on the EU side, primarily the European Central Bank (as bank supervisor) and national securities regulators coordinated by the European Securities and Markets Authority, are gradually tightening their requirements for key personnel to reside mainly on EU territory rather than in the UK.

As crisply summarised by *Financial Times* columnist Simon Kuper, many financial firms' Brexit policy until this year was to *"sit tight and do nothing until post-Brexit arrangements for finance forced [their] hand."*

That phase has ended. Firms that drag their feet face regulatory disruption, as happened to broker TP ICAP in late January. Such tussles between regulators and regulated entities, rather than between the European Commission and the UK government, are where most of the financial-sector Brexit action is likely to be in 2021. They typically happen behind closed doors, and the regulators typically hold most of the cards.

For all the talk of *"Big Bang 2.0 or whatever"*, then, the UK's comparative advantage as the best location for financial business in the European time zone is unlikely to recover to its pre-Brexit level.

The negative macroeconomic impact for the UK could turn out to be moderate thanks to offsetting effects, such as a cheaper currency and less onerous real estate costs in London, which may generate greater economic activity, especially in non-financial services sectors.

A specific concern is the financing of the UK government, which has been significantly dependent on financial sector-related tax revenue in recent years.

As for the 27 remaining EU countries, as a whole they are gaining financial activity as a consequence of Brexit. How much and where exactly is not yet quite clear.

As predicted, the leading contenders for the relocation of international (non-EU) firms appear to be, in alphabetical order, Amsterdam, Dublin, Frankfurt, Luxembourg and Paris, with respective specialisations in the imperfectly integrated EU single market – eg. Dublin and Luxembourg in asset management, Frankfurt in investment banking, and Amsterdam in trading.

But for future EU financial services competitiveness and stability, much will depend on further market integration, the pace of which remains hard to predict. The European banking union is still only half-built in the absence of a consistent framework for bank crisis management and deposit insurance; and the grand EU rhetoric on capital markets union has yielded little actual policy reform since its start in 2014.

Though a proactive approach would be preferable, any next steps towards market integration may be prompted by events, such as the still-unfolding Wirecard scandal. ■

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Climate change and central banking

In the famous fable *Belling the Cat*[1] a group of mice gather to discuss how to deal with a cat that is eating them one by one. They hatch a plan to put a bell on the cat so they can hear it coming and escape before being caught. When it comes to who will actually do it, however, each mouse finds a reason why they are not the right mouse for the job, and why another mouse should do it instead. The cat never does receive a bell – and the story ends poorly for the mice.

In many ways, that fable describes mankind's reaction to the threats posed by climate change. Already in 1986, the front cover of *Der Spiegel* showed Cologne cathedral half-submerged by water and the headline declared a 'Climate Catastrophe'[2].

This is just one example, among many, that demonstrates that people were aware of the risks posed by climate change a generation ago. Yet, while many people agreed on the seriousness of the issue, and that something had to be done, concrete action has been much less prevalent.

It is with this history in mind that I want to talk about the role of central banks in addressing climate change. Clearly, central banks are not the main actors when it comes to preventing global heating.

Central banks are not responsible for climate policy and the most important tools that are needed lie outside of our mandate. But the fact that we are not in the driving seat does not mean that we can simply ignore climate change, or that we do not play a role in combating it.

Just as with the mice in the fable, inaction has negative consequences, and the implications of not tackling climate change are already visible. Globally, the past six years are the warmest six on record, and 2020 was the warmest in Europe[3].

The number of disasters caused by natural hazards is also rising, resulting in $210 billion of damages in 2020[4]. An analysis of over 300 peer-reviewed studies of disasters found that almost 70% of the events analysed were made more likely, or more severe, by human-caused climate change[5].

That said, there are now signs that policy action to fight climate change is accelerating, especially in Europe. We are seeing a new political willingness among regulators and fiscal authorities to speed up the transition to a carbon neutral economy, on the back of substantial technological advances in the private sector.

This increased action is often considered as a source of transition risk, which we need to take into account and reflect in our policy framework. This is not 'mission creep', it is simply acknowledging reality.

Climate change is one of the greatest challenges faced by mankind this century, and there is now broad agreement that we should act. But that agreement needs to be translated more urgently into concrete measures

Yet the transition to carbon neutral is not so much a risk as an opportunity for the world to avoid the far more disruptive outcome that would eventually result from governmental and societal inaction.

Scenarios show that the economic and financial risks of an orderly transition can be contained. Even a disorderly scenario, where the economic and financial impacts are potentially substantial, represents a much better overall outcome in the long run than the disastrous impact of the transition not occurring at all[6].

It now seems likely that faster progress will be made along three interlocking dimensions. Each of them lies outside the remit of central banks, but will have important implications for central bank balance sheets and policy objectives.

Including, informing and innovating

The first dimension along which we expect rapid progress is including the true social and environmental cost of carbon into the prices paid by all sectors of the economy.

Appropriate pricing can come via direct carbon taxes or through comprehensive cap and trade schemes. Both are used to some extent in the EU. It is likely, though, that the next steps in Europe will come mainly via the EU's Emissions Trading System (ETS), a cap and trade scheme.

The ETS is an essential infrastructure, although it has not always been successful in the past at delivering a predictable price of carbon. Moreover, it currently covers only around half of EU greenhouse gas emissions and a significant amount of allowances continue to be given for free.

The effective price of carbon is expected to rise if the EU's targets for reducing emissions are to be reached. Modelling by the OECD and the European Commission[7] suggests that an effective carbon price between €40-60[8] is currently needed, depending on how stringent other regulations are.

The introduction of the ETS Market Stability Reserve and the review of the ETS scheduled for this year should provide the opportunity to deliver a clear path towards adequate carbon pricing.

The second dimension where we expect to see progress is greater information on the exposure of individual companies. At present, information on the sustainability of financial products – when available – is inconsistent, largely incomparable and at times unreliable.

That means that climate risks are not adequately priced[9], and there is a substantial risk of sharp future corrections. Yet for an open market economy to allocate resources efficiently, the pricing mechanism needs to work correctly.

This requires a step change in the disclosure of climate-related data using standardised and commonly agreed definitions. While TCFD-based[10] disclosures have underpinned public/private efforts to better inform, disclosure needs to be at a far more granular level of detail than is currently available.

In Europe. climate disclosures are governed by the Non-Financial Reporting Directive (NFRD), which is currently under review[11]. The Eurosystem has advocated for mandatory disclosures of climate-related risks from a far greater number of companies, including non-listed entities.

Moreover, disclosures should be complemented by forward-looking measures that assess the extent to which both financial and non-financial firms are aligned with climate goals and net zero commitments.

The European Taxonomy Regulation[12] that entered into force last year is also an important milestone along this path. But it still needs to be fleshed out with concrete technical criteria and complemented by an equivalent taxonomy for carbon-intensive activities. A further essential step is the consistent and transparent inclusion of climate risks in credit ratings. Here, again, we have high hopes that progress will now speed up.

While adequate carbon prices and greater information on exposures will help provide incentives to decarbonise, that economic transformation cannot take place without the third dimension: substantial green innovation and investment.

Both, however, require a complex ecosystem of which finance is a key element[13], so we expect to see increasing availability of green finance. Green bond issuance by euro area residents has grown sevenfold since 2015, reaching €75 billion in 2020 – this represents roughly 4% of the total corporate bond issuance[14].

We need to see funding for green innovation increasing from other market segments as well, especially as recent analyses point to the beneficial role of equity investors in supporting the green transition[15]. Assets under management by investment funds with environmental, social and governance mandates have roughly tripled since 2015, and a little more than half of these funds are domiciled in the euro area.

Completing the capital markets union should provide a further push to support equity-based green finance by fostering deep and liquid capital markets across Europe.

Simultaneous progress along each of these three dimensions increases the likelihood of substantial economic change in the near term. That is so because movement along each dimension reinforces progress along the others and magnifies the effectiveness of climate policy.

For example, the economic impact of higher carbon prices depends on the availability of alternative green technologies. In the past, a sudden and substantial increase in carbon taxes could have resulted in an economic downturn, substantial stranded assets and threats to financial stability. Today, however, solar power is not only consistently cheaper than new coal or gas-fired plants in most countries, but it also offers some of the lowest cost electricity ever seen[16].

Green finance and innovation are also developing rapidly. Introducing well-signalled carbon pricing therefore becomes more feasible and could further sharpen incentives both to develop new technologies and to carry out the substantial investment required for the widespread adoption of the green technologies that already exist.

Climate change and central banks

Today, then, central banks face two trends – more visible impacts of climate change and an acceleration of policy transition. Both trends have macroeconomic and financial implications and have consequences for our primary objective of price stability[17], for our other areas of competence including financial stability and banking supervision, as well as for the Eurosystem's own balance sheet. Central banks are both aware of those consequences, and determined to mitigate them. Much has already been accomplished and more is under way.

The founding of the Network for Greening the Financial System (NGFS), with membership including all major central banks, is testament to that collective engagement with climate change.

At the ECB, we are now launching a new climate change centre to bring together more efficiently the different expertise and strands of work on climate across the Bank. Climate change affects all of our policy areas. The climate change centre provides the structure we need to tackle the issue with the urgency and determination that it deserves.

In the area of financial stability and banking supervision, the ECB has taken concrete steps towards expanding the financial system's understanding of climate risks and its ability to manage them. We have issued a guide on our supervisory expectations relating to the management and disclosure of climate-related and environmental risks[18].

A recent survey of the climate-related disclosures of 125 banks suggests there is still a way to go. It evaluated climate disclosures across several basic information categories. Only 3% of banks made disclosures in every category, and 16% made no disclosure in any category[19]. ECB Banking Supervision has requested that banks conduct a climate risk self-assessment and draw up action plans, which we will begin assessing this year. We will conduct a bank-level climate stress test in 2022.

The ECB is also currently carrying out a climate risk stress test exercise to assess the impact on the European banking sector over a 30-year horizon. Preliminary results from mapping climate patterns to the address-level location of firms' physical assets show that in the absence of a transition, physical risks in Europe are concentrated unevenly across countries and sectors of the economy.

But there is more: climate change also impacts our primary mandate of price stability through several channels. This is why climate change considerations form an integral part of our ongoing review of our monetary policy strategy. Climate change can create short-term volatility in output and inflation through extreme weather events[20], and if left unaddressed can have long-lasting effects on growth and inflation.

Transition policies and innovation can also have a significant impact on growth and inflation. These factors could potentially cause a durable divergence between headline and core measures of inflation and influence the inflation expectations of households and businesses.

The transmission of monetary policy through to the interest rates faced by households and businesses could also be impaired, to the extent that increased physical risks or the transition generate stranded assets and losses by financial institutions. According to a recent estimate by the European Systemic Risk Board, a disorderly transition could reduce lending to the private sector by 5% in real terms[21].

And climate change can also have implications for our monetary policy instruments. First, the Eurosystem's balance sheet itself is exposed to climate risks, through the securities purchased in the asset purchase programmes and the collateral provided by counterparties as part of our policy operations.

Furthermore, several factors associated with climate change may weigh on productivity and the equilibrium interest rate, potentially reducing the space available for conventional policy. For example, labour supply and productivity may diminish as a result of heat stress, temporary incapability to work and higher rates of mortality and morbidity[22].

Resources may be reallocated away from productive use to support adaptation, while capital accumulation may be impaired by rising destruction from natural hazards and weaker investment dynamics related to rising uncertainty[23].

And the increase in short-term volatility and accelerated structural change could hamper central banks' ability to correctly identify the shocks that are relevant for the medium-term inflation outlook, making it more difficult to assess the appropriate monetary policy stance.

Our strategy review enables us to consider more deeply how we can continue to protect our mandate in the face of these risks and, at the same time, strengthen the resilience of monetary policy and our balance sheet to climate

risks. That naturally involves evaluating the feasibility, efficiency and effectiveness of available options, and ensuring they are consistent with our mandate.

The ECB is also assessing carefully, without prejudice to the primary objective of price stability, how it can contribute to supporting the EU's economic policies, as required by the treaty. Europe has prioritised combating climate change and put in place targets, policies and regulations to underpin the transition to a carbon-neutral economy. While the Eurosystem is not a policy maker in these areas, it should assess its potential role in the transition.

We recognise that our active role in some markets can influence the development of certain market segments. The ECB currently holds around a fifth of the outstanding volume of eligible green bonds. Standardisation helps nascent markets gain liquidity and encourages growth. And our eligibility criteria can provide, in this context, a useful coordination device.

For example, since the start of this year, bonds with coupon structures linked to certain sustainability performance targets have been eligible as collateral for Eurosystem credit operations and for outright purchases for monetary policy purposes.

We have also taken action with regards to our non-monetary policy portfolio, namely our own funds and pension fund. The ECB raised the share of green bonds in its own funds portfolio to 3.5% last year and is planning on raising it further as this market is expected to grow in the coming years. Investing parts of the own funds portfolio in the green bond fund of the Bank for International Settlements marks another step in this direction.

A shift of all conventional equity benchmark indices tracked by the staff pension fund to low-carbon equivalents last year significantly reduced the carbon footprint of the equity funds. Other central banks are also aligning decisively their investment decisions with sustainability criteria[24].

Conclusion

Climate change is one of the greatest challenges faced by mankind this century, and there is now broad agreement that we should act. But that agreement needs to be translated more urgently into concrete measures. The ECB will contribute to this effort within its mandate, acting in tandem with those responsible for climate policy.

Unlike the mice in the fable, not only do we have to recognise that we cannot keep waiting for someone else to act, we also must recognise that the burden cannot fall on one party alone. There is no single panacea for climate change, and combating it requires rapid progress along several dimensions.

Relying on just one solution, or on one party, will not be enough to avoid a climate catastrophe. And here we can actually learn something from mice. As the Roman playwright Plautus wrote, *"How wise a beast is the little mouse, who never entrusts its safety to only one hole."*[25] ■

Christine Lagarde is the President of the European Central Bank

Endnotes

1. Also known as the Council of Mice.

2. Der Spiegel (1986), 11 August.

3. Source: Copernicus Climate Change Service.
4. Source: MunichRe.
5. See https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world
6. See recent climate scenario analysis, including: Vermeulen, R, Schets, E, Lohuis, M, Kölbl, B, Jansen, D-J and Heeringa, W (2018), "An energy transition risk stress test for the financial system of the Netherlands", Occasional Studies, Vol. 16, No 7, De Nederlandsche Bank; Allen, T et al. (2020), "Climate-Related Scenarios for Financial Stability Assessment: An Application to France", Working Paper Series, No 774, Banque de France; European Systemic Risk Board (2020), "Positively green: Measuring climate change risks to financial stability", June.
7. OECD (2019), "Taxing Energy Use 2019"; European Commission (2020), "Stepping up Europe's 2030 climate ambition", Staff Working Document, 17 September.
8. Per tonne of CO_2.
9. See the Eurosystem's reply to the European Commission's public consultations on the Renewed Sustainable Finance Strategy and the revision of the Non-Financial Reporting Directive.
10. Task Force on Climate-related Financial Disclosures.
11. European Commission (2020), "Consultation Document – Review of the Non-Financial Reporting Directive".
12. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (OJ L 198, 22.6.2020, p. 13).
13. See Lagarde, C (2020), "Fostering sustainable growth in Europe", Keynote speech at the European Banking Congress, Frankfurt, 20 November.
14. The majority of this issuance – €67 billion – is denominated in euro, representing 6% of euro-denominated issuance by euro-area residents.
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22. See, eg. Hsiang et al. (2017), "Estimating economic damage from climate change in the United States", Science, Vol. 356, Issue 6345, pp. 1362-1369.
23. Dietz, S and Stern, N (2015), "Endogenous Growth, Convexity of Damage and Climate Risk: How Nordhaus' Framework Supports Deep Cuts in Carbon Emissions", The Economic Journal, Vol. 125, No 583, pp. 574-620; Benmir, G, Jaccard, I and Vermandel, G (2020), "Green asset pricing", Working Paper Series, No 2477, ECB, October.
24. See, for example, Jordan, T (2020), Introductory remarks, Swiss National Bank, 17 December; Sveriges Riksbank (2020), Sustainability strategy for the Riksbank; Banque de France, Responsible investment policy: reinforcing exclusions with regard to fossil fuels, Press Release, 19 January 2021. NGFS (2019), A Sustainable and Responsible Investment Guide for Central Banks' Portfolio Management, Network for Greening the Financial System; NGFS (2020), Progress report on the implementation of sustainable and responsible investment practices in central banks' portfolio management, Network for Greening the Financial System.
25. "Cogito, mus pusillus quam sit sapiens bestia, aetatem qui uni cubili nunquam committit suam." Plautus, Truculentus, Act IV, scene iv.

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