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FINANCE 2021

Presented by



EURO EXIM BANK
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CHRISTOPHER WALLER
EXPLORES FINANCIAL RISKS
ASSOCIATED WITH CLIMATE
CHANGE

JON CUNIFFE EXAMINES
THE RADICAL CHANGE ON
THE HORIZON FOR PAYMENTS
AND MONEY

GITIA GOPINATH WONDERS
HOW ADAM SMITH WOULD
HAVE RESPONDED TO THE
EMERGENCE OF AI

21ST CENTURY FINANCE

Foreword

W

elcome to the Summer edition of **FINANCE21**, 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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Climate change and financial stability

A red umbrella is shown from a low angle, looking up against a bright blue sky. The sun is visible in the upper left, creating a lens flare effect with rays of light. The umbrella's ribs and fabric are clearly visible, and it appears to be open and ready for use.

Christopher Waller explores financial risks associated with climate change, and cast doubt on the need for special focus on how banks are preparing for climate change risks

Climate change is real, but I do not believe it poses a serious risk to the safety and soundness of large banks or the financial stability of the United States¹. Risks are risks. There is no need for us to focus on one set of risks in a way that crowds out our focus on others. My job is to make sure that the financial system is resilient to a range of risks. And I believe risks posed by climate change are not sufficiently unique or material to merit special treatment relative to others². Nevertheless, I think it's important to continue doing high-quality academic research regarding the role that climate plays in economic outcomes.

In what follows, I want to be careful not to conflate my views on climate change itself with my views on how we should deal with financial risks associated with climate change. I believe the scientific community has rigorously established that our climate is changing. But my role is not to be a climate policymaker.

Consistent with the Fed's mandates, I must focus on financial risks, and the questions I'm exploring are about whether the financial risks associated with climate change are different enough from other financial stability risks to merit special treatment. But before getting to those questions, I'd like to briefly explain how we think about financial stability at the Federal Reserve.

Financial stability is at the core of the Federal Reserve and our mission. The Federal Reserve was created in 1913, following the Banking Panic of 1907, with the goal of promoting financial stability and avoiding banking panics. Responsibilities have evolved over the years.

In the aftermath of the 2007-09 financial crisis, Congress assigned the Fed additional responsibilities related to promoting financial stability, and the Board of Governors significantly increased the resources dedicated to that purpose.

Events in recent years, including the pandemic, emerging geopolitical risks, and recent stress in the banking sector have only highlighted the important role central banks have in understanding and addressing financial stability risks.

The Federal Reserve's goal in financial stability is to help ensure that financial institutions and financial markets remain able to provide critical services to households and businesses so that they can continue to support a well-functioning economy through the business cycle.

I believe that placing an outsized focus on climate-related risks is not needed, and the Federal Reserve should focus on more near-term and material risks in keeping with our mandate

Much of how we think about and monitor financial stability at the Federal Reserve is informed by our understanding of how shocks can propagate across financial markets and affect the economy. Economists have studied the role of debt in the macroeconomy dating all the way back to Irving Fisher in the 1930s, and in the past 40 years it has been well established that financial disruptions can reduce the efficiency of credit allocation and have real effects on the broader economy³.

When borrowers' financial conditions deteriorate, lenders tend to charge higher rates on loans. That, in turn, can lead to less overall lending and negatively affect the broader economy⁴. And in the wake of the 2007-09 financial crisis, we've learned more about the important roles credit growth and asset price growth play in 'boom-bust' cycles⁵.

Fundamentally, financial stress emerges when someone is owed something and doesn't get paid back or becomes worried they won't be paid back. If I take out a loan from you and can't repay it, you take a loss. Similarly, if I take out a mortgage from a bank and I can't repay it, the bank could take a loss. And if the bank hasn't built sufficient ability to absorb those losses, it may not be able to pay its depositors back.

These dynamics can have knock-on effects on asset prices. For example, when people default on their home mortgage loans, banks foreclose and seek to sell the homes, often at steep discounts. Those foreclosure sales can have contagion effects on nearby house prices⁶.

When a lot of households and businesses take such losses around the same time, it can have real effects on the economy as consumption and investment spending take a hit and overall trust in financial institutions wanes. The same process works when market participants fear they won't be paid back or be able to sell their assets. Those fears themselves can drive instability.

The implication is that risks to financial stability have a couple of features. First, the risks must have relatively near-term effects, such that the risk manifesting could result in outstanding contracts being breached. Second, the risks must be material enough to create losses large enough to affect the real economy.

These insights about vulnerabilities across the financial system inform how we think about monitoring financial stability at the Federal Reserve. We identify risks and prioritize resources around those that are most threatening to the US financial system. We distinguish between shocks, which are inherently difficult to predict, and vulnerabilities of the financial system, which can be monitored through the ebb and flow of the economic cycle.

If you think about it, there is a huge set of shocks that could hit at any given time. Some of those shocks do hit, but most do not. Our approach promotes general resiliency, recognizing that we can't predict, prioritize, and tailor specific policy around each and every shock that could occur⁷.

Instead, we focus on monitoring broad groups of vulnerabilities, such as overvalued assets, liquidity risk in the financial system, and the amount of debt held by households and businesses, including banks. This approach implies that we are somewhat agnostic to the particular sources of shocks that may hit the economy at any point in time.

Risks are risks, and from a policymaking perspective, the source of a particular shock isn't as important as building a financial system that is resilient to the range of risks we face. For example, it is plausible that shocks could stem from things ranging from increasing dependence on computer systems and digital technologies to a shrinking labour force to geopolitical risk.

Our focus on fundamental vulnerabilities like asset overvaluation, excessive leverage, and liquidity risk in part reflects our humility about our ability to identify the probabilities of each and every potential shock to our system in real time.

Let me provide a tangible example from our capital stress test for the largest banks. We use that stress test to ensure banks have sufficient capital to withstand the types of severe credit-driven recessions we've experienced in the United States since World War II⁸.

We use a design framework for the hypothetical scenarios that results in sharp declines in asset prices coupled with a steep rise in the unemployment rate, but we don't detail the specific shocks that cause the recession because it isn't necessary. What is important is that banks have enough capital to absorb losses associated with those highly adverse conditions.

And the losses implied by a scenario like that are huge: last year's scenario resulted in hypothetical losses of more than \$600 billion for the largest banks. This resulted in a decline in their aggregate common equity capital ratio from 12.4 percent to 9.7 percent, which is still more than double the minimum requirement.

That brings us back to my original question: Are the financial risks stemming from climate change somehow different or more material such that we should give them special treatment? Or should our focus remain on monitoring and mitigating general financial system vulnerabilities, which can be affected by climate change over the long-term just like any number of other sources of risk? Before I answer, let me offer some definitions to make sure we're all talking about the same things.

Climate-related financial risks are generally separated into two groups: physical risks and transition risks. Physical risks include the potential higher frequency and severity of acute events, such as fires, heatwaves, and hurricanes, as well as slower moving events like rising sea levels.

Transition risks refer to those risks associated with an economy and society in transition to one that produces less greenhouse gases. These can owe to government policy changes, changes in consumer preferences, and technology transitions.

The question is not whether these risks could result in losses for individuals or companies. The question is whether these risks are unique enough to merit special treatment in our financial stability framework.

Let's start with physical risks. Unfortunately, like every year, it is possible we will experience forest fires, hurricanes, and other natural disasters in the coming months. These events, of course, are devastating to local communities. But they are not material enough to pose an outsized risk to the overall US economy.

Broadly speaking, physical risks could affect the financial system through two related channels. First, physical risks can have a direct impact on property values. Hurricanes, fires, and rising sea levels can all drive down the values of properties. That in turn could put stress on financial institutions that lend against those properties, which could lead them to curb their lending, and suppress economic growth.

The losses that individual property owners can realize might be devastating, but evidence I've seen so far suggests that these sorts of events don't have much of an effect on bank performance⁹. That may be in part attributable to banks and other investors effectively pricing physical risks from climate change into loan contracts.

For example, recently researchers have found that heat stress—a climate physical risk that is likely to affect the economy—has been priced into bond spreads and stock returns since around 2013¹⁰. In addition, while it is difficult to isolate the effects of weather events on the broader economy, there is evidence to suggest severe weather events like hurricanes do not likely have an outsized effect on growth rates in countries like the United States¹¹.

Over time, it is possible some of these physical risks could contribute to an exodus of people from certain cities or regions. For example, some worry that rising sea levels could significantly change coastal regions.

While the cause may be different, the experience of broad property value declines is not a new one. We have had entire American cities that have experienced significant declines in population and property values over time.

Take, for example, Detroit. In 1950, Detroit was the fifth largest city in the United States, but now it isn't even in the top 20, after losing two-thirds of its population. I'm thrilled to see that Detroit has made a comeback in recent years, but the relocation of the automobile industry took a serious toll on the city and its people.

Yet the decline in Detroit's population, and commensurate decline in property values, did not pose a financial stability risk to the United States. What makes the potential future risk of a population decline in coastal cities different?

Second, and a more compelling concern, is the notion that property value declines could occur more-or-less instantaneously and on a large scale when, say, property insurers leave a region en masse. That sort of rapid decline in property values, which serve as collateral on loans, could certainly result in losses for banks and other financial intermediaries.

But there is a growing body of literature that suggests economic agents are already adjusting behaviour to account for risks associated with climate change¹². That should mitigate the risk of these potential 'Minsky moments'¹³.

For the sake of argument though, suppose a great repricing does occur; would those losses be big enough to spill over into the broader financial system? Just as a point of comparison, let's turn back to the stress tests I mentioned earlier.

Each year the Federal Reserve stresses the largest banks against a hypothetical severe macroeconomic scenario. The stress tests don't cover all risks, of course, but that scenario typically assumes broad real estate price declines of more than 25 percent across the United States.

In last year's stress test, the largest banks were able to absorb nearly \$100 billion in losses on loans collateralized by real estate, in addition to another half a trillion dollars of losses on other positions¹⁴.

What about transition risks? Transition risks are generally neither near-term nor likely to be material given their slow-moving nature and the ability of economic agents to price transition costs into contracts. There seems to be a consensus that orderly transitions will not pose a risk to financial stability¹⁵. In that case, changes would be gradual and predictable.

Households and businesses are generally well prepared to adjust to slow-moving and predictable changes. As are banks. For example, if banks know that certain industries will gradually become less profitable or assets pledged as collateral will become stranded, they will account for that in their loan pricing, loan duration, and risk assessments.

And, because assets held by banks in the United States reprice in less than five years on average, there is ample time to adjust to all but the most abrupt of transitions¹⁶.

But what if the transition is disorderly? One argument is that uncertainty associated with a disorderly transition will make it difficult for households and businesses to plan. It is certainly plausible that there could be swings in policy, and those swings could lead to changes in earnings expectations for companies, property values, and the value of commodities.

But policy development is often disorderly and subject to the uncertainty of changing economic realities. In the United States, we have a long history of sweeping policy changes ranging from revisions to the tax code to things like changes in healthcare coverage and environmental policies. While these policy changes can certainly affect the composition of industries, the connection to broader financial stability is far less clear.

And when policies are found to have large and damaging consequences, policymakers always have, and frequently make use of, the option to adjust course to limit those disruptions.

There are also concerns that technology development associated with climate change will be disorderly. Much technology development is disorderly. That is why innovators are often referred to as 'disruptors'.

So, what makes climate-related innovations more disruptive or less predictable than other innovations? Like the innovations of the automobile and the cell phone, I'd expect those stemming from the development of cleaner fuels and more efficient machines to be welfare-increasing on net.

So where does that leave us? I don't see a need for special treatment for climate-related risks in our financial stability monitoring and policies. As policymakers, we must balance the broad set of risks we face, and we have a responsibility to prioritize using evidence and analysis.

Based on what I've seen so far, I believe that placing an outsized focus on climate-related risks is not needed, and the Federal Reserve should focus on more near-term and material risks in keeping with our mandate. ■

Christopher J Waller is a member of the Board of Governors of the Federal Reserve System

Endnotes

1. *The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board.*
2. *While the actions the Federal Reserve has taken to date are mostly in an exploratory spirit, they could lead to the perception that we intend to give climate change special treatment in the future. For example, recent actions include the organization of a Supervision Climate Committee and a Financial Stability Climate Committee, the issuance of Principles for Climate-Related Financial Risk Management for Large Financial Institutions in December 2022, and the pilot Climate Scenario Analysis exercise initiated with the issuance of scenarios in January 2023.*
3. *For example, Bernanke (1983) showed how financial disruptions can reduce the availability of credit and reduce aggregate demand, and Diamond and Dybvig (1983) showed how bank runs can affect the real economy.*
4. *In their articulation of the financial accelerator, Bernanke, Gertler, and Gilchrist (1999) demonstrate concepts like this. [Return to text](#)*
5. *For example, see Schularick and Taylor (2012); Jorda, Schularick, and Taylor (2013); and Kiley (2021).*
6. *For example, Harding, Rosenblatt, and Yao (2009) identify a contagion discount on properties close to foreclosed properties.*
7. *There are also unanticipated risks, which makes it all the more important to be comprehensive and effective in mitigating known risks.*
8. *The conditions characterized by severe post-war recessions with steep rises in unemployment rates and declining asset prices tend to put significant stress on the balance sheets of the largest banks, making them well suited for a capital stress test.*
9. *Blickle, Hamerling, and Morgan (2021) study FEMA disasters and find that they have an insignificant or small effect on U.S. banks' performance.*
10. *See Acharya, Johnson, Sundaresan, and Tomunen (2022).*
11. *See Linder, Peach, and Stein (2013) for a study of the effect of Hurricane Sandy on the economy.*

12. For example, in addition to the previously mentioned Acharya et al paper, in a recent paper Meisenzahl (2023) shows that banks have reduced lending in areas more affected by climate change.

13. Based on the work of economist Hyman Minsky, this is the sudden onset of a market crash when sentiment shifts following a period of rapid speculative growth.

14. Total losses were \$612 billion, of which losses on first-lien mortgages, home equity, and commercial real estate loans were \$98.8 billion. See <https://www.federalreserve.gov/publications/files/2022-dfast-results-20220623.pdf>

15. In their reports on climate-related risks to the financial system, both the Financial Stability Board (2020) and the Financial Stability Oversight Council (2021) indicate that risks to the financial system associated with an orderly transition are most likely contained.

16. Drechsler, Savov, and Schnabl (2021) estimated the average asset repricing maturity between 1997 and 2013 was 4.23 years

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This article is based on a [speech](#) delivered at the IE University – Banco de España – Federal Reserve Bank of St. Louis Conference 'Current Challenges in Economics and Finance', Madrid, Spain, May 11, 2023.

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Fostering innovation for climate neutrality

A glowing lightbulb with a tree inside, symbolizing green innovation. The tree is illuminated from within, and the lightbulb is set against a dark background.

The pace of innovation is not aligned with carbon neutrality. Mario Cervantes, Chiara Criscuolo, Antoine Dechezleprêtre and Dirk Pilat argue for policies to encourage the adoption of green innovation

Achieving climate neutrality will require cost reductions and the rapid diffusion of existing technologies, as well as innovation in new technologies. However, climate-related innovation has declined since 2012, while the deployment of existing technologies has grown, resulting from a policy emphasis on deployment rather than R&D.

This column argues that science and technology policies targeted at early-stage technologies most needed for net zero emissions are critical to accelerate innovation. Carbon pricing, the removal of fossil fuel subsidies and other demand-side instruments can encourage the adoption of technologies that are closer to the market.

Countries representing more than 90% of global GDP have now announced targets of climate neutrality by 2050 (Net Zero Stocktake 2022). Reaching these targets requires massive technological change (Van der Ploeg and Venables 2023). Further reducing the cost of mature technologies, such as renewables, will help make these fully competitive with carbon-based alternatives, allowing them to be deployed at scale.

However, many other technologies, such as green hydrogen, are still in their infancy and need further development. IEA estimates that half of the global reductions in energy-related CO₂ emissions through 2050 will have to come from technologies that are currently only at the prototype or demonstration phase (IEA 2021).

Low-carbon innovation is lagging and has moved from R&D to diffusion

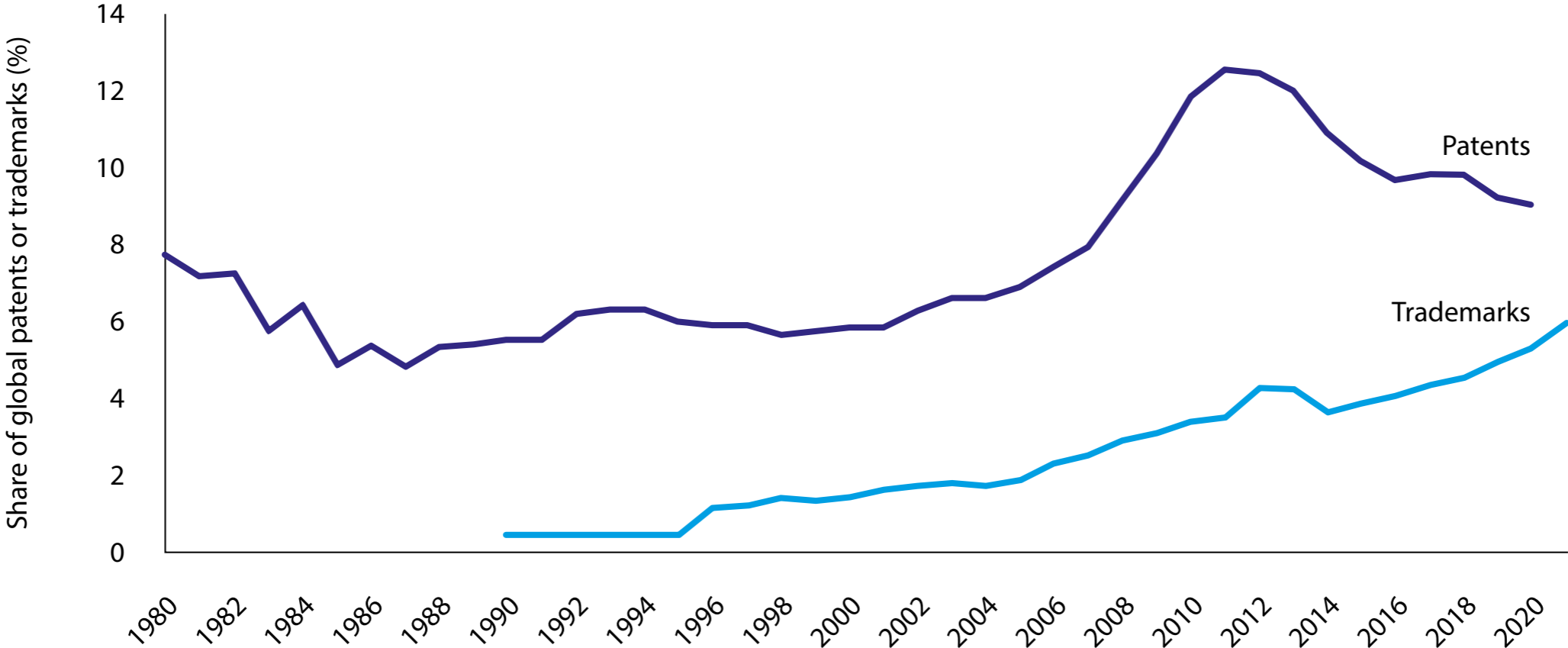
Despite the urgency, the pace of innovation is not aligned with carbon neutrality (Cervantes *et al* 2023). Over the past decade, climate-related innovation, measured as the share of patent filings in climate related technologies relative to all technologies, has slowed down (Figure 1).

In contrast, the deployment of existing technologies, measured by the growth of trademark filings for climate-related goods and services, has risen. While venture capital (VC) investment in green start-ups has grown over the past decade, it has decreased since 2018 (Bioret *et al* forthcoming).

Governments urgently need to increase public R&D expenditures targeted at technologies that are still far from market, but necessary to reach carbon neutrality by 2050

Figure 1. Global low-carbon patenting has declined, but climate-related trademarks continue to rise

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Note: Patent data refer to families of patent applications filed under the Patent Cooperation Treaty (PCT), by earliest filing date. Trademark filings are from the European Patent Office, the US Patent and Trademark Office and the Japan Patent Office.

Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, February 2023.

Moreover, VC investors appear focused on late-stage ventures, as opposed to seed investment into new ventures. Together, these trends suggest that the business sector is more focused on the diffusion and commercialisation of existing technologies than on the development of new innovations.

This results from a policy emphasis on deployment rather than R&D, notably a levelling-off of concrete climate policy measures across OECD countries between 2010 and 2020, particularly for innovation-related policies (Kruse *et al* 2022).

Public expenditures on R&D for low-carbon technologies have remained flat (as a percentage of GDP) over the last 30 years (Figure 2), despite pledges by many countries to double clean energy R&D funding between 2016 and 2021.

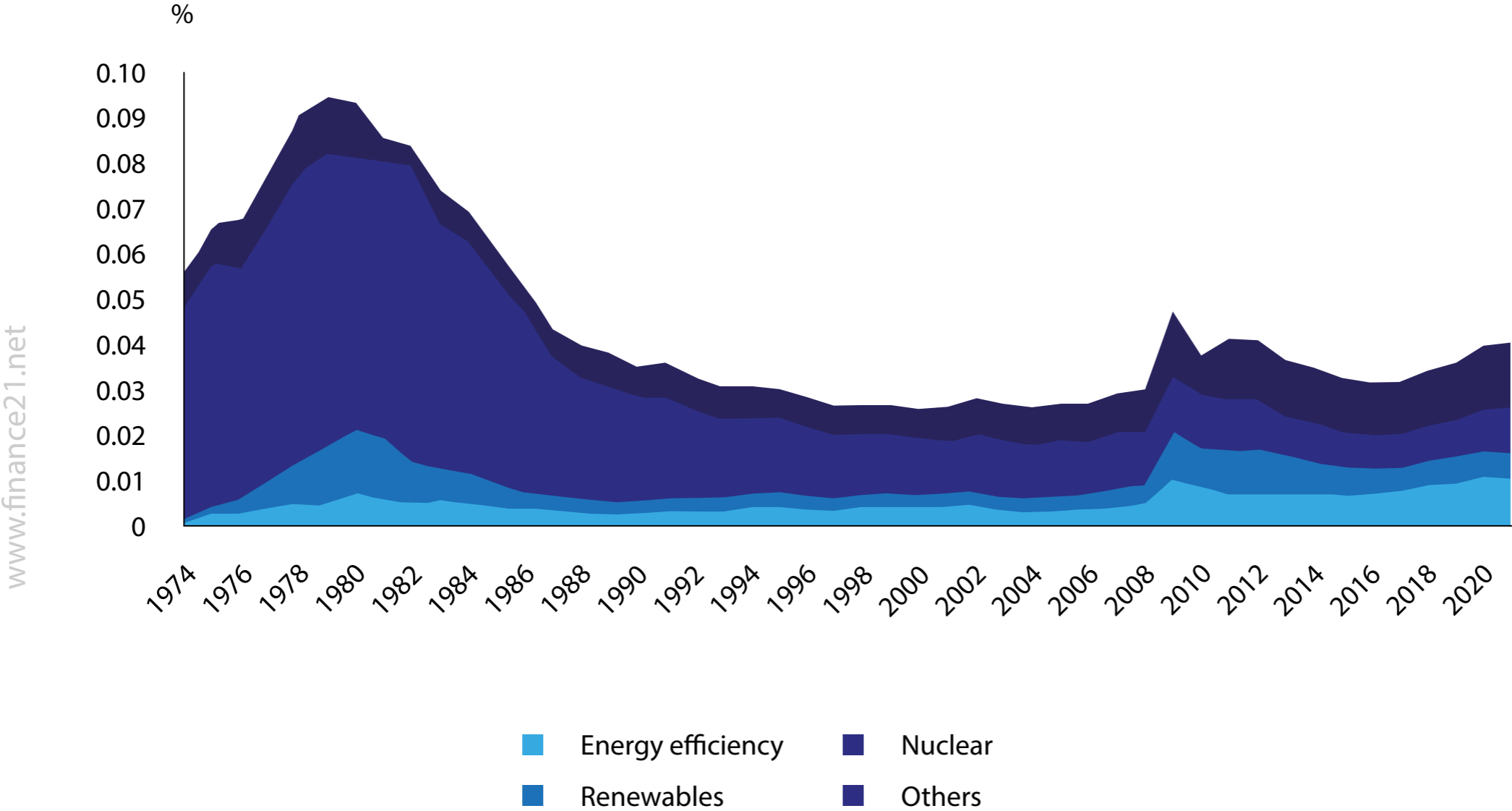
Recent policy actions such as the European Union member countries' Recovery and Resilience Plans and the US Inflation Reduction Act may give a renewed impetus to such R&D.

The contrast between government spending on R&D and support for deployment is striking. European countries spent €458 million in 2018 to support R&D in wind and solar power (Figure 3). The cost to society implied by subsidies for the deployment of wind and solar technologies that same year represented €78,400 million – 150 times more than public R&D. This ratio is smaller in the US and Japan, but there also the emphasis is clearly on support for deployment rather than R&D.

Net zero innovation policies are well justified

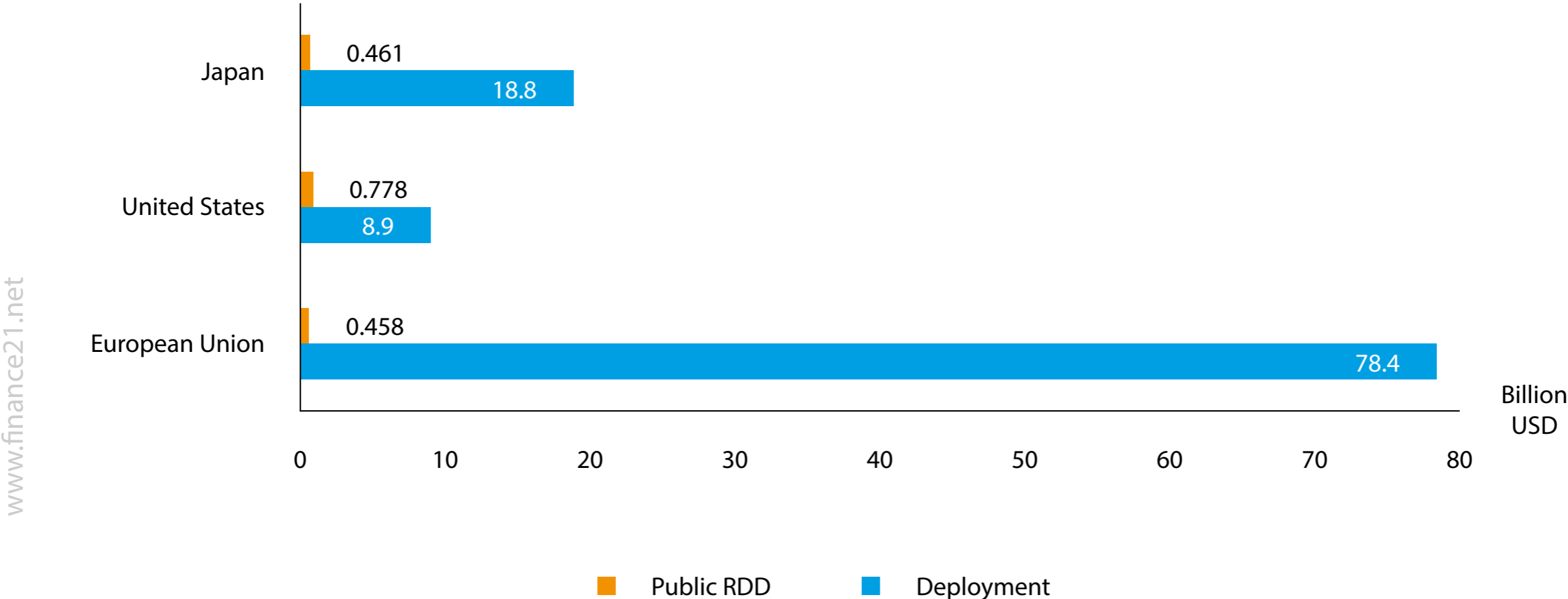
Given the range of barriers and market failures discouraging low-carbon innovation, the theoretical justifications for low-carbon innovation policies are well established.

Figure 2. Low-carbon public RD&D expenditures in GDP across IEA countries, 1974–2020



Note: The 'Others' category includes carbon capture and storage, hydrogen and fuel cells, other power and storage technologies, and other cross-cutting technologies and research.
 See <https://www.iea.org/data-and-statistics/data-product/energy-technology-rd-and-d-budget-database-2>
 Source: IEA Energy Technology RD&D Budgets database, December 2022.

Figure 3. Public RD&D and deployment support in renewable energy, 2018 (billion USD)



Source: IEA Energy Technology RD&D Budgets database, December 2022; Taylor, Michael (2020), Energy subsidies: Evolution in the global energy transformation to 2050, International Renewable Energy Agency, Abu Dhabi.

This includes the existence of significant social benefits from innovation in new technologies, which are particularly high for low-carbon technologies (Dechezleprêtre *et al* 2014), but also learning-by-doing (Grubb *et al* 2021).

In addition, carbon remains largely unpriced at the global level: 60% of carbon emissions are not priced at all and the average effective carbon price is only €16.7/tonne CO₂ (OECD 2022). This reduces the incentives to develop and adopt new low-carbon technologies.

Science, technology and innovation (STI) policies are critical because technological progress reduces the costs of emissions reduction policies, as demonstrated by the sharp decline in the costs of batteries and solar energy over the past decade (IPCC 2022).

By reducing the cost of technology, STI policies reduce the social and economic costs of reaching climate objectives. This increases the responsiveness of emissions to carbon prices, which implies much lower carbon prices to reach the same climate target.

Therefore, STI policies can partially substitute for low carbon prices, which is important as these are often difficult to implement politically. Voters strongly prefer subsidies to low-carbon technologies over other climate policies such as carbon pricing, bans or regulations (Stantcheva *et al* 2022).

What can policies do?

First, governments urgently need to increase public R&D expenditures targeted at technologies that are still far from market, but necessary to reach carbon neutrality by 2050. This implies making low-carbon R&D the highest priority in governments' research budgets and providing a long-term and stable perspective for such funding.

Governments should focus their support on technologies that are central to decarbonisation pathways and that are unlikely to be provided by the market. Carbon capture, utilisation and storage (CCUS), advanced high-energy density batteries, hydrogen electrolyzers, direct air capture, and biofuels account for a large share of emissions reductions until 2050 in all climate models, but receive only around one-third of the level of public R&D funding of the more established low-carbon technologies (Cervantes *et al* 2023). In general, countries need to adopt a portfolio approach to diversify industrial and technology risks, thus avoiding lock-in and give all green technologies a fair chance.

Second, rebalance the use of R&D support instruments. R&D tax credits have positive effects on firms' innovation activities, but more on experimental development than on basic and applied research (Galindo-Rueda *et al* 2020). Conversely, grants have larger positive effects on the R&D stage.

Horizontal R&D support has advantages, but by construction mainly benefits technologies that have the highest short-run returns. Tax credits are therefore not the right policy tool to promote new technologies that are not close to the market, such as hydrogen, justifying a stronger focus on targeted instruments.

Third, close the funding gap for large-scale demonstration projects of technologies that still have a low technology readiness level. For example, CCS demonstration projects currently cost around \$1 billion (OECD 2021). The recent announcement by 16 countries at the September 2022 Clean Energy Forum to commit U\$94 billion for clean energy demonstration is an important step in the right direction.

Fourth, while R&D support policies by nature target domestic firms only, deployment subsidies also benefit foreign firms. Deployment policies should therefore be designed with a clear understanding of the supply side so that they do not face constraints in the domestic economy, such as skill shortages and lack of infrastructure.

Provisions limiting the foreign content of goods and services risk slowing down the climate transition, especially in the presence of shortages in the domestic economy.

Fifth, barriers to external funding should be reduced to help high-risk companies raise funds. Favourable tax schemes, low-interest or subsidised loans for young firms, and a greater mobilisation of government venture capital toward the green transition can help.

Sixth, collaboration in low-carbon innovation should be strengthened. There is ample room for improvement in collaborative R&D, between firms, between firms and public research institutions and between countries, to capitalise on complementary skills and resources at the domestic and international levels.

Coordinated action can accelerate innovation, enhance economies of scale, strengthen incentives for investment, and foster a level playing field where needed.

Finally, low-carbon innovation policies need to be embedded in a broader package. Carbon pricing and the removal of fossil fuel subsidies are necessary to encourage the adoption of clean technologies that are closer to market and help 'redirect' innovation toward low-carbon activities.

For example, the introduction of the European carbon market (EU ETS) led to a large and rapid increase in low-carbon innovation among regulated companies (Calel and Dechezleprêtre 2016).

The low-carbon transition will involve a massive structural transformation that will require the alignment of policy frameworks beyond STI and climate policies. Competition and entrepreneurship policies play a critical role in encouraging business dynamism and the reallocation of resources.

Education and skills policies can help develop skills for the transformation and helps workers adjust to structural change. An efficient and cost-effective shift to a low-carbon economy thus requires the engagement of many parts of government beyond those traditionally mobilised in the development of climate change policies. ■

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Climate action: approaching a tipping point?



Sarah Breeden reflects that we haven't yet reached the tipping point in an unavoidably uncertain transition. Governments, business, finance and central banks all have unique roles to play to get us there

I am going to reflect on our collective progress in the transition to net zero. It is timely to do so. The latest [IPCC synthesis report](#) provides yet another stark warning of the impact that climate change will have on our planet. We are now a third of the way through the decisive decade; a decade where we will need to cut global emissions by over 40%, if we hope to limit warming to 1.5C¹. And yet global CO₂ emissions continue to rise².

For us to meet this challenge we need to collaborate and to take individual responsibility for the role we each play.

For the Government, it is to set out the pathway to net zero. For each of you – and the firms you represent – it is to apply those pathways in boardroom decisions; decisions that will not only help facilitate an orderly transition, but also help ensure the long-term relevance and value of the companies you lead.

For the finance sector, it is to support and enable that transition. And for the Bank of England, it is to work within its objectives to ensure the financial system is resilient to the risks from climate change and supportive of the transition to net zero.

With that in mind, I wanted to reflect on a [speech](#) I delivered in 2020 on how to move beyond rhetoric to make climate action a reality.

I had split our journey into three phases. Firstly, recognising and identifying the financial risks climate changes poses. Secondly, building capabilities to enable us to turn aspiration into action. And thirdly, making business decisions to advance the transition.

With almost three years passed, I want now to evaluate our progress, identify the barriers we have encountered, and consider what else is needed if we are to progress.

Back in 2020, I suggested that we had probably achieved the first phase of our journey to net zero. Conversations with leaders in the financial sector made it increasingly clear that climate change is central to the future of their businesses, not just the confines of Corporate Social Responsibility departments.

It is difficult, but essential, for real economy and financial firms to make transition-driven business decisions in the absence of complete clarity on our pathway to net zero

I suggested we had entered the difficult second phase of turning aspiration into action, across the financial sector and the real economy. This phase involves a lot of hard work: the collection of data and the building of new tools that better enable climate considerations to be embedded in strategy and risk management.

And I finished with a hope that we were fast approaching the third and final phase – with these tools actively used in financial and business decisions to progress an orderly transition to net zero.

Since then, a global pandemic, a war and the fastest tightening in financial conditions in thirty years have meant that things have not panned out as we might have expected. Let's take stock of where that has left us.

Taking stock

My prism on this is as a central banker and regulator, where we have good sight of how the UK's banks and insurers are building their approaches to climate risks. These firms sit at the centre of the economy, and their responses matter.

I have seen a step-change in their approach. They are making more serious investments in developing effective capabilities – both to manage climate-related financial risks and to identify opportunities. But are they enough?

Let me explore this across four core dimensions: scenario analysis; firm risk management capabilities; disclosure; and green finance.

Learning from scenario analysis

I'll start first with scenario analysis - an essential tool for understanding the size and pathways of unprecedented and uncertain future climate risks.

The Bank has delivered its first climate scenarios exercise, the [CBES](#). In my view this was transformative, both in shining a light on otherwise opaque risks and in building capabilities.

Importantly, the exercise required firms to understand how their real economy customers were both exposed to these risks and the actions they would take to manage them. This was one of the most challenging aspects of the work – as it revealed gaps in real economy firms' understanding of what climate transition means for them. A gap I will return to.

The CBES also showed that costs were lowest, and opportunities greatest, with an early and well managed transition. That underlines that while governments set public climate policy, banks and insurers have a collective interest in managing climate-related financial risks in a way that supports that transition over time.

Managing climate related financial risks

Second, interactions with banks and insurers had revealed them to be in the early stages of developing their climate risk management capabilities. To address this, we set the world's first supervisory expectations for climate risks in 2019 – expectations that became part of the PRA's core supervisory processes last year.

Our reviews and observations – including the CBES – have shown significant progress. However, a distance remains to the endpoint and all firms need to invest to make further progress.

We have given firms a huge amount of homework to do, as set out in our latest [Dear CEO](#) letter and in direct supervisory feedback. I can assure you we will be marking that homework.

Progress on climate related disclosures

Third, in 2020, the quantity and quality of climate disclosures was in its infancy. We had recognised the need for it to move from the static to the strategic, for it to be forward-looking and for it to be comparable across firms.

Now, mandatory disclosures for large corporates under the TCFD are a reality in the UK and are driving the right conversations around board tables.

Here at the Bank we are soon to publish our fourth TCFD-aligned report, overcoming challenges with each new report.

And internationally the ISSB is due to build on the work of the TCFD by publishing its first global standards on climate later this year – in a fraction of the time usually taken.

I have very little doubt that in the future we will look back at the ISSB's work as a fundamental building block of comparable global green markets.

The growth of green finance

Fourth, we have seen and continue to see growth in the green finance market. The share of green finance in total finance has steadily increased, reflecting burgeoning investor demand and the financial system's ability to innovate³. That poses new challenges, including greenwashing, and markets regulators like the FCA are responding accordingly.

But it's not only green products we need to see growth in. More fundamentally, we need to see an increase in transition finance projects that help business deliver long-term emissions reductions – greening our future economy, not just investing in the currently green.

To that end, I welcome the Government's [2023 Green Finance Strategy](#). It includes a huge number of measures, but I was especially pleased to see commitments that will create the required cross-economy infrastructure for financing – including sector investment plans, an industry-led Transition Finance Market Review, and a Net Zero Business and Investment Group to advise government on the needs of the private sector to mobilise capital.

Turning aspiration into action

The reason I have spent some time on these four areas is not just because a lot has happened. It is because it is important to recognise the progress we have seen.

But have we reached a tipping point where firms' capabilities and understanding of the opportunities and risks from transition are driving strategic decision-making? Well here is the reality check. The shift I had hoped to see in stronger linkages between climate change and strategic decision making across the economy have proved harder to deliver in practice.

Why is that? Undoubtedly, those headwinds of the last three years and for which we have no recent precedent have reduced our collective ability to take action. This is undeniably unfortunate – but it is a legitimate rationale.

Indeed, against this backdrop we have perhaps seen more progress than might have been expected. But we cannot get away from the fact that regardless of this legitimacy, climate risks continue to build and still need to be addressed.

Beyond these unexpected headwinds, the key challenges have come from foreseeable sources. I am conscious I have adopted a number of lists – but bear with me for one final one as I set out four key challenges we will need to overcome if we are to turn aspiration into action that advances the transition. And in the spirit of being solutions focused, not just a naysayer, I will also provide views on how to overcome each of the challenges.

Challenges to advancing the transition

The first challenge is that filling capability gaps in the transition finance infrastructure takes time, so we need to continue to take urgent steps now.

Collectively we need to equip the financial sector with forward-looking information from the real economy to allocate capital effectively and mobilise finance at scale.

That means the rapid implementation of [ISSB standards](#), finalising the Transition Plan Taskforce's [framework](#) for transition plans, and the adoption of innovations that reduce greenwashing such as product labels.

The Government's 2023 Green Finance Strategy sets out further detail on the timeline for Sustainability Disclosure Requirements and commits to reflect developments in international standards. It also commits to consult on the requirements for the UK's largest companies to disclose their transition plans.

But, the responsibility for driving forward the transition to net zero is not only for governments and the authorities in building the frameworks. As NEDs, it includes all of your firms in using those frameworks. And you can, and must, make progress now whilst policy is developing – ahead of regulation and to support the development of best practice.

A necessary foundation for that is investing in education to increase your staff's understanding of climate issues. Without that, none of this can happen.

Transition plans are fundamental to driving the right transition. They allow financiers both to manage their risks and to allocate capital to support real economy decarbonisation. And by highlighting where there is clarity about the way forward and where gaps remain, they compel the right conversations. I encourage you all to engage in them now.

The second challenge is that the world does not stand still. We have seen unexpected political and economic headwinds and it seems prudent to assume more will come.

With unexpected headwinds and limited bandwidth, longer-term issues can end up deprioritised. Issues do not though go away – quite the opposite, they build in the background. So we all need to be nimble and adaptable in our responses to the near-term whilst continuing to make progress on the long-term.

We must also learn lessons as we go. Russia's illegal invasion of Ukraine, for example, was a shock to our transition pathway and highlighted the sorts of disorderly transition risks we have been worried about. We saw first-hand the economy-wide costs of a necessary reduction in (Russian-imported) fossil fuels before alternative energy sources were in place - a reminder of the costs of disorderly transition.

But we cannot ignore the broader challenges. The fallout of this crisis and the near-term imperative to tackle energy security issues has reduced bandwidth to address other issues. This is a good segue to my third challenge.

The third challenge is that it is difficult, but essential, for real economy and financial firms to make transition-driven business decisions in the absence of complete clarity on our pathway to net zero.

It is easy for me to stand here and tell you that you should be making decisions now that stretch many years into the future, to manage the risks and seize the opportunities of net zero, without full clarity on the policy path to get there. But we need to recognise that setting clear and comprehensive policy will take time, likely years. The recent Green Finance Strategy takes us forward in a significant way, but the extent of policy making is formidable.

We should also not be in any doubt that the transition is already building, creating opportunities and crystallising risks, and that its speed will only accelerate. Within the UK, policies on energy efficiency in buildings are driving changes now⁴. And transition policies elsewhere such as the US Inflation Reduction Act will have onshored impacts for the UK.

So firms cannot, and should not, delay taking action to better understand how transition might impact their businesses.

As I mentioned earlier, the CBES revealed a significant gap in the understanding of real economy firms on what the transition to net zero means for them. Whilst I recognise there is uncertainty, I urge firms to explore how different scenarios are relevant to their strategy, to test their specific vulnerabilities and to identify opportunities.

Here at the Bank, we have helped create tools to support such analysis⁵. And they continue to be enhanced. They include carbon prices consistent with different pathways to net zero to help you identify robust strategies. I encourage you to use them.

And the fourth challenge is that system wide change is complex as the actions of one are dependent on actions of others, so it is important to coordinate action throughout the supply chain.

Each firm should be stretching its horizons – building capabilities now that enable action to drive long-term reductions in emissions through their value chain. That does not mean immediately ceasing to deal with high emission counterparties and suppliers. That does not necessarily remove emissions, perhaps chasing them into the shadows instead.

Rather, economy-wide emissions reductions will come through proactive engagement with counterparties and suppliers, and decisions aligned to the transition over time. This means understanding the needs of firms up and down the supply chain and having difficult discussions about steps to reduce emissions.

And smaller corporates will need help from larger corporates and their financiers to develop their climate expertise. The collaboration between GARP and Chapter Zero shows how effective that can be in driving faster progress.

I truly believe that transformation can come from constructive and systematic engagement with your value chain. I therefore urge you to convene your opposite numbers in and around the real economy. Chapter Zero is a great network.

Conclusion

We know the costs of transition to a net zero economy are lowest with early and well-managed action. And we are making good progress in supporting that transition, arguably more than we might have expected given the shocks we have faced.

But there is still much more to do. We have not yet reached the tipping point where we have built the capabilities and the transition finance infrastructure that will support the right strategic decisions in an unavoidably uncertain transition.

We all have a role to play in driving progress. Governments globally have the key role in developing the policy paths and infrastructure that deliver the transition and draw us closer to this tipping point. Central banks and regulators can operate within their objectives to catalyse, complement and amplify those policies.

And, business and finance can – indeed in order to manage their future risks will need to – make progress whilst policy is developing, ahead of clarity on sectoral paths and regulatory practice. Be assured that the difficult conversations that follow are a sign of success on our pathway to net zero, not a sign of failure.

Waiting for certainty and perfect information creates an excuse to go slowly. But this is a collective action problem where seemingly rational individual inaction makes our collective future problems much bigger. So we must not let perfection be the enemy of progress. And after all, managing uncertainty is what you do all the time. Be brave here too.

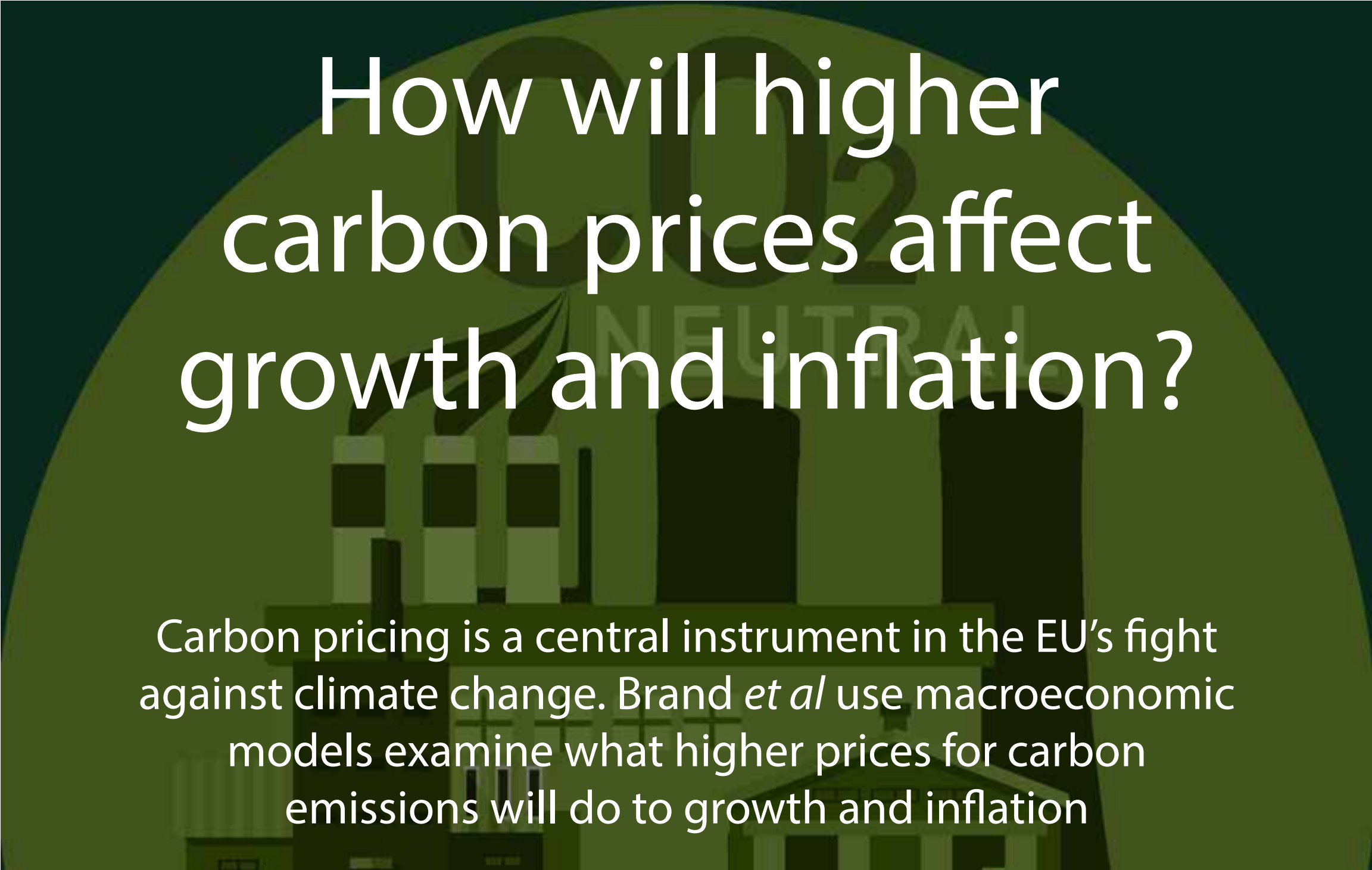
I will leave you with an encouragement (again) to each play your role, and to make the most of this important network. ■

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Endnotes

1. In pathways that limit warming to 1.5°C with no or limited overshoot, net global GHG emissions are projected to fall by 43% below 2019 levels by 2030. See IPCC (2023), '[AR6 Synthesis Report: Climate Change 2023](#)'.
2. World Economic Forum (2022), '[Analysis: Global CO₂ emissions from fossil fuels hits record high in 2022](#)'.
3. From around 0.1% in 2012 to above 4% in 2021. See The City UK (2022), '[Green finance: a quantitative assessment of market trends](#)'.
4. 40% of homes in England now have an EPC rating of B and C or better. See Department for Business, Energy & Industrial Strategy (2022), '[Energy efficiency: what you need to know](#)'.
5. See CFRF (2022), '[Climate Financial Risk Forum Guide 2022: Scenario Analysis in Financial Firms](#)', NGFS (2023), '[Scenarios Portal](#)', Bank of England (2021), '[Guidance for participants of the 201 Biennial Exploratory Scenario: Financial risks from climate change](#)'.

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How will higher carbon prices affect growth and inflation?

Carbon pricing is a central instrument in the EU's fight against climate change. Brand *et al* use macroeconomic models examine what higher prices for carbon emissions will do to growth and inflation

Carbon pricing is a central instrument in the EU's fight against climate change, but it will also affect our economies. In this post on The ECB Blog, we use macroeconomic models to look at what higher prices for carbon emissions will do to growth and inflation.

Urgent action is needed to reduce greenhouse gas emissions and prevent the most disastrous effects of climate change. This is why the EU aims to reduce such emissions by 55% by 2030 (compared to 1990 levels), and to achieve net zero emissions by 2050.

The EU's Fit-for-55 package will use measures like carbon prices, regulation and green investment, all of which will affect the economy. But how, and with what economic consequences?

Carbon pricing and the economy

In this post we focus on carbon pricing. It is the most effective instrument to reduce emissions because it is targeted at the carbon footprint of the economy. It forces everyone to take the damage caused by emissions into account – for example when running a business, driving a car, or heating a home.

Carbon pricing usually takes the form of a tax imposed on emissions or an emission trading scheme in which companies can buy and sell the right to generate emissions (which *The ECB Blog* will look at in a dedicated post soon). All forms of carbon pricing provide incentives to reduce emissions. They do that by putting a price tag on the emissions from consumption and production.

For example, you might travel less often by plane as you see prices rising due to the fact that airlines have to buy carbon emissions allowances.

How does carbon pricing affect the economy and, eventually, growth and inflation? Carbon prices influence both supply and demand primarily via higher energy prices – either directly via their impact on consumer prices or indirectly via their impact on production costs.

Model-based estimates of carbon-price increases consistent with the International Energy Agency's net zero scenario in 2050 suggest a moderate impact on euro area GDP and inflation over the current decade

On the supply side, the increase in production costs drives up inflation and results in lower production. If the government sets out the future path of carbon price increases in a credible way, firms can anticipate and factor in those higher costs when they set their prices or decide on production volumes. The more firms do so today, the stronger the inflation impact will be upfront.

On the demand side, higher carbon prices hit household incomes and firm profits. This in turn reduces consumption and investment, eventually creating downward pressure on inflation. The more households and firms take into account future carbon price increases for their spending today, the more they will frontload this reduction in consumption and investment. So we have two forces moving inflation in opposite directions.

There are a number of factors affecting how strong these effects are, and in which direction they pull. Fiscal policy, for example, can redistribute the receipts from carbon taxes to low-income households. This would reduce the loss of real incomes and help sustain household consumption.

If countries around the world tax carbon emissions differently this will affect international competitiveness, the terms of trade (the amount of goods a country can purchase for a certain amount of exported goods), and the demand for export goods.

Quantifying the overall effect of carbon pricing on the economy is fraught with a high level of uncertainty, including model uncertainty. To deal with this uncertainty, we used six macroeconomic models to assess the impact of raising carbon prices in the euro area¹.

For the calculation we assumed a carbon price increase from €85 in 2021 to €140 per tonne of CO₂ emission by 2030². For the rest of the world, we factored in a proportionate increase in carbon prices, albeit from lower levels.

What would be the quantitative impact of this increase in carbon prices on the euro area economy? The models suggest that it would moderately lower consumption and investment, with GDP falling 0.5-1.2% below baseline by 2030 (see Chart 1, top, where the baseline refers to a scenario with no changes in carbon prices).

Across all models, the median estimate for GDP translates into average annual growth dropping by roughly 0.1 percentage points. Likewise, the models suggest that the maximum impact on annual inflation would be modest at less than 0.2 percentage points per year in the period up to 2025, and falling gradually thereafter (see Chart 1, bottom).

Accordingly, the carbon price increase, as assumed for this simulation, would only have a rather limited economic impact on the euro area economy. That means monetary policy would face only a modest trade-off in terms of stabilising inflation relative to output.

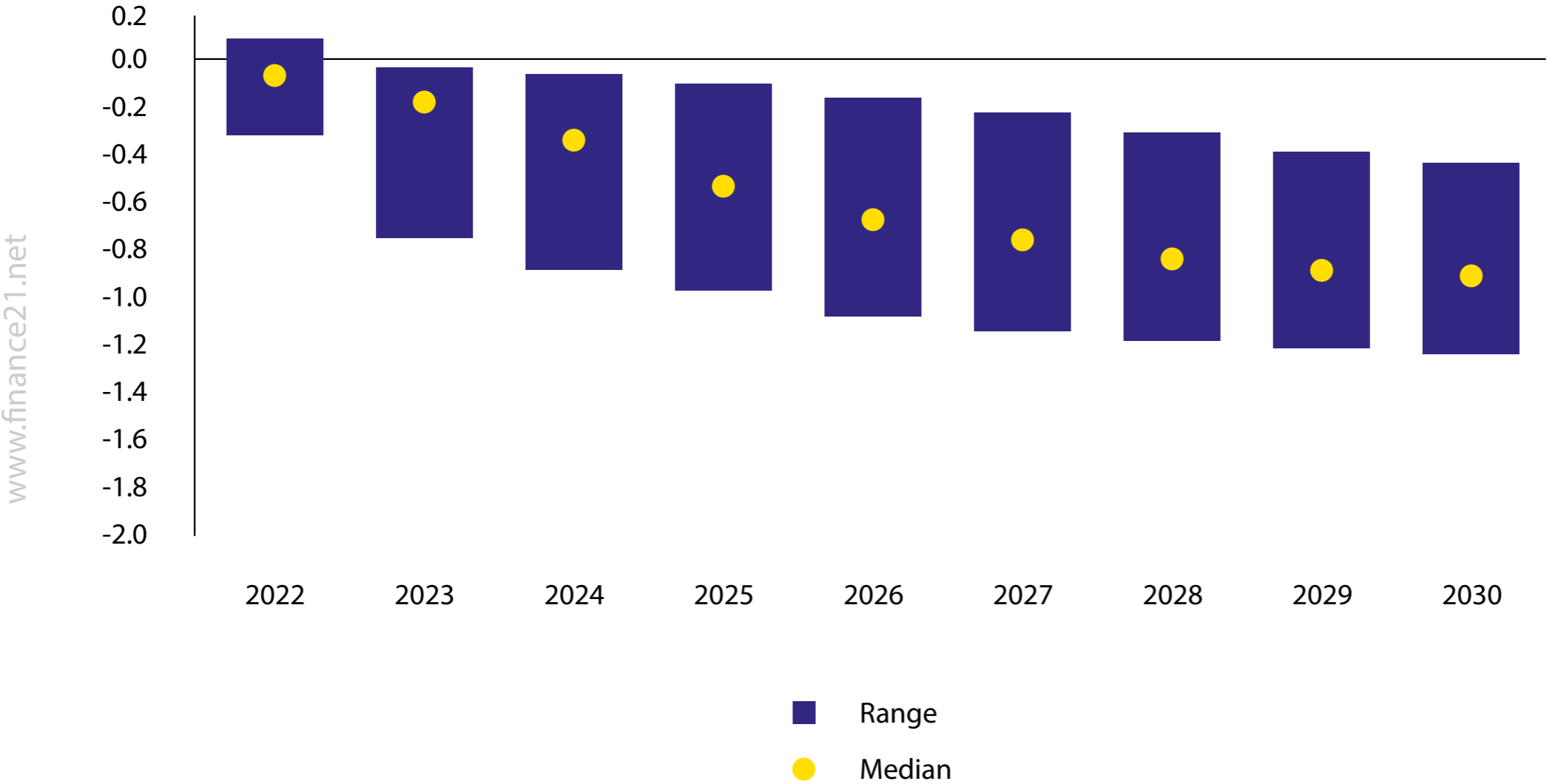
The size and, ultimately, the direction of the resulting response of policy interest rates depend on the model. Models emphasising the adverse supply-side effects of the scenario, with a larger impact on inflation, tend to prescribe a limited increase of policy interest rates. And models in which adverse demand effects dominate tend to show a small decline of policy rates.

Raising carbon prices is expected to support the transition to a low-carbon economy. But the carbon price increase in our scenario would reduce carbon emissions in the euro area by only around 11% by 2030. This is the median estimate of our six models (see Chart 2).

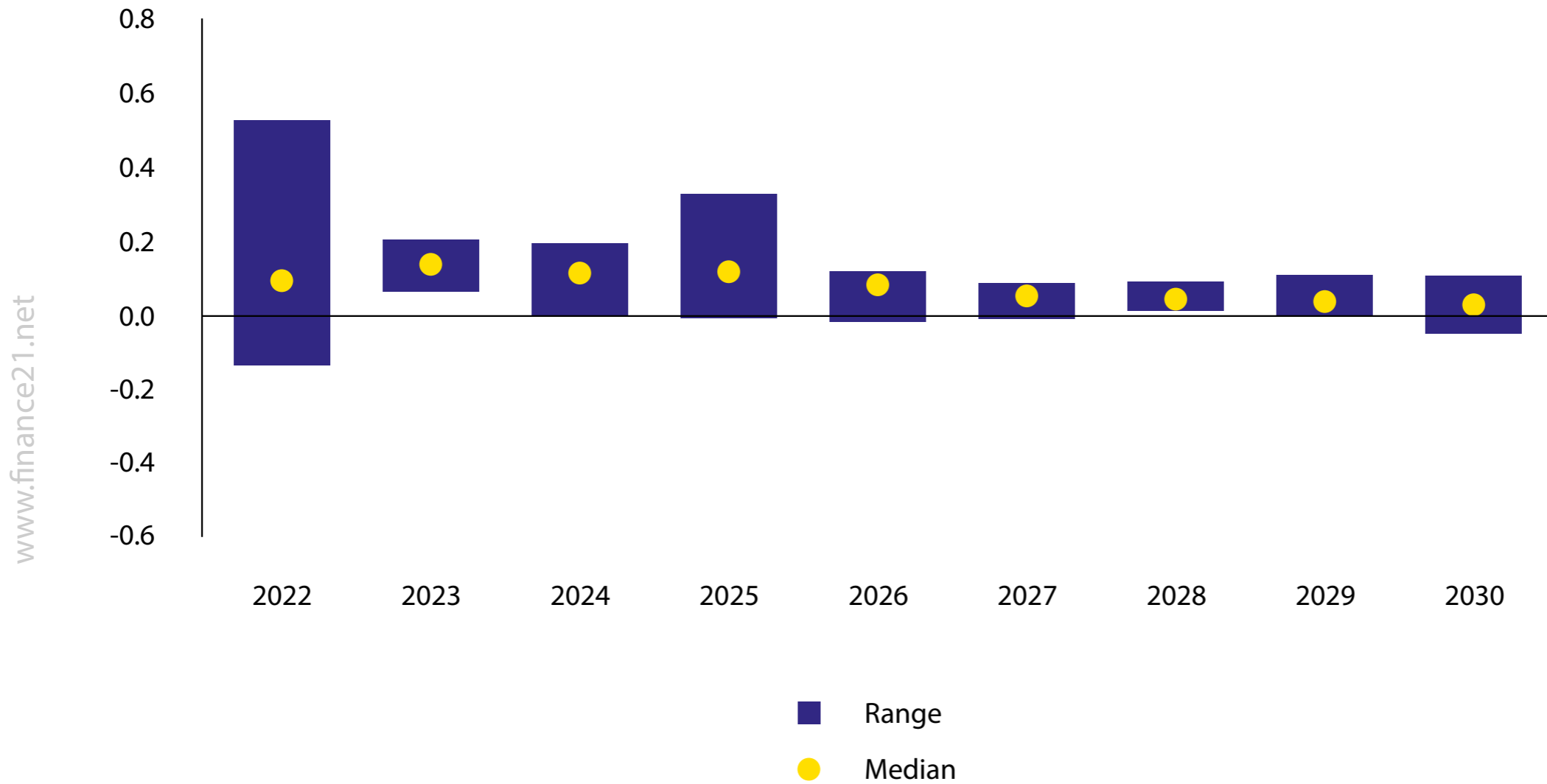
And that figure is far below the EU's intermediate goal of reducing emissions by 46% by 2030 (compared to 2021 levels). This shortfall highlights the need for a more ambitious carbon pricing policy, additional regulatory action, green investments, and technological adaptation and innovation.

Chart 1. Carbon pricing impact on real GDP (LHS) and inflation (RHS)

Percentage and percentage-point deviation from baseline paths



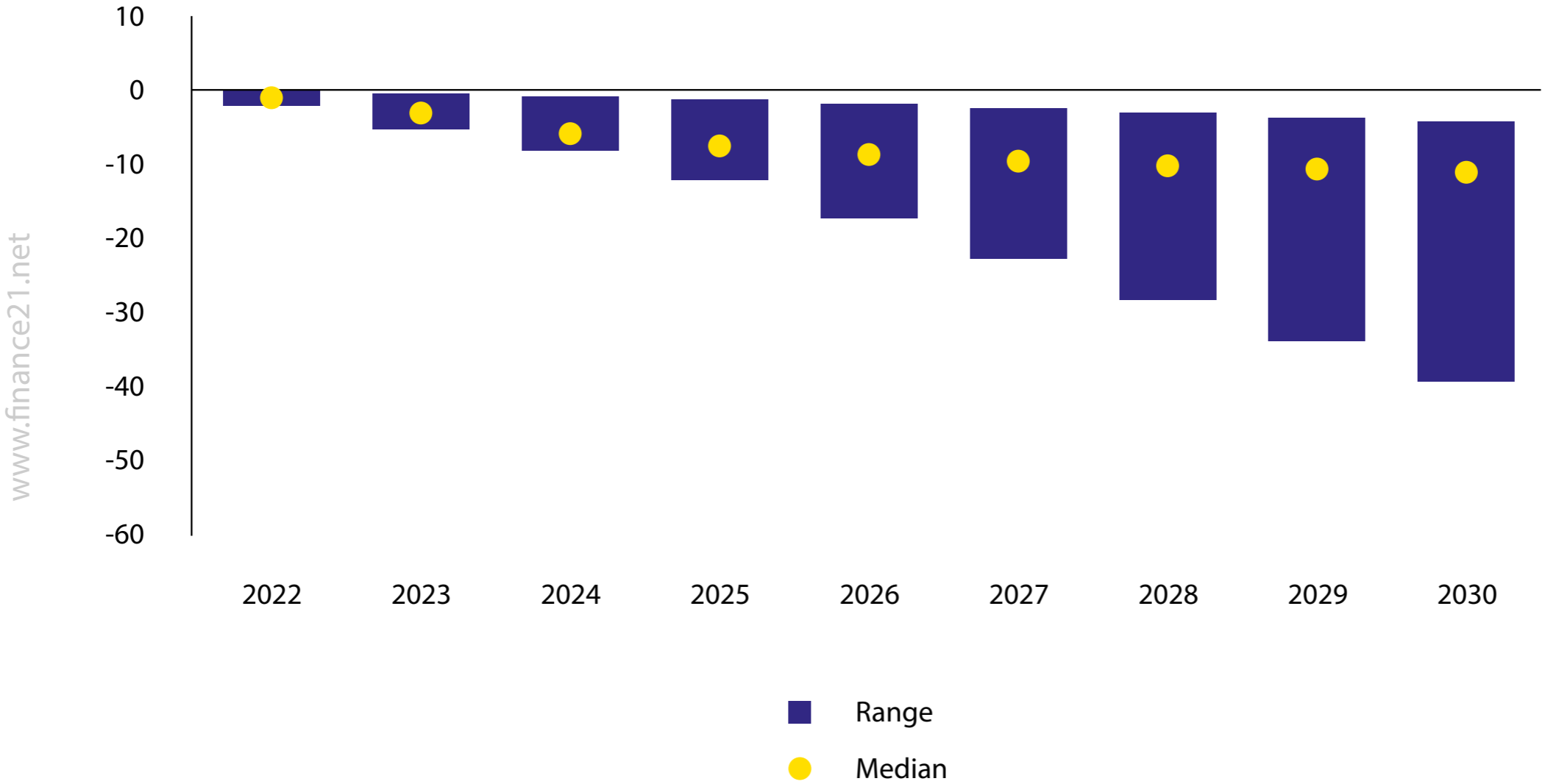
Percentage and percentage-point deviation from baseline paths



Note: The charts display the impact (range and median across models) of the assumed carbon price increase on euro area real GDP and inflation between 2022 and 2030. Sources: NAWM-E, E-DSGE I + II, G-Cubed, NiGEM and Oxford.

Chart 2. Carbon pricing impact on carbon emissions

Percentage deviation from baseline paths



Note: The chart displays the impact (range and median across models) of the assumed carbon price increase on euro area carbon emissions between 2022 and 2030. Sources: NAWM-E, E-DSGE I + II, G-Cubed, NiGEM and Oxford.

We have to put the estimated reductions in carbon emissions in the euro area into an international perspective. The euro area currently contributes a mere 5% of global carbon emissions. Achieving a substantial effect on global emissions would require a more ambitious increase in carbon prices in the rest of the world.

If these carbon prices were aligned with those for the euro area by 2030, the estimated reduction in global carbon emissions would be about three times greater than in our benchmark scenario. In this event, the euro area terms of trade would improve by more, while euro area foreign demand would weaken more strongly, doubling the estimated negative impact on euro area GDP.

How fast carbon emissions can be reduced depends on how quickly the economy adjusts to higher prices for carbon emissions. If capital and labour get reallocated more swiftly, if the economy adapts more rapidly to new technologies and if there is sufficient financial support, the process can go faster.

It would also help if green energy could replace fossil fuel generated energy more easily than assumed in the models. This would reduce emissions more strongly and also mitigate the impact on GDP and inflation. More green investments or major technological advances would also help in this regard.

To conclude, model-based estimates of carbon-price increases consistent with the International Energy Agency's net zero scenario in 2050 suggest a moderate impact on euro area GDP and inflation over the current decade, with modest inflation-output trade-offs for monetary policy as it seeks to preserve price stability.

But the estimated carbon emission reductions by 2030 are limited, equal to around one-fourth of the EU's intermediate goal. Achieving greater cuts in emissions with higher carbon prices would have a bigger impact on inflation and GDP, with more sizeable trade-offs for monetary policy.

Accordingly, reaching the EU's climate goals will require a mix of ambitious carbon emission pricing, additional regulatory action and technological innovation, as set out in the Fit-for-55 package. ■

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Endnotes

1. Three of these models were developed at the ECB in line with its climate change action plan: the New Area-Wide Model with a disaggregate energy sector (NAWM-E), as well as two smaller-scale environmental DSGE models with financial frictions and costly abatement, respectively (E-DSGE I + II). The three other models are commercial models that are widely used for climate change analysis: NiGEM, G-Cubed and the Oxford Economics model.
2. The starting value of €85/tCO₂ in 2021 corresponds to estimates of effective carbon rates by the Organisation for Economic Co-operation and Development. The terminal value of €140/tCO₂ by 2030 is aligned with the carbon price assumption in the International Energy Agency's net zero scenario for 2050, as set out in its 2022 World Energy Outlook.

This [blog](#) was prepared in liaison with Alina Bobasu, Kai Christoffel, Alistair Dieppe, Michael Dobrew, Marien Ferdinandusse, Alessandro Ferrari, Thaïs Massei, Romanos Priftis, Angela Torres Noblejas and Aurelian Vlad.



Mobilising transition finance

Many jurisdictions now require companies to demonstrate 'climate alignment'. Alexander Lehmann says investors need tools to evaluate whether transition plans are credible

One aim of sustainable finance regulation is to push companies towards activities that will be compatible with the target to limit global warming to 1.5 degrees Celsius above pre-industrial levels. This type of regulation – for example setting out classifications of what economic activities count as ‘green’¹ – seeks to encourage financing for activities and technologies that are clearly carbon neutral.

But financial markets now increasingly focus on transition finance as a component of the broader sustainable finance asset class. Transition finance refers, for example, to financing for emission reductions and low-carbon technologies in industries such as cement or steel, where no purely green technologies are readily available. Transition financing is also needed for energy companies in the process of switching to renewables and phasing out their fossil-fuel assets.

From ‘cheap talk’ to credible climate plans

Some observers have argued that transition finance requires a new classification that would set out intermediate technologies and ‘shades of green’ deployed on the path to a net zero world – in other words, technologies that are not, in a strict sense, sustainable, but which are needed to get to sustainability.

Shipping, for instance, is a typically ‘hard-to-abate’ sector. Gas, rather than oil-powered, vessels may reduce emissions initially while not offering the ultimate net zero technology, such as green hydrogen. In the European Union, a technical expert group has proposed such a separate transition classification (Platform on Sustainable Finance 2022), but EU legislation on this right now does not seem likely.

That is no grave loss. A static classification of activities is neither sufficient nor necessary for transition finance to take off. Transition finance relies inherently on forward-looking climate commitments by companies.

Only on the basis of well-defined transition plans will investors be in a position to understand the residual climate risks to which companies are exposed, while bond and loan markets will increasingly feature contracts that link financial terms to the achievement of climate outcomes.

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This central role of corporate climate plans has been recognised in templates for transition plans developed by, for example, the Organisation for Economic Co-operation and Development (OECD, 2022) and the G20 Sustainable Finance Working Group (2022).

The sheer number of net zero targets companies have announced would suggest that this concept is well-established. In fact, transition plans are a much more complex aspect of corporate disclosure and strategy. They should, for instance, explain how emissions in the upstream and downstream value chain are captured.

They should also explain the incentives management has to deliver on the plan, for instance, by setting internal carbon prices or linking executive pay to climate outcomes.

Some companies have already adopted this relatively comprehensive concept, in part based on templates that the Financial Stability Board's Taskforce on Climate-Related Financial Disclosures (TCFD) first designed in 2016.

However, overall, the quality of corporate climate disclosures remains disappointing. In February 2023, the Climate Disclosure Project showed that only a small fraction of the 18,000 companies monitored globally met all key indicators of high-quality climate transition plans (CDP, 2023).

Only in a handful of EU countries do more than 10 percent of reporting companies define plans that meet most of the required indicators. According to the UK-based Transition Pathway Initiative, only one-quarter of about 400 large and listed global companies have made a strategic assessment of issues related to the climate transition. Major aspects of management quality were often inadequate².

New regulatory standards

Against this backdrop, a number of regulatory initiatives will now likely bring more clarity on the elements corporate transition plans should include:

- In the EU, the Corporate Sustainability Reporting Directive (CSRD, (EU) 2022/2464) will require roughly 50,000 companies to publish their climate transition plans, beginning in the 2024 accounting period. A 2022 European Commission proposal for a Corporate Due Diligence Directive³ remains under negotiation but is likely to raise standards further by requiring considerable detail in such plans, including how they would be in line with the 1.5 degree warming scenario. The European Financial Reporting Advisory Group, the EU's accounting body, has published a draft standard that fleshes out these requirements (EFRAG, 2022).
- In parallel, the International Sustainability Standards Board (ISSB) is developing new disclosure rules, with a climate standard to take effect from 2024 (ISSB, 2022). This also requires companies to publish transition plans.
- Standards in the United Kingdom will also be important, given the close linkages to EU capital markets and London's possible role as a green finance hub for emerging markets, as envisaged in the UK government's 2023 green finance strategy (HM Government, 2023). Detailed standards for the transition plans of large or listed companies are expected in late 2023⁴.
- In addition, there are now various guidelines and regulations on transition finance and related corporate disclosures in Japan⁵ and other key Asian markets.

Much has been made of the EU's greater ambition in disclosure. The EU's 'double materiality' concept, which is embodied in the CSRD (reflecting sustainability risks to the firm as well as the firm's impact on the planet) will go well beyond the equivalent ISSB standards⁶.

In terms of the format and content of corporate transition plans, the emerging EU, UK and international accounting standard templates are, in fact, very close. Unlike for green finance and the often-complex classifications of activities, regulatory equivalence, which could foster cross-border capital flows, seems a realistic prospect.

Fleshing out the fine print

Transition plans will quickly become an important tool in corporate strategy, and will be central to non-financial disclosures and reporting. But the high-level language in the EU directives and the new accounting standard will need to be fleshed out in further guidance and backed up in national legislation.

Three aspects should be addressed:

- The EFRAG (2022) standard should be clearer on how the pathways for emission reductions will be set. This involves tricky judgements on how the finite remaining budget for global greenhouse gas emissions is allocated to industrial sectors, and how EU and national targets are translated to each company.

There also needs to be clearer guidance on emissions arising further down the value chain ('scope 3' – indirect emissions) and whether targets are to be set in relative (intensity) or absolute terms. The sheer variety of methodologies invites arbitrage towards lower standards.

- Sound transition plans will also need to be backed up by corporate governance and transparency rules. The EFRAG standard only requires companies to explain how the transition plan is embedded in the overall business strategy and that it has been approved by management bodies, which risks resulting in superficial language.

An ongoing review of four related EU directives in this area (including the one on the harmonisation of transparency requirements)⁷ should therefore be accelerated and should support the ambition for better sustainability disclosures.

Corporate governance rules are largely in the competence of EU countries and are defined in a patchwork of national legislation, securities regulations and non-binding codes or guidance from central banks. Climate-related aspects should become more central, for instance by requiring a climate strategy review in annual shareholder meetings.

- Finally, investors' assessments of corporate transition plans will rely on certification and verification by assurance providers and other private companies. This industry is set to expand, with the audit profession playing a more prominent role. Verification providers should be free of conflicts of interest and should deploy transparent models. The EU could design a relatively light-touch system of accreditation, as is already planned in support of the EU's new green bond standard⁸.

The potential of the EU's corporate bond market

If designed well, transition plans will underpin the further growth of green and transition finance. They will guide the design of bonds and loans that tie financial terms to climate outcomes.

In 2022, over 21 percent of European bond issuance was labelled as sustainable in some form. Within this total, sustainability-linked bonds, which reward issuers for achieving targets rather than spending on certain projects, have grown particularly strongly.

In 2022, about 200 EU companies issued such bonds for a total amount of €89 billion. Despite this rapid growth, the market for corporate bonds linked to climate outcomes is still quite immature. The European Securities and Markets Authority (ESMA, 2023) has shown that there has been a near-uniform bond contract structure and typically undemanding coupon step-up penalties, which were largely unrelated to the issuer's credit risk.

Many of the performance targets set in corporate bond issues seem to have been unambitious, or have failed to capture relevant emissions. As it operates currently, the EU's corporate bond market does not reward climate commitments sufficiently.

Once corporate transition plans become more transparent and credible, banks and bond investors will be in a position to fund companies that are committed to certain climate outcomes, and which can signal this commitment credibly. This will not only channel additional finance to those companies fully engaged in the climate challenge, but will also exert a more meaningful discipline over the private-sector low-carbon transition than has been possible so far. ■

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Endnotes

1. As in the European Union taxonomy for sustainable activities; see https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en
2. See <https://www.transitionpathwayinitiative.org/>
3. See https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en
4. See <https://transitiontaskforce.net/workplan/>
5. See https://www.meti.go.jp/english/press/2021/0507_001.html
6. For a discussion, see <https://www.bruegel.org/event/corporate-disclosure-sustainability-risks-reconciling-international-and-eu-approaches>
7. See https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13128-Corporate-reporting-improving-its-quality-and-enforcement_en
8. See Council of the EU press release, 'Sustainable finance: Provisional agreement reached on European green bonds', 28 February 2023, <https://www.consilium.europa.eu/en/press/press-releases/2023/02/28/sustainable-finance-provisional-agreement-reached-on-european-green-bonds/>

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Climate regulation and financial risk

Berg *et al* argue that it would be welfare-enhancing if policy changes were to follow a predictable longer-term path, and suggest a role for financial regulation in the transition

Climate risk has become a major concern for financial institutions and financial markets. Yet, climate policy is still in its infancy and contributes to increased uncertainty. For example, the lack of a sufficiently high carbon price and the variety of definitions for green activities lower the value of existing and new capital, and complicate risk management.

This column argues that it would be welfare-enhancing if policy changes were to follow a predictable longer-term path. Accordingly, the authors suggest a role for financial regulation in the transition.

Transitioning to a carbon-neutral economy requires structural changes. Fossil fuel-based energy needs to be replaced by renewable alternatives (eg. wind and solar), and high-carbon activities such as heating need to be transformed (IEA 2021).

Public debate and academic contributions have been focusing on ways to implement the low-carbon transition (NGFS 2019), on the financial costs of a late transition (Alogouskofis *et al* 2021), and on the benefits of early action (Gourdel *et al* 2022). The debate is increasingly relevant for financial stability analysis and risk management (BIS 2021).

For example, to inform climate stress tests, the Network for Greening the Financial System (NGFS) has developed climate scenarios showing higher costs and risks for high-carbon activities, in particular in a late or disorderly transition (NGFS 2021).

While these scenarios take carbon taxation into account, they fail to consider how changes in financial regulation, both over time and across constituencies, affect financial valuations and investment levels.

Absent a coherent climate regulatory strategy, financial institutions and markets may not perform efficiently, as their role in reallocating funds and managing risks may be severely impaired.

This should not be seen as a surprise: policy uncertainty adds risks, increasing the cost of capital for green investments and thus the value of postponing adjustments (Castellini *et al* 2021).

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Regulatory uncertainty and risk assessment

A set of climate policies such as a carbon tax and environmental and financial regulation, preferably coordinated globally, is needed to send the right signals to investors and elicit an effective response (Stiglitz *et al* 2017).

However, these are slow in the coming. Drivers of this policy uncertainty and limited coordination include:

- Swinging perception of climate risks by policymakers, also due to swings in public opinion (eg. the gilet jaunes demonstrations in France, presidential succession in the US)
- New climate-related information reflecting availability of new data and improved methodologies, as well as the availability of new technologies that alter economic and policy trade-offs
- The global dimension of climate policy and the difficulties to reach consensus¹
- Exogenous shocks, such as the current energy price crisis, which may inadvertently increase the attractiveness of regenerative energy sources or, by contrast, divert policies from formerly envisaged path of transition
- Poor quality of corporate carbon risk disclosure leading to unfair competitive advantage and greenwashing possibilities², as well as different disclosure coverage at the regional and global level, contributing to contradictory and ambiguous information to investors³

Implications of policy uncertainty for investments and risk management

As argued above, policy uncertainty tends to increase the cost of capital as far as the transition is concerned, negatively affecting the willingness (but also the ability) of investors to fund low-carbon activities in a variety of ways.

First, policy uncertainty has direct consequences for investment valuation as it bears negatively on net present values. The more volatile green policy measures, the lower their impact on investment decisions – and the lower the green investment levels in the economy.

Second, by fostering uncertainty throughout, delays in climate policy decisions contribute to a scarcity of green assets, so that a sudden swing in demand may trigger commensurate green asset price increases (Demekas and Grippa 2021).

Once the transition occurs, and green assets are more plentiful with technology at scale, a decrease in green asset prices might follow. Hence, uncertain climate policies may induce destabilizing swings in the prices of green assets over time.

As uncertainty contributes to delay the transition towards low-carbon real activities, market pressure to move towards greener technologies will remain limited. If a transition occurs unexpectedly, high-carbon firms will have stranded assets on their balance sheet (Mercure *et al* 2018) and losses in the P&L statement. This, in turn, may translate into credit risk for financial institutions funding them (Battiston *et al* 2017).

Third, policy uncertainty affects risk assessment at the level of financial institutions, which therefore may:

- Assume that others, including governments, will do what is needed in the public interest – so there is no need to act on their side
- Underestimate the systemic spillovers from joint or concentrated exposures to, or fire-sales of, stranded assets

- Ignore – or even encourage – the migration of activities to less-regulated parts of the world and financial markets

The upshot is that policy uncertainty may result not only in a slower-than-necessary green transition, but also in higher risk of financial instability.

A secondary effect operates via a reduced willingness of financial institutions to fund the low-carbon transition, generating a negative feedback loop as the delay in the transition may raise financial instability (Battiston *et al* 2021).

Conclusions: the need for policymakers to act now

Is there a way to lower policy uncertainties so that greening investment decisions can take place rapidly and with large impact? What role should financial regulators and supervisors play?

We argue that these actors, and in general all relevant policymakers, should devote sufficient resources to assessing the implications of policy uncertainty for individual and systemic financial risk, and reflect on the implications of such uncertainty on the financial system.

There is surprisingly little discussion about the role of policy uncertainty as a potential source of idiosyncratic and systemic risk for financial markets. This is where supervisory institutions and central banks should play a more active role.

A systematic analysis of how various policy decisions (eg. carbon tax, banking regulation, subsidies, environmental regulation) – and in particular their variability over time – influence corporate investment decisions and bank

lending conditions could better inform policymakers about the costs of discretionary climate actions and policy volatility, and the related trade-offs.

In particular, policymakers that regulate financial markets and intermediaries could reduce transition risk by following a few basic principles:

- They should strive to render climate-related rules impactful, by making them stable over time, credible in implementation, and predictable in evolution. For the sake of price stability, policy changes should be predictable and not easily reversible.

For credibility, policy changes should be impactful rather than cosmetic. For predictability, rule changes should follow a particular direction, say, increasing the carbon price steadily. To this aim, benchmarking for all three characteristics (stability, credibility, predictability) should be used.

- Rule setting by policymakers and regulators should explicitly consider the impact new rules and regulations could have on (a) existing capital in place, and (b) new investments in high- and low-carbon activities. The asset price effects of rule setting are the driving force of corporate adjustment towards a net zero economy, and an explicit consideration of opportunity costs can help to improve the effectiveness of rule setting.
- Finally, to enhance the effectiveness of climate policymaking, policymakers should take into account expectation formation by financial industry participants, via transparency about (a) climate-related impact of investment (eg. by supporting data standardization, comprehensive collection, full disclosure), and (b)

the longer-term policy agenda (e.g. rule changes), encompassing the international/global dimension of this agenda. ■

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Endnotes

- 1. An example is the UNFCCC COP27 conference held in Sharm-el-Sheik in 2022.*
- 2. For instance, in the transport sector, Scope 3 emissions represent more than 90% of total emissions but are rarely reported, or when reported the quality varies greatly from firm to firm with differences of also 30 times in values across companies (Bressan et al 2022).*
- 3. For instance, while the SEC is eager to leave Scope 3 emissions out of firms' disclosure efforts, both the European Financial Reporting Advisory Group (EFRAG) in charge of updating the European Sustainability Reporting Standards (ESRS), and the International Sustainability Standards Board (ISSB), require Scope 3 emissions disclosure in accordance with the GHG emissions Protocol. Scope 3 emissions cover emissions through corporate's upstream and downstream value chain (eg. suppliers and distributors), business travel, leased assets, and financial exposures through financial contracts (equity and debt).*

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Britain's road to Brexit

Patrick Minford evaluates the progress being made on the Brexit agenda, focussing on trade, regulation and the EU border

In this article I evaluate the progress being made in the Brexit agenda. This has always been one of long-term reform, involving trade with the EU and the rest of the world, as well as the restoration of UK-based regulation.

Free trade: the official assessment misunderstands the gains from international trade agreements

Britain has just signed a highly significant trade agreement with nearly a dozen Asian countries - the Comprehensive and Progressive Agreement for Trade Partnership, the CPTPP; call it the Trans-Pacific Partnership, TPP, agreement for short.

According to the Department of Trade's official assessment the TPP will add 0.08% to UK GDP in the long run, which has been derided by Remainer opinion as negligible compared with the supposed loss of GDP due to lower EU trade, set at 4% of GDP by the Office of Budget Responsibility, a government-funded budgetary watchdog.

These official estimates are flawed by two key mistakes. First, they are based on so-called 'gravity' models which assume that trade effects of trade liberalisation fall off the higher the distance of a trade partner. Second, they assume that trade barriers with the EU must be raised by Brexit in spite of the Trade and Cooperation Agreement, TCA, with the EU whose aim is precisely to eliminate trade barriers between the UK and the EU.

Start with the second; it takes time first for negotiations on numerous details to be concluded, as the long discussions on implementing the Northern Ireland Protocol of the TCA illustrate. It also takes time for people and businesses to adapt to the new border processes. But as the recent agreement on the Protocol show, they eventually succeed.

It is reasonable to assume that other details will similarly be sorted out over time; hence we should assume the TCA achieves its long run objective of removing trade barriers with the EU, in which case there will be no long run EU trade effects.

Now turn to the first issue of the gains from wider trade agreements, found to be minimal by the official model used. In our trade modelling work at Cardiff University, we have repeatedly tested the 'gravity' model on different countries' data and found it to be widely rejected.

One of the major objectives of Brexit is to replace the EU's intrusive precautionary principle with the pragmatic common law principles under which experimentation is permitted to enable vigorous innovation

The reason is that while of course 'gravity' (ie. distance and size) does affect the extent of trade by itself, the effects of trade liberalisation and other changes over time have rather similar effects on all trade and they work by bringing down national prices into line with world competition; a model along these lines is generally consistent with the data.

The 'gravity' model that says they have limited price effects and disproportionately affect nearer and larger trade partners is generally rejected by the data.

How the gravity model fails in tests of its ability to mirror long term trade trends

Many followers of economic debate think that a good test of a theory is its ability to forecast future events. But it turns out that forecasting well is a bad test of a model; many poor models forecast well, and many good models forecast badly.

Forecasts in other words have little to do with how well a model understands the underlying causal processes at work, which is what we care about. Models that are based on exploiting lagged indicators usually do better than good causal models, and all forecasts are upset by big shocks that are unforecastable, reducing forecasting ability all round and making forecast success largely a matter of luck. This criticism also applies to 'likelihood ratio' testing which is based on models' capacity to forecast past data accurately.

Instead, a reliable way of testing models is to ask if they can mimic the behaviour of real-world data. This behaviour is produced by the unknown true model, so the closer a model can get to producing similar behaviour, the greater its claim to be the true model.

This test of a model is known as 'indirect inference' testing; in this method the data behaviour is described accurately by some past relationships found in the data, and the proposed causal model is simulated to see if it implies relationships close to this- and so is 'indirectly' similar rather than 'directly' forecasting data.

In repeated 'Monte Carlo' experiments using mocked-up data from supposed true models we have found that these indirect inference tests are extremely powerful in rejecting false models, whether of the macro economy or of trade.

In recent work at Cardiff we have asked whether a model of world trade including all the major countries or country blocs of policy interest- the US, the EU, China, the UK, and the rest of the world- can mimic these countries' behaviour in trade and output.

We have a 'classical' and a 'gravity' version of the model. The results are striking - as the table below of the probabilities of each model for each country and the world as a whole show rather strikingly. What can be seen is that the gravity model probability falls in all cases below the 5% cut-off level (ie. 0.05), while the Classical model generally has a probability well above this level.

The only exception is the US whose individual facts are not well fitted by either model. Nevertheless, the Classical model fits the world as a whole very well. It also fits UK trade facts particularly well.

You might ask why so many economists adhere to gravity models in commenting on Brexit. The answer seems to be that these models do quite well in mimicking short term macro behaviour, in effect behaving like business cycle macro models, which frequently use the same gravity assumption that trade in different countries' goods compete imperfectly.

Table 1. Test results of the full world global model

Country	P-values	
	Classical model	Gravity model
UK	0.2429	0.0412*
US	0.0037*	0.0078*
Euro area	0.0936	0.0114*
CH	0.0829	0.0142*
World	0.3095	0.026*

Note: P-value * indicates a rejection of the model at 5% significance level.

Source: Minford, P, Dong, X, Xu, Y (2021) 'Testing competing world trade models against the facts of world trade', Cardiff Economics [working paper E 2021/20](#).

But while this assumption works well for the short run, in the long run it breaks down as competition irons out differences between products. We know that in the short run Brexit is bound to cause disruption, but the whole point of Brexit, as we have seen, is to improve long run performance - in the process ironing out the EU trade disruption through the improving TCA.

This testing failure of the gravity model, as we have just seen, applies strongly to UK trade in particular (as found some time ago in [earlier work of ours](#))

The TPP countries currently account for about 6% of our trade in goods- largely food and manufactures. But the key point totally missed in the official assessment is that our importers will now have a barrier-free source of these goods for them to access if they need to and our exporters will have their markets to sell to; this via competition will reduce our import and export prices on these goods to world levels.

This in turn impacts on our consumer choices and our production structure. Eliminating the trade barriers to these goods that we inherited from the EU- which are estimated to average about 20% - would according to our detailed model of UK trade and the economy increase UK GDP in the long run by around 6% - a big gain, very many times the official estimate - and lower consumer prices by 12%.

This is the 'static' benefit, assuming trade does not grow, as of course it will, given that Asia is a fast-growing part of the world economy.

A natural reaction to this estimate will be that, just as the official one was far too small, this one is extravagantly large. It is certainly true that it is based on a long-term assessment, not the short term gravity models used by Remainers.

It also assumes that in the long term there is free trade within this Pacific bloc which is the aim of the TPP; the initial agreement is hedged about with quota restrictions on the amount that can be freely traded but these should be eventually phased out as markets develop and confidence expands that they are not disrupting them; UK businesses will be incentivised to accept easier import access by the reciprocal access for their exports.

Furthermore, the TPP is due to expand as new members join; those interested include S Korea, Thailand, several Latin American economies and both Taiwan and China. The US could also return to being a member. As it expands the TPP will reinforce these competitive effects on our economy.

The gravity models used to condemn Brexit are short term in focus, not much different from the 'macroeconomic' models we use for analysing the business cycle. Hence, they put much emphasis on the short-term EU trade disruption due to the mere fact of creating a new border, which in time with the TCA and WTO rules on 'seamless' borders should disappear; and they do not factor in the long-term effects of lowering the large EU barriers against non-EU trade.

It is these that loom large in the classical trade model that properly explains long term trade/economy movements. Unfortunately, commentators generally look for quick results from policy changes that can only work well in the long term. Brexit was always about the long-term economic gains from self-government and not about quick wins.

Our estimate is aimed at this long-term situation; it is large relative to the short-term and it will take a long time. But Rome was not built in a day, nor will post-Brexit Britain emerge blinking successfully from transitional problems in just a few years.

How this free trade agenda leads to a full Brexit with EU irrelevance

Because of the short-term focus of the current Whitehall consensus gravity model, it is not well understood just what radical implications this free trade has for our future relations with the EU.

As we have seen in the long-term free trade implies equalisation of our home prices with world prices, which in turn means that we would export to the EU at these very same prices and would only import from the EU goods that were priced at the same competitive level.

This means that any threats by the EU to levy tariff or other trade barriers on UK goods in the course of any future negotiations on the TCA and any proposed new UK regulations, would be entirely empty. The reason is simple

enough; UK export prices to the EU would be unaffected, as for example should they fall, UK goods would be diverted to other world markets at the full world price.

Hence any EU trade barriers would simply raise the prices paid for UK goods by EU consumers. Should EU sales suffer as a result, then more goods would be sold elsewhere at world prices.

Similarly, if the UK were to raise barriers against EU imports in retaliation against any such EU barriers, it would not affect UK prices of these imports as they would have to compete with world imports to be sold at all. As a result, EU sellers' prices would be reduced. If as a result they supplied less imports, these would be replaced by imports from elsewhere.

It follows that the TCA itself would become irrelevant, dominated as our trade with the EU would now be by the prices prevailing in the world at large. Furthermore, the EU would get most welfare from UK trade free of barriers as this would keep down the prices of UK goods to its consumers and keep up the prices of its UK exports to world prices.

Hence, we would expect that our relations with the EU would default to barrier-free trade. As for UK regulations, the UK would be entirely free to set them as it suited it best, free of EU trade threats.

Progress in restoring UK-based regulation

It can be seen from this trade analysis that the UK will be unrestricted in its ability to restore UK-based regulation once free trade around the world is created. Meanwhile there has been progress on this front on the ground.

The Retained EU Law Bill currently going through Parliament mandates the sunseting of all remaining EU regulations by the end of 2023; while this target date has now been abandoned as too ambitious, it is reasonable to assume the sunseting process will be completed in the next year or so.

Most significantly in any case, existing regulations by now are all the responsibility of UK regulators, under the direct control of Parliament. This will ensure that UK regulation is done by new UK processes supervised by UK law and regulators in consultation with UK industrial interests. The sunset deadline forces these bodies to work urgently to find optimal UK replacements.

One of the major objectives of Brexit is to replace the EU's intrusive precautionary principle with the pragmatic common law principles under which experimentation is permitted to enable vigorous innovation. As long as EU regulations are left in place by default, their replacement is delayed by bureaucratic inertia. As nature abhors a vacuum, so the abolition of remaining EU regulations should stimulate the necessary consultations to produce new UK-based regulation.

Conclusions

What this all implies is that the Brexit agenda is indeed being rolled out, contrary to much Remainer vilification, and is set to bring material long term benefits to the UK economy as this continues, besides ensuring that Brexit is fully completed.

Meanwhile EU trade will continue to bounce back in the short run as the government continues to negotiate the necessary details to achieve the TCA's aim of free trade with the EU. With Brexit now well on track, it is important that our Civil Service establishment gets behind it and does not minimise its significance.

We should add that those wanting Brexit to succeed in the long run should not be afraid of an agenda for improving the TCA and relations with the EU, fearful of making concessions over short run issues. What our analysis here shows is that in the long run, once free trade truly prevails, the UK will be entirely free to set its own trade and regulative policies, regardless of EU pressures. ■

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Economic growth cannot solve everything

THE ONLY
SUSTAINABLE
GROWTH IS
DEGROWTH

Degrowth isn't the same as a recession – it's an alternative to growing the economy forever. Katharina Richter discusses the benefits

The UK economy unexpectedly shrank by 0.3% in March, according to the [Office of National Statistics](#). And though the country is likely to narrowly avoid an official recession in 2023, just as it did the previous year, the economy is projected to hit the worst growth rates since the [Great Depression](#), and the worst in the [G7](#).

For many people, this certainly feels like a recession, with [food prices](#) soaring and [pay falling dramatically](#) below inflation meaning many people are having to reduce their standard of living.

Against this backdrop, the main political parties are focused on delivering economic growth for a better future. One of Prime Minister Rishi Sunak's five [priorities](#) for 2023 is simply "*growing the economy*", while opposition leader Keir Starmer has [pledged](#) to turn the UK into the fastest growing G7 economy.

Sunak and Starmer's priorities reflect conventional economic [wisdom](#) that "*growth, growth, growth*" increases incomes and standards of living, employment and business investment. When the economy doesn't grow, we see unemployment, hardship and inequality.

Growth cannot solve everything

However, economic growth on its own is not going to solve these multiple and intersecting crises, as it only counts the total value of goods and services produced without measuring qualitative change – whether this stuff makes you feel happy or secure.

In contrast, an increasing number of [policymakers](#), thinkers and activists argue for abandoning our obsession with growth at all costs. Instead of pursuing GDP growth, they suggest orienting the economy towards social equality and wellbeing, environmental sustainability and democratic decision making. The most far reaching of those proposals are made under the umbrella term of degrowth.

Degrowth is a set of ideas and a [social movement](#) that presents a comprehensive solution to these issues. The pandemic demonstrated that a new normal can be achieved at pace, as we saw sweeping changes to how many of us lived, worked, and travelled.

At the time, [headlines](#) equated the pandemic-related GDP squeeze with the perceived 'misery of degrowth'. With persistently high inflation rates and the cost of living still spiralling, these debates are going to resurface.

Degrowth envisions a society in which wellbeing does not depend on economic growth and the environmental and social consequences of its pursuit [...] proposes an equitable, voluntary reduction of overconsumption in affluent economies

Degrowth is not the same as shrinking GDP

To begin with, degrowth is not the same as negative GDP growth. Instead, degrowth envisions a society in which wellbeing does not depend on economic growth and the [environmental](#) and [social](#) consequences of its pursuit. Degrowth proposes an equitable, voluntary reduction of overconsumption in affluent economies.

Equally important is to shift the economy away from the ecologically and socially harmful idea that producing more stuff is always good. Instead, economic activity could focus on promoting care, cooperation and autonomy, which would also increase wellbeing and give people a bigger say in how their lives are run.

Yet, for many people the word smacks of misery and the type of frugality they are trying to escape from during the cost of living crisis.

But degrowth, if successfully achieved, would arguably feel better than a recession or a cost-of-living crisis. Here are three reasons why:

1. Degrowth is democratic

The first is the undemocratic and unplanned nature of a recession or cost-of-living crisis. Most citizens would agree, for example, that they had little to no control over the deregulation of the finance industry, and subsequent boom in sub-prime mortgage lending and derivatives trading that caused the 2008/09 financial crash.

Degrowth, on the other hand, is a profoundly democratic project. It emphasises direct democracy and deliberation, which means citizens can shape which economic sectors are decreased and by how much, and which ones will grow and by how much.

One example of such a democratic endeavour is the [Climate Assembly UK](#), whose 108 members were selected through a civic lottery process and were broadly representative of the population. After listening to expert testimony, the assembly issued a number of [recommendations](#) to support the UK's net zero climate target. Over a third of all members prioritised support for sustainable growth. Economic growth itself was not among the top 25 priorities.

2. Degrowth would be egalitarian

Recessions, especially when coupled with fiscal austerity, tend to amplify existing inequalities by hitting the poorest members of society first, including [women](#), working-class communities and ethnic minorities.

Degrowth drastically differs from a recession because it is a redistributive project. For instance, a [universal basic income](#), an unconditional monthly state payment to all citizens, is a popular policy with degrowthers.

The degrowth vision is that basic income should guarantee a dignified living standard, remunerate [unpaid care](#), and provide access to healthcare, food and accommodation for those in need. It could be financed by 'climate income' schemes that tax carbon and return revenues to the public.

3. Degrowth wouldn't hinder climate action

In an economy reliant on growth, a recession is generally bad news for the environment.

For instance, for the UK to hit its net zero [targets](#), it must make annual public investments of between £4 billion and £6 billion by 2030. A recession would threaten public spending as well as the confidence investors have in low carbon developments in transport, housing or energy.

But such investments do not have to depend on growth but could instead be made through collective and democratic decisions to make climate action a priority. Carbon taxes will play a large part in this, as will stopping fossil fuel subsidies like the [£3.75 billion tax break](#) granted to develop the Rosebank oil and gas field in the sea north of Scotland.

To make sure we stay within the environmental limits within which we can safely operate, sometimes known as our [planetary boundaries](#), degrowth suggests democratically establishing limits on resource use. For example, global greenhouse gas emissions or non-renewable energy use could be [capped](#) at a given level and decline annually.

Sharing these resource 'caps' among the population would ensure that while we stay within these safe environmental spaces, everyone has equitable access to the resources required to lead a fulfilling life. In contrast to the pursuit of endless growth, degrowth puts both climate action and human [wellbeing](#) at its heart. ■

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Lessons from recent stress in the financial system

Aymo Brunetti argues that big banks must become globally resolvable, or significantly 'smaller'

The subsidised emergency takeover of Credit Suisse by UBS brings the current global 'too big to fail' regime into question. This column argues that an in-depth analysis of the global resolution framework by both regulators and academics is needed. The main question is whether a resolution of a global systemically important bank is indeed feasible in plausible scenarios. An affirmation would clearly be the best possible result of this analysis.

However, if such a resolution proves not to be realistic, then there should be no hesitation to drastically reduce the global risks of such institutions via regulation of their business models.

Sunday, 19 March 2023 was a historic day for Swiss economic policy – and not in a positive sense. It was the day Swiss authorities announced a subsidised shotgun marriage between the two globally systemic Swiss banks. Credit Suisse had suffered a dramatic loss in confidence in its business model that triggered a spectacular bank run, which was ultimately resolved by a de facto takeover by UBS.

This event is not only relevant for Switzerland but for the entire regulatory framework of global financial markets. It puts a huge question mark on whether global 'too big to fail' (TBTF) provisions for such cases will ever work as planned.

Instead of a resolution according to the gone concern framework promoted internationally by the Financial Stability Board (FSB 2021), the Credit Suisse case was handled as if we were back in 2008. The government stepped in and used taxpayer money to avoid a potentially catastrophic breakdown of an obviously still 'too big to fail' institution.

And all international observers applauded this swift action that clearly went against the provisions painstakingly designed, implemented, and internationally coordinated in the past decade.

Swiss authorities will certainly hurry to produce an in-depth analysis of the case and its regulatory consequences. The case, however, goes far beyond this and deserves a thorough international inquiry as it is relevant for the regulation in all financial centres.

It is important not to hastily discard the 'too big to fail' concept of global resolutions of large banks in view of the recent experience

In my view, the follow-up to the Credit Suisse case must now finally and unequivocally achieve the goal declared in 2008: there must be no company that is too big to fail! And ultimately there are only the approaches mentioned in the title of this column.

Either a global resolution without state support is possible in plausible crisis scenarios, or the big banks must become 'smaller'; the quotation marks mean less risky, in the sense that it may no longer be allowed to do business that endangers global financial stability.

Resolvability remains the silver bullet

The concept that a business idea can fail and thus a company can go bankrupt is one of the fundamentals of a functioning market economy. If this possibility does not exist, it leads to seriously distorted incentives and to dysfunction.

Large banks that are 'too big to fail' are therefore unacceptable in a market economy, and correspondingly intensive efforts were made to find a solution after the Global Crisis. The goal of global regulatory efforts became clear very quickly: a large bank must become resolvable and thus lose its 'too big to fail' status.

This means that in the event of a crisis, the authorities must be able to order a restructuring or an orderly bankruptcy. If this succeeds, it is clearly superior to all other regulatory approaches.

Indeed, any alternative means regulating the banks' business activities, which has the disadvantage of any planning approach. Not only would the authorities have to know the existing businesses and their risks and regulate them, but they would also have to continuously assess any innovation and re-regulate accordingly.

In view of these bureaucratic challenges, it is much more effective to leave the big banks their entrepreneurial freedom on the condition that they can be wound up at any time.

This approach remains the silver bullet of big bank regulation and has guided international 'too big to fail' regulatory efforts over the past decade. This was also the case in Switzerland where reports of two expert groups that included regulators, academics, and private sector representatives provided the blueprint for the current regulation (Swiss TBTF Commission 2010, Swiss Strategy Commission 2014).

Based on these requirements, the big banks rebuilt their organisation at great expense so that the systemically important parts could be spun off in the event of a crisis. At the same time, bail-in capital and international agreements were to ensure that the rest of the bank could be restructured or wound up in an orderly manner.

Urgent feasibility analysis

The recent decision by the Swiss authorities not to wind down Credit Suisse according to this procedure now raises fundamental questions. Did they simply find and implement a less far-reaching alternative here, or would proceeding according to plan not have worked, or triggered a severe global financial crisis? Was a global resolution of Credit Suisse feasible, and if not, why not?

These questions are of fundamental importance not only for Swiss financial market policy, but also for international ones, since 'too big to fail' regulation works according to these rules in all locations of global systemically important banks. Switzerland can and should undertake this analysis for itself as soon as possible but can also press with some legitimacy for a rapid and in-depth international evaluation of the event and its consequences; this is of interest to all major financial centres.

This in-depth analysis should cover the specific case of the demise of Credit Suisse in spring 2023, but also think through alternative plausible crisis scenarios. It can lead to three conceivable outcomes:

1. A global resolution would be possible and defensible with acceptable risks.
2. A global resolution would be too risky today because there are still substantial gaps in the concept and/or a bankruptcy of a major bank in clearly identifiable businesses would trigger massive turbulence.
3. A global resolution is fundamentally not feasible under plausible scenarios.

Only based on this analysis – which should be available as soon as possible in view of the urgency of the problem and the political pressure – will it then be advisable to adjust ‘too big to fail’ regulation.

Of course, ideal would be to arrive at result 1, ie. that resolution according to plan is possible. The conclusion would then be that the fears of the authorities in the case of Credit Suisse were exaggerated and that – if necessary, with a few cosmetic adjustments in the international agreements – in the future a major bank can be confidently sent into forced restructuring or bankruptcy in the event of a crisis.

Unfortunately, based on the current state of knowledge, this outcome is rather unlikely. One would have to be very certain and have a consensus on this within the Financial Stability Board to come to the conclusion that no regulatory adjustments are needed.

In my assessment, the most likely outcome is 2: global resolution is not fundamentally impossible, but it will take some and substantial adjustments before this concept really works. It seems clear that a number of the reforms

needed to achieve this would only be possible in an international context involving all relevant financial centres. Accordingly, it is likely to take a long time.

Individual countries that are especially affected, such as Switzerland, should, therefore, seriously consider taking earlier actions such as significantly higher capital requirements for transactions that endanger global resolvability.

It cannot be ruled out that the conclusion 3 will be reached, ie. that global resolution is fundamentally not possible and even reforms cannot save the system. This would be a very far-reaching finding, which would also have to lead to a fundamental realignment of big bank regulation internationally.

From the perspective of Switzerland, which is particularly exposed, this would mean that the 'too big to fail' problem could only be solved by a drastic downsizing of UBS's global systemically important activities. In fact, Switzerland could probably no longer be the host country of such a bank.

Of course, it is good for a country with a sizeable financial centre if a major global bank is based here. But that is only on the condition that its business model can fail, just like any that of any other company.

If that is not the case, then a small country especially should not hesitate to accept the withdrawal of the headquarters of such a bank; the potential costs of a failure are far too great. There should be no industrial policy style subsidies in favour of large banks.

Conclusion

Overall, it is important not to hastily discard the 'too big to fail' concept of global resolutions of large banks in view of the recent experience. Considerable efforts have been made by the banks and the authorities in recent years to

make this possible. Resolvability remains the most efficient way to tackle the problem of the implicit 'too big to fail' subsidy for big banks.

However, if the analysis concludes that the concept cannot be implemented even with additional regulatory efforts, then economic policy must aim at making the banks smaller and/or globally less risky, even with far-reaching interventions.

This is especially the case for a small country with a large financial centre. Given the internationally record-breaking size of Switzerland's largest bank in relation to GDP, the country simply cannot afford an UBS with a state guarantee. Larger countries might have the fiscal means to do this but subsidising global banks is an especially inefficient and unfair policy. ■

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Editors' note: This column is part of the Vox debate on 'Lessons from Recent Stress in the Financial System.' This article was first published on [VoxEU.org](https://voxeu.org).

The background of the slide is a collage of Chinese banknotes. A 20 Yuan note is prominent in the upper left, featuring a portrait of Mao Zedong and the text '中国人民银行' (People's Bank of China) and '毛泽东 1893-1976'. Below it, a 100 Yuan note is visible, also featuring Mao Zedong. The notes are slightly overlapping and have a soft, semi-transparent appearance.

Will China's new financial regulatory reform be enough?

China's leadership has made financial risk a core priority. Martin Chorzempa and Nicolas Véron discuss the regulatory reforms

Executive summary

Effective financial supervision plays a crucial role in maintaining financial stability and a healthy financial system. China's leadership has made financial risk a core priority, and in reforms approved in March 2023, it reassigned regulatory responsibilities, creating a new supervisory body that will take over some responsibilities from the central bank, the banking and insurance regulator, and the securities regulator.

The aim is that a change to the financial supervisory architecture (who does what in financial supervision) will make China's system more effective and stable. In this policy brief, we argue that this incremental reform will not solve the core issues China faces in financial supervisory effectiveness.

We provide an overview of China's large and complex financial system, including its largely state-owned banks (some of which are the largest in the world by assets), securities markets and other financial intermediaries.

Traditional divisions between different types of activities and institutions have been blurred by the rise of large financial conglomerates, risk-transfer techniques and internet-based finance.

Reforms in 2018 to China's supervisory architecture did not eliminate perceived shortcomings, including failures to effectively regulate financial conglomerates, fintech and regional banks.

We then survey global benchmarks against which China's financial supervisory architecture can be compared, including the United States and European Union. China's supervisory system is already more streamlined, at least on paper, than either of these most comparable global counterparts. Like them, China's system does not correspond exactly to any of the three textbook archetypes of supervision: sectoral, twin-peaks or integrated supervision.

Ultimately, the effectiveness of China's financial supervisory architecture suffers from excessive state intervention in the financial system through other channels, including through the unique and pervasive influence of the communist party, which hampers supervisory independence and makes it difficult to establish accountability for regulatory failures.

While the recently announced reform may improve coordination across supervisory bodies, coordination within the new quasi-integrated supervisor, across central departments, and between them and local branches, will remain a challenge.

China consolidated its financial supervisory architecture in 2018, but even after these reforms, supervisory failures have persisted

1 Reform looms for China's financial system

President Xi Jinping's determination to exert more control over China's government and economy faces a new challenge: overhauling a system of financial regulation that oversees a highly complex web of banks, nonbanks, shadow banks and competing interests in local and national governments and the party bureaucracy.

As China's leaders have acknowledged, the country's economy has had trouble returning to its growth rates of past decades¹. These difficulties pre-dated the pandemic and include a slumping real-estate sector, weak private investment, feeble consumer demand and deteriorating local government finances.

In the face of these and other issues, China's leadership is pondering deeper questions of how to optimise its state and party organisations and their roles in financial regulation².

Before the latest announced changes, China's financial supervisory architecture was restructured five years ago, merging the authorities in charge of banking and insurance into the China Banking and Insurance Regulatory Commission (CBIRC), and giving the People's Bank of China (PBOC) a greater role in financial-sector oversight.

On 7 March 2023, a new reform was announced, with the CBIRC renamed the National Financial Regulatory Administration (NFRA) and acquiring some competences previously located in other agencies. Further supervisory integration is being considered soon under the authority of the Chinese Communist Party (CCP)³.

Financial supervision is a multifaceted public-policy task with several objectives, most prominently financial stability (addressing systemic risk), financial consumer protection (addressing information asymmetries) and financial market integrity (addressing fraud and criminal practices).

Even in regimes that do not share China's party-dominated features, achieving these diverse and sometimes mutually misaligned tasks is difficult, and financial supervisory architecture choices – who does what among public entities with a financial supervisory mandate, or supervisors⁴ – have been a matter of animated debate in many jurisdictions, often in the wake of a financial crisis.

This policy brief aims to inform the discussion in relation to China with accounts of experiences in other jurisdictions, especially those with a large and complex financial sectors, that may serve as reference points. It also aims to inform readers outside China about Chinese financial-sector evolution and policy developments.

It focuses on supervisory architecture, stopping short of a comprehensive consideration of current financial stability challenges and financial services policy reform in China. It argues that although the financial system needs reform, no fundamental change of supervisory architecture is presently necessary.

Over the last four decades, a time of tremendous economic growth, China's financial sector has grown much more complex, a complexity compounded by the pervasive role of the CCP spanning all organisational structures of the government, supervisory agencies and most financial firms.

Reforming the financial supervisory system to avoid major bank failures and system-wide instability is an ongoing challenge, to which the responses of the Chinese authorities have been broadly effective so far, while largely aligning with the letter of applicable international financial regulatory standards.

On paper, China's current financial supervisory architecture is more streamlined than the equivalents in the United States and European Union, where the architecture of financial supervision is exceedingly complex because of burdensome historical and political legacies.

China's recently announced reshuffle, like previous changes in supervisory architecture, appears incremental rather than radical. It will not, however, resolve fundamental challenges hobbling China's financial system, which are not linked to specific choices of supervisory architecture but rather to excessive CCP and state intervention, and the lack of supervisory independence resulting from China's CCP-dominated governance system.

Despite the growth of private-sector financial firms, China's banking system remains dominated by a handful of gigantic institutions that are majority-owned by the central government. Similarly, several of the larger insurers are central state-owned enterprises. Many of the largest securities firms are mixed-ownership enterprises, with state entities holding significant stakes.

The party-state structure applies heavy-handed control over capital and credit allocation decisions, subject to political or government priorities or favouritism. Some Chinese scholars have criticised the system as reflecting excessive state intervention⁵.

These features risk a collision with the normal functions of financial regulation, such as formulating minimum capital requirements for banks and insurers, cleaning up failing or failed borrowers, ensuring regulatory compliance, conducting stress tests and crafting disclosure rules to protect investors.

2 China's financial sector and current supervisory architecture

The starting point for China before Deng Xiaoping started the reform era was a so-called mono-bank system under the planned economy, in which the People's Bank of China played the roles of central bank, regulator and monopolistic commercial bank all in one (Lardy, 1998).

2.1 China's financial sector has unique features and has become very large and complex

Since 1978 several commercial banks have been carved out of the PBOC, and the creation of other banks and financial firms has been allowed, resulting in China now having a very large and complex financial sector, by most measures among the largest in the world. The Chinese banking system is the world's largest in terms of aggregate assets, ahead of the euro area and well ahead of the United States (Figure 1)⁶.

Its public equity market is second only to that of the United States in terms of total market capitalisation. Its bond market has also become the world's second largest, behind the US and ahead of both Japan and the euro area⁷.

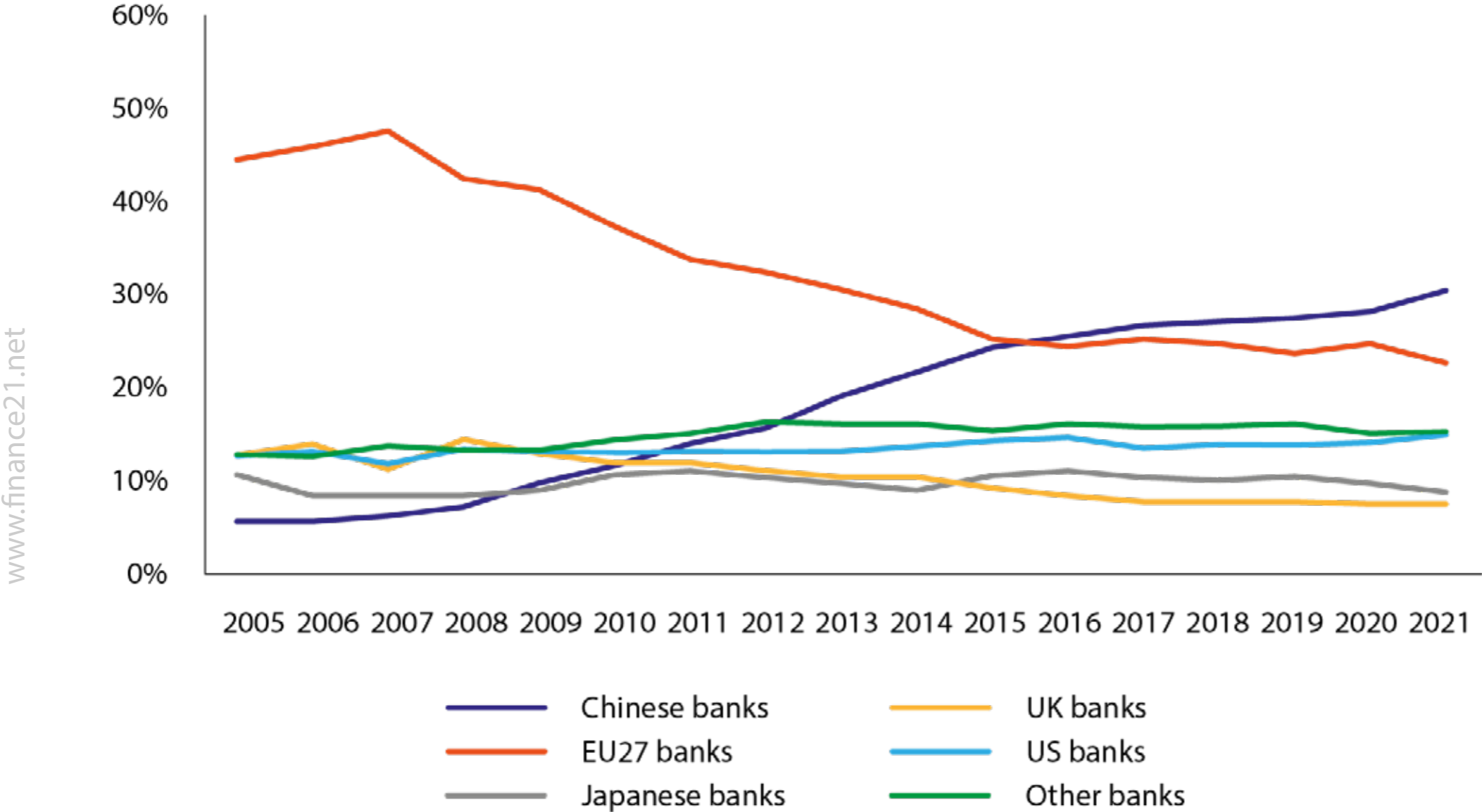
Since 2019 the world's four largest banks by total assets have been Chinese: the Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China and Bank of China⁸. Many of the smaller Chinese banks – some of which are very large by international standards – have diverse shareholder structures that includes a mix of public and private-sector entities.

Similarly, several of the larger insurers are central state-owned enterprises, with the significant exception of Ping An, a private sector company⁹. Several of the largest securities firms, including CITIC Securities and Haitong, are mixed-ownership enterprises, with state entities holding significant stakes, though not the majority of equity.

The high degree of state ownership and intervention in the financial sector is a defining feature of China's financial system, including through the mechanisms associated with the involvement of the CCP. State and CCP channels of influence include ownership, personnel appointments and more, all of which complicates financial supervision.

The party-state interferes in multiple ways in the operational management of financial firms, through detailed regulations but also direct nudging (or heavy-handed direction) of capital and credit-allocation decisions.

Figure 1. Geographical distribution of the world's top 100 banks by total assets, 2005–21



Source: Bruegel based on *The Banker*.

The CCP Central Organisation Department is the main institutional player for the appointment of the top executives of the largest state banks. These executives double as government officials with vice-ministerial rank (Heilmann, 2005) and often revolve in their careers between state financial firms and supervisory bodies.

For example, the current top banking supervisor, Guo Shuqing, was China Construction Bank chair from 2005 to 2011, and his successor there transitioned to the bank chairmanship from leading the PBOC's anticorruption body.

To be sure, some of these features are not entirely unique to China. It is natural that the state selects the executives of banks in which it holds majority ownership. 'Revolving doors' between government and the financial industry exist in many other countries, including the United States. And neither financial repression nor directed credit are exclusive to China.

Still, the role of state-owned financial firms is much greater in China than in any other of the world's very large financial jurisdictions, and the CCP has no functional equivalent almost anywhere else.

The complexity of China's financial sector results in part from the country's extraordinary burst of entrepreneurship since the 1980s, as new types of private financial firms have emerged, including asset managers, leasing firms, peer-to-peer (P2P) lending platforms and specialised insurers.

The four largest state-owned banks are no longer as dominant, falling from 95 percent of the total assets of Chinese banks among the world's 1,000 largest banks in 2002, to 56 percent in 2022¹⁰. The 16 other Chinese banks in the 2022 ranking have diverse shareholding structures, and half of them are headquartered in places other than Beijing or Shanghai. The smallest, Bank of Ningbo, had over \$316 billion in assets as of end-2021, equivalent to the twelfth-largest bank in the United States.

Like the US and EU, but unlike almost any other jurisdiction in the world, China now has multiple financial centres. In addition to Beijing, where the largest banks and other state-owned financial giants are headquartered, these include: Shanghai, a hub for the equity market with many large branches of banks headquartered elsewhere; Shenzhen, the most vibrant centre for startup finance and venture capital; Hong Kong, a major venue for international finance despite its loss of stature in recent years; and Dalian, the location of China's main futures exchange and commodities market.

By contrast, in the next largest jurisdictions (other than China, the EU and the US), a single financial centre dominates: Tokyo in Japan, London in the United Kingdom, Toronto in Canada, Sydney in Australia¹¹, Seoul in Korea and Zürich in Switzerland.

2.2 China's evolving financial supervisory arrangements and challenges

China's financial rulemaking has converged substantially with relevant international standards in recent decades.

In particular, China's accounting standards are largely consistent with the International Financial Reporting Standards. China has also adopted the international standards defined by the Basel Committee on Banking Supervision.

On the latter point, China is better aligned with the internationally accepted norms than the EU; on the former, China is better aligned than the US, which maintains a purely national accounting framework¹².

The Chinese government established the China Securities Regulatory Commission (CSRC) in 1992, the China Insurance Regulatory Commission (CIRC) in 1998 and the China Banking Regulatory Commission (CBRC) in 2003.

This 'one bank and three commissions' model involved specialised supervisors for the different types of financial firms and markets, with the central bank, the PBOC, sometimes playing a coordinating role.

In 2015, China established a deposit insurance agency, initially hosted directly by the PBOC (Desai, 2016), and entrusted since 2019 to the Deposit Insurance Fund Management Co. Ltd, a PBOC subsidiary¹³.

The rise of shadow banking, for example in wealth management products and trusts that also conducted lending, especially after 2008, blurred lines between the regulatory silos and led to a rethink.

The International Monetary Fund (IMF, 2017, page 34) found in its last published Financial Sector Assessment Programme report on China that *"oversight of risks is hampered by a regulatory architecture that can leave significant gaps in functional supervision"* and that incentivises regulatory arbitrage. Financial firms that performed the same functions but took a different form could face vastly different regulatory requirements and oversight.

Since that IMF report was published, the Chinese authorities have taken steps to contain the risks of shadow banking, clamping down on some of the regulatory arbitrage like banks' off-balance-sheet lending, but have struggled to keep pace with some financial-sector developments.

Online P2P lending illustrates the pitfalls of a supervisory architecture in which supervisory authority is determined by the type of financial firm. Most P2P lending platforms were effectively underground banks masquerading as tech companies (Chorzempa, 2018).

None of the supervisors had been given explicit authority over the P2P segment and it grew to massive scale, at which point none wanted to touch it and risk being blamed for the eventual implosion. Chinese officials estimated

that 50 million investors were involved, with around 800 billion renminbi (\$115 billion) outstanding when authorities shut down the entire P2P industry in 2019–20¹⁴.

The CIRC was long widely viewed as captured by the insurance industry, and in 2017 its chairman Xiang Junbo was arrested for corruption. It failed to police risky behaviour, like the sale of risky short-term investments disguised as insurance, which led to the high-profile collapse of large insurers, requiring the government to step in at enormous cost and effort to restructure them (eg. Anbang Insurance Group in early 2018).

With the stated aim of improving coordination among financial authorities, in the wake of the 2017 National Financial Work Conference, China established the Financial Stability and Development Committee (FSDC), headed by a vice premier (Liu He) who outranked the heads of regulatory agencies, and with a small secretariat hosted by the PBOC.

China consolidated its financial supervisory architecture in March 2018, merging the CIRC into the CBRC to form the China Banking and Insurance Regulatory Commission. The PBOC took over some of the CBIRC's policymaking functions related to overall financial stability and systemically important financial institutions. The CSRC remained mostly untouched in that round of reform¹⁵.

Even after these reforms, supervisory failures have persisted. A failing bank in Inner Mongolia, Baoshang Bank, was taken over by authorities in May 2019 and later sent into bankruptcy, the first Chinese bank in two decades to do so.

Authorities blamed its controlling shareholder, the Tomorrow Group, a conglomerate whose founder Xiao Jianhua was swept up in a corruption probe, for treating Baoshang as a 'piggy bank' through lending to companies associated with the parent¹⁶.

Such lending within the same group of entities, known as related-party lending, and corruption also played a role in serious issues at the Bank of Jinzhou in Liaoning Province, Hengfeng Bank in Shandong and several other relatively small local financial institutions.

In response to the challenge of supervising financial conglomerates, the PBOC created a financial holding company regime in November 2020, through which it supervises at the group level companies that control banks or multiple financial firms, or surpass certain thresholds for financial assets¹⁷.

The lack of effective coordination, especially between the CSRC and the PBOC/CBIRC, and despite the creation of the FSDC, played a role in the last-minute cancellation of Ant Group's blockbuster initial public offering (IPO).

The PBOC and CBIRC had not decided on a stable regime to regulate Ant Group, a complex financial technology firm, at the time the CSRC approved its IPO. When the risks posed by Ant Group's size and business model were revealed late in the process, authorities opted to hastily cancel the offering.

A more effective approach would arguably have had the CSRC coordinate with the PBOC and CBIRC to ensure their approval of the IPO of a firm under their authority (Chorzempa, 2022, page 219).

The coordination challenge is not only horizontal, across central authorities in Beijing, but also vertical, between authorities in Beijing and those in local governments – and also in the PBOC, CBIRC (and future NFRA) and CSRC, and between their head offices in Beijing and their local offices.

While the CBIRC has supervised all banks and insurers, other financial firms not subject to the CSRC's authority have typically been supervised by financial services bureaux at the provincial and/or sub-provincial levels¹⁸.

Traditionally these have included small loan companies, local asset-management firms and financial leasing firms, but more recently also fintech firms that provide nationwide services through the internet. The rise of such nonbank financial firms supervised at the local level poses challenges for supervision, as local regulators lack both the authority and capacity to effectively oversee such firms' activities.

These challenges are compounded by generally insufficient resources allocated to financial supervision in China, at least at the central level. The IMF (2017, page 39; also Figure 11 on page 40) noted that supervisory resources *"are insufficient to adequately oversee a large and complex financial system, and need to be substantially increased."*

There is no indication that this shortcoming has been substantially addressed since. The new reforms may actually make the situation worse as they involve significant pay cuts for supervisory staff and other civil servants, which is likely to impede talent attraction and retention, and to create even more avenues for supervisory capture and corruption.

3 Experiences from other jurisdictions

The unique features of China's financial sector call for a highly tailored policy and supervisory architecture. There is no reason for China to replicate any model from abroad, but knowledge of relevant experiences in other jurisdictions can usefully inform the Chinese policy debate, if only to avoid repeating mistakes made elsewhere.

Chinese officials have in the past asked for advice and studied foreign models, including those of the United Kingdom and United States, when considering reforms¹⁹.

3.1 Varieties of financial supervisory architecture

In most countries, the specialised public agencies tasked with the supervision of financial firms and markets are only decades old (Hotori *et al* 2021), with the result that there is less depth of accumulated comparative experience

in this than in other policy areas for which China has looked abroad for inspiration. For example, Germany created a securities regulator only in 1994, two years after the establishment of the CSRC.

A commonly held categorisation identifies three main archetypes:

- A sectoral supervisory architecture (also referred to as institutional or functional) in which separate agencies supervise, for example, banks, insurers and securities firms. This is the main organising principle of financial supervisory architecture in China.
- An integrated architecture entails a single authority in charge of most or all supervisory roles, as is the case with Japan's Financial Services Agency (FSA) or Germany's BaFin²⁰.
- A 'twin peaks' architecture distinguishes between prudential supervision, aimed at mitigating systemic risk and preserving financial stability, and conduct-of-business supervision, aimed at mitigating information asymmetries and protecting savers, investors and other consumers of financial services, as well as the integrity of the system as a whole²¹. Australia, Belgium, the Netherlands, South Africa and the United Kingdom all operate under a twin-peaks architecture. In the UK, the Bank of England is the prudential peak and the Financial Conduct Authority the conduct-of-business peak.

Realities are always more complex than any such taxonomy can capture, and each category comes with significant variations, based on the circumstances that led to its adoption. Intersecting the three archetypes is the central bank's involvement in financial supervision, a question of relevance for China, as previous debates over architecture have included suggestions to integrate supervision under the PBOC²².

In a sectoral framework, it is common but not universal that the central bank or a body under its direct authority is the banking supervisor. The prudential authority is under the central bank in most twin-peaks jurisdictions (but not in Australia).

There is more variation in integrated supervision countries; the integrated supervisor is either the central bank itself (eg. in Hungary, Ireland, Russia, Singapore), or a separate institution (eg. in Germany, Japan, South Korea, Switzerland).

Some maintain mutually independent bank examination channels at the central bank and the integrated supervisor (eg. Japan), while others have organised a division of labour (eg. Germany, where the Bundesbank performs most operational banking supervision, which feeds into BaFin's decision making²³).

Resolution, a hot topic in China following the recent bank failures, is an additional point of differentiation. The creation of a dedicated resolution authority – thus avoiding what has often been described as 'constructive ambiguity' as to how failing banks may be handled – has happened only very recently in most jurisdictions other than the US, where the Federal Deposit Insurance Corporation (FDIC) was established for that purpose in 1934.

In most cases, bank-resolution authority is vested in the main banking supervisor – for example, BaFin in Germany, the FSA in Japan (jointly with the national deposit insurer) and the UK Prudential Regulatory Authority (part of the Bank of England). The main outliers are the United States with the FDIC, and the EU, as detailed below.

3.2 China's benchmarks and their limitations

Because of the massive size and complexity of China's financial system, for matters of financial supervisory architecture, the most meaningful comparison points are the US and the EU (or euro area)²⁴.

For some aspects of the discussion on supervisory architecture, Japan and the UK can also provide useful reference points; both, however, have smaller financial systems, and their complex financial activities overwhelmingly occur in one location, respectively Tokyo and London, a considerably simpler setup than in China, the US or the EU, where competition among financial centres is associated to some extent with rivalry between the corresponding local governments. Other jurisdictions are generally too small for a direct comparison to be useful.

A common feature of the US and EU financial supervisory architectures is their considerable complexity and related challenges of turf delineation and overlap – much greater, on the face of it, than in China.

The US has four federal prudential supervisors for deposit-taking financial firms: the Federal Reserve, FDIC and Office of the Comptroller of the Currency (OCC) for banks, and the National Credit Union Administration (NCUA) for the separate system of credit unions. The FDIC is the resolution authority for banks, and the NCUA for credit unions.

In addition, each US state has its own autonomous banking supervisor, although in practice there is significant coordination with their federal peers. There is no US federal insurance supervisor; even large nationwide insurers are supervised only at state level.

The Securities and Exchange Commission has a broad mandate over securities markets, but must share the turf of derivatives markets with the Commodities Futures Trading Commission, a division of labour that is a historical legacy with no apparent justification in substance²⁵.

There are separate supervisors for publicly sponsored specialised financial institutions, anti-money laundering supervision and macroprudential oversight. Thus, the US supervisory architecture has many elements of a sectoral architecture, but is considerably more complex.

In the EU, arrangements at member-state level are much more variable than at state level in the US, let alone at provincial level in China. To start with, the European Central Bank (ECB) is the central bank for most but not all EU countries²⁶, most of which have several financial supervisory authorities under different models.

The 20 countries of the euro area, together with Bulgaria, have in the last decade pooled banking supervision in a Single Supervisory Mechanism (SSM) that brings together the ECB as central decision-making institution and the respective national bank prudential supervisors²⁷.

For these countries, the Brussels-based Single Resolution Board plays a central but not exclusive role in resolving larger banks. Smaller banks in the banking union, and all banks in other EU countries, are resolved by national resolution authorities, if not through a court-ordered bankruptcy process (Gelpern and Véron, 2019).

Three other sectoral EU-level agencies coordinate supervision, respectively for banking, insurance and pensions, and securities and markets. Aside from limited exceptions, however, they are not financial supervisors, which makes their names partly misleading²⁸. The EU is also in the process of creating a central Anti-Money Laundering Authority.

3.3 Strengths and weaknesses of different arrangements

It is extremely difficult to evaluate the relative performance of supervisory frameworks. The direct costs and administrative burden of supervision should not be neglected, but cannot be the dominant assessment criterion, given the much greater magnitude of policy outcomes at stake.

Arguably the most important role is to avert financial instability, and to mitigate it when it happens, but financial crises are infrequent and tend to be caused by a multiplicity of factors that are impossible to fully disentangle.

As for conduct-of-business supervision, quantitative indicators are inherently ambiguous: a rise in the number of fines for noncompliance, say, may be caused by more widespread violations (bad), or greater strictness (good), or both.

There have been fads in this area, which in retrospect have often appeared unfortunate. For example, during the 2000s a number of jurisdictions followed the 1998 decision to establish the UK FSA as an integrated supervisor, a move that is now widely viewed as misguided and that the UK reversed in 2011 with the shift to a twin-peaks framework.

Special resolution regimes for banks, outside of the US, are a more recent development that remains largely untested, although major shortcomings are already evident in the case of the euro area banking union (Restoy *et al* 2020).

The advantages and shortcomings of each archetype are well known. Sectoral supervision offers apparent legal clarity and skill specialisation, but it is undermined by the blurring of sectoral boundaries – not least because of financial innovations such as derivatives and other risk transfer techniques – and the emergence of diversified financial conglomerates.

Also, a purely sectoral framework may struggle to provide effective conduct-of-business supervision if there are perceived trade-offs with prudential objectives, as often happens.

Integrated supervision ostensibly eliminates overlaps and gaps, since everything is brought under a single roof, but it has to manage different kinds of supervisory responsibilities that entail different cultures.

In particular, discretionary risk assessment for prudential supervision contrasts with a more rules-based compliance mindset for conduct-of-business supervision. These are either effectively kept separate in the integrated structure, thus creating silos, or brought together, with the likelihood that at least one important responsibility may be neglected, with catastrophic consequences.

The UK FSA is generally considered to have failed in its prudential role because of lack of sufficient focus on financial stability risks, which allowed the fiascos of Northern Rock, the Royal Bank of Scotland and other British banks that were exposed as fragile or unviable in 2007 and 2008.

The twin-peaks option is favoured by many academics and independent observers, but it does not eliminate coordination issues since the same financial firms are subject to supervision by multiple authorities with possibly inconsistent requirements²⁹.

Furthermore, there are many links between prudential and conduct-of-business challenges, making the distinction often debatable. For example, financial crime or the misleading distribution of risky savings products are conduct-of-business violations, but they can also have significant financial-stability implications.

The question of whether to place the prudential supervision of banks with the central bank or elsewhere is similarly contentious. There are synergies between central banking and banking supervision, particularly for liquidity policy and financial-stability analysis, but there is also a potential conflict of interest between the two roles.

For example, a central bank that is also a banking supervisor may be tempted to pursue excessively accommodative monetary policy to mitigate perceived weaknesses in the banking system, in extreme cases to hide its own supervisory failures.

The UK went full circle on this issue, separating the FSA from the Bank of England in the late 1990s, then reintegrating prudential supervision in the Bank of England in the early 2010s.

In the EU, the ECB (2001) argued forcefully in favour of synergies between monetary policy and banking supervision, was initially overruled with the creation of the European Banking Authority, and was eventually vindicated with the establishment of the SSM in 2012-14.

The US maintains a hybrid model in which the Federal Reserve System plays a key role in the prudential supervision of banks, but is far from the only agency involved.

As for resolution authority, separating it from the main supervisor (albeit with 'backup' supervisory authority, as is the case with both the US FDIC and the EU Single Resolution Board), has significant advantages in terms of eliminating perverse incentives for supervisors to wait too long before taking action ('supervisory forbearance'). But this separation also increases organisational complexity and the need for interagency coordination.

A jaded view is that any framework is bound to be found wanting at some point, and that reforms of supervisory architecture are political reactions to inevitable supervisory failures. This view, however, does not entirely match the record. In many cases, the supervisory architecture was changed not merely because the supervisor failed, but because specific pernicious supervisory incentives needed structural correction.

This was the case, for example, with the replacement of the UK FSA with a twin-peaks architecture, and with the replacement of national prudential supervision of banks with the SSM in the euro area, both decided in the early 2010s. Conversely, there have been a number of cases in which supervisors have ostensibly failed in their prudential mandates, but the architecture was not subsequently changed in a major way.

For example, the Netherlands did not reverse its adoption of a twin-peaks framework following a series of bank collapses between 2008 and 2012. The US adopted only incremental architectural changes following the so-called subprime crisis of 2007-08 – mainly the elimination of the tainted Office of Thrift Supervision and the transfer of its role to the OCC.

The US Financial Crisis Inquiry Commission (2011, page xviii), in its landmark report of January 2011, stated: *“We do not accept the view that regulators lacked the power to protect the financial system. They had ample power in many arenas and they chose not to use it.”*

The above-mentioned complexity of the US and EU financial supervisory architectures, the two most relevant benchmark jurisdictions for China, offers nuanced lessons. One way to look at it is to recognise administrative and political inertia, and to observe that the streamlining of supervisory architecture in these two large jurisdictions has been extraordinarily challenging.

Another perspective is that the persistence of at least certain features of the supervisory architecture is positive for predictability and accountability, and that top-down disruption of existing structures would likely do more harm than good insofar as it undermines that predictability.

Table 1 summarises some key financial supervisory tasks in selected large jurisdictions, with much simplification. It highlights the complexity of the US and EU frameworks, relative to China and even more so to Japan and the UK.

As we have noted, it is improbable that China can beneficially adopt a supervisory architecture as streamlined as those of Japan and the UK, but it can aim to avoid the considerably greater complexity of the US and EU frameworks.

Table 1. Selected financial supervisory responsibilities in China, the US, the EU, Japan and the UK

	Bank prudential supervision	Bank resolution	Insurance prudential supervision	Payment services providers	Securities market and asset management supervision	Financial consumer protection
China (before recently announced reform)	CBIRC under PBOC policy direction	Under review; includes PBOC and local authorities	CBIRC under PBOC policy direction	Mostly local authorities	CSRC	All central and local authorities
United States	Federal Reserve System, OCC, FDIC, NCUA for credit unions, state authorities	FDIC for banks, NCUA for credit unions	State authorities	Mostly state authorities	SEC, CFTC, state authorities	SEC, CFPB, state authorities
European Union	ECB in euro area (within SSM), national authorities elsewhere	SRB in euro area, national authorities, court-ordered processes	National authorities	National authorities	National authorities, with limited role for ESMA	National authorities
Japan	FSA, with parallel capacity at Bank of Japan	FSA, Deposit Insurance Corporation of Japan	FSA	FSA	FSA	FSA
United Kingdom	Bank of England	Bank of England	Bank of England	FCA	FCA, Financial Reporting Council	FCA

Notes: CBIRC = China Banking and Insurance Regulatory Commission; CFPB = Consumer Financial Protection Bureau; CFTC = Commodity Futures Trading Commission; ECB = European Central Bank; FDIC = Federal Deposit Insurance Corporation; FSA = financial services agency; NCUA = National Credit Union Administration; OCC = Office of the Comptroller of the Currency; PBOC = People's Bank of China; SEC = Securities and Exchange Commission; SSM = Single Supervisory Mechanism.

Source: Bruegel.

4 Policy considerations for China

China's financial supervisory architecture should correspond to the specifics of its financial sector and broader policy system. No textbook architecture with theoretically clean divisions between all the different supervisory tasks will match all the financial-supervision challenges China's authorities face. Streamlined frameworks that work reasonably well in smaller countries with less-complex financial systems would not necessarily function well in China.

Conversely, among jurisdictions of comparable size and complexity, neither the US nor the EU, both of which have multiple supervisory bodies, offer particularly useful templates for how to organise financial supervision in China.

China has modified its supervisory architecture in recent decades through incremental and tailored adaptation, driven by changes in its own financial system while taking into account the international context.

The 2018 reform made China's framework more streamlined; as the original proponent of the twin-peaks concept noted, it *"represents a further step towards the adoption of a Twin Peaks structure"* in China (Taylor, 2021, page 31).

China's reforms of shadow banking regulation in recent years, from shutting down P2P without broader financial instability, to reducing the risk of banks' off-balance-sheet lending, are also indications that the existing setup can address supervisory challenges that cut across different types of financial institutions and markets. It remains to be seen, however, whether the steps announced in March 2023 will further improve supervisory effectiveness.

A full-fledged twin-peaks architecture would arguably be desirable, but it should be noted that the corresponding strengthening of the consumer protection task would constitute a significant policy inflection from the priorities of Chinese policymakers observed in the past.

Going further by consolidating all financial supervision in the PBOC as a single integrated supervisor would not solve the coordination challenges. Managing such a sprawling and unwieldy organisation with so many often-competing responsibilities would inevitably result in some tasks being undermined, as happened with the UK FSA in the early 2000s.

It is doubtful that such a setup would lead individual departments to coordinate better than recent practice between the PBOC and CBIRC.

Reshuffling the architecture in a major way may also have short-term downsides, especially at this juncture. It may add to already high uncertainty related to the coming renewal of China's economic and financial leadership, an unclear growth outlook and continued stress in the real-estate sector.

Implementing a new architecture and completing the corresponding transition is likely to take several years. Known details about a new umbrella CCP organisation that would oversee all existing agencies, a change that has been signposted in addition to the reform announced on 7 March, are not specific enough for a confident assessment of how it might interfere with those agencies' supervisory responsibilities and alter the incentives for better (or worse) supervisory consistency and effectiveness³⁰.

This is not to downplay the scale of the challenges confronting China's financial supervisors. As summarised in section 1, these include major governance concerns in supervised entities (such as oligarchic banks); operational coordination across different agencies or different departments within a single large agency; insufficiently clear divisions of responsibility that result in risk avoidance and blame shifting; corruption; and the fundamental difficulties of achieving good corporate governance and supervisory independence in China's CCP-centred system.

None of these are clearly linked to a particular choice of supervisory architecture archetype, whether sectoral or twin peaks or integrated. Instead, to deal with such challenges, China should try to improve the operation of its financial supervision structure within a generally stable supervisory architecture.

Clarifying the responsibilities and mandates of the different supervisors and individual departments within them, by contrast, is a matter of high priority. There are too many competing and unclear mandates among China's financial-sector authorities, leaving too much scope for blame shifting and blame avoidance.

In the event of a supervisory failure, it should be possible to identify unambiguously where the failure occurred. As for bank resolution specifically, experience in both the US and EU highlights the great advantages of a centralised, predictable system in which a single authority is in charge of decision-making, even for cases of failures of small banks (Gelpern and Véron, 2019).

Before announcing the supervisory reforms in early March, the Chinese authorities circulated a draft Financial Stability Law, which may be adopted in revised form later in 2023³¹. While representing potential progress compared to the status quo, that text still suggested too many cooks in the resolution kitchen.

Whether the resolution authority is embedded in the PBOC or in the new NFRA, or is created as a new, separate institution, it should belong in one and only one central institution to avoid supervisory forbearance and to maximise efficiency in responding to future crises, which will inevitably happen even if only at local level.

The dominant role of unitary national authorities (PBOC, CBIRC/NFRA and CSRC) in China's setup has some advantage over the more fragmented US and EU arrangements, in line with the objective of an integrated financial

system that operates on a level playing field, and discourages supervisory arbitrage in which firms play different local supervisors against each other.

It would be unfortunate for China to jeopardise this advantage by assigning explicit responsibility to local authorities in resolution issues, even if such a move might help in terms of face-saving or expediency. In that spirit, the draft financial stability law should be amended to assign clearer exclusive responsibility to central authorities in resolving the financial institutions they supervise, if they are determined to be failing or likely to fail.

The main challenge for China's financial-sector policy remains its unfinished transition from a state-directed to a market-based financial system, and the way the CCP's pervasive role creates obstacles to good corporate governance in individual financial firms and to the independence of supervisory authorities.

Too often, political authorities and sometimes the supervisors themselves intervene directly in financial firms' capital and credit-allocation decisions, occasionally resulting in failures of risk control and risk management.

Chinese reformers should aim at a clearer and more rigorous division of responsibilities, in which financial firms manage financial opportunities and risks, and supervisors focus exclusively on their respective public-policy mandates. No major changes to the current supervisory architecture, beyond incremental adjustments like that recently announced, are needed for that. ■

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Endnotes

1. See for example Alicia García-Herrero, *'Li Keqiang's farewell points to employment as China's major problem'*, *First Glance*, 7 March 2023, Bruegel.
2. Xinhua, *'The Political Bureau of the CCP Central Committee held a meeting and decided to convene the second plenary session of the 20th CCP Central Committee'* (in Chinese), 21 February 2023.
3. Reuters, *'China to set up new financial regulator in sweeping reform'*, 7 March 2023. In the previous two decades, comparable financial-sector reforms had been preceded by National Financial Work Conferences, held about every five years since 1997. In this cycle, a National Financial Work Conference was expected in 2022 (Wei and He, 2022) but was not held, and the decision was announced at the annual session of the National People's Congress, China's rubber-stamp legislature. See also Alicia García-Herrero, *'China's new regulator hints at a major clean-up of the world's largest financial sector'*, *First Glance*, 13 March 2023, Bruegel.
4. 'Regulator' and 'supervisor' are often used as synonyms in this area. We conform to international practice by referring to them as supervisors, while recognising that the extent and nature of their authority to enact binding rules ('regulation' in a narrow sense) vary considerably across jurisdictions. The administrative resolution of certain failing financial firms outside of the generally applicable court-ordered bankruptcy framework is a task that is in principle separate from both regulation and supervision, and has gained prominence in multiple jurisdictions in the past 10-15 years. 'Supervision' is occasionally used in this text as shorthand to encompass both supervision and resolution.
5. See for example Yiping Huang, *'Remarks at the launch event of the 2022 CF40 Financial Reform Report'* (in Chinese), 25 April 2022.
6. Because US banks originate and distribute a lot of asset-based securities instead of keeping them on their balance sheet, the aggregate size of the US banking sector measured by total assets is significantly smaller than its peers in the euro area and China.
7. Including sovereign, sub-sovereign, agency and corporate bonds. Source: International Capital Market Association, <https://www.icmagroup.org/market-practice-and-regulatory-policy/secondary-markets/bond-market-size/> (as of August 2020).

8. Source: *The Banker* annual [Top 1,000 World Banks](#) rankings.
9. The Shenzhen municipal government is among its largest shareholders, but with only a single-digit stake.
10. Source: *The Banker* database, authors' calculations.
11. Although two of Australia's four large banks are headquartered in Melbourne.
12. As documented by the International Financial Reporting Standards Foundation's jurisdictional profiles (<https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/>), and the Basel Committee's Regulatory Consistency Assessment Programme reports (https://www.bis.org/bcbs/implementation/rcap_jurisdictional.htm). The EU has been determined to be 'materially non-compliant' in the latter programme's risk-based capital category, arguably the most important, and 'largely compliant' in three of the other four categories. By contrast, China has been deemed 'compliant' (the highest rating) in all five categories.
13. Wu Yujian, Zhang Yuzhe and Denise Jia, '[PBOC Sets Up Deposit Insurance Fund Management Company](#)', *Caixin Global*, 30 May 2022.
14. Bloomberg News, '[China's peer-to-peer lending purge leaves \\$115 billion in losses](#)', 14 August 2020.
15. Pan Che, Fran Wang, Wu Hongyuran and Wu Xiaomeng, '[China to Merge Banking, Insurance Regulators](#)', *Caixin Global*, 13 March 2018.
16. Wu Hongyuran and Han Wei, '[How China Prevented a Local Bank Crisis from Snowballing](#)', *Caixin Global*, 17 August 2020.
17. Fitch Ratings, '[China's new rules on financial holding firms to curb systemic risks](#)', *Non-Rating Action Commentary*, 14 October 2020.
18. 'Provincial' is used here as shorthand for any mainland Chinese territory directly under the central government, namely the 22 provinces, but also direct-administered municipalities (Beijing, Chongqing, Shanghai and Tianjin) and autonomous regions (Guangxi, Inner Mongolia, Ningxia, Tibet and Xinjiang).
19. Michelle Price and Benjamin Kang Lim, '[China Asks Britain for advice on Creating Financial Super-Regulator](#)', *Reuters*, 15 May 2016.

20. BaFin is the acronym for the Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority), established in 2002 by the merger of several public bodies.
21. The expression “twin peaks” in this context was coined by Michael Taylor (1995) and is now widely used (Godwin and Schmulow, 2021).
22. Lingling Wei, [‘China’s Latest Plan for Market Control Involves the Central Bank’](#), Wall Street Journal, 14 July 2016.
23. See Deutsche Bundesbank, [Cooperation with the Federal Financial Supervisory Authority](#), accessed 7 February 2023.
24. As a consequence of the UK’s departure in 2020, the euro area represents the overwhelming majority of the financial sector in the EU by almost any measure. For example, the euro area has represented more than nine-tenths of total EU banking assets continuously since early 2020, versus less than three-quarters when the UK was in the EU (source: European Central Bank Consolidated Banking Data series).
25. See CRS (2020) for a somewhat more detailed overview of the US supervisory architecture.
26. Seven of the 27 EU countries still have their own currency. Among these, Bulgaria is on a path toward euro adoption, with no certainty yet as to the final date. The 20 EU countries that have adopted the euro do not have an independent monetary policy; their national central banks exist as independent institutions that participate in the ECB-centred Eurosystem.
27. On the supranational integration of banking sector policy, known as banking union, see for example Teixeira (2020).
28. The three agencies are the European Banking Authority (EBA), European Insurance and Occupational Pensions Authority and European Securities and Markets Authority (ESMA), known collectively (and confusingly) as the European Supervisory Authorities (ESAs). ESMA has some direct supervisory responsibilities, for example for central counterparties from non-EU countries, credit rating agencies and trade repositories. One of the authors (Véron) is an independent nonexecutive director of DTCC Data Repository (Ireland), a trade repository directly supervised by ESMA.
29. Norman Blackwell, [‘Financial Regulation in the UK Is Ripe for a Serious Rethink’](#), Financial Times, 11 January 2023.
30. Keith Zhai and Lingling Wei, [‘China to Shake Up Financial System as Xi Jinping Installs Key Associates’](#), Wall Street Journal, 20 February 2023.
31. Fitch Ratings, [‘China’s New Financial Stability Law to Curb Contagion Risk’](#), Fitch Wire, 2 February 2023.

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What SVB and Credit Suisse tell us about financial regulations

SVB and Credit Suisse have exposed regulation failures. Jon Danielsson and Charles Goodhart argue the best way forward would be to focus on shock absorption and moral hazard, not the current approach of buffers and risk measurements

Neither Silicon Valley Bank (SVB) nor Credit Suisse should have failed, thanks to all the measures put in place after the global crisis in 2008. In the words of Mark Carney, then governor of the Bank of England and the head of the Financial Stability Board, “[o]ver the past decade, G20 financial reforms have fixed the fault lines that caused the global financial crisis” (Carney 2017).

Those post-2000 G20 financial reforms are founded on the philosophy of modern regulations. The notion is that all important risk is identified and measured, to be used by banks and the financial authorities to determine the appropriate level of risk. Then it is easy for the banks and regulators to fine-tune risk.

If we need more growth, reduce capital requirements, as we did in March 2020, or demand more capital if risk is too high, as we should have done before 2008. Risk plays a key role in that because the amount of capital is a direct function of the riskiness of a bank (Perotti 2023, Dewatripont *et al* 2023).

The case of Credit Suisse and Silicon Valley Bank challenges the modern philosophy of regulations. While there are many factors at work, here we want to focus on the trilemma of financial policy:

1. The economy should grow, or at least recessions must be avoided.
2. Inflation needs to be close to its 2% target.
3. Financial stability is to be high.

Financial regulations – both of the micro variety, including Basel III, and the macroprudential variety – play a key role in achieving these objectives. The problem is they cannot be achieved simultaneously. So the authorities need to pick the ones they prefer, hence the trilemma.

This conflict was not apparent in the decade after the 2008 global crisis because all three objectives were in sync. Financial policy helped growth via quantitative easing and low interest rates, inflation stayed close to its target, and financial stability appeared high. But that was an illusion.

The problems we now see in the system have arisen because the financial authorities have been trying to do the impossible: maintain growth while keeping inflation under control and financial stability high

Lax monetary policy, designed to help the economy grow, made the financial system dependent on low interest rates. Banks adapting their operations to the low interest rate environment was not seen as a problem because they would only face difficulty if rates were to rise.

Consequently, a necessary condition for that monetary policy to be sensible is that inflation would never rise. It was a bet on low inflation and low interest rates lasting forever, akin to writing a deep out-of-the-money and decades-long maturity put option on inflation.

The longer monetary policy stayed lax, the more systemic risk increased, along with the growing dependence on money creation and the low rates. While not exactly hidden, these problems were hard for the private sector to find out because of the lack of granularity in accounting disclosures. However, the authorities had all the data and could identify the problems.

The ultimate consequence of the lax monetary policy was to undermine objective three, namely, financial stability. That should not have been a problem, since all the authorities had to do was rein in risk by raising capital.

The problem is that increasing capital when the economy is doing poorly, as it is now, is recessionary. High financial stability conflicts with the first objective, namely, economic growth. The modern philosophy of financial regulations put the financial authorities in an impossible position with no good options.

If we want the economy to grow to meet the first objective, we must disregard the other two. First, by keeping funding costs low, limiting interest rate rises, and fuelling inflation. And second, by keeping the cost of lending easily affordable, which means capital must be low and bank leverage high, fuelling systemic risk.

Fight inflation, and we end up with a recession because lending becomes too dear and financial stability drops because banks' capital position is eroded, hurting growth and even causing recession.

Prop up financial stability by raising capital levels, and lending becomes too expensive, growth is curtailed, and the economy is pushed into recession.

All of this was foreseeable and avoidable, especially since housing regulations and monetary policy in the same institution should facilitate the cooperation of these two policy domains, helping the architects of financial policy to identify the weaknesses in the policy framework.

While there are many reasons why the authorities disregarded the possibility that the three policy objectives could be in conflict, and politics certainly plays a significant role in that, the failure of the modern philosophy of regulations is a major cause.

The financial authorities face two key problems. The first is that the financial system is, in effect, infinitely complex, and even if the authorities successfully identify a lot of risk and areas where it is taken, there is an infinite scope for risk to emerge elsewhere. There is no way to identify and manage all of that risk effectively. Doing so would make financial regulations so onerous that the banks would cease functioning as institutions that intermediate between savers and investors.

The second problem is that, in general, financial risk cannot be properly measured. A few years ago, we proposed the notion of the riskometer (Danielsson 2009), a mythical device that, once plunged deep into the bowels of Wall Street, gives us an accurate measurement of risk. The problem is that the riskometer does not exist, as it is not possible to directly measure most financial risk.

We can only infer it by the impact it leaves on the world, such as price fluctuations. To translate those fluctuations into risk, we need a model. Since there are an infinite number of candidate models, there are an infinite number of alternative measures of the same risk, many of which are equally plausible ex ante.

These two problems mean that the modern philosophy of financial regulations is not sound. It is based on the notion that the financial authorities and banks maintain virtuous feedback between risk identification and measurement to the amount of risk being taken.

Just like the thermometers in the risk managers' office allow them to keep the temperature steady at 21C°. The necessary conditions for this virtuous feedback loop to exist are that the financial system is not infinitely complex so that the authorities can identify risk wherever it may happen, and for the riskometer not only to exist but to be as accurate as a thermometer.

Neither condition is met, as the case of Credit Suisse and Silicon Valley Bank makes clear. That is why regulatory policy after 2008 is a failure. That begs the question of what we should do about it.

The most obvious and likely option will be to simply ramp up the existing regulatory framework, tighten the rules, and increase bank capital. While that might provide an immediate calming of market distress, it will also make financial intermediation more costly, reduce lending in the all-important SME sector, and even be recessionary. It is, at best, only a very short-term solution and will increase systemic risk in the longer term.

We can leave finance to the market, treating the banks like any other firm in the economy. That is not politically feasible because when the next crisis happens, the government will be under such popular pressure to act that it will have to step in, as has been demonstrated many times in history.

Consequently, it is better for the authorities to be prepared for the eventuality, which means we cannot leave banks to the market.

Or we can change the regulatory framework, perhaps requiring banks to hold 100% reserves for demand deposits and maturity match assets to liabilities. While that would prevent Credit Suisse and SVB-type scenarios, it also would make financial intermediation very costly, and hence be highly recessionary.

We can look to technology. The system might then be founded on central bank digital currencies (CBDCs), created much more ambitiously than they are currently conceived of. We could all hold central bank-issued tokens of fiat money. That would ensure perfect liquidity, with banks akin to tech companies overseeing the decentralised financial system – what is known as Web5 and DeFi.

This might be a fine solution, but it is very ambitious and will take decades to implement, and a key unresolved issue is that we do not want the central bank to be involved in lending decisions.

We propose two alternatives. The first is not to think about the problem of regulating the financial system from a risk-based buffer perspective, which current regulations do, but instead to approach it from a shock absorption point of view.

When shocks happen, how best should they be absorbed? Current regulations make banks act as shock amplifiers because they harmonise beliefs via standardised risk-measurement techniques and action through mandated buffers.

This means, in practice, that when shocks arrive, the system's institutions react to them in the same way, all buying or selling simultaneously, which is the basic mechanism behind the shock amplification.

The solution is to make the institutions of the financial system more heterogeneous or diverse. Then, when a shock comes along, some banks buy while others sell, in aggregate creating random noise. Achieving this is straightforward since it is just a matter of tweaking regulations.

Instead of emphasising risk and buffers, encourage different business models. The micro regulators should be actively encouraged to embrace new entrants with different business models, even more than now. This would quickly increase the shock absorption capacity of the system with the additional benefit of providing cheaper and better tailored services to the banks' clients, helping with economic growth (see Danielsson 2022 for more details).

Furthermore, it is easy to address the moral hazard created by banks being limited liability corporations managed by people who get bonuses when things go well, while being protected from the downside. We cannot return to the pre-Victorian approach of unlimited liability for all because it would mean that banks could never get equity capital from outsiders.

But there is no reason why we could not require senior bank management to face multiple liability and, in the case of CEOs, possibly to have unlimited liability. If senior management faced a really serious loss when their bank failed, there would be far less need for masses of restrictive regulations.

The problems we now see in the financial system, including the downfall of Silicon Valley Bank and Credit Suisse, have arisen because the financial authorities have been trying to do the impossible: maintain growth while keeping inflation under control and financial stability high.

The question, then, is how financial regulations should respond to the current market turmoil and rising long-term systemic risk. While there are viable solutions, such as curtailing moral hazard, increasing shock absorption, and new technology, we suspect the lessons learned will be different.

The financial authorities will double down on current approaches, with more stringent regulations and higher capital levels that ultimately will hurt the economy and increase systemic risk. ■

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Authors' note: The authors were on the panel for an online conference "Silicon Valley Bank Failure: Implications for Risks to the Global Financial System" on 23 March 2023. Watch the discussion [here](#). This article was originally published on [VoxEU.org](#).



Prudential regulation lessons for Europe and the world

Mathias Dewatripont, Peter Praet and André Sapir
consider the regulation lessons to be learned from the
Silicon Valley Bank collapse

While the collapse of Silicon Valley Bank appears to be an example of failure of both bank management and supervision, it also offers insights about prudential regulation. This column draws two main lessons in this respect. The first is that the episode should increase the resolve of public authorities to further improve the resolution framework in the EU. The second is that the extent of protection, in both Europe and worldwide, of short-term deposits that (large and small) companies rely upon for their ordinary business is flawed and needs to be adapted.

Silicon Valley Bank (SVB) was a bank with \$212 billion in assets and \$175 billion in deposits that was admittedly 'special': very specialised in tech, with mostly uninsured start-up deposits rather than retail deposits. It did not aggressively search for deposits by offering particularly high interest rates, so it did not 'gamble for resurrection'.

Instead, its problem stemmed from its asset side, which did not primarily consist of loans but was instead mostly standard and liquid securities that were poorly hedged as far as interest rate risk was concerned. The recent increase in interest rates combined with poor hedging lowered the value of its assets, and eventually led to insolvency when some depositors sought to withdraw their deposits.

SVB clearly looks like an example of US failure in both regulation and supervision. Together with other banks, SVB had successfully lobbied Congress for weaker regulation, which allowed it (and others) to rely on held-to-maturity accounting, and to be exempted from the Basel liquidity coverage ratio (LCR) requirement.

In terms of crisis management, after unclear communication by the authorities (*"FDIC will not do a bailout but will try and help uninsured depositors, through a dividend"*), the weekend of 11/12 March 2023 ended with the decision to fully guarantee uninsured deposits too, so there was a bailout (which the authorities may or may not recoup in the future through fees levied on the banking sector as a whole).

This decision echoes the earlier ones for hedge fund LTCM or investment banks Bear Stearns and Merrill Lynch (and differs from the Lehman decision), with a rationale that is both similar to (avoiding runs) and different from (the goal this time is to protect tech startups rather than financial creditors) these three previous cases.

When considering bailout versus bail-in/bankruptcy, the financial authorities are facing the familiar trade-off between financial instability and moral hazard

General principles

Banks engage in maturity transformation, which can lead to runs. As Diamond-Dybvig (1983) showed in their Nobel Prize-winning contribution, multiple Nash equilibria exist under incomplete deposit insurance. This is even truer in a phone/internet banking era: SVB witnessed \$42 billion deposits being withdrawn on 9 March 2023 alone!

Risks of contagion do exist, but it is still worth asking why the failure of a medium-sized special US bank like SVB can lead to big banks in Europe losing more than 10% of their stock market value in a couple of days.

One reason of course is that some of the factors having affected SVB – in particular, the current cycle of interest rate increases and the risk of recession – can potentially impact every bank. This situation echoes to some extent the savings and loans episode of the 1980s in the US, where these specialised savings institutions were collateral damage of the anti-inflation policy of the Fed.

Markets are naturally volatile, even more so when investors start asking themselves whether banks have engaged in imprudent maturity transformation, which supervisors may have unduly allowed.

Moreover, for every institution that has hedged itself against an increase in interest rates, there is a counterparty that has accepted this risk and may, or may not, have hedged it, and so on. This can lead to nervousness (*“are we in 2008 again?”*) and liquidity problems for some banks that inevitably turn into solvency problems. At this point, panics can become self-fulfilling when depositors, ie. those who can run, start doing so when they are less than fully protected.

When considering bailout versus bail-in/bankruptcy, the financial authorities are facing the familiar trade-off between financial instability and moral hazard.

One should not forget the lesson of the 15 September 2008 Lehman episode, when the decision to impose losses on short-term depositors was made in order to avoid a bailout, but which ended up being the costliest bank failure for taxpayers by creating panics and deepening the Great Recession.

Of course, moral hazard is an important problem which should not be underestimated, and ex-post deposit guarantees increase it and are therefore problematic.

However, in order to address this issue effectively, one needs to concentrate losses on those investors who cannot run, that is, equity, bondholders and term depositors (and possibly sue top management and board members for misbehaviour). Spreading the pain among those who can run is definitely a counterproductive idea.

Anyway, one can certainly not hope to impose 'serious discipline' on banks through bailing in short-term deposits held by individuals, or by (large or small) firms for their 'ordinary business' (ie. to make payments to the owners of their premises, their staff and their suppliers, and to receive customer payments).

Typically, such depositors do not have the expertise, nor should it be their 'job', to monitor banks, hence they tend to react 'randomly' by running, which will typically be destructive for the economy.

This is the idea underlying the 'representation hypothesis' put forward by Dewatripont and Tirole (1994): one should delegate the monitoring function of short-term depositors to other parties, namely, a combination of long-term private investors and supervisory and resolution authorities.

This should be done with a combination of instruments: (1) appropriately calibrated solvency ratios (risk-weighted 'capital', non-risk-weighted 'leverage', and overall 'loss absorbency', which adds to capital subordinated debt

instruments TLAC and MREL)¹; (2) liquidity ratios (the one-month LCR and the longer-term net stable funding ratio); (3) sufficient marking-to-market of assets; (4) intrusive-enough supervision (with good stress tests); (5) good resolution plans and thresholds; and (6) appropriate macroprudential buffers.

The Basel Committee and the Financial Stability Board have come up with an important package of rules in this respect. Pushback from industry, however, has weakened this package (the EU is still Basel III non-compliant, and the US has many banks that 'escape' a number of Basel III rules, which technically apply only to 'internationally active institutions').

Two lessons for prudential regulation, one for Europe and one for the world

In the EU, we do not have a credit institution like SVB, and supervision appears better when compared to the SVB debacle (even though Basel III compliance would be desirable).

This being said, the first lesson from this episode is that it should increase the resolve of public authorities to further improve the resolution framework in the EU.

As discussed for example in Dewatripont *et al* (2021), the Banking Recovery and Resolution Directive (BRRD) has worked 'backwards' by legally preventing from its beginning in 2016, "even under extraordinary circumstances", any bailout before 8% of the unweighted balance sheet of a troubled bank has been bailed in.

This '8% bail-in rule' would make sense but only if all EU banks had 8% of long-term subordinated securities that could be bailed-in (ie. would belong to MREL).

However, today, some banks cannot satisfy the 8% bail-in rule without hitting short-term depositors. Under BRRD, for such banks the US approach to SVB is legally unavailable.

Some progress has been made over the years in raising loss absorbency. It would therefore be good if EU authorities were to: (1) communicate about the percentage of banks/banking assets that already do satisfy this 8% long-term subordinated claims condition (in principle, at least all GSIBs and all banks above €100 billion of assets); and (2) in order to avoid deposits moving to safer/too-big-to-fail institutions, announce a plan that would temporarily suspend this 8% condition until it is reached thanks to a precise publicly announced timetable, potentially forbidding to distribute dividends until it is achieved.

The second lesson from this episode, relevant not just for Europe but worldwide, is that the current regulatory treatment of short-term deposits that (large and small) companies rely upon for their ordinary business is flawed and needs to be adapted.

Protecting such company deposits only up to \$250,000 or €100,000 means forcing them to face unnecessary risks, and for some big companies, this is almost like not insuring them at all, and this can be economically very costly.

There are several possibilities to address this. A first one is to significantly increase the protection of these company deposits, and to price this risk by charging banks deposit insurance fees, just like for currently insured deposits (making sure of course that banks in trouble get resolved promptly, otherwise these fees become irrelevant as soon as the bank is becoming insolvent).

Calibration of insurance thresholds for these deposits is obviously a challenge which should be addressed carefully. A natural approach would be to link the insurance threshold to company size, corrected for business model. In any case, it should be actuarially fairly priced.

A second, less 'radical' approach would be to reduce the intrinsic risk faced by short-term company deposits by: (1) raising the volume of claims junior to them (as stressed in our first lesson); and/or (2) strengthening the LCR requirement by raising the expected monthly outflow rates (which currently ranges from 5% for SMEs up to 40), given the speed of withdrawals observed at SVB, which has been boosted by new technologies.

Banking regulation and supervision cannot eliminate all risks. However, the above two lessons offer clear directions to make the banking system safer and better equipped to support the real economy. ■

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Endnote

1. Total loss absorbency capacity (TLAC), is imposed by the FSB on all global systemically important banks (GSIBs), while minimum requirement for own funds and eligible liabilities (MREL) is imposed on EU banks.

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South Africa-Isle of Man: strengthening connections

www.finance21.net

Finance Isle of Man looks forward to enhancing relations
between the two countries' business communities

Following the success of this year's Isle of Man INDABA event, representatives from the Isle of Man Government look forward to supporting another delegation to South Africa in October to further strengthen business and finance connections.

Representatives of Finance Isle of Man are often in South Africa for a series of high-profile conferences aimed at building business relationships, identifying opportunities, and enhancing connections between the two countries' business communities and finance industries.

The Isle of Man has a longstanding and close relationship with South Africa and is home to a large South African expat community. The Island also plays host to a number of companies across the financial services industry that have operations in both countries. These include Nedbank Private Wealth International, Derivco International and Standard Bank.

Those attending the events will have the opportunity to meet and network with representatives from the Isle of Man Government. They will also have the chance to meet Isle of Man based South African business leaders who have built, expanded and grown their own companies in the island. Attendees will also have the opportunity to hear more about the range of expansion opportunities available in the Isle of Man for their businesses.

Home to an award-winning financial and professional services sector, the Isle of Man offers South African businesses that are interested in international growth and expansion a gateway to global markets. The Island has a thriving financial services sector and is able to offer international businesses world class services across areas including banking, fiduciaries, insurance, pensions, wealth management and employee benefits. The Island also plays host to an array of diverse global companies across sectors including finance, tech, eGaming and engineering and manufacturing.

Last year's INDABA was also joined by Hon Alfred Cannan MHK, Chief Minister of the Isle of Man. The events included panel discussions focussed on a range of issues and gave attendees the opportunity to learn about growing and internationalising their businesses, wealth planning, asset protection, succession planning and more.

The Isle of Man offers South African businesses that are interested in international growth and expansion a gateway to global markets

This year's panel discussions will focus on raising foreign capital for growth into South Africa & Africa alongside wealth solutions/structuring for families. Full details of this year's panel discussions will be confirmed in the coming weeks and those in attendance will once again have the opportunity to network with Isle of Man business leaders and entrepreneurs to learn about the opportunities that exist for businesses, intermediaries and clients in the Isle of Man. ■

To book your place to attend please visit <https://iom-za.org/>.



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Emergence of ESG

A stylized graphic of a globe, composed of several overlapping, semi-transparent shapes in various shades of green and blue. The shapes are arranged to suggest the continents and oceans of the Earth, with a focus on environmental colors.

There is a shift to integrated reporting. Stakeholders want to understand an organisation's impact on society and the environment

Deloitte delivers audit & assurance, financial & risk advisory, consulting, and tax services to many leading businesses in the Isle of Man and beyond. We have seen increasing demand and developments in the rapidly evolving realm of Environmental, Social and Governance (ESG).

We have seen a shift towards more integrated reporting with companies including information in, or alongside, their annual reports to help stakeholders make informed decisions about the sustainability of a business. Stakeholders want to understand an organisation's financial performance, the resilience of its business model and its wider impact on society and the environment.

Some of the key drivers of ESG we have seen locally and around the world are:

1. Policy and regulatory developments

Jurisdictions are increasingly requiring climate-related disclosures. Some, such as the UK, require listed companies to make disclosures in accordance with the Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD).

The Paris Agreement on climate change was formally extended to the Crown Dependencies on 22 March 2023 by the UK. This refers to the commitment to pursue efforts to limit a global temperature increase to 1.5C above pre-industrial era levels and well below 2C. The [extension of the agreement](#) to the Isle of Man was announced at COP26 in Glasgow in 2021 but was only formally ratified and deposited with the United Nations recently.

The Isle of Man has committed to achieving net zero emissions by 2050, with an interim target of 35% by 2030. The Islands' [Climate Change Plan 2022-2027](#) is the framework towards achieving these commitments in the short term.

Across the Channel Islands many financial services organisations, including our regulators, now disclose information about their ESG metrics and targets; the Jersey Financial Services Commission has published its ESG principles since 2020, and last year the Guernsey Financial Services Commission published its greenhouse gas emissions.

Investment in robust controls, processes, transparent reporting of the control environment and clarity on the company's policy for assurance of non-financial information will be critical in building confidence and trust

2. Global sustainability standards

The development of global sustainability reporting standards by the International Sustainability Standards Board (ISSB) is a key enabler for developing high-quality, consistent and comparable sustainability reporting.

As jurisdictions move to adopt the ISSB standards, and as some policymakers and regulators move to mandate jurisdictional sustainability reporting, companies must put the right processes governance, processes and controls in place to ensure they can meet these new requirements.

The ISSB will issue its first two disclosure standards, S1 on general disclosure requirements for sustainability reporting, and S2 on climate-related disclosures by the end of June 2023. The ISSB board has agreed that its standards will be effective from 1 January 2024. Various jurisdictions are considering how and when to bring these standards into their local requirements, including the UK.

The ISSB is currently consulting on its agenda priorities, which include nature and biodiversity. Social topics such as human capital and human rights are also identified as potential priorities. The consultation is open until 1 September 2023.

The ISSB will look to leverage the work of [existing standards and frameworks](#) to accelerate its progress. S2 for example builds on TCFD. And the ISSB will look to leverage the work of the Task Force on Nature-related Financial Disclosure (TNFD).

On 28 March, the TNFD released the fourth version (beta v0.4) of its draft risk management and disclosure framework, which they plan to finalise in September 2023. Deloitte's latest [blog](#) provides insights for corporates and financial institutions to help them understand the framework in the context of their own organisation.

Some companies already report on a wide variety of sustainability topics, including greenhouse gas emissions, use of land and water, nature and biodiversity, and social policies and practices, such as the gender pay gap, modern slavery and the ethical use of big data and AI.

However, for many companies, ESG reporting will be challenging as the data and controls for non-financial information may be less developed than for financial processes.

Investment in robust controls, processes, transparent reporting of the control environment and clarity on the company's policy for assurance of non-financial information will be critical in building confidence and trust.

[Deloitte's annual survey](#) of more than 2,000 C-suite leaders from around the globe included respondents from a range of major industries. Among those surveyed, 75% said their organisations have increased their investments in corporate sustainability initiatives over the past year.

3. Growth of sustainable finance

In recent years, financial services have increasingly moved into sustainable finance. The investment management sector, for example, has seen a proliferation of funds that describe themselves as sustainable or environmentally conscious, supported by a fast-growing sustainable finance regulatory framework and increasing investor demand.

Jersey has made amendments to integrate ESG into its Codes of Practice for Certified Funds in Q2 2021. Guernsey has a sustainable funds framework which provides eligibility criteria in which funds can be classed under the [Guernsey Green Fund](#) or [Natural Capital Fund](#) designations.

More than £13 billion in sustainable finance products supporting social and sustainable initiatives have been listed on The International Stock Exchange (TISE), a regulated market specialising in international bond issuance based out of Guernsey.

4. Market-led demand for ESG disclosure

Stakeholders demand greater transparency about organisations' impacts on people and the world around them. Businesses have a crucial part to play in decarbonising their operations and supply chains, as well as mitigating nature loss. Globally, there has been a plethora of pledges from corporate citizens to improve their effects on climate change, biodiversity loss and society.

However, these commitments need to be supported by meaningful actions. Progress needs to be measured, reported and, when necessary, regulated to alleviate concerns of greenwashing – where a firm makes misleading or unsubstantiated claims about the environmental benefit of its products or services.

Assurance can enhance trust

Reporting on non-financial metrics can be more demanding than reporting on financial metrics, as data collection and control processes are often new. Independent assurance can enhance confidence in the information reported. The level of assurance most used at present is limited assurance under the assurance standard ISAE3000/3410.

Some policymakers and regulators are already introducing requirements for assurance of sustainability information, and some envisage the move from limited to reasonable assurance – for example, in the EU under the Corporate Sustainability Reporting Directive.

Deloitte Climate Collective

We have launched the Deloitte Climate Collective which aims to help businesses take actionable steps towards sustainable prosperity by providing valuable insights and fostering collaboration.

The Deloitte Climate Collective is a group of business leaders who share a passion for the environment and are committed to making a positive impact in the Isle of Man.

Through sharing knowledge, expertise, and resources, and catalysing cross-sector collaborations, we can collectively help address the most pressing sustainability challenges facing us today.

At Deloitte, we believe that it's crucial to devote time, energy, and resources to the increasing environmental crisis we face as a global community. Our [World Climate strategy](#) aims to drive responsible climate choices within our organisation and beyond.

Goals of the Deloitte Climate Collective:

1. Assist members to define, advance and achieve their ESG goals.
2. Help realise new business opportunities arising from the net zero economy, sustainability and ESG revolution for our collective members and our region.
3. Encourage greater collaboration on tangible action.

Find out more and join the Deloitte Climate Collective using the QR code below.



To find out more about integrating ESG into strategy and ESG Assurance, please contact Charlotte Vale, Director, Advisory and Assurance at Deloitte in the Isle of Man. ■

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Trade fragmentation matters for bank credit supply

Claudia Buch, Linda Goldberg and Björn Imbierowicz discuss new evidence from the International Banking Research Network on how trade uncertainty can be amplified through the supply of credit

Recent geopolitical events have raised concerns that markets for goods and services could become more fragmented. Clearly, trade uncertainty has increased. The consequences for financial intermediation of fragmentation and uncertainty are not well understood though. If banks affected by adverse trade events contract lending, the effects of the initial shock for the real economy could be amplified.

Studies conducted in the International Banking Research Network show that fragmentation shocks reallocate and sometimes reduce overall credit supply through banks. This reallocation can reinforce fragmentation and change the consequences from trade disruptions.

Over the past decade, threats of restrictive trade policy and geopolitical risks have emerged and intensified. There has been a series of adverse shocks to globalisation (Aiyar *et al* 2023): the trade conflict between China and the US, Brexit, the COVID pandemic, and Russia's war of aggression against Ukraine.

These shocks can affect bank credit provision. Banks are important for financing international trade and providing credit to the real economy¹. Trade policy and uncertainty shocks might even be reinforced by banks, domestically and internationally, by transmitting financial stress through lending and liquidity flows (eg. Peek and Rosengren 2000, Cetorelli and Goldberg 2012, Schnabl 2012, De Haas and Van Horen 2013, Niepmann 2015, Niepmann and Schmidt-Eisenlohr 2017, Amiti and Weinstein 2018, and Federico *et al* 2020).

The International Banking Research Network (IBRN) initiated a project where country teams investigated how trade uncertainty, fragmentation events and deglobalisation shocks are amplified through the supply of credit. Studies use granular confidential regulatory data on banks to show how fragmentation shocks reallocate and sometimes reduce credit supply through banks.

This reallocation both reinforces fragmentation and influences the pattern of consequences from trade disruptions. Studies draw on detailed information about the specific shocks to firms (to capture the demand side) and banks' exposures to those firms, along with bank characteristics (to capture the supply side).

Banks' credit supply responds to trade fragmentation shocks and increased uncertainty. When a fragmentation event occurs, banks decrease their supply of credit

Specific episodes explored include the effects of Russia's invasion of Ukraine in 2014 on Italian banks (Federico *et al* 2023), of the Brexit referendum on German banks (Imbierowicz *et al* 2023), of retaliatory trade restrictions from China on Norwegian banks (Cao *et al* 2022), of the euro area sovereign debt crisis on Portuguese banks (Bonfim and Fèlix 2023, Pedrono 2022), and of the increase in uncertainty since 2016 from intensifying trade tensions between the US and China on US, Chilean, and Mexican banks (Correa *et al* 2023, Margaretic and Moreno 2023, Bush *et al* 2023).

Other work looks at changes in services trade in a broad range of economies from 2014 through 2019 (Lloyd *et al* 2022 for the UK) or at the geographic specialisation of banks from 2006 to 2019 (Pedrono 2022).

Trade fragmentation spills over into bank lending activity

All studies confirm that banks' credit supply responds to trade fragmentation shocks and increased uncertainty. When a fragmentation event occurs, banks decrease their supply of credit. This effect goes beyond the firms immediately affected as banks also restrict credit to firms which are not directly exposed to the event. Hence, the initial shock is amplified across the universe of bank borrowers.

The magnitude of the decline in credit differs across countries. As regards large US banks, those exposed to trade uncertainty reduce credit originations by 0.5 percentage points, which compares to an average growth rate of 4.2% prior to the shock (Correa *et al* 2023).

A standard deviation increase in Italian bank exposure (around 0.45 percentage points) to a trade shock is associated with a 0.8 percentage point decrease in credit supply (Federico *et al* 2023) and high-exposure Norwegian banks decrease their lending in all lending categories by 3-6% following the trade shock (Cao *et al* 2022). Given the

differences in the type of shock and the measures used for analysis, the results overall suggest a generally material effect on bank credit supply.

Trade shocks are transmitted through increased risks of loans on banks' balance sheets. On impact, trade shocks have adverse effects on the financial soundness of firms. Firms experience a decline in revenues, lower liquidity, and a higher propensity of loan default (Federico *et al* 2023)².

Banks respond to higher risks and uncertainty arising from international trade shocks by taking precautionary measures. They increase loan loss provisioning and reduce risk taking. This manifests as a contraction of credit to riskier borrowers, and not just to those exposed directly to the initial uncertainty.

This type of mechanism is identified from analyses of banking responses in Chile, Germany, Italy, Norway, and the US. US banks, for example, contract credit supply more for firms that are more informationally remote, that strongly rely on trade finance, are that are internationally integrated into global value chains.

Firms facing larger information asymmetries, such as having shorter banking histories and being foreign firms, are also affected more. US banks which are exposed to higher uncertainty curtail loans specifically designated for investment.

Borrowers relying on financing through banks exposed to trade uncertainty are unable to fully substitute reduced lending with alternative external sources of credit. Accordingly, a contraction of credit supply can have adverse impacts on firms in terms of lower ability to borrow, capital expenditures, and asset growth (Correa *et al* 2022).

In Chile, banks reallocate credit from firms in nontraded sectors to those involved in global value chains, and to a lesser extent, to importers who are exposed to countries exhibiting an increase in trade uncertainty (Margaretic and Moreno 2023).

Portuguese banks more exposed to foreign firms decrease loan supply during crises but increase lending towards domestic firms (Bonfim and Félix 2023). In Germany, banks reduce credit supply to less profitable firms following the Brexit events (Imbierowicz *et al* 2023).

Some subsidiaries of large multinational corporations can access internal crossborder capital markets in response to the credit supply shock, mitigating some of the negative real economic outcomes. Overall, these banking channels add to the broader set of effects of Brexit on UK firms (Bloom *et al* 2019).

Some types of banks are more prone to credit supply adjustments

Beyond their direct balance sheet exposures to the firms impacted by trade events, the characteristics of banks matter for the magnitude of their credit supply response to international trade disturbances.

The resilience of banks matters for their response to shocks. Large US banks with lower levels of capital and a higher dependence on market funding reduce lending by more than their better capitalised peers or those relying more on retail funding.

Similarly, relative to their peers, German banks with lower levels of capitalisation and lower return on assets tend to have larger reductions in their credit supply to firms which are not directly exposed to the event. The adjustment by Chilean banks which are smaller is to extend new loans with shorter maturities and higher interest rates.

The geographic presence of bank affiliates in foreign countries has an impact as well. Generally, the contraction of credit is larger for banks with business models that support global trade as measured by the extent to which banks engage in trade finance and have loan exposures to foreign residents. The UK study looks at differences across banks with and without foreign affiliates (Lloyd *et al* 2022).

Banks without foreign affiliates decrease crossborder lending. Those banks with a foreign affiliate decrease intragroup lending but increase direct crossborder lending. Barriers to competition have the strongest impact especially for banks which have already established a presence in the other country.

The geographic specialisation of banks also determines the relationship between bilateral crossborder lending of banks and bilateral trade of firms: more geographically specialised banks provide more crossborder lending to firms in the same industry in which they specialize, but less so following an adverse trade shock (Pedrono 2022).

Similarly, under increased trade uncertainty surrounding the renegotiation of the North American Free-Trade Agreement (NAFTA), foreign banks operating in Mexico with their parent headquartered in the US and Canada reduced credit supply, while those with foreign parents elsewhere, increased credit supply (Bush *et al* 2022).

Concluding remarks

Trade policy uncertainty and fragmentation events have become major concerns for global production and trade (Fajgelbaum and Khandelwal 2021), with simulations showing that these events could lead to substantial reductions in economic growth (Bolhuis *et al* 2023).

Cross-country studies organised by the International Banking Research Network emphasise additional financial-sector factors that can affect credit supply and output effects of fragmentation events. Adverse trade shocks affect banks' borrowers, and the effects of those shocks are amplified through contractions in credit supply.

Importantly, these effects go beyond the specific firms that are directly affected by the trade-related events. This body of research shows that shocks to banks, which derive from borrowing firms' exposures to trade and trade uncertainty, generate ripple effects.

A decline and reallocation of bank credit supply can reinforce fragmentation and potentially slow the adjustment of firms to trade shocks.

A general conclusion from very detailed studies is that banks that are more resilient – with diversified portfolios, better capitalisation and liquidity buffers – are better placed to absorb adverse shocks and maintain lending, containing some of the adverse spillovers from trade shocks through credit supply. ■

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Endnotes

1. See the discussion and literature review in Buch and Goldberg (2020).
2. See also Baker et al (2016), Born et al (2019), Bloom et al (2019), and Fajgelbaum and Khandelwal (2021).

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The evolving nature of banking, bank culture, and bank runs

In light of the recent bank failures Michelle Bowman discusses supervision, regulation, bank management culture, and technology, and how each of these changes the dynamics of building a stronger and more resilient financial system

Given the recent banking system stress many are welcoming a fresh look at whether the Dodd-Frank era changes to the financial system and the approach to supervision and regulation have kept pace with the evolving nature of banking, the evolving culture of banking, and how the risks of bank runs today have evolved to be meaningfully different from what we've seen in the past. While my remarks will largely focus on the United States, the lens through which regulators and policymakers should view these issues has some broader applicability and is worthy of an ongoing discussion.

I will begin by offering a few thoughts on US monetary policy. At our most recent meeting, in light of the ongoing unacceptably high inflation, the Federal Open Market Committee (FOMC) increased the target range for the federal funds rate by 25 basis points.

With this increase, the FOMC has raised the federal funds rate by 5 percentage points since March of last year. These increases, combined with the runoff of our balance sheet, are having the desired effect of tightening financial conditions. In my view, our policy stance is now restrictive, but whether it is sufficiently restrictive to bring inflation down remains uncertain.

Some signs of slowing in aggregate demand, lower numbers of job openings and more modest gross domestic product (GDP) growth indicate that we have moved into restrictive territory. But inflation remains much too high, and measures of core inflation have remained persistently elevated, with declining unemployment and ongoing wage growth.

And, as senior loan officers signalled beginning last summer, credit has continued to tighten¹. I expect this trend will continue given increased bank funding costs and reduced levels of liquidity.

While the US banking and financial system remains sound and resilient, the recent failures of three US banks with unique risk profiles have added to the uncertainty surrounding the economic outlook. This uncertainty is further complicated by stock price movements among regional banks.

Should inflation remain high and the labour market remain tight, additional monetary policy tightening will likely be appropriate to attain a sufficiently restrictive stance of monetary policy to lower inflation over time.

No efficient banking system can eliminate all bank failures. But well-designed and well-maintained systems can limit bank failures and mitigate the harm caused by any that occur

I also expect that our policy rate will need to remain sufficiently restrictive for some time to bring inflation down and create conditions that will support a sustainably strong labour market.

Of course, the economic outlook is uncertain and our policy actions are not on a preset course. I will consider the incoming economic and financial data during the intermeeting period and its implications for the economic outlook in determining my view of the appropriate stance of monetary policy.

I will look for signs of consistent evidence that inflation is on a downward path when considering future rate increases and at what point we will have achieved a sufficiently restrictive stance for the policy rate.

In my view, the most recent CPI and employment reports have not provided consistent evidence that inflation is on a downward path, and I will continue to closely monitor the incoming data as I consider the appropriate stance of monetary policy going into our June meeting.

My remarks will address the recent bank failures in the United States and how the evolution of the banking industry has influenced and amplified bank deposit run risk. I will then discuss supervision, regulation, bank management culture, and technology, and how each of these changes the dynamics of our approach to building a stronger and more resilient financial system. Finally, I will close with my views on the importance of approaching the future in a deliberate, evidence focused, and thoughtful manner.

The evolving context of banking and bank failures

Those who are involved in the business of banking will not find this shocking, but it is a fundamental fact that banking involves risk. It is inherent in, and foundational to, the business of banking: banks take demand

deposits—a short-term liability—and make term loans—creating a long-term asset. Absent this intentional risk-taking, banks could not play their indispensable role of credit provision in the economy.

There are many other risks, with the specific risks that banks face today as varied as the wide range of bank business models. The most fundamental banking risks include credit, concentration, interest rate, liquidity, cybersecurity, more recently operational risk and, of course, the risk of contagion.

Banking simply cannot work in its current and historical form without risk, so unless the goal is to change the nature of banking, the task of policymakers and regulators is not to eliminate risk from the banking system, but rather to ensure that risk is appropriately and effectively managed.

Fundamentally, this is the basis for the bank regulatory frameworks that exist around the world. In countries with well-functioning and appropriately regulated banking systems, banks serve an indispensable role in credit provision and economic stability.

The goal is to create and maintain a system that supports prudent banking practices, and results in the implementation of appropriate risk management. No efficient banking system can eliminate all bank failures. But well-designed and well-maintained systems can limit bank failures and mitigate the harm caused by any that occur.

In practice, the 'maintenance' of the bank regulatory and supervisory framework has often been challenging, in part because maintenance requires vigilance in responding to evolving circumstances and risks.

Lapses in this effort are revealed when something breaks, which could include fragilities resulting from the emergence of unidentified risks and financial stability threats; banking practices that expose shortcomings in the

supervisory framework; or policymakers, regulators, and/or examiners who have lost sight of the fundamental goal of encouraging prudent banking practices and appropriate risk management.

The need for maintenance of the US bank regulatory and supervisory framework has come into stark relief with the failures of two large banks in March, followed by a third at the beginning of May. The future and current policy choices made in responding to these failures will have important consequences for the US banking system.

Including the extent to which bank regulation will continue to drive banking activities from regulated banks and into shadow banks. While shoring up the resiliency of the banking sector is important, it is also important that we consider the consequences of any regulatory change.

Before discussing the direction of policy, I think it's imperative that we pause and consider where we are and what has changed.

The failure of Silicon Valley Bank

As financial services have evolved to meet the demands and expectations of sophisticated and wealthy businesses and individuals, risks inherent in the very nature of these services—instant accessibility and transferability of funds—created the potential for instability at an extensive and accelerated scale.

For Silicon Valley Bank in particular, while the run was ignited by traditional concerns, it was much faster than previous bank runs, was fuelled by the most modern communication methods and social media, and was enabled through new technology that allows customers to move money on a scale and at a velocity not previously accessible directly to customers.

On Thursday, March 9, SVB experienced a deposit outflow of more than \$40 billion, and more than \$100 billion was anticipated in queue for outflow on Friday, March 10. Let's consider this in comparison to past bank failures and the pace and size of deposit outflows.

Prior to SVB, the largest bank failure in US history was the failure of Washington Mutual, which experienced two periods of large deposit outflows, the first lasted 23 days with outflows of \$9.1 billion, and the second \$18.7 billion over 16 days². In other bank failures resulting from deposit runs, deposits flowed out of the bank in significantly smaller volumes and over much longer time horizons than SVB experienced on March 9 and 10³.

The recent bank runs have many familiar elements. SVB relied on funding from extremely large deposits of technology and health care sector firms, which were mostly uninsured (more than 95 percent) and held in transaction accounts. In traditional banking, uninsured depositors have historically been exposed to credit risk on their bank deposits, which provides some incentive for them to impose market discipline on the bank, such as by discouraging excessive risk-taking.

As we were very recently reminded, a disproportionate percentage of uninsured depositors can also present risk, since they may have strong incentives to withdraw their funds at the slightest sign of actual or perceived bank stress. These dynamics and incentives are certainly not new but have featured prominently in past bank runs⁴.

The most significant shift has been one of speed. This is where modern technology has played a significant role, both in facilitating the transfer of funds and in the access to, and expedited flow of, information among depositors.

Evolving technology and customer expectations

Back-end money transfer systems have been gradually shifting to real-time payments, which are immediately

available to customers upon transfer, rather than being subject to a waiting period while it is processed between financial institutions.

Many bank websites provide capabilities that appear to allow customers to initiate funds transfers in real time. Sophisticated customers that hold uninsured deposits also have tools at their disposal—like the ability to initiate wire transfers between financial institutions—that allow faster transfers of funds.

The capacity to initiate transfers, and even the changed perceptions of customers that they can move their funds at any time of day or night, have caused important structural shifts. Large depositors may have less incentive to act as a force for market discipline, even for banks where they hold large uninsured deposits in their operational accounts.

These depositors have a cheaper and more efficient mechanism at their disposal to protect against credit risk—they can pull their money out in banking's new normal. These changes have exacerbated the potential flight risks of uninsured deposits, while changing some of the incentives for depositors imposing market discipline.

Bank runs and the rumour mill

The speed and size of deposit withdrawals were a feature, not a cause, of the recent US bank failures. We live in a world where a wide array of communication tools—text messaging, group chats, and social media postings—have enabled expedited, if not always more accurate, dissemination of information.

The spread of information has always played an important role in bank confidence and bank runs. When information is more readily and quickly accessible and shared among shareholders, creditors, customers, and depositors, bank management needs to be attuned to how it communicates, especially when remediating identified weaknesses.

The failure of SVB illustrates this dynamic. Uninsured depositors were connected by a closely linked network of business relationships and contacts, and strong ties with venture capital fund investors. The flow of information among these depositors—and the mechanisms that pushed them to act collectively—seem apparent in retrospect, but the closely linked relationships among this group exacerbated the risks involved in SVB’s public communication of its remediation strategy.

But while the risk of uninsured depositors acting collectively was a significant vulnerability, communications from management caused this group to begin to withdraw their deposits on a massive scale and in a coordinated fashion.

We know that there were many supervisory issues at SVB over several years. At the time the bank failed, it had been selling securities to improve liquidity and raising capital to address some of these fundamental weaknesses in its funding and liquidity.

Simply the act of announcing that the bank’s management was taking steps to remediate these issues created panic—highlighting the risks they were confronting—and the panic spread quickly.

Social media has also played a role in fuelling stock price volatility, which can lead to other risks to a bank. In October of last year, rumours circulated about Credit Suisse’s stock price conflating stock price with capital and liquidity strength.

Despite Credit Suisse management’s efforts to intervene and calm markets, its stock experienced significant volatility, resulting in an increase in the spreads on the firm’s credit default swaps and a decrease in the value of its bonds.

Credit Suisse had been dealing with significant issues for an extended period of time, but this incident highlighted how quickly investor sentiment can change in the age of social media.

Bank culture and mindset

A more subtle way we are seeing banking evolve is most evident in the 'culture' of banking for those banks whose business models directly involve funders of startups, transformative new technologies, or novel activities like digital and cryptoassets.

For many banks, innovation has been a long-term priority because it enables them to offer customers new products and services and remain competitive in the current financial services environment⁵. But regardless of the business model, the culture of a bank must also prioritize the values and rules that make banks successful over time. This includes not only being responsive to the needs of their customers and communities, but also maintaining a strong risk-management culture.

The expansion from traditional bank business models brings an influx of non-bankers into bank management. Over the past several years, there have been a number of charter-strip acquisitions, where a new management group transforms a traditional bank's business model.

And we have seen consistent growth in banking-as-a-service partnerships—where the bank partners with a nonbank company, often a fintech, to offer new products and services. Even without these external influences, bankers who leverage innovation as a significant aspect of their business model often have a mindset that is compatible with continued innovation and are less sensitive to regulatory and supervisory communications. I view these trends as part of a cultural shift within these banks.

Some innovators espouse an ‘ask for forgiveness, not permission’ mentality when it comes to regulation and compliance. This is a particularly dangerous mindset when it comes to banking. Bank supervisors often rely on their interactions with bankers to communicate supervisory concerns.

This enables supervisors to provide feedback to bank management before these issues escalate and are cited in examination reports and as Matters Requiring Attention (MRAs), Matters Requiring Immediate Attention (MRIAs), or enforcement actions.

But bank management must be receptive to these supervisory messages and should take proactive measures to address the issues identified. This kind of proactive approach may not be the most natural reaction for those who have been successful in a less-regulated tech or start-up environment.

The policy response

Given the recent banking sector stress, it is clear that we need to review the bank regulatory and supervisory framework to determine whether updates are needed. As we consider potential changes to improve supervision and regulation, we should start from a baseline understanding of the available tools and determine whether those tools have been utilized and implemented effectively.

Before regulators seek new tools, it is necessary to understand the need—how would the use of those new tools address deficiencies in the existing regulatory toolkit? Imposing additional requirements on regulated institutions without understanding this need results in additional costs and can have unintended consequences like encouraging bank consolidation and constraining credit availability to critical business activities or geographies.

In addition to these unintended consequences, we also need to carefully consider the broader implications of regulatory change for financial stability.

The policy response to a crisis should be multifaceted, as changes to different elements of supervision and regulation in combination may be the most efficient and effective response. We should have no illusions that ‘getting it right’—finding the right combination of regulatory and supervisory changes—is a simple task. This fine tuning is a core element of maintaining an effective system, constantly re-evaluating whether our tools are effective and used appropriately.

There are a few specific areas where I see a need to revisit our approach, specifically in supervision, regulation, and technology.

Supervision

Starting with supervision, effective bank supervision requires both transparency in expectations, and an assertive supervisory approach when firms fail to meet these expectations.

In the past, I have spoken about the virtue of transparency in supervision⁶. Transparency in supervisory expectations builds legitimacy, promotes a compliance culture, and is critical to ensuring that we preserve due process. Transparency between a bank and its examiners can be a profoundly effective tool by allowing bankers to air issues early with their examiners.

This type of communication promotes understanding—of the bank and its operation by examination staff, and of regulatory expectations by the bank’s management and board of directors. Amorphous standards or standards that change without prior notice frustrate this goal.

If regulators are clear in our expectations with banks, and banks fail to meet those expectations, regulators are well-positioned to take strong action and demand remediation of supervisory issues. When a bank fails to promptly address identified issues, the bank and the banking system run the risk that those issues can become far more damaging over time. There is a significant cost to delay.

While the specific timelines for remediation of supervisory issues vary significantly across firms, the Board has published statistics on the number of and general nature of supervisory findings, and how those have evolved over time⁷.

Remediation of technology infrastructure, data, and operational resilience issues often take longer to address than those in other business areas or related to risk management⁸. Some variability is reasonable as these issues vary in complexity. And, to the extent that a bank is reliant on third parties, core providers, or others to help remediate issues, providing sufficient remediation time can be necessary and appropriate.

Providing time to remediate issues should not be a pretext for inaction or inattention to important supervisory issues. Ultimately, one of the primary goals of supervision is to hold the bank accountable for safety and soundness and consumer compliance. Accountability is critical for both the bank and for supervisors. Where regulators have failed in supervision, we must hold ourselves accountable.

Part of the solution to inaction may simply be to take a stronger approach when examiners have identified deficiencies in need of remediation. But for some banks, management's responsiveness to supervision—traditionally an area that rewarded conservative and prudent management—has changed, with a greater emphasis on innovation, especially those that promise to transform the business of banking.

These shifts impact supervision, in that we need to re-evaluate the effectiveness of formal and informal enforcement mechanisms. If moral suasion as an informal tool is less effective, and bank management and boards are less attuned to hear and respond to supervisory messages, we need to reconsider our supervisory toolkit.

This may mean taking more formal remediation measures, with definitive timelines, and imposing meaningful consequences for firms that fail to remediate issues in a timely way.

In addition to being transparent, supervision must be nimble and responsive because the financial services landscape and bank risks evolve over time. The low interest rate environment following the 2008 financial crisis shifted the supervisory focus away from interest rate risk to other risks, just as the current rising rate environment required supervisors to return to interest rate and emerging credit risk⁹.

Supervision must also complement regulation. While regulation is a critical tool, it operates with a significant lag for most developed banking systems. This is where supervision can complement regulation to address emerging threats and risks by allowing supervisors to pivot to those fundamental risks that may be most salient based on that bank's business model and evolving economic conditions.

Regulation

In response to the recent bank failures, it is tempting to engage in a wholesale revision of the bank regulatory framework. Before changing rules, we need to take a critical look at actual weaknesses and acknowledge the strengths that should be preserved.

As a threshold matter, today's regulatory system is fundamentally strong. But as the Federal Reserve continues to carefully monitor developments and changes to the banking system, we must recognize that the regulatory framework has been transformed through a broad range of changes in response to the 2008 financial crisis.

These changes have led to a strong and resilient banking system. Overall, our regulatory framework is also strong. This framework has materially increased bank capital and liquidity and added a number of other requirements to improve resiliency, including new stress testing and resolution planning requirements.

Following the 2008 crisis, the US regulators implemented changes designed to improve the quality and quantity of bank capital. This included the introduction of common equity tier 1 (CET1) as a measure of the highest quality form of regulatory capital, and the capital conservation buffer.

Today, large US banks are also subject to additional capital requirements, based on the tiering framework. For all banks with over \$100 billion in assets, the requirements include the stress capital buffer and a number of additional GSIB and large firm-specific requirements. The US capital requirements are described as 'gold plating' the standards set in the Basel III reforms.

This is today's starting point, and it is strong. With the commitment of US regulators to implement Basel III capital reforms, there will soon be additional changes to the capital framework¹⁰. I would like to better understand the US approach to these reforms before passing judgement, but if changes are implemented in a way that takes costs and benefits into consideration and preserves capital neutrality, in my view, these reforms could improve the capital framework.

Prior to 2008, there were also no standardized, quantitative liquidity requirements for US banks and their holding companies. Today, there are two: the Liquidity Coverage Ratio, which supports short-term resilience by requiring banks to have liquidity to cover net cash outflows in a 30-day stress period; and the Net Stable Funding Ratio, which requires firms to maintain stable funding over a one-year time horizon. There are also internal liquidity stress testing and liquidity buffer requirements.

With this in mind, we should be careful and intentional about any significant changes to the regulatory framework, including imposing new requirements that will materially increase funding costs, like higher capital requirements or the requirement of firms to issue long-term debt.

Many of the issues related to the recent bank failures have been identified in bank management and supervision. Therefore, a broad-based imposition of new capital requirements on all banks with more than \$50 billion in assets would be a far more costly solution than taking the time to specifically identify and address known management and supervisory process issues. Relying on the timeless adage to guide us: if it ain't broke, don't fix it.

I do not mean to suggest that regulation has worked perfectly and needs no improvement or maintenance. I think where we find improvements are necessary, we should make them. But we should also be working toward a defined goal and verifiable end state that incorporates the principle of efficiency. And of course, regulation should be durable throughout the economic cycle.

Our regulatory framework is extremely complex with many overlapping and sometimes contradictory requirements. Engaging in a piece by piece, regulation by regulation approach will likely have a similar outcome.

Technology

We should also review and update the Fed services available to support banking system resiliency. In payments, the Federal Reserve offers payments-related services including Fedwire® to facilitate wire transfers. In the US, the Federal Reserve serves as the 'lender of last resort' to the banking system, providing loans at the discount window since the early part of the twentieth century.

These tools are important but are not effective mechanisms to rescue troubled institutions. Discount window lending is available only to institutions that meet certain minimum eligibility standards, and that have collateral available to pledge.

Its function is to provide a solvent institution with a vital backup source of liquidity to meet unexpected customer outflows. Similarly, the ability to process fast, efficient payments can also facilitate effective market functioning, but its utility is limited.

In light of the extensive recent use of these tools and the lessons that can be learned, I think it is time to review these tools—which operate during limited, fixed hours and rely to some extent on dated technology—to determine whether they have kept up with the pace of change for the future payments landscape and expectations of liquidity planning. These tools must be nimble and flexible to support the banking system during times of stress.

I think it is important that we understand how well these tools functioned in early March as two US banks experienced stress and ultimately failed, and what can be improved regarding timeliness or effectiveness of fulfilling the lender of last resort function.

The path forward

My views on the path forward are informed by serving as the bank commissioner for the state of Kansas as its lead regulator and supervisor, my experience as a banker, and especially by my service on the Board of Governors since 2018, during a time when the banking system has experienced many unique stresses including those associated with the COVID pandemic.

There have already been some preliminary and expedited internal reports published on the failures of SVB and Signature Bank, and I fully expect to see additional reports and analysis of these failures, and the failure of First Republic, in the coming months¹¹.

These preliminary reviews are an important first step for the US bank regulators working to identify root causes of these bank failures and holding themselves accountable for supervisory mistakes. There are additional steps that we can take.

First, I believe that the Federal Reserve should engage an independent third party to prepare a report to supplement the limited internal review to fully understand the failure of SVB. This would be a logical next step in holding ourselves accountable and would help to eliminate the doubts that may naturally accompany any self-assessment prepared and reviewed by a single member of the Board of Governors¹².

This external independent report should also cover a broader time period, including the events of the weekend following the failure of SVB, and a broader range of topics beyond just the regulatory and supervisory framework that applied to SVB, including operational issues, if any, with discount window lending, Fedwire services, and with the transfer of collateral from the Federal Home Loan Banks.

Second, I believe we need to do a better job identifying the most salient issues and moving quickly to remediate them. It is clearly evident that both supervisors and bank management neglected key, long-standing risk factors that should be an area of focus in any examination.

These include concentration risk, liquidity risk, and interest rate risk. We have the tools to address these issues, but we need to ensure that examiners focus on these core risks and are not distracted by novel activity or concepts.

Finally, we should consider whether there are necessary—and targeted—adjustments we should make to banking regulation. This will likely include a broad range of topics, including taking a close look at deposit insurance reform, the treatment of uninsured deposits, and a reconsideration of current deposit insurance limits¹³.

We should avoid using these bank failures as a pretext to push for other, unrelated changes to banking regulation. Our focus should be on remediating known, identified issues with bank supervision and issues that emerge from the public autopsy of these events.

A debate about regulatory changes must also consider where we are today as compared to prior to the 2008 financial crisis. The banking system is strong and resilient despite recent banking stress. The Fed has refined regulatory standards over time at the direction of Congress, most recently pursuant to the bipartisan Economic Growth, Regulatory Relief, and Consumer Protection Act¹⁴, and through so-called ‘tailoring’ regulations designed to better align regulation with risk.

Even with the implementation of these changes, banks today are better capitalized, with more liquidity, and are subject to a new range of supervisory tools that did not exist prior to 2008. This paints a picture of a banking system that is not only strong today but is well prepared to continue supporting the provision of credit and the broader economy.

Calls for radical reform of the bank regulatory framework—as opposed to targeted changes to address identified root causes of banking system stress—are incompatible with the fundamental strength of the banking system. I am extremely concerned about calls for casting aside tiering expectations for less complex institutions, given the clear statutory direction to provide for appropriately calibrated requirements for these banks.

I have heard the drumbeat calling for broad, fundamental reforms for the past several years, shifting away from tailoring and risk-based supervision. I believe this is the wrong direction for any conversation about banking reform.

The unique nature and business models of the banks that recently failed, in my view, do not justify imposing new, overly complex regulatory and supervisory expectations on a broad range of banks. If we allow this to occur, we will end up with a system of significantly fewer banks serving significantly fewer customers.

Those who will likely bear the burden of this new banking system are those at the lower end of the economic spectrum, both individuals and businesses.

The American economy relies on a broad and diverse range of businesses supported by a broad and diverse range of banks. The elimination of regional banks from the US banking system would be devastating to businesses and communities across America. Especially for those regions whose communities are not sufficiently served by larger institutions. ■

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Endnotes

1. See [Senior Loan Officer Opinion Survey on Bank Lending Practices](#).
2. See Jonathan D Rose, [“Old-Fashioned Deposit Runs,”](#) Finance and Economics Discussion Series 2015-111, table 1 (Washington: Board of Governors of the Federal Reserve System, November 2015).
3. See Board of Governors of the Federal Reserve System, [“Financial Stability Report,”](#) box 3.1. (Washington: Board of Governors, May 2023).
4. See Rose, [“Old-Fashioned Deposit Runs.”](#)
5. See Michelle W Bowman, [“The Innovation Imperative: Modernizing Traditional Banking”](#) speech at the Independent Community Bankers of America ICBA Live 2023 Conference, Honolulu, Hawaii (March 14, 2023).
6. See Michelle W Bowman, [“Independence, Predictability, and Tailoring in Banking Regulation and Supervision,”](#) Speech to the American Bankers Association Community Banking Conference, Orlando, Florida (February 13, 2023).
7. See Board of Governors of the Federal Reserve System, [“Supervision and Regulation Report”](#) (Washington: Board of Governors, November 2022).
8. Board of Governors of the Federal Reserve System, [Supervision and Regulation Report](#).
9. Starting in the summer of 2022, the Federal Reserve took important steps to implement this shift in priorities for the regional banking organization portfolio (which includes banking institutions with between \$10 billion to \$100 billion in assets), and community banking organization portfolio (which includes banking institutions with less than \$10 billion in assets). These efforts culminated in internal outreach to examiners and external outreach to banks in both the RBO and CBO portfolios to promote awareness and proactive management of these risks in the fall of 2022. See, eg. Ask the Fed, a Program of the Federal Reserve System, [“A Discussion of Unrealized Losses at Community Banks in a Rising Interest Rate Environment”](#) (December 16, 2022); Community Bank Connections, [“2022 Year-End Message from Governor Bowman”](#) (“... banks with unrealized securities losses need to carefully consider the potential impact of holding securities with below-market interest rates, including, among other things, the impact on their liquidity, capital, and earnings.”); and Ask

the Fed, a Program of the Federal Reserve System, *“Risk Considerations in a Rising Rate Environment: Applying a Sound Supervisory Approach* (April 11, 2023).

10. See Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of the Comptroller of the Currency, *“Agencies Reaffirm Commitment to Basel III Standards”* joint press release (September 9, 2022).

11. See Government Accountability Office, *“Bank Regulation: Preliminary Review of Agency Actions Related to March 2023 Bank Failures”* GAO-23-106736 (Washington: Government Accountability Office, April 2023); Federal Deposit Insurance Corporation, *“FDIC’s Supervision of Signature Bank”* (Washington: Federal Deposit Insurance Corporation, April 28, 2023); Michael Barr, Vice Chair for Supervision of the Board of Governors of the Federal Reserve System, *“Review of the Federal Reserve’s Supervision and Regulation of Silicon Valley Bank”* (April 28, 2023).

12. As noted in Vice Chair for Supervision Michael Barr’s review of the supervision and regulation of Silicon Valley Bank, “[the] report was written with the benefit of hindsight on the particular facts and circumstances that proved most relevant for SVB and SVBFG. The report was prepared in a compressed time frame from March 13, 2023, through April 28, 2023, and further work over a longer period could draw additional or different conclusions.” Barr, *Review of the Federal Reserve’s Supervision and Regulation of Silicon Valley Bank*.

13. See Federal Deposit Insurance Corporation, *“Options for Deposit Insurance Reform”* (Washington: Federal Deposit Insurance Corporation, May 1, 2023).

14. Economic Growth, Regulatory Relief, and Consumer Protection Act, Public Law No. 115-174, 132 Stat. 1296 (2018).

The views expressed here are my own and not necessarily those of my colleagues on the Federal Open Market Committee or the Board of Governors. This article is based on a [speech](#) delivered at the ECB’s 21st Annual Symposium on Building the Financial System of the 21st Century: An Agenda for Europe and the United States, Frankfurt, Germany, May 12, 2023.

The growing quest for deposit stability

A stylized illustration of a hand in a black suit jacket with a white cuff, holding a stack of seven black books. The books are fanned out, with their spines pointing towards the right. The background is a solid blue color.

There are many who ask for radical reforms of regulation and deposit insurance. Fernando Restoy argues that strengthening supervision should be considered first

The timing of my remarks are particularly opportune as recently we have had episodes of financial distress that have required the intervention of deposit guarantee funds. Moreover, only a couple of weeks ago the European Commission released an important legislative proposal on crisis management and deposit insurance (CMDI).

My remarks are largely motivated by those two developments. More concretely, I plan to focus on the implications of uninsured deposits for financial stability.

Without expanding much on what we all know well, the recent turmoil has affected banks with different risk profiles on both sides of the Atlantic. On the American side of the ocean, a few mid-sized banks – with significant interest rate risk exposure – have failed. On this side, a major bank – actually a globally systemically important bank (G-SIB) – with a weak business model also failed.

While those banks were quite different, their failure followed a broadly common pattern. Although all failing banks satisfied minimum solvency requirements, market concerns about their viability provoked sharp corrections in equity prices which triggered unprecedented runs on deposits, particularly those not covered by the deposit guarantee scheme.

Those bank failures shined a spotlight on the significant increase in non-covered deposits and the structural risks posed by banks' reliance on them. A larger demand for banks' deposits can well result from a specific juncture characterised by ample liquidity and low opportunity costs in a context of low market rates.

However, the speed at which the runs took place – fuelled by social media and the new technological means to move funds rapidly from banks' accounts – could call into question prevailing assumptions about the stickiness of non-covered deposits.

The prospect of a structural loss of stability in banks' deposit base could have severe implications for the sustainability of commercial banks' business models and the robustness of the current regulatory framework, including features of current deposit guarantee schemes.

I believe that supervision can become more effective with a more forward-looking and intrusive approach. Authorities should have the means, powers and culture to challenge more forcefully banks' business plans, internal organisations and decision-making processes

That has triggered a debate on what policy actions, if any, should be explored to preserve banking system stability in the light of recent developments. Let me share with you some preliminary ideas in that regard.

How to contain bank runs: the US experience

Arguably, both prudential regulation and deposit insurance share the same origin. In the first half of the 19th century there was a wave of bank failures affecting in particular the redeemability of bank notes issued by entities chartered in some US states, starting in New York in 1829. These triggered the creation of the first insurance programmes.

Those programmes included not only the insurance of a series of banks' obligations but also the introduction of some regulatory restrictions, such as a specific list of eligible investments for bank capital and the creation of an authority with examination powers.

Prudential regulation and oversight were introduced mainly to mitigate the risk exposure of the insurance programmes. Yet authorities also recognised at that time the supplementary objective of providing assurance about banks' safety to their clients¹.

The establishment of a prudential regime for banks has accompanied all deposit insurance programmes implemented since then in the United States, including the one leading to the creation of the Federal Deposit Insurance Corporation (FDIC) in 1933. Indeed, the first federal deposit insurance scheme had a limited coverage (\$2,500).

However, it also contained a detailed set of rules – including the compulsory separation of investment and commercial banking – established rigorous admission requirements and gave the FDIC substantial supervisory powers.

Over the years, this scheme combining insurance coverage up to a specified limit and prudential controls has served the US financial system well and restrained the number of bank runs. This outcome has been supported by the progressive increase of the maximum coverage amount (currently \$250,000) and the strengthening of prudential regulation in parallel with the development of international standards.

In their latest version, Basel III, those standards include, for the first time, liquidity requirements (a Liquidity Coverage Ratio (LCR) and a Net Stable Funding Ratio (NSFR)) that differentiate between covered and non-covered deposits as a function of their estimated stability. In the US, however, only a few large banks are directly subject to the Basel standards.

In addition, the development, starting in the 1950s, of a broadly successful bank failure management regime has further contributed to the overall stability of banks' deposit base. At present, that regime gives non-covered deposits the same privileged ranking as covered deposits in the hierarchy of liabilities in insolvency.

Moreover, the FDIC can support transfer transactions involving all (and not only covered) deposits if this satisfies a least cost test, ie. if it is less expensive for the deposit insurance fund than paying out covered deposits in liquidation.

As seen recently, that requirement to adopt the least cost method of managing a bank failure can be waived in case of a risk to financial stability. Under this regime, there have been a relatively limited number of bank failures in which non-covered deposits have suffered losses².

That has logically generated the stabilising perception – but in no way the certainty – that non-covered deposits have, in practice, a fair amount of protection.

The US experience illustrates that, at least until now, limited coverage deposit insurance can deliver sufficient stability, but only if it is properly accompanied by an effective prudential framework and a bank failure management regime which moderates expected losses for uncovered deposits.

The European situation

What is the situation in Europe in terms of those elements that help maintain the stability of banks' deposit base?

The summary could be that, compared with the US, deposit coverage is smaller, the prudential regime is somewhat more stringent (at least for small and medium-sized institutions) and the bank failure management framework is relatively weaker.

As you all know better than anyone else, deposit insurance is currently only provided at the national level, but following rules established in European legislation. The coverage is harmonised and kept at a maximum of €100,000.

Prudential regulation, which closely follows the Basel standard, is also developed in European legislation and applies with little adjustment to all credit institutions in the EU. The rule book includes Basel's LCR and NSFR, which have been applicable in Europe since 2015 and 2021, respectively.

As for bank failure management, the current framework is a combination of a centralised regime (a common resolution framework) for banks whose failure passes a public interest test and domestic (mostly non-bank-specific) insolvency regimes for the rest. The former largely relies on the application of creditors' bail-in rules that can affect non-covered deposits for banks under resolution.

The latter contains a partially harmonised creditor hierarchy that gives covered depositors preference over holders of all other non-preferred liabilities, including non-covered depositors.

As has been discussed already for a few years, including in a forum with European deposit insurers like this one back in 2018³, this framework fails to offer a robust toolbox to deal effectively with the failure of mid-sized banks which are too large and sophisticated to be subject to liquidation but also too small and too unsophisticated to be able to issue large amounts of bail-in-able liabilities.

In particular, as those banks typically have little market funding, their failure would often imply losses for non-covered deposits, through the application of bail-in in resolution and, in liquidation, through their subordination to covered deposits. In order to avoid the destabilising implications of that outcome, European authorities have often relied on substantial bailouts.

In particular, given the existing restrictions on public support in resolution, in recent crisis episodes they have opted for stretching the potential under national insolvency regimes to support the sale of failing banks with the provision of liquidation aid by the state.

The most reasonable approach to addressing these deficiencies is to learn from the US experience and facilitate sale of business strategies – involving the transfer of deposits to an acquirer – by establishing effective funding arrangements, with the key participation of deposit insurance funds. Some proposals in that direction have been put forward over the last few years⁴.

Building on those proposals, the European Commission⁵ has recently launched a legislative initiative aimed at improving the crisis management framework by facilitating transfer strategies under the common resolution framework.

Without being exhaustive, the proposal establishes a general depositor preference rule to replace the current super-preference of covered deposits and makes deposit insurance funds more readily available to support sale of business operations under resolution. The amount of funds available remains capped through a US-type least cost restriction but without the flexibility created by the systemic exception.

In parallel, the proposal aims to expand the range of cases that are dealt with through resolution by effectively banning the application of domestic insolvency regimes when public liquidation aid is foreseen.

Bringing more failures within the resolution framework not only gives resolution tools effective transfer powers, but also brings an additional source of funding from the Single Resolution Fund in appropriate cases.

The proposal is a major step towards improving the European crisis management framework. Yet, as the European Commission openly recognises, a significant drawback is that the new framework for funding transfer strategies relies heavily on national arrangements rather than on a European deposit insurance scheme.

This not only deprives the new framework of the diversification benefits of a pan-European fund, but also makes it unable to contribute to the core banking union objective of denationalising banks' risk.

Those shortcomings are also relevant from the point of view of providing stability to uncovered deposits. In that regard, the expected availability of public funds to support the liquidation of failing banks under domestic insolvency regimes, while sub-optimal from the point of view of limiting taxpayer' costs of a bank crisis, could have a stabilising effect on non-covered deposits.

By excluding (formally unlimited) liquidation aid under insolvency regimes and replacing it with funding provided by national deposit insurers in resolution, which is subject to quantitative limits, the proposal might not contribute much by itself to strengthening the expected protection of non-covered deposits in a crisis episode.

Importantly, the lack of a European deposit insurance scheme with a greater capacity to support transfer strategies of individual banks than national funds could increase the perceived uncertainty about the protection of uncovered deposits in a bank's failure.

On recent reform proposals

Arguably, the current framework that combines limited deposit insurance coverage, a prudential regime and bank failure arrangements, while helpful for containing bank runs, it is not meant to eliminate the risk that a bank's crisis will entail costs for non-covered depositors.

In fact, as discussed before, recent developments might suggest that the probability and speed of bank runs could become more acute in the future.

Against that background, it is reasonable to consider reforms aimed at further protecting the stability of the financial system in these new circumstances. Some reforms of this kind are already being put forward and can be broadly classified around the three key elements described above: coverage of the deposit insurance scheme, prudential rules and bank failure management.

A first set of measures would entail increasing the current limits of insurance coverage for all or specific types of deposits, and eventually the coverage of all deposits without pre-specified quantitative limits.

A second set of measures would seek to strengthen prudential regulation. In particular, some observers are now proposing more stringent controls on those risk factors that have had a bearing on recent bank failures.

Those would include a review of Basel III's LCR to further restrict the instruments that would qualify as high-quality liquid assets or to modify the underlying assumptions (eg. non-covered deposit stickiness) that determine the required volume of those assets.

A far-reaching regulatory reform, but with a similar objective, could consider the introduction of collateralisation obligations for non-covered deposits to explicitly enhance the protection of those instruments⁶.

A last set of proposals focuses on the management of banks' liquidity distress. Rather than trying to prevent bank runs, some initiatives aim to make them less disruptive by ensuring that central banks can cover any liquidity gap created by a bank run with collateralised lending.

In its purest form, such a proposal would imply requiring banks to pledge ex ante sufficient qualifying collateral to central banks to cover all their runnable liabilities such as deposits or short-term market funding⁷.

All those proposals merit a careful analysis, particularly if further evidence emerges that current developments are the result of a structural reduction in the effective stability of the deposit base of financial institutions. Yet that analysis should include a rigorous assessment of the potential costs and side effects of each proposal.

A fundamental consideration is that reform options should not aim to fully transfer all banks' risks away from bank creditors to the state or the industry. Otherwise, this might well lead to disproportionate costs for taxpayers or the banking sector and may denigrate banks' risk management.

In particular, a scenario in which some depositors would withdraw funds to avoid losses when the bank is perceived as weak constitutes a powerful disciplining device for banks' managers which can hardly be fully replaced by stricter regulation.

In addition, while it is worth considering whether some technical adjustments could be warranted, excessively stringent liquidity requirements (through higher minimum liquidity ratios or the collateralisation of non-covered deposits) could ultimately impair commercial banks' business models and make them constrain their credit supply and/or rely more on expensive and less stable short-term market funding.

Those potentially adverse effects are present, possibly to a larger scale, in the more radical proposals aimed at constraining the acceptable volume of runnable liabilities as a function of the assets that could be pledged to the central bank.

As the central bank would need to cover the risk of lending in critical situations, acceptable collateral could only consist of either relatively safe assets (such as government securities) or risky assets (such as loans) only if they are subject to conservative haircuts.

Since deposits would be constrained by available collateral, the proposal could possibly create funding gaps for the loan portfolio that might have to be covered either by reducing banks' lending in favour of less risky exposures or increasing the reliance on costlier longer-term (non-runnable) market liabilities.

Therefore, when considering this type of proposal, authorities should bear in mind the potential negative impact of those initiatives on banks' profitability, safety and soundness, and ability to intermediate. Otherwise, these

initiatives could lead either to the reduction of credit availability to the real economy or to an excessively prominent role of non-banking intermediaries.

The role of supervision

What about supervision? Arguably, the far-reaching regulatory proposals are motivated by a lack of trust in the ability of the existing regime to preserve a well-functioning banking system in a context of a more unstable deposit base. That could well be the justified, although much more evidence and analysis would still be required to establish the need to substantially modify the current regulatory framework.

That said, while the case for radical regulatory reforms still remains quite uncertain, I believe there are already clear arguments for reviewing supervisory practices and seeking ways to strengthen them.

For example, the materialisation of interest rate risks triggered several bank failures. But banks' vulnerabilities unveiled by those failures went beyond specific exposures or funding sources. This included excessively risky balance sheet structure, deficient risk management and unsound growth strategies.

In other words, the root cause of the weaknesses of failing banks was a flawed business model and poor governance. Of course, the large amount of non-covered deposits – while not the predominant funding source in all cases – accelerated the failure, but this was not the main vulnerability of the failing banks.

Put differently, the assumption that non-covered deposits are now less stable than in the past should primarily lead to the conclusion that more and earlier policy action is needed to promote sustainable business models and sound governance practices.

Importantly, the ability of standard prudential rules to address this type of weakness is limited. There is simply no feasible amount of capital and liquidity requirements than can compensate for banks with poor governance or business models. To the contrary, an attempt by authorities to compensate for a bank's structural deficiencies with more capital and liquidity could well exacerbate problems and further undermine the viability of the institution.

Actually, the prompt identification and correction of those deficiencies is the core business of supervision. Indeed, under the current Basel III pillar 2, supervisors have a broad range of powers and tools – including both quantitative and, more importantly, qualitative measures – that could help correct banks' structural weaknesses⁸. Unfortunately, Pillar 2 is not sufficiently well developed in all jurisdictions.

The European banking union is a good example of a jurisdiction which has developed a well-structured supervisory review and evaluation process (the SREP) which supports the application of Basel's pillar 2.

In particular, unlike other jurisdictions, together with capital and liquidity adequacy, the ECB's SREP evaluates the governance and business model sustainability of all banks under its remit. On the basis of that evaluation, it regularly conveys recommendations or requirements to banks in order for them to address their weak points.

In a recent report commissioned by the ECB, a group of experts have praised this structure, although we have also recommended that the approaches followed when deploying qualitative measures be further improved by refining their formulation, prioritisation and monitoring⁹.

More broadly, I believe that supervision can become more effective with a more forward-looking and intrusive approach. Authorities should have the means, powers and culture to challenge more forcefully banks' business plans, internal organisations and decision-making processes without, obviously, alleviating any management responsibility.

Conclusion

I believe it would be a mistake to downplay the relevance of the recent bank failures. At a minimum, they indicate that a scenario in which banks and their regulation would need to adapt to a less stable deposit base cannot be ruled out.

Against that background, given the potential disruption that this scenario could generate, we cannot now exclude the need to eventually consider bold policy reforms. In any event, those reforms should be grounded on compelling evidence and, crucially, on a rigorous cost-benefit analysis.

For the time being, though, those episodes already constitute a good case for speeding up a full implementation of the Basel standards in all jurisdictions. Moreover, they support the need to put in place or further develop pragmatic bank failure management regimes that sufficiently acknowledge the need to provide non-covered deposits with a sensible degree of protection when banks fail.

More importantly, I believe that supervision already has the potential to address the root causes of many bank failures, and that this potential is often not fully exploited.

Frankly, before we even think of introducing far-reaching changes in prudential rules or in the scope for deposit guarantees, I would first give supervision another chance. ■

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Endnotes

1. FDIC (1998)
2. Since 1992 (2008), in only 20% (6%) of the failures, non-covered depositors have suffered losses, the average loss being 28% (43%). See FDIC (2023).
3. Restoy (2018).
4. See eg Restoy (2019), Restoy et al (2020), Gelpern and Veron (2020) and Garicano (2021).
5. European Commission (2023).
6. FDIC (2023).
7. See King (2023) and Noonan (2023). The latter contains quotes from Paul Tucker on the matter.
8. Coelho et al (2023).
9. See Dahlgren et al (2023).

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When will they ever learn? The US banking crisis of 2023

Anat Admati, Martin Hellwig and Richard Portes argue that US authorities should acknowledge the evident banking crisis and suggests reforms to address the underlying solvency problems

At a [press conference on 3 May 2023](#), Jay Powell, the Federal Reserve Chair, suggested that *“the resolution and sale of First Republic ... is an important step toward drawing a line under (the) period of severe stress”* that started with Silicon Valley Bank (SVB)'s 10 March failure. Mr Powell's statement suggests that either he did not understand the nature and the extent of the problems afflicting US banks or that he understood but chose to ignore them. Markets have not accepted the view he expressed¹.

The crisis in US banking is 'systemic', concerning a large part of the banking system not because banks are so interconnected but because they have followed similar strategies and are now in a similar bind. SVB is an extreme example, but the difficulties of SVB suggest lessons about other banks in the US and elsewhere.

On 31 December 2019, SVB's financials showed \$62 billion in deposits, \$33 billion in loans, and \$29 billion in securities². On 31 March 2022, 27 months later, the bank's disclosures included \$198 billion in deposits, \$68 billion in loans, and \$127 billion in securities. The massive inflows consisted mostly of large uninsured corporate deposits.

With interest rates close to zero for several years, corporate treasurers saw no gains from investing in money market instruments rather than deposits.

SVB lending did not keep pace with the tripling of deposits during this period. Excess inflows were placed in safe, fixed-interest securities such as government bonds and agency debt. But 'safety' does not mean absence of risks to market values from interest rate changes.

In 2022, the Federal Reserve started raising interest rates to fight inflation. Investors then moved gradually from deposits to money market investments that paid higher interest. By 31 December 2022, SVB's deposits had declined by \$25 billion.

In response, it reduced its cash, borrowed from the Federal Home Loan Bank, and slowed replacements of maturing securities. In the first two months of 2023, deposits declined further. On 8 March, the bank announced that \$21 billion worth of securities had been sold at a loss of \$1.8 billion.

The crisis provides an opportunity to implement long-delayed restructuring of the banking sector, with some banks leaving and some merging. It is important that solvent banks should be the ones to survive. And the too-big-to-fail problem must not be exacerbated

To compensate for the loss, it would raise new equity. Potential equity investors shied away and depositors became aware that SVB had incurred losses on securities and could not raise more equity. They reacted with a massive run, withdrawing \$42 billion on 9 March. On 10 March, the authorities closed the bank, citing “*inadequate liquidity and insolvency.*”

SVB had in fact been insolvent at least since September 2022, but its accounting practices concealed that fact. Interest rate increases since March 2022 had led to a substantial decline in the fair values of SVB’s assets. These losses hardly appeared in the accounts because SVB had classified most securities and loans as ‘held to maturity’ (HTM).

For such assets, accounting rules do not require acknowledging valuation losses from interest rate increases. If the assets are held to maturity and there is no concern about whether promised payments will be made in full, there will ultimately be no losses, goes the logic.

Holding assets to maturity, however, requires the bank to roll over its short-term debt or maintain all its deposit funding. If market rates increase, doing so at previous low rates may be impossible^{3,4}.

SVB’s insolvency was evident from its Annual Report 2022. That report gives the accounting value of HTM securities as \$91 billion while mentioning that fair value was only \$76 billion. The difference of \$15 billion far exceeded the tangible equity of the bank, which was given as \$12 billion. If the losses had to be realised, the bank would have to default. The 8 March announcement showed that loss realisation had begun.

The Federal Reserve’s report on SVB (Federal Reserve 2023) refers to management recklessness and to the supervisors’ slowness in addressing this recklessness and raises many disturbing questions. The bank received high

regulatory ratings; most of the issues supervisors raised were procedural and ignored the key issues that ultimately led to the bank's failure.

The preliminary review by the Government Accountability Office (GAO) notes that the Federal Reserve failed to engage in prompt corrective action as had been recommended in 2011 (GAO 2023). The supervisory failure was consistent with the 'light touch' approach to regulation and supervision at the Federal Reserve⁵.

The Fed report also treats interest rate and liquidity risks as though they had nothing to with each other. Changes in asset values and the changes in refinancing conditions were two sides of the same coin, however, both driven by the increase in interest rates in 2022.

The report also fails to discuss the bank's solvency problem and the supervisors' blindness towards this problem, which was masked by capital ratios based on accounting valuations and risk weights. For HTM assets, risk-based regulations are concerned only with credit risk and ignore the possibility of losses in fair value.

Supervisors should have recognised the declines in the market values of SVB's assets as highly relevant to its viability and should have acted on this information.

SVB was special in having such extraordinary deposit growth in 2020 and 2021, catering to a very small socially connected clientele, having an extreme level of unrecognised losses on its assets, and having more than 90% uninsured deposits. These facts explain the extent and speed of the run, but the ultimate cause of the run was the underlying solvency problem.

This problem was not, and is not, unique to SVB or First Republic Bank, which failed for similar reasons⁶. Between early 2020 and March 2022, banks saw their deposits grow because money market investments were unattractive. Much of this growth went into fixed-income securities, which lost value when interest rates increased again. According to Jiang *et al* (2023), the total unrealised losses on securities in US banks amount to some \$2 trillion⁷.

If one half of all uninsured deposits were withdrawn, about 190 banks would have to realise losses so large that they might be unable to repay insured deposits. If asset prices fell because many banks were selling simultaneously, the number of banks affected would be even larger.

The cases of SVB and First Republic have alerted markets to the systemic problem, as the Fed also recognised by invoking the 'systemic risk exemption' to justify its interventions.

The Fed's policy reaction, which expanded its lending programmes to banks, neutralises the effects of deposit withdrawals temporarily, but does nothing to alleviate the banks' solvency problems. If a bank pays off depositors by borrowing from the Fed rather than selling securities, its borrowing costs rise above the return on the securities.

Borrowing at 5% while earning less than 2% on government bonds bought in 2021 is a path to failure⁸. So is retaining deposits by raising rates paid to depositors if asset yields remain low.

Much of this looks like a replay of the Savings and Loans (S&L) crisis of the 1980s. When market rates of interest peaked in 1980-81, depositors moved their funds from S&Ls to money market funds. In response to the S&Ls' complaints about the resulting 'liquidity problems', regulation of deposit rates was abolished so S&Ls could match money market rates. But these rates were much higher than the 6% they earned on fixed-rate mortgages made in 1965 that still had 15 years to go.

Under fair-value accounting, a large part of the S&Ls would have been insolvent in 1981 (Kane 1985). Then as now, however, there was no fair-value accounting for HTM assets. The 'zombie' S&Ls spent the 1980s gambling for resurrection, using funds from depositors attracted by high interest rates and by deposit insurance to taking risks that blew up when interest rates rose again in 1989. The ultimate cost to taxpayers was much higher than it would have been if insolvencies had been addressed in 1981.

Today, policymakers, lobbyists, and commentators seem to miss the obvious lesson: ignoring insolvencies while also insuring deposits can lead to disastrous outcomes. The Federal Reserve is now providing liquidity support without restoring solvency, prolonging the agony and encouraging some banks to start gambling for resurrection as the S&Ls did in the 1980s.

Expanding deposit insurance without eliminating zombies is similarly problematic. If bailouts of uninsured depositors continue, the extra levies on the banking industry to cover losses to the insurance fund may harm the viability of remaining banks.

US authorities should acknowledge the evident banking crisis and find appropriate ways to address the underlying solvency problems. The losses that have been incurred must be recognised and absorbed by appropriate parties. The US Treasury might absorb losses by purchasing outstanding government debt at nominal values, but doing so would aggravate the government's fiscal problems and is likely a political non-starter. Alternatively, the Federal Reserve might engage in such purchases, but this could raise monetary policy issues.

One immediate way to reduce solvency problems would be to restrict executive compensation as well as payouts to shareholders such as dividends and stock repurchases for banks whose equity capital fails to meet specified standards when fair-value accounting is applied.

This would prevent managers and shareholders, who had benefitted from the upside of risks, from continuing to pay themselves excessively while their bank exposes depositors and the deposit insurance system to significant risks of losses.

The crisis provides an opportunity to implement long-delayed restructuring of the banking sector, with some banks leaving and some merging. *It is important that solvent banks should be the ones to survive.* And the too-big-to-fail problem must not be exacerbated.

Mergers should involve small and medium banks rather than banks that are already too big themselves. The takeover of First Republic Bank by JPMorgan Chase in the US is a case in point. So is the shotgun acquisition of Credit Suisse by UBS that we discussed in a companion piece (Admati *et al* 2023).

Longer term, we need regulatory reforms to prevent a recurrence of the problems that underlay SVB's failure. Extensions of deposit insurance that have been proposed by many observers are not a panacea and must be treated with caution if we want to avoid a repeat of the S&L debacle (Dewatripont *et al* 2023, Heider *et al* 2023, Perotti 2023).

Certain transactions such as meeting payrolls may require large transactions balances. The \$3.3 billion that Circle Corporation held with SVB, however, had little to do with transactions and much with a convenient way of holding assets.

Corporate wealth management should not benefit from the levy on the banking industry that is needed to reimburse depositors of an insolvent bank. There is a case for limits to guaranteed deposits except for a grace period surrounding large transactions. The central bank might offer depository facilities for institutions that necessarily hold large balances.

The following reforms should have been introduced long ago:

- Apply mark-to-market or fair-value accounting to all assets; abandon the fiction that changes in fair values of HTM assets are irrelevant.
- Stop compartmentalising risks – recognise correlations among different risks that arise from common dependence on macro developments such as changes in interest rates affecting fair values of assets as well as the scope and conditions for rolling over short-term liabilities.
- Strengthen supervision under Pillar 2 of the Basel Accord, which asks supervisors to consider the professionalism of bankers. The extent of maturity transformation at SVB was unprofessional. Supervisors should have interfered much more actively early on.
- Raise equity requirements to enable banks to withstand fair-value losses on all assets when interest rates rise. If SVB had been subject to a 20% equity requirement, its losses would have been borne by shareholders rather than falling on the FDIC.

Narrow interests and intellectual misconceptions have blocked such reforms despite many banking crises. When will they ever learn? ■

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Endnotes

1. Bank stock prices are far from recovering. The closures of SVB and First Republic have also caused substantial and persistent increases in banks' deposit funding costs (see Slok 2023).
2. All numbers are quoted from the 10Ks and 10 Qs that SVB filed with the Securities and Exchange Commission.
3. The claim that 'deposits are merely an accounting record' and that banks 'create' money by making loans, and therefore that banks never have to worry about funding problems and only have liquidity problems, is fundamentally flawed and misleading. From the bank's perspective, deposits are a form of debt, a legal liability that they must fulfil should the depositor want to withdraw funds, or else a third party such as the government fulfils, or the bank defaults and the depositor is not paid in full (Admati and Hellwig 2019, Claim 6).
4. The run on SVB also made it clear that deposits are no longer as 'sticky' as they were in the past and cannot be considered a long-duration liability that hedges long-duration assets.
5. See Wilmarth (2013) and "The Regulatory Breakdown Behind the Collapse of Silicon Valley Bank", New Yorker, 19 March 2023, which includes an interview with Peter Conti-Brown.
6. Signature Bank in New York also failed on 12 March 2023, two days after SVB. FDIC (2023) traces this failure to the impact of the November 2022 failure of Silvergate Bank in California and to poor management and lack of response to supervisors.
7. Drechsler et al (2023) arrive at a similar figure.
8. At this writing, the Federal Reserve is charging at least 5% in its discount window (see <https://www.frbdiscountwindow.org/>). On 12 March, it opened a new Bank Term Funding Program that makes loans of up to a year, currently at 4.74% interest. Both programmes value bank collateral at par, which is often much higher than the standard fair market value. In addition, many US banks borrow from the Federal Home Loan Bank (FHLB) system, which generally lends with harsher terms. Both Silicon Valley Bank and First Republic Banks borrowed from the San Francisco FHLB, and many more are taking such 'advances' (eg. <https://www.risk.net/risk-quantum/7956520/schwab-turns-to-costly-fhlb-advances-as-deposits-drop>).

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EU moving towards better international bank capital standards compliance

CREDIT SUISSE

The US and Swiss bank collapses show the importance of strong capital and liquidity positions and should signal to the EU the benefits of closer adherence to Basel III, Nicolas Véron believes

The collapses in rapid succession of Silicon Valley Bank (SVB) and Signature Bank in the United States, and of Credit Suisse in Switzerland, have reawakened debates on banking policy. In the United States, reports assessing what went wrong are expected from both the [Federal Reserve](#) and [Federal Deposit Insurance Corporation](#) (FDIC) on 1 May. In Switzerland, the unorthodox engineering of Credit Suisse's takeover by UBS has generated [lawsuits](#) and [investigations](#).

By contrast, in the European Union as in the United Kingdom, there have been no visible signs of banking-sector weakness. Since more than nine-tenths of EU [banking assets](#) are in the euro area and under European banking supervision led by the European Central Bank (ECB), that counts as a success for the single supervisory mechanism – the main finished piece of the EU banking union project, on which the EU embarked in 2012.

As emphasised by ECB Supervisory Board Chair Andrea Enria, in a 21 March [speech](#), European supervisors have been focused on both interest-rate risk and business-model risk in recent years, two areas at the core of the SVB and Credit Suisse disasters. This stands in sharp contrast to the pre-2012 period, when banking supervisors in the EU looked [unable](#) to get anything right.

Meanwhile, EU banking union remains incomplete – and it is likely that the absence of banking sector turmoil in the EU will mean that pre-existing political obstacles will continue to prevent its completion any time soon.

The two key stumbling blocks are a European deposit insurance scheme (EDIS), for which the Commission's ill-fated [proposal](#) of 2015 has been left unadopted despite protracted negotiations, and the regulatory treatment of banks' sovereign exposures (RTSE), which has been negotiated in parallel, outside of public view and also without concrete results.

On 16 June 2022, an acrimonious meeting of euro area finance ministers in the Eurogroup format acknowledged the impasse. Ministers decided to shelve the discussions on EDIS and RTSE and [asked](#) the European Commission to make proposals on a more limited reform agenda of crisis management and deposit insurance (CMDI).

In doing so, they admitted that the EU framework for the handling of unviable banks, which they had enshrined in 2014 in the bank recovery and resolution directive (BRRD, 2014/59/EU), had [not worked](#) as intended.

The recent banking turmoil has given the Basel framework renewed legitimacy: SVB may not have failed so miserably if it had not been exempted from the Basel framework

Closer to the US?

This policy area is hard to grasp, and not only because of its unseemly proliferation of four-letter acronyms. In simplistic terms, the essence of the CMDI project is to move closer to the US system in which the FDIC is the single authority for both deposit insurance and the resolution of failing banks.

In that system, all deposits, insured or not, have equal and preferred status to the failing bank's other liabilities, a feature known as general depositor preference. This creates incentives for the FDIC to finance takeovers of failing banks by sounder peers, protecting all depositors from losses in most cases.

A degree of market discipline is nevertheless preserved, since uninsured depositors have incurred losses in a minority of [bank failures](#) in recent decades.

The irony is that, by invoking a systemic risk exception and extending an unlimited guarantee to all depositors of SVB and Signature Bank, the US authorities may have departed [permanently](#) from this model, at precisely the time when the EU was considering adopting it.

The European Commission had planned to publish its CMDI proposal on 8 March, then [procrastinated](#) and eventually [published](#) it on 18 April. In the meantime, the US systemic risk exception was [triggered](#) on 12 March.

Basel III

Moving towards a US-inspired system with general depositor preference, as that proposal suggests, still makes sense for the EU. But this may be impossible without simultaneously completing the banking union, because the continued reliance on national deposit guarantee arrangements defeats the purpose of a single Europe-wide framework.

In any case, time is short to wrap up CMDI before the end of the current EU legislative cycle in about spring 2024, especially as several EU countries appear **unhappy** with it. The CMDI proposal will likely end up being useful as a basis for public debate rather than actual legislation.

All is not deadlocked, however. Another rule, which transposes into EU law the international accord known as **Basel III Endgame**, was **proposed** in October 2021. Its adoption is expected before end-2023. The current, non-final version is **not compliant** with the Basel III template.

However, the recent banking turmoil has given the Basel framework renewed legitimacy: SVB may not have failed so miserably if it had not been **exempted** from the Basel framework. As noted by Bundesbank President Joachim Nagel in a **speech** on 14 April, *"it is now all the more important to implement the Basel III rules globally without any concessions."*

The EU should focus on achieving that outcome, even as it leaves its menagerie of other acronyms – EDIS, RTSE and CMDI – unfinished for the time being. By emphasising the importance of strong capital and liquidity positions, the US banking mess could usefully lead EU policymakers to adopt the Basel III Endgame in a compliant manner. ■

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Improving banking resolution in the EU

The Commission's Crisis Management and Deposit Insurance proposal has the potential to improve bank resolution in the European Union, Mathias Dewatripont, Peter Praet and André Sapir suggest

The collapse of several US regional institutions and of Crédit Suisse in the last two months has increased the urgency for crisis management reform in the EU. This column argues that the Crisis Management and Deposit Insurance proposal by the European Commission has the potential to improve bank resolution in the EU while protecting depositors and financial stability.

The authors suggest it should be accompanied by further efforts to increase loss-absorbency and liquidity requirements, supervision, and managerial accountability in order to reduce moral hazard, while taxpayer interests could be better served if additional flexibility were granted to resolution authorities to temporarily nationalise troubled banks under state aid control.

The events of the last two months have demonstrated the importance of a banking regulation ecosystem which combines (i) flexibility to deal efficiently with a bank in crisis in order to avoid financial instability, and (ii) enough preventive measures to lower the probability of crises while also limiting moral hazard.

Recently, several banks have been under stress and, so far, four in the US and one in Switzerland have needed public intervention. Each time, money from deposit insurance funds and/or the treasury has been used, and the problem bank has 'disappeared'.

Moreover, even in the case of a globally systemically important bank (GSIB) like Crédit Suisse, authorities went for absorption of the entire bank by an even larger one.

Evaluations of the events differ. Some are rather positive, stressing that financial instability was avoided (Löyttyniemi 2023). Others, however, are outright negative, stressing in particular the 'unsustainability' of

megabanks overlapping multiple jurisdictions (Brunetti 2023, Admati *et al* 2023). Both sides make valid points in our view.

More generally, there is the question of the 'political sustainability' of repeatedly relying on public money for 'bank bailouts'; the failure of supervisory authorities to prevent these crises can easily lead to 'bailout fatigue'.

We welcome the new flexibility offered by the CMDI proposal because it will help improve financial stability, which is crucial for the real economy and therefore also for taxpayers

This is one reason Lehman happened in 2008, after the Long-Term Capital Management (LTCM) and Bear Stearns interventions. It also explains the US savings and loans crisis in the 1980s, when the Federal Savings and Loans Insurance Corporation (FSLIC) fund was exhausted and the US Congress refused to replenish it.

The current banking situation is already leading to soul-searching in the US (and also the UK), with the Federal Deposit Insurance Corporation (FDIC) suggesting a ‘targeted extension’ of deposit insurance for companies’ working capital. Some go even further, advocating a general extension of deposit insurance (eg. Heider *et al* 2023)¹.

In this column, we focus on the specific situation in the EU, where so far in the recent turmoil there has not been a ‘bank in crisis’. This happy situation is partly the result of the fact that Basel III requirements apply to all EU banks, in contrast with the situation in the US, where many banks (including Silicon Valley Bank) are exempted of such requirements, which apply only to the biggest ones.

By contrast, the example of Crédit Suisse is more worrisome, since it is a GSIB headquartered in a fully Basel III-compliant country, Switzerland – which is not the case for the EU.

More worrisome for the EU is the fact that, under its Banking Recovery and Resolution Directive (BRRD), public money is harder to access than in the US or Switzerland until 8% of the balance sheet of the troubled bank has been bailed-in. As stressed, for example, by Dewatripont (2014 a, 2014b) and Dewatripont *et al* (2021, 2023), it can be very dangerous for financial stability if one cannot reach this 8% without bailing-in depositors.

The result has been that the BRRD, in force since January 2016, has been very largely ignored – especially in the Banking Union – when dealing with troubled banks, with national authorities preferring to use other options, in particular national bankruptcy laws.

This loophole has allowed troubled banks to be declared bankrupt, and therefore not 'banks' any more, which means that the BRRD is no longer relevant, thereby allowing national authorities to sell (part of) such 'non-banks' to ... a bank (as Italy has shown with two Venetian banks)!

Given the potential cost in terms of financial instability from failing banks, avoiding bailing-in depositors by using this loophole was probably useful, but such an unharmonised approach – and thus an unlevel playing field – is clearly not first-best. Reforming the system is therefore needed.

Evaluation of the Crisis Management and Deposit Insurance proposal

In our view, the Crisis Management and Deposit Insurance (CMDI) proposal by the European Commission² is an important step in the right direction because it comes to terms with the reality that the EU framework (the BRRD) has not been used in resolution since it could be hitting depositors and destabilise the entire banking sector.

The CMDI rightly proposes to ease, under certain conditions, the use of deposit guarantee scheme (DGS) money in order to protect deposits while resolving troubled banks. Note that the CMDI refers to national DGS schemes since the Commission (realistically) feels the time is not yet ripe for moving to a European Deposit Insurance System (EDIS) in the euro area, a desirable endpoint to complete the Banking Union.

Evidence presented by the Commission along its CMDI proposal credibly shows that the problem is more acute for mid-sized and smaller banks than for larger ones because the former have a higher share of deposits in their balance sheet.

For banks with at least €100 billion of assets, the BRRD obliges them to have a minimum buffer of 8% of own funds and subordinated securities which are bail-inable, giving them access to the EU Resolution Funds.

The innovations in the CMDI proposal are that it (1) recognises that small and medium-sized banks may not have a sufficient amounts of bail-inable own funds and subordinated securities to meet the 8% requirement of the BRRD without hitting deposits; and (2) allows national DGSs to cover the gap between the two in resolution.

The CMDI would permit easier access to DGS money and protection of deposits by : (i) eliminating the 'super seniority' of the insured deposits (and the DGS) over other deposits; and (ii) introducing generalised depositor protection, which means that senior bonds, and not only junior ones, can be bailed-in without having to touch deposits (a feature which is already in place in some EU countries).

Note, however, that the CMDI proposal de facto means that national DGSs would become junior in resolution to deposits since they would intervene to protect them, a big change in comparison to their current super seniority status.

Facilitating access to DGS money in order to resolve a bank in trouble without hitting depositors is an idea we strongly subscribe to. At the same time, we are conscious of the fact that using public money for banks in trouble is never popular, and that safeguards are therefore needed to avoid a political backlash. This leads to the following considerations:

1. It is 'politically astute' of the Commission to say in the CMDI proposal that deposit-guarantee and resolution funds will be paid for by the banking industry rather than by 'individual taxpayers'. In reality, as tax-incidence reasoning indicates, this is only partly true: individual depositors/taxpayers will be impacted to some extent since banks will adjust their behaviour, for instance by paying lower interest rates on deposits. Moreover, one should not forget that moral hazard is not reduced by industry-funded bailouts, but only by bail-ins.

2. What is needed, therefore, in order to reduce crisis events due to moral hazard (and also to avoid both a political backlash and also opposition by large banks, which fear having to pay for smaller ones) is to continue beefing up long-term subordinated loss-absorbency for all banks, small and large³. Enhanced loss-absorbency is thus a complement to and not a substitute for the crisis-time flexibility introduced by the CMDI. Both flexibility and enhanced loss-absorbency capacity are needed in order to credibly claim, as the Commission does, that CMDI *“will improve cost-efficiency, support the real economy and its competitiveness.”*
3. Another way to increase crisis prevention is enhanced supervision. In this respect, recent evidence of ‘click banking’ leading to higher deposit volatility in times of increasing interest rates suggests more demanding stress tests and higher outflow rates in the computation of the Basel liquidity coverage ratio.
4. This being said, since it is impossible to make sure that deposit guarantee and resolution funds will not be used, it is important that those deemed responsible for the problems are seen to be ‘punished’. Next to the bail-in of creditors and shareholders, holding management accountable in front of courts in cases of misbehaviour would be helpful in this respect. (Beyond this, it is surprising that, in a sector plagued by such intense leverage, regulation allows managerial compensation to be tied to stock prices, given that it induces them to take risks regulation then tries to reduce.)
5. The CMDI proposal insists on exit of the problem bank from the market as a condition for access to DGS money. This is also a useful disciplinary mechanism. One should, however, avoid ‘unintended consequences’ in terms of unnecessarily ‘tying the hands’ of public authorities in their resolution strategy. Indeed, history is full of examples where taxpayers have benefited from the state temporarily nationalising troubled banks rather than being forced to find a buyer at very short notice, especially in crisis times where multiple banks may be in trouble.

Allowing for the option of temporary ownership by a member state is also natural in a setting where DGS money is still national. Asking for the state to exit 'within X years' could, however, help protect taxpayer interests too. One could benefit here from the expertise that DG Competition has acquired since the Great Financial Crisis as a watchdog ensuring that state aid is kept to a minimum and unfair advantage is not obtained by the acquiring bank (Dewatripont *et al* 2010).

In conclusion, we welcome the new flexibility offered by the CMDI proposal because it will help improve financial stability, which is crucial for the real economy and therefore also for taxpayers.

However, in order to avoid worsening moral hazard, such flexibility should be accompanied by additional measures: beefing up the loss-absorbency capacity of all banks; enhancing bank supervision, in particular for new risks to the banking landscape; and making bank managers more accountable.

Finally, one should not unnecessarily tie the hands of resolution authorities by forcing excessively rapid sales of troubled banks. ■

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Endnotes

1. See also Perotti (2023) for a regulatory reform of the treatment of deposits.
2. See https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2250
3. One may indeed want to beef up capital also for those big banks whose market capitalisation as a percentage of their total assets is low, which may indicate an 'excessive use' of internal models.

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Economic uncertainty creating difficulty for central banks

Francesco Papadia says regaining price stability is difficult but doable, but the bigger problem facing central banks is economic uncertainty, not managing the trilemma

While headline inflation in the euro area is moving in the right direction, core inflation remains stubbornly high, close to 6%. Unemployment is historically low, but growth prospects are mixed. Financial stability is considered at risk, especially because of possible tensions around Italian bond yields.

In this context, the International Monetary Fund in April [summarised a recurrent narrative](#), writing that Europe must strike a balance between *“sustaining the recovery, defeating inflation and safeguarding financial stability.”*

In handling this trilemma, much of the focus is on central bank policies. Measures taken by central banks are considered critical for the economies in which they work. The importance of the trilemma and of central bank policies should not be underestimated, but both issues should be put in context.

Central banks must of course find the right balance between competing objectives. The primary objective of price stability does not mean they can forget about financial stability and the risk of bearing down too hard on economic activity. But this balancing act is the essence of central banking, and conditions could easily be more difficult than they are now.

The current situation is not one of stagflation, which would create an acute dilemma between fighting inflation or the recession: unemployment is very low and economic activity prospects are uncertain but not unequivocally negative.

Financial stability must be preserved, but so far the situation is not worrying, in terms either of stress in the financial system, or of the spreads between the yields of peripheral and core countries.

The European Central Bank can dedicate itself to the objective of regaining price stability with the reasonable expectation that it can do so without causing financial instability or too much damage to economic activity and employment.

The main issue for central banks is part of a more general problem: under the pressure of events, the public sector is taking an ever-larger role in shielding private participants from economic hardships

The assessment that central bank policies are of critical importance also needs qualification. Only for inflation is central bank action decisive. The possible fragmentation of global trade and production, poor demographics, immigration tensions, climate risks and geopolitical developments and crises, are graver problems to be dealt with and solutions to them will be achievable, if at all, only over the longer term. In any case, it is not central banks that have the primary responsibility for dealing with these longer-term problems.

The fact that the ECB and the Fed have been able to maintain their focus on inflation and could thus further increase rates confirms the reading that possible damages to economic activity and unemployment, as well as risks to financial stability, have to be considered but are not overwhelming.

This attitude reinforces the market view that central banks are serious about bringing inflation back towards 2%, even if their success is far from assured.

Adding to a favourable reading, at least relative to the prevailing narrative, of the situation facing central banks is their [reactivation of dollar swaps](#), complementing what they are doing domestically. Swaps allow central banks in selected economies to 'print dollars', in the sense that they can influence the Fed's balance sheet, with the Fed's consent of course. So, the tool is potent, and its mere existence can have beneficial effects, even if it is not used.

All this does not mean that there have not been problems in the policy response of central banks to the latest crises. The main issue for central banks is part of a more general problem: under the pressure of events, the public sector is taking an ever-larger role in shielding private participants from economic hardships.

With the global financial crisis, COVID-19 and Russia's invasion of Ukraine, this was justified from a short-term perspective. But the medium and long-term negative consequences must be controlled. A difficult balance must be maintained between providing immediate help while minimising its moral hazard consequences.

Relatedly, the bank resolution framework created after the Great Financial Crisis – envisaging bailing in of private investors – is proving difficult to implement. It is unclear whether the answer is better implementation of the bailing-in solution or a return to the old bail-out approach. The former may be preferable, but practical difficulties dog its implementation.

In conclusion, the task of central banks is difficult, but the balancing act between regaining price stability while avoiding financial instability and excessive damage to economic activity and employment could be more demanding – as it has been in the past. The real difficulty currently is economic uncertainty.

Fundamental economic relationships, such as that between unemployment and inflation, have become muddier, making decisions much more difficult to take. This, rather than dealing with the trilemma, is the most difficult challenge. ■

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The power and perils of the artificial hand



www.finance21.net

- Generative AI could change our lives. Gita Gopinath considers artificial intelligence through the ideas of Adam Smith

Nowadays, it's almost impossible to talk about economics without invoking Adam Smith. We take for granted many of his concepts, such as the division of labour and the invisible hand. Yet, at the time when he was writing, these ideas went against the grain. He wasn't afraid to push boundaries and question established thinking.

Smith grappled with how to advance wellbeing and prosperity at a time of great change. The Industrial Revolution was ushering in new technologies that would revolutionize the nature of work, create winners and losers, and potentially transform society. But their impact wasn't yet clear. *The Wealth of Nations*, for example, was published the same year James Watt unveiled his steam engine.

Today, we find ourselves at a similar inflection point, where a new technology, generative artificial intelligence, could change our lives in spectacular—and possibly existential—ways. It could even redefine what it means to be human.

Given the parallels between Adam Smith's time and ours, I'd like to propose a thought experiment: if he were alive today, how would Adam Smith have responded to the emergence of this new 'artificial hand'?

Beyond the invisible hand

To explore this question, I'd like to start with his most famous work, *The Wealth of Nations*. A seminal idea in this work is that the wealth of a nation is determined by the living standards of its people, and that those standards can be raised by lifting productivity, that is the amount of output produced per worker.

This idea is especially relevant today because global productivity growth has been [slowing](#) for more than a decade, undermining the advancement of living standards.

AI could certainly help reverse this trend. We could foresee a world in which it boosts economic growth and benefits workers. AI could raise productivity by automating certain cognitive tasks while giving rise to new higher-productivity tasks for humans to perform.

With machines taking care of routine and repetitive tasks, humans could spend more time on what makes us unique: being creative innovators and problem solvers.

AI could be as disruptive as the Industrial Revolution was in Adam Smith's time. We will need to carefully balance support for innovation with regulatory oversight

Early evidence suggests AI could substantially raise productivity. A [recent study](#) examined how customer-service agents worked with a conversational assistant that used generative artificial intelligence. The AI assistant monitored customer chats and gave agents suggestions for how to respond. The study found that productivity rose by 14% with the use of this technology.

It's interesting to note that the greatest productivity impact was on newer and lower-skilled workers. Why? The study suggests that AI can help spread the knowledge of more experienced, productive workers. Imagine how productive a company could be if every employee performed at the level of its best employee!

If such dynamics hold on a broad scale, the benefits could be vast. Goldman Sachs has [forecast](#) that AI could increase global output by 7%, or roughly \$7 trillion, over a decade. That is more than the combined size of the economies of India and the United Kingdom.

While it is far from certain that such sizeable gains will be realized, it is probably safe to say that when it comes to maximizing efficiency, Adam Smith would be wary of stifling the artificial hand of AI.

Aside from the gains in productivity, AI could shake up the labour market in unprecedented ways. Recently, we have seen the loss of 'middle-skill' jobs due to automation, resulting in large clusters of high-paying and low-paying jobs at either pole of labour markets. The literature shows that AI could affect occupations and industries differently than previous waves of automation.

Recent empirical studies suggest AI could reduce job-market polarization, by putting downward pressure on wages of high-paying jobs. Some studies suggest that AI adoption could flatten the hierarchical structures of firms,

increasing the number of workers in junior positions and decreasing the number in middle management and senior roles.

The number of jobs affected could be sweeping—some researchers estimate that two-thirds of US occupations could be vulnerable to some form of automation.

So, what will be the net impact on the job market? It is by no means guaranteed that AI will benefit humans, or that the gains of the winners will be sufficient to compensate the losers. It's quite possible that AI might simply replace human jobs without creating new, more productive work for humans to move into, as the economist Daron Acemoglu has [noted](#).

Thus, despite AI's potential, we need to consider the broad negative effect it could have on employment—and the social upheaval that could cause. Given that the wellbeing of the individual and the plight of the common worker underpinned much of Adam Smith's thinking, this would surely have troubled him.

He was interested in developing an economy that worked for everyone—not simply a chosen few. Throughout *The Wealth of Nations*, he criticized the mercantilist trade system under which England sought to expand its exports at all costs, with too much market power being concentrated in the hands of companies granted trading monopolies.

Today, the market for the components to develop AI tools is highly concentrated. A single company has a dominant position in the market for silicon chips best suited for AI applications, for example. Many AI models require massive computing power and huge amounts of data—the lifeblood through which these models hone their 'intelligence'.

To be sure, open-source programmers have shown an impressive ability to design their own AIs. But only a handful of large corporations may have the computing and data firepower to develop high-end models in the future.

While Smith would have been impressed by the emergence of such a powerful technology in a globalized economy, he might also have realized that the invisible hand alone may not be enough to ensure broad benefits to society. In fact, in many areas—from finance to manufacturing—the invisible hand hasn't been enough to ensure broad benefits for quite some time.

New approach to regulation

Which brings me to a point I'd like to emphasize—we urgently need sound, smart regulations that ensure AI is harnessed for the benefit of society. One of the challenges is the extent to which humans may come to depend on the judgment of AI systems.

They rely on existing data, and hence may replicate the embedded bias in that data. Some models have shown a tendency to confidently defend false information—a phenomenon known as AI 'hallucination'. If we cede control to AI in areas such as medicine and critical infrastructure, the risks could be severe and even existential.

When it comes to AI, we need more than new rules: we need to recognize that this might be an entirely new game. And that will require an entirely new approach to public policy.

New legislation proposed by the EU is an encouraging start. The EU's Artificial Intelligence Act classifies AI by risk levels. The highest-risk systems would be banned. This would include government systems that rank people based on social compliance, known as 'social scoring'. The next-highest risk level would be tightly regulated, with requirements for transparency and human oversight.

Beyond regulating AI systems directly, we must be prepared to address the broader effects of AI on our economies and societies. Given the threat of widespread job losses, it is critical for governments to develop nimble social safety nets to help those whose jobs are displaced, and to reinvigorate labour market policies to help workers remain in the labour market. Taxation policies should also be carefully assessed to ensure tax systems don't favour indiscriminate substitution of labour.

Making the right adjustments to the education system will be crucial. We need to prepare the next generation of workers to operate these new technologies and provide current employees with ongoing training opportunities.

Demand for STEM specialists will likely grow. However, the value of a liberal arts education—which teaches students to think about 'big questions' facing humanity and do so by drawing on many disciplines—may also increase.

Clearly, we need international coordination on regulation, because AI operates across borders. It is therefore encouraging to see that the G7 has formed a working group to study AI. In the end, we'll need a truly global set of rules. Considering how fast the technology is moving, time is of the essence.

Redefining human

All that said, to truly consider the implications of AI from Adam Smith's perspective, we need to go back to his first major work, *The Theory of Moral Sentiments*.

Smith explored what enables us to behave morally. In his view, it's our ability to experience 'sympathy': we can imagine each other's joy and pain, and as a result, we temper our 'passions' and learn to be civil toward others. It's what allows us to build and sustain a rules-based society.

But what happens when you add artificial intelligence into the mix? Of course, AI has been part of our lives for years—it completes our sentences when we're typing on our phones and recommends what video we should watch next.

What's remarkable about the latest wave of generative AI technology is its ability to comb vast amounts of knowledge and distil it into a convincing set of messages. AI doesn't just think and learn fast—it now speaks like us, too.

It's unclear whether AI will evolve to the point where it could be called truly sentient. But if it can already replicate human speech, it may be difficult to know the difference. The glue that binds the concept of society conceived by Smith—sympathetic human beings interacting in the spirit of compromise—begins to disintegrate.

This has deeply disturbed scholars such as Yuval Harari. Through its mastery of language, Harari argues, AI could form close relationships with people, using 'fake intimacy' to influence our opinions and worldviews.

That has the potential to destabilize societies. It may even undermine our basic understanding of human civilization, given that our cultural norms, from religion to nationhood, are based on accepted social narratives.

It's telling that even the pioneers of AI technology are wary of the existential risks it poses. Just last week, more than 350 AI industry leaders signed a statement calling for global priority to be placed on mitigating the risk of 'extinction' from AI. In doing so, they put the risk on par with pandemics and nuclear wars.

So much of Adam Smith's work is based on the idea of information being effectively transmitted through society. Markets send signals through prices to producers and consumers. Human beings pick up emotional cues from each

other, enabling them to civilize their behaviour. But AI can significantly damage the integrity of that information and the fundamental benefits that it confers to society.

Smith would no doubt be troubled by the possibility of 'hallucinating' software spreading fake news and deepening divides in society. Thus, there's a good chance he would have supported rules that protect consumer privacy, and limit misinformation in the age of AI.

Conclusion

I'd like to stress that this debate is ongoing, and I don't claim to have all the answers. I've pointed out a few of the issues surrounding AI, and how we can use Adam Smith's thinking and philosophy as a guide to help us navigate the path ahead.

AI could be as disruptive as the Industrial Revolution was in Adam Smith's time. We will need to carefully balance support for innovation with regulatory oversight.

Because of AI's unique ability to mimic human thinking, we will need to develop a unique set of rules and policies to make sure it benefits society. And those rules will need to be global. The advent of AI shows that multilateral cooperation is more important than ever.

It's a challenge that will require us to break out of our own echo chambers and consider the broad interest of humanity. Adam Smith is best remembered for his contribution to economics, but his body of knowledge was much broader. He was a student of the law, history, rhetoric, languages, and mathematics. In the same spirit, harnessing AI for the good of humanity will require an interdisciplinary approach.

Writing on the cusp of the Industrial Revolution, Smith could hardly have foreseen the world we live in today, some 300 years after his birth. Now, we may once again be on the brink of technological transformations we can't foresee.

For better or worse, humans aren't known for walking away from the next stage of scientific and technological progress. Usually, we simply muddle through. This time, as we confront the power and perils of the artificial hand, we need to summon every ounce of our empathy and ingenuity—the very things that make human intelligence so special. ■

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This article is based on a [speech](#) to commemorate 300th anniversary of Adam Smith's birth, University of Glasgow, June 5, 2023.

Open banking's promise of a financial revolution

Giorgio Barba Navaretti, Giacomo Calzolari and Alberto Pozzolo argue that the scope and the aims of open banking, although potentially ground-breaking, may thus be overstated

Open banking involves giving third parties access to information that is otherwise captive in a bilateral relationship between a provider of financial services and its client. Yet, there are considerable limits to the diffusion of financial information and to the use of such information to enhance competition. This column argues that the scope and the aims of open banking, although potentially ground-breaking, may thus be overstated. A new regulatory framework should be devised to deal with the potential shortcomings of open banking along the lines of the EU's Digital Markets Act and Digital Services Act.

According to Rivero and Vives (2023), open banking (OB) *“refers to those actions that allow third-party firms, either regulated banks or non-bank entities, to have access under customer consent to their data through application programming interfaces (API).”* In other words, open banking allows customers to easily, swiftly, and freely transfer their own payment information to any authorised third party of their choice, thus increasing the set of financial intermediaries they can use for their transactions and limiting rent extraction by incumbent banks.

Where does open banking come from? The kick start comes from regulation. In the EU, the starting point was the approval in 2015 of Directive (EU) 2015/2366, known as PSD2, which requires that financial institutions open up their data in favour of account information service providers (AISPs), payment initiation service providers (PISPs), and card-based payment instrument issuers (CBPIIs).

In the UK, PSD2 was transposed into legislation with the Payment Services Regulation of 2017, leading to the foundation in the same year of the Open Banking Implementation Entity (OBIE), an independent organisation of the nine largest retail banks in Britain and Northern Ireland.

Similar legislations were introduced for example in South Korea (Beck and Park 2021) and Australia, favouring the diffusion of open banking.

Clearly, the transmission of financial information to other intermediaries was possible also before open banking, and it has become even more relevant with the entry of new fintechs, which may be able to provide to their customers better services than incumbent banks (Boot *et al* 2020). But regulations like PSD2 make such processes faster and less costly, with potentially disruptive effects.

A realistic outcome of open banking might therefore be an increase of market concentration in the hands of few traditional financial intermediaries that are uniquely placed to offer bundles of services

The reasons stated in PSD2 for giving access to information to third parties are three-fold: enhancing competition, fostering innovation, and favouring inclusion. In this column, we only deal with competition.

Remarkably, PSD2 focuses on data about payments. And in fact, the fastest growing services at the moment are those helping to connect different accounts – for example, bank, credit cards, and investment accounts – to provide a comprehensive view of the financial position of an individual or a firm (Emma, Tink, and TrueLayer already offer these services).

But it is becoming increasingly clear to the industry that granting access to customers' payment information will also ease a customer-targeted provision of other banking and financial services and the development of a range of innovative products.

On the one hand, liquidity and payments management can be made more efficient through a comprehensive view across different banking accounts. On the other hand, payment information generates a great deal of information on the characteristics of a bank customer, which is extremely valuable for the provision of additional products such as loans or investment services.

This evolution towards even broader open banking may have the potential to change financial intermediation radically. But for this to happen, consumers must be willing to share their data and adequate technology must be in place to ensure seamless data access through the use of APIs and cloud computing¹. If these conditions are met, open banking is expected to change the way financial intermediation occurs.

Yet, there are considerable limits to the diffusion of financial information and to the use of such information for the purposes of enhancing competition. Open banking is essentially about enabling transfers of data and information to some third parties, but not making it generally available.

Key to the understanding of the potential impact of this innovation, therefore, is an assessment of how information will in fact be spread and used. If we take this perspective, we believe that the scope and the aims of open banking, although potentially ground-breaking, may sometimes be overstated and its desirable implications cannot be taken for granted.

Even assuming that adequate technologies are available, the impact of open banking depends on how the financial information will in fact be spread and used. This is relevant for both the demand and the supply of information.

On the demand side, third parties will enter only if they have some way of leveraging the value of the information that they acquire, most likely keeping it private for themselves.

On the supply side, open banking does not open up information concerning a client to everybody, but only to those that the client explicitly authorises. But to how many potential counterparts are clients willing to disclose their private transactions? It is unlikely that it will be a large number.

An additional issue is how the information can be effectively used. Opening up the information even to a single new provider can be beneficial to the client: compared to the incumbent, the entrant may offer new services or the same services at better conditions.

However, who the provider of these services is matters a lot. Things are very different if the new entrant is a fintech rather than an established bank. If data reach other incumbent operators, like traditional banks, we may not expect a sizeable impact on competition (Barba Navaretti *et al* 2018).

On the contrary, data availability may induce a 'winners takes all' scenario, where few companies offer multiple products and services. Digital markets are a clear example of the effect of strategies that rely on the reusability of personal data for multiple purposes and services.

A realistic outcome of open banking might therefore be an increase of market concentration in the hands of few traditional financial intermediaries that are uniquely placed to offer bundles of services.

Established banks might even be challenged by platforms offering several products and services (Cornelli *et al* 2020). Such platforms would broker numbers of potential suppliers of financial services, matching clients with services, acting as the intermediaries in a two-sided market.

Having the technology to guarantee efficient matchings, they would keep the information within the platform and would limit its transfer to other providers of financial services. If the client only transferred their information to a single platform, that platform would enjoy monopoly power and information rents.

Network externalities would be a distinctive element of this scenario. Only platforms with a very large client base and a large number of potential suppliers can effectively use clients' data to offer efficiently targeted services. The market power built on relationship-based financial intermediation with restricted data access would be replaced by a new, network-based market power with customer-shared data.

Another risk emerges if the provider of financial services and hence the holders of the data on financial transactions is a bigtech firm (eg. the recent opening of Apple Bank). In principle, if these companies entered the market, competition would increase. Yet, these firms leverage detailed users' information to capture clients in several markets, with reinforcing feedback effects induced by even more data from the many services and products they offer.

Open banking thus has the potential to favour bigtech companies disproportionately, and strengthen their business model with the inclusion and mutual reinforcement of financial services in their ecosystems. Remarkably, the flow of data originated by open banking may be more valuable for bigtechs than for traditional banks.

Currently, the promise of innovative banking platforms remains unfulfilled, as new entrants primarily focus on creating effective application interfaces rather than offering truly ground-breaking financial services. However, once open banking reaches full potential, it may reshape the financial landscape. It will be essential to guide this process to prevent market tipping and concentrations similar to those seen in digital markets.

Historically, policymakers believed that ex-post interventions would suffice to address market power issues in digital markets. However, as we have learned from experience, this is not the case, and regulators have had to catch up with new regulations like the Digital Markets Act (DMA) and the Digital Services Act (DSA).

In the case of financial markets, proactive regulation will be crucial to avoid a similar scenario of late intervention. To achieve this, it will be useful to learn from the lessons of digital markets while creating regulations tailored to the unique characteristics of the financial industry (Caffarra *et al* 2020). ■

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Endnotes

1. A related issue, that we do not address here, is that such enabling technologies (Garcia and Ehrentraud 2020) themselves pose regulatory problems, as shown in the Wirecard case (Barba Navaretti et al 2020).

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The *latest issue* of *European Economy: Banks Regulation and the Real Sector* discusses the implications of these developments in financial markets. This article was originally published on [VoxEU.org](https://voxeu.org).

Are cryptoassets a threat to financial stability?

A collage of various assets including gold bars, silver coins, and cryptocurrencies like Bitcoin, Ethereum, and Litecoin. The background is dark, and the assets are arranged in a layered, overlapping manner. A gold bar with 'CREDIT SUISSE' and 'ONE OUNCE FINE GOLD 999,9' is prominent in the center. A silver coin with 'LITECOIN' and 'VIRES IN NUMERIS' is visible on the right. A Bitcoin coin is at the bottom, and an Ethereum coin is on the left.

Cryptoassets and markets are a relatively recent innovation in finance. Claudia Buch says there is a need to monitor and take preventive action against risks in these markets

Spring has come and gone, but whether the cryptoasset winter is over remains to be seen. Those who see cryptoassets mainly as a conduit for illegal and gambling activities would certainly hope that turbulent spells in markets for cryptoassets have provided a salutary lesson. Those who see productive potential in these new technologies would hope that these episodes help separate the wheat from the chaff.

Which of those views prevails is an open issue. Whether cryptoassets that promise to improve the provision of financial services ultimately deliver on those promises crucially depends on the regulatory response. Which services are useful, how market structures evolve, whether new entrants are able to challenge the incumbents, what risks are associated with this – all this is shaped by regulations that apply to crypto markets¹.

I would like to focus on the financial stability implications of cryptoassets. So far, the crypto market has been small. Market capitalisation of cryptoassets stands around 0.2% of global financial assets².

However, if there is one thing we've learnt from the past, it is that even seemingly small pockets of distress can breed financial crises. Cryptoassets promise innovative ways of providing financial services, just as the securitisation of financial assets did in the 1990s.

Securitisation was an innovation considered to improve the allocation of risks in the financial system. It, too, started small in the 1980s, only to grow to an annual issuance volume of approximately half of outstanding mortgage and consumer loans in 2007³.

Similarly, the US mortgage market was considered to be of relatively minor importance – only to send shockwaves through the global financial system in 2007-08⁴.

Hence, assessing risks to financial stability early on is important. In a nutshell, financial stability is about ensuring that the financial system provides its services to the real economy – even in times of stress and structural change⁵.

Currently, the cryptoasset world is not very connected to the traditional financial system or to the real economy⁶. This may be good news. Failures and stress in these markets may not put financial stability at risk. But it could

Cryptoassets promise more innovative ways of providing financial services than the traditional financial system, but they also entail risks that are strikingly similar: high market concentration, complexity, common exposures, and high operational risk

also mean precisely the opposite: perhaps there is not much real value-added in cryptoassets and the underlying technologies while, at the same time, high leverage in largely unregulated markets could lead to instability in the core financial system?

Before answering these questions and addressing the need for regulatory action, let me start by giving an overview of how we assess financial stability. In the second part, I will apply these concepts to the cryptoasset market. This comparison will show that:

- First, risks inherent in cryptoasset markets require preventive regulation.
- Preventive regulation requires, second, monitoring risks in cryptoasset markets early on, and
- third, international initiatives to address risks and improve monitoring, but relevant gaps remain, in particular to prevent crossborder regulatory arbitrage⁷.

What matters for financial stability?

Defining what is 'systemic' is not easy from a conceptual point of view, and recent stress in the financial system shows that the market environment matters. Different indicators are thus used to capture the degree of systemic importance of financial institutions.

Banks are classified as either significant or less significant institutions, with implications for regulation and supervision. The classification of banks uses a number of indicators: size, interconnectedness and common exposures, complexity, and substitutability.

Before comparing the core financial system to the cryptoasset system based on these indicators, let me stress that the quality of information is radically different.

For the core financial system, in particular for banks, we have fairly good information. Banks are tightly regulated, and regulation requires reporting. These reporting systems have been significantly upgraded following the global financial crisis, which involved costs for both banks and public authorities⁸.

These investments are paying off: we now know much more about linkages in the financial system, and about exposures and risk concentrations. This information is not perfect, but gaps that were identified during the global financial crisis have been closed fairly well – and work continues.

In the cryptoasset world, the situation is drastically different: cryptoasset markets are not (yet) regulated comprehensively, which means there are hardly any reliable reporting systems. One might think that this would not be necessary.

After all, one of the promises of cryptoassets is transparency: all information should be publicly available and traceable for everyone. But publicly available transaction data is hardly sufficient to monitor and assess risks in cryptoasset markets. For example, transactions cannot be linked to specific individuals, and much trading of cryptoassets takes place 'off-chain'⁹.

Unless proper reporting standards are applied, we have to rely on information provided voluntarily. Such information can hardly be checked for validity, and it is potentially subject to manipulation. This risk is particularly high for self-reported trading volumes on unregulated exchanges. There is indeed increasing evidence of price manipulation, in particular in illiquid markets¹⁰.

Most of the data on cryptassets that I use in the following is taken from publicly available sources. It has been subjected to some plausibility checks, such as comparisons with other sources, but should still be treated with caution.

But let's begin by looking at indicators of systemic risk in the banking system.

Size

The bigger banks are, the larger is their systemic footprint. Generally, banking systems are dominated by very few, very large players. Idiosyncratic shocks that affect these institutions can thus have implications for the entire financial system¹¹.

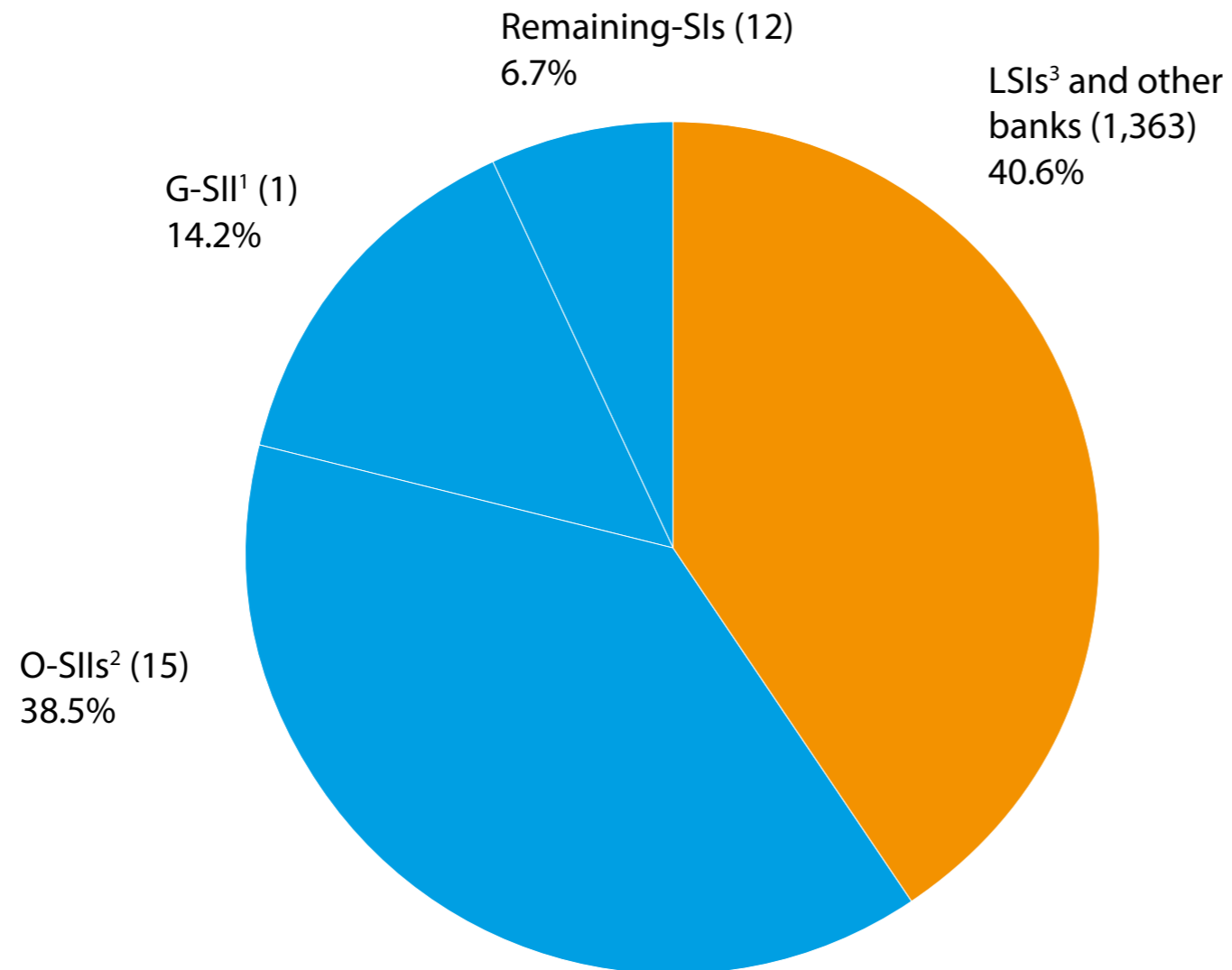
The German banking sector is no exception: the top 1% of banks account for 51% of market share in terms of total assets. The large number of smaller banks – more than 1,300 savings banks or cooperatives – have an aggregate market share of 41% (Chart 1). This chart shows the market share in terms of total assets of German banks (€9.4 trillion in Q4 2022) grouped by their level of systemic importance. The figures in brackets refer to the number of banks in each group.

For the purpose of this illustration, global systemically important institutions are not included in the set of other systemically important institutions, which, including the G-SII, would contain 16 banks. In the same way, the G-SII and O-SIIs are not included in the subset of the remaining significant institutions (SIs) in this illustration. Less significant institutions (LSIs) and other banks constitute the rest of the banking system.

The systemic footprint of large banks cannot be observed directly. However, statistical indicators can be used to assess this impact indirectly. One relevant question is, for example, how a potential shortfall in capital for a

Chart 1. A few large banks dominate the German banking sector.

Significant institutions



Sources: Financial Reporting (FINREP) and balance sheet statistics (BISTA). 1 Global systemically important institution. 2 Other systemically important institutions. 3 Less significant institutions.

Deutsche Bundesbank.

stressed large bank is correlated with a shortfall in capital for the entire financial system. This is what the CoVaR methodology measures (Chart 2)¹².

Calculating this measure for the German financial system recently shows a decline in the level of systemic risk. Yet, the current levels still exceed those before the global financial crisis.

In the aftermath of the 2007-08 financial crisis, the G20 launched financial sector reforms to reduce the 'too big to fail' problem: banks which become so large that their disorderly failure would cause significant disruption to the wider financial system and economic activity.

Systemically important banks are often rescued – or 'bailed-out' – by the government in the event of distress. They benefit from an implicit guarantee, which becomes explicit in times of crisis. This changes incentives: if risks are ultimately borne by the taxpayer, funding costs may not fully reflect risks, thus incentivising excessive risk-taking, balance sheet growth, and management compensation.

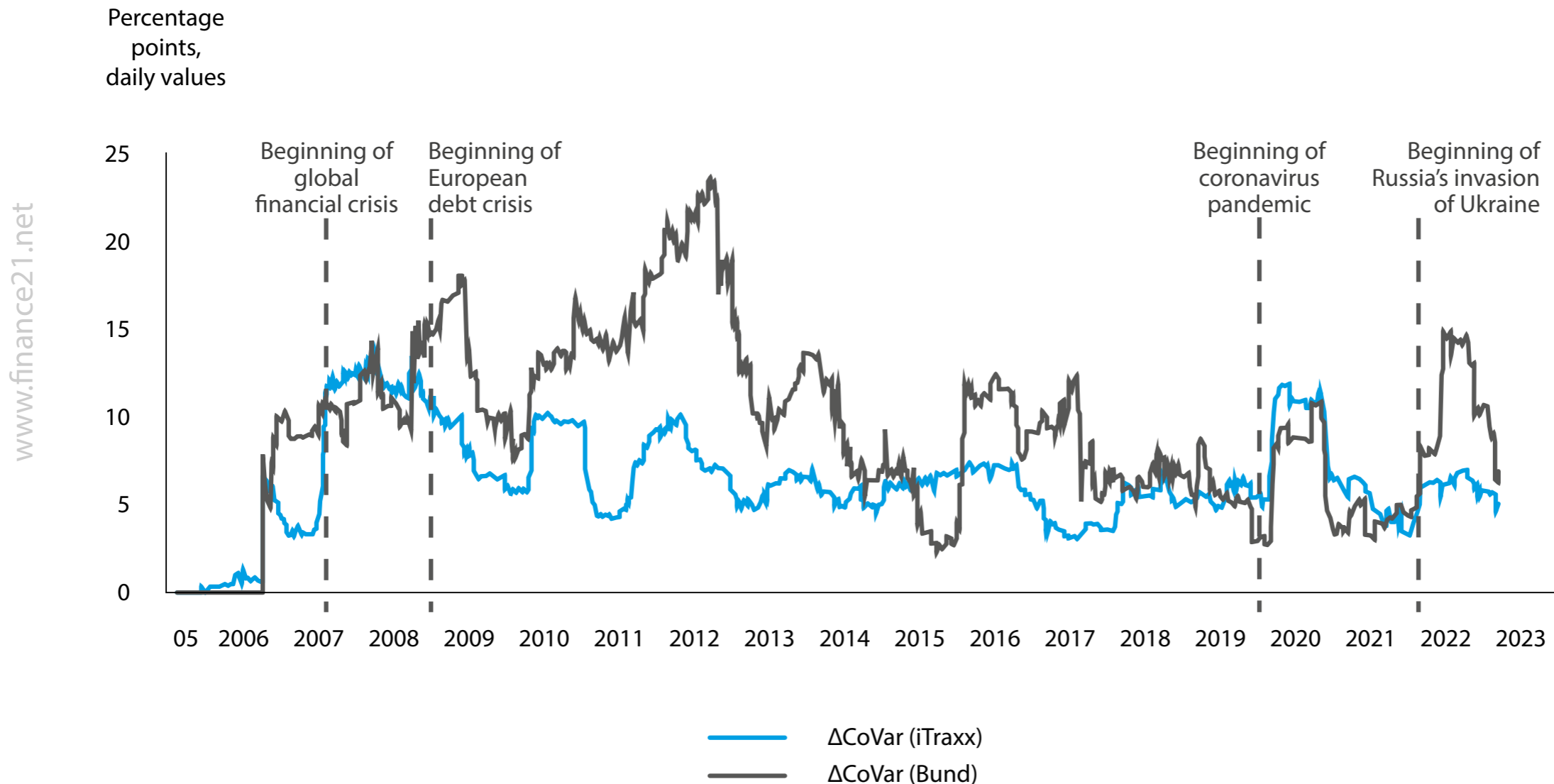
In order to mitigate these risks, tighter capital requirements and supervision are imposed on systemically important banks, and the effects of these reforms have been evaluated by the Financial Stability Board, which is an international entity to monitor the global financial system¹³.

Interconnectedness and common exposures

Size alone is certainly not a sufficient metric to assess systemic importance. Smaller banks can be systemically important if the system is highly interconnected and if banks are exposed to the same type of risk – such as interest rate risk.

Chart 2. The systemic footprint of banks in Germany has trended downwards but remains above levels observed before the global financial crisis.

Development of ΔCoVar over time*



Source: HIS Markit and Bundesbank calculations. * This figure shows the development of two market-based indicators following the ΔCoVar methodology. ΔCoVar (iTraxx) measures contagion effects from an individual systemically important institution to the private sector (proxied by the CDS index iTraxx EUR, which includes 125 large European companies). The indicator measures the difference (ie. the increase) in the value at risk (VaR) of the private sector in the median state and the VaR in the event of a systemically important institution experiencing distress. ΔCoVar (Bund) measures contagion effects from an individual O-SII to the public sector (represented by the CDS on German sovereign bonds). Deutsche Bundesbank.

One channel for interconnectedness is the interbank market. During the global financial crisis, liquidity provision through the interbank market suddenly dried up. Banks cut credit lines to each other as uncertainty about counterparty credit risk increased.

Hence, between 2008 and 2022, the share of interbank assets and liabilities in terms of total loans of German banks fell from 19% to 8%. Liquidity provision through central banks increased¹⁴. More recently, the volume in the German interbank market has increased, but it remains far below the values observed prior to 2008 (Chart 3).

While the interbank market is a channel for direct contagion in the financial system, common exposures to the same shock can lead to indirect contagion effects. This risk is particularly acute at the current juncture.

Higher interest rates and higher risk to the growth outlook expose vulnerabilities in the financial system that have built up over time. Maturity transformation exposes banks to interest rate risk. Adverse shocks to the real economy can increase credit risk for many banks quite broadly.

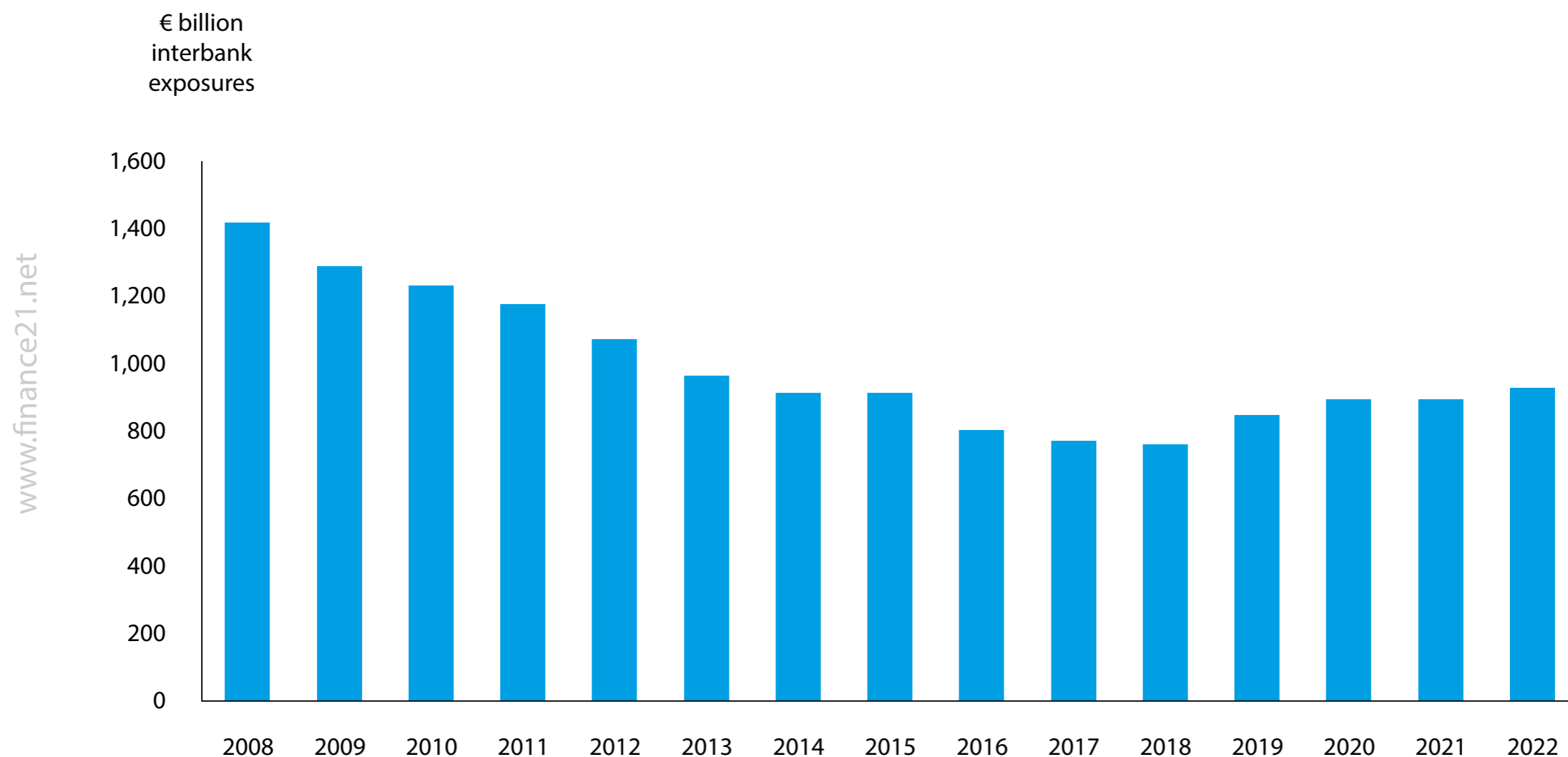
Complexity

A highly complex entity can be systemically important. Complexity can have different dimensions, such as the volume of derivatives business, a large number of (international) affiliates, or operational complexity. The more complex a bank is, the greater the costs and time needed to resolve it¹⁵.

A crossborder resolution of such an entity requires coordination among authorities in multiple jurisdictions¹⁶. A vivid example of the resolution of a complex entity is the Lehman Brothers insolvency: it took 14 years after the bank's failure to resolve it¹⁷.

Chart 3. Interbank exposures have declined following the global financial crisis.

Development of interbank exposure in Germany since the global financial crisis*



Source: Credit register of loans of €1.5 million or more. * This chart shows the year-end figures of interbank credit-related on-balance-sheet and off-balance-sheet exposures (such as loans and loan commitments) in the German banking system from 2008 to 2022. Deutsch Bundesbank.

Substitutability

Very specialised providers of financial services can be systemically important, even if they are small or not highly complex. Providers of infrastructure such as the payment systems services are one example. If such an institution experiences distress or even fails, other services can be disrupted as well and liquidity may dry up. The more specialised the institution, the more costly it is to replace its services¹⁸.

Leverage

Time and again, leverage in the financial system has been a trigger of financial crises. High leverage makes borrowers vulnerable to adverse shocks such as a rise in interest rates or losses in income. This increases credit risk and leads to losses for financial institutions. Poorly capitalised – highly ‘leveraged’ – financial institutions respond by cutting the provision of financial services and credit, which has negative repercussions for the real economy.

Therefore, the reform agenda of the past decade has focused on reducing leverage in the financial system. Banks are indeed better capitalised than they used to be – while leverage in the private and public sector has continued to increase.

Are cryptoassets relevant for financial stability?

There is no simple metric that measures ‘financial stability’. Rather, financial stability is shaped by the complex interaction between the financial products that are offered, market structure, leverage and governance of financial institutions, regulation and, not least, the incentives and objectives of the people who are providing these financial services.

The one important distinction between providers of traditional financial services, such as banks, and cryptoasset providers is technology. Apart from that, many features are similar – including potential risks to financial stability.

So let's discuss these features in turn, beginning with what cryptoassets actually are.

What are cryptoassets?

Currently, there is no internationally agreed definition of cryptoassets. According to the Financial Stability Board (FSB), a cryptoasset is a “(...) *digital asset (issued by the private sector) that depends primarily on cryptography and distributed ledger or similar technology.*”

The traditional financial system uses conventional IT infrastructure. Securities transactions and holdings are recorded by a central securities depository in a centralised database – a ‘ledger’¹⁹.

In contrast, cryptoassets are issued and recorded on a shared and distributed digital ledger – a ‘blockchain’. The most popular blockchains for cryptoassets are public and permissionless.

‘Public’ means that all transactions are visible to all, but in a pseudonymous way: participants within the network interact via identification code, but the actual identity of the participant is usually unknown. ‘Permissionless’ means that new information can be added by anyone (‘miners’ or ‘validators’) fulfilling the technical requirements using a computerised process that validates transactions (‘consensus mechanism’).

Depending on the underlying consensus mechanism, mining and validation of some cryptoassets requires a lot of computing power, which makes the process very energy-intensive. For example, cryptoassets like Bitcoin have an energy consumption comparable to that of a medium-sized country like Spain²⁰.

Despite these technological differences, cryptoassets have features in common with the traditional financial system: trading on marketplaces and exchanges, provision of payments services, lending, or use of collateral in financial transactions.

Two types of cryptoassets are relevant:

- The first are 'native' tokens. These are not backed by any real or financial assets and are hence labelled 'unbacked' cryptoassets. This distinguishes them from traditional financial instruments or currencies. Unbacked cryptoassets have no fundamental value and are not backed by any cash flows, and their price is driven entirely by sentiment²¹.

The two best-known native tokens are Bitcoin and Ether, the native token of the Ethereum blockchain. Native tokens are integral to permissionless blockchains as they reward miners or validators for settling transactions by adding new blocks to the chain.

- The second type of cryptoassets are stablecoins. These are mostly pegged to central bank currencies such as the US dollar. Stablecoins have been primarily developed to overcome inefficiencies and reduce costs in the traditional payments system²².

Although coined as being 'stable', the market valuations of stablecoins in fact fluctuate quite significantly. Also some stablecoins are not fully audited, and they disclose their reserves on a voluntary basis only. Hence, the existence and composition of reserves cannot always be verified.

Size and market structure

The total market capitalisation of all cryptoassets traded on exchanges reached an all-time high of roughly US\$3 trillion in 2021 (Chart 4). In the first half of 2022, prices for cryptoassets collapsed. Besides changes in the macroeconomic environment, this price decline reflected the widespread use of leverage. Many cryptoasset

intermediaries became insolvent, and market capitalisation dropped to US\$1 trillion in early 2023, or 0.2% of global financial assets.

The market is highly concentrated. The top six tokens accounted for more than 70% of market capitalisation²³. As regards issuers of stablecoins, 90% of market capitalisation is concentrated within the three largest entities (Chart 5).

A large proportion of all cryptoasset trading takes place on just a few platforms. Centralised cryptoasset service providers and cryptoasset conglomerates offer many different services simultaneously, such as brokerage, trading, lending, custody, as well as clearing and settlement. This concentration of activities can lead to conflicts of interest and excessive risk-taking though.

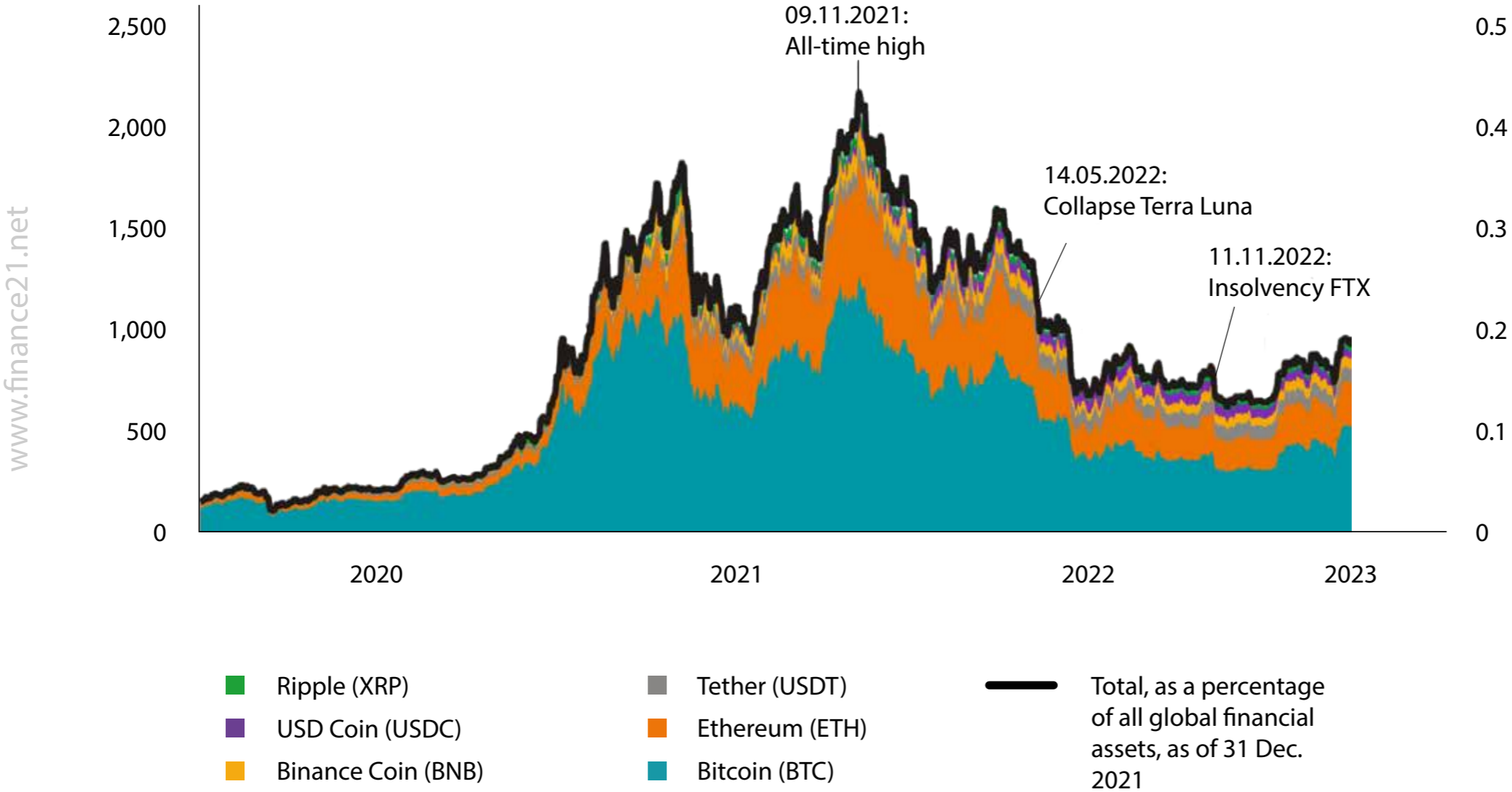
Part of cryptoasset activity has shifted to decentralised finance (DeFi). In this model, financial intermediaries are replaced by autonomous (and self-executing) open-source software protocols deployed on public blockchains.

Unlike in the case of centralised cryptoasset exchanges, where most transactions are initially settled outside of the blockchain network, all transactions are executed on the blockchain ('on-chain'). Changes to the software code should not be decided by central bodies, but by a 'community' and 'governance token', representing a kind of voting right.

What sounds like a decentralised system is, in practice, often highly concentrated. The monitoring and governance of DeFi protocols is often in the hands of a few founders or developers, who gradually transfer relevant rights to a broader community. Hence, only a very few projects function in a truly decentralised manner²⁴.

Chart 4. Market capitalisation of cryptoassets is highly concentrated and low compared to the traditional financial system.

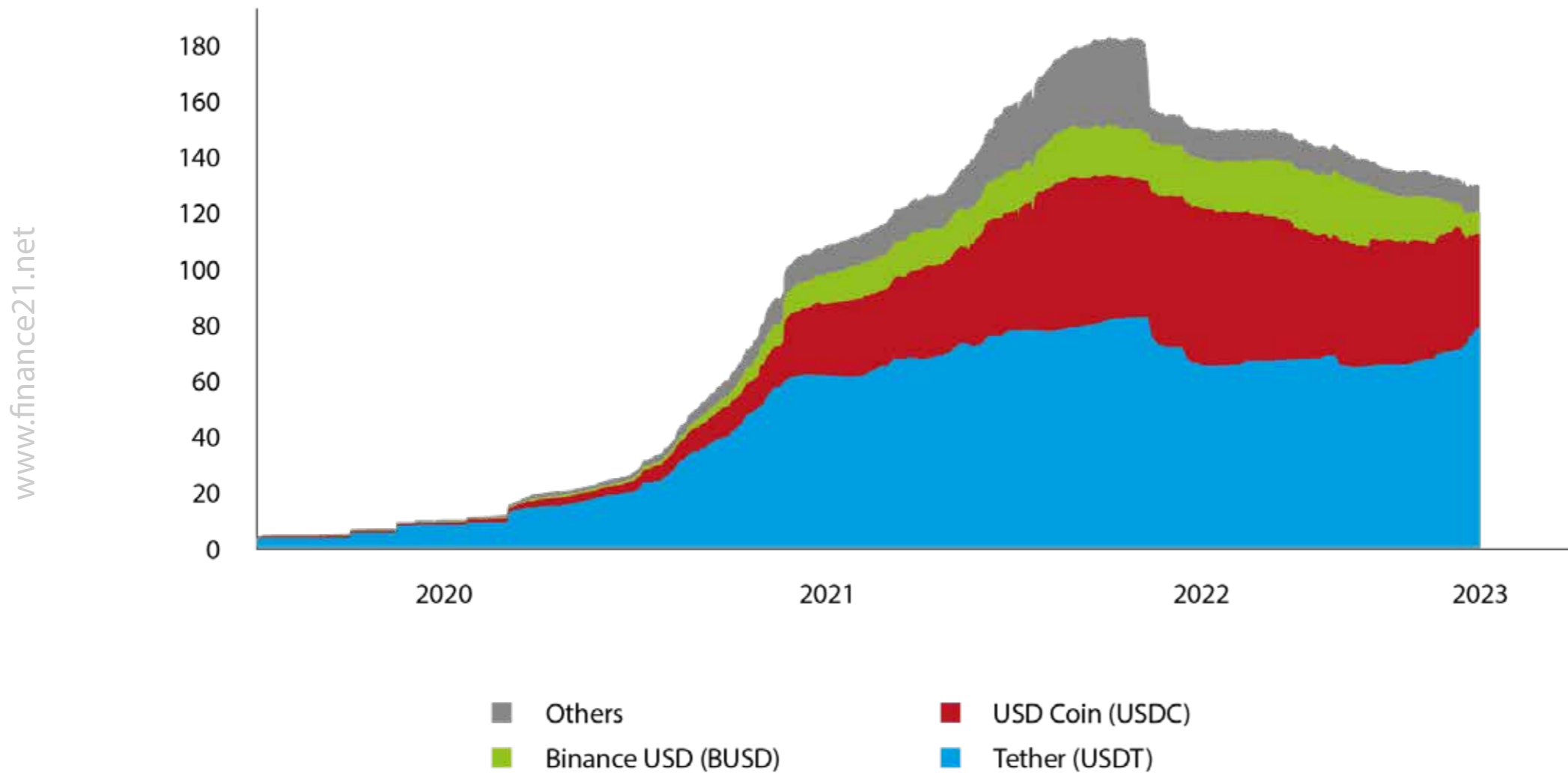
US\$ billion,
as of 31 Dec. 2021



Sources: Coincodex.com and Financial Stability Board.
Deutsche Bundesbank.

Chart 5. The market for stablecoins peaked in early 2022, and it is highly concentrated.

US\$ billion,
daily data



Sources: Coinindex.com.
Deutsche Bundesbank.

A key metric to evaluate the size of DeFi is total value locked (TVL), reflecting the sum of crypto- assets that have been transferred to the software code underlying a DeFi protocol²⁵. These codes are called 'smart contracts'.

These protocols can replicate a wide range of financial services, but lending and trading of cryptoassets are currently the most important ones. After very strong growth in 2021, the size of the (global) DeFi market decreased enormously in 2022, in line with the overall development in the cryptoasset market (Chart 6).

In today's most important blockchains, validators join groups ('pools'). The resulting high concentration at the level of validators can potentially have a negative impact on the security and transparency of a blockchain²⁷.

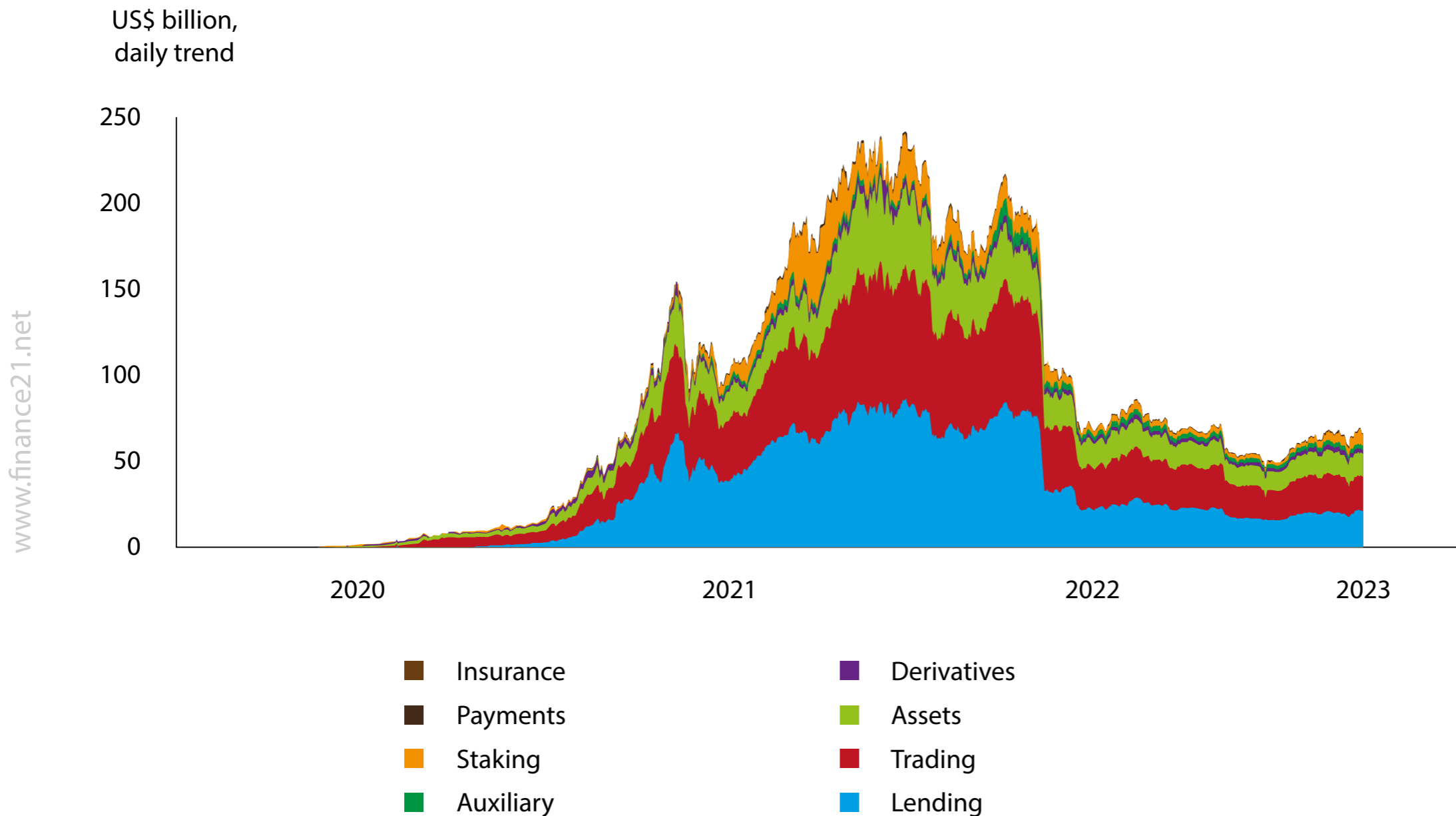
Common exposures and interconnectedness

The cryptoasset system is highly interconnected, as highlighted by the recent bankruptcies of numerous cryptoasset entities. Procyclical selling can thus affect the overall volatility of cryptoasset markets.

Common exposures in the cryptoasset system largely correspond to those in the traditional financial system. Prices of cryptoassets have been responsive to macroeconomic fundamentals such as monetary policy shocks, especially since 2020²⁸. Prices declined sharply during recent periods of increased macro-financial risks, much in line with traditional asset classes such as equities (Chart 7).

In addition, the cryptoasset system is highly exposed to settlement and operational risk in a small number of blockchains. For example, almost two-thirds of DeFi activity is based on the Ethereum blockchain as a settlement layer²⁹.

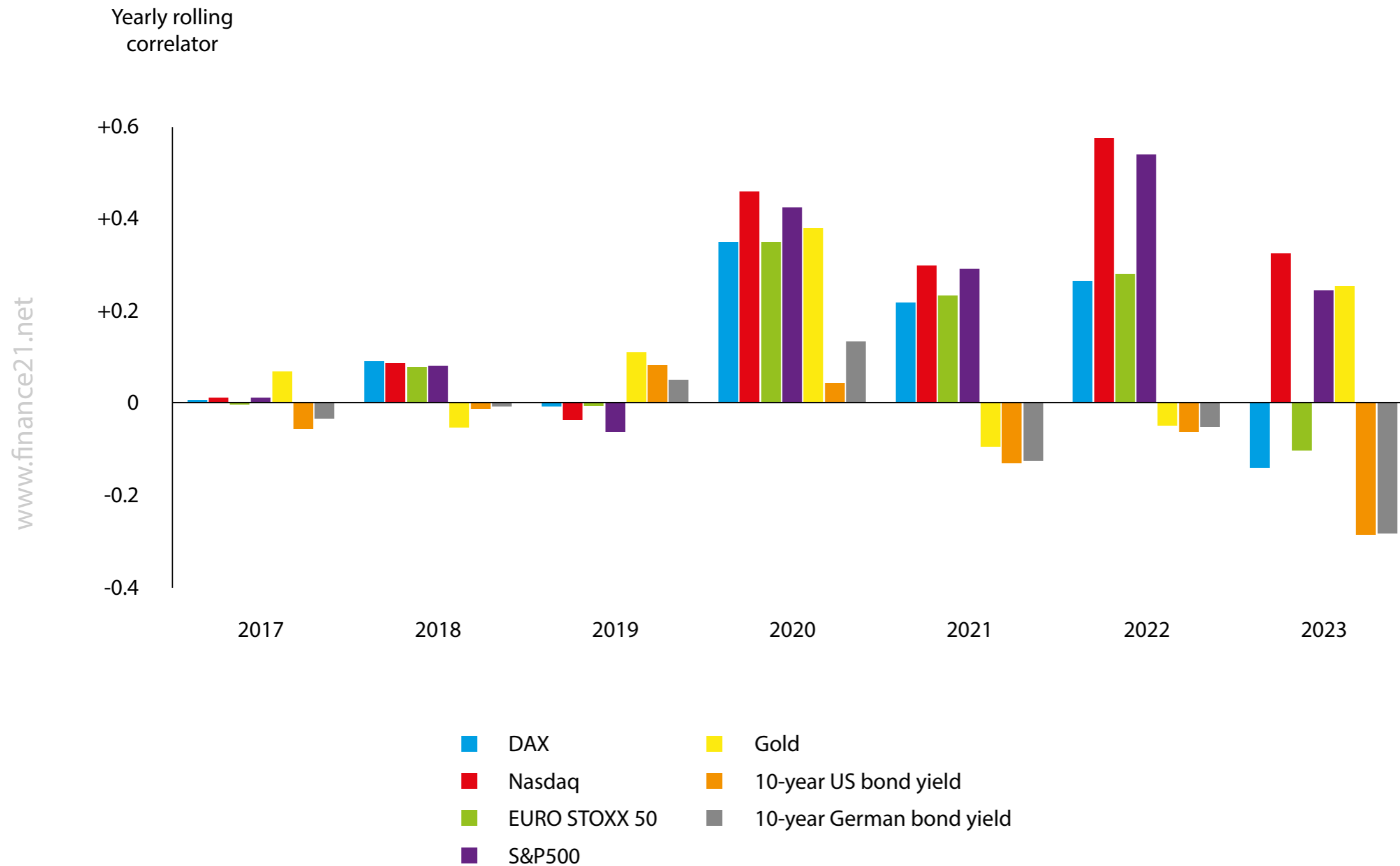
Chart 6. DeFi activity peaked at end-2021 before collapsing in line with the overall cryptoasset market.



Source: DefiLama.com and Bundesbank calculations. * The size of the decentralised finance market is commonly measured using total value locked (TVL). TVL represents the sum of all assets deposited in decentralised finance protocols earning rewards, interest, new tokens, fixed income, etc. It should be noted that TVL can vary depending on the source used, the calculation method, and the actual amounts depend on the liquidity of the markets. This indicator is further broken down into selected decentralised finance initiatives such as trading, staking and payment protocols.

Deutsche Bundesbank.

Chart 7. Correlations between Bitcoin returns and other asset classes have fluctuated over time.



Sources: Bloomberg Finance LP and Bundesbank calculations.
Deutsche Bundesbank.

The cryptoasset system is exposed to liquidity risk. Only a few stablecoins are crucial for the liquidity of cryptoasset trading, and they are also widely used as collateral for collateralised loans or margin trading.

Liquidity in the cryptoasset system specifically depends on a few stablecoins pegged to the US dollar³⁰. These back their tokens mainly by investments in money market instruments. The system is thus exposed to shocks in money markets.

Currently, the cryptoasset system is not highly connected with the financial system. As long as cryptoasset entities do not have the necessary licences themselves, they depend on banks as a bridge between central bank currencies and the cryptoasset world to receive funding.

Yet, only a few internationally active banks reported cryptoasset exposures as at the end of June 2022, accounting for only 0.013% of total exposures³¹. Similarly, investment funds based in the EU have limited exposure to cryptoassets as well.

In April 2022, 111 funds reported cryptoasset exposures, all of which were Alternative Investment Funds³². The majority of these funds were small, with net asset values below €100 million. By way of comparison, there is a total of around 60,000 investment funds in the EU, representing an aggregate net asset value of around €18 trillion³³.

Complexity

Cryptoasset providers can be highly complex. Cryptoasset conglomerates resemble financial conglomerates with complex risk profiles³⁴. They not only operate as pure exchanges, but offer many different services within a single entity, including custody and derivatives trading.

In the traditional financial system, these activities are separated or subject to prudential requirements in order to prevent conflicts of interest. In the case of FTX, for example, a similar separation or sufficient governance structures were not in place³⁵.

Cryptoasset conglomerates provide financial functions across multiple jurisdictions and operate through a network of global affiliates. Some are headquartered in unregulated offshore regions or have no known headquarters at all.

In addition, it is difficult to enforce rights against a specific person in a decentralized system without appropriate governance structures. This prevents effective supervision through domestic regulators, especially in the absence of international agreements on regulatory compliance and supervision³⁶.

Substitutability

Some blockchains and assets within the crypto system would be difficult to replace in the short term. At the current juncture, the crypto system is largely self-referential, and cryptoassets are hardly used outside the crypto system. This limits negative implications for the functioning of the broader financial system or for the real economy.

In certain developing countries, however, the situation differs. El Salvador, for example, has declared Bitcoin to be legal tender. But even in countries that actively promote the use of cryptoassets as a means of payment, adoption seems to remain limited³⁷.

Leverage

High leverage is a key risk for financial stability – in traditional finance as well as in cryptoasset markets. A high degree of leverage amplifies boom and bust phases within the cryptoasset system, and it can be a channel for the propagation of shocks to the traditional financial system³⁸.

Leverage is a particular issue in the cryptoasset system, as collateral often consists of unbacked cryptoassets with no intrinsic value, which tend to be highly volatile. Borrowed funds are often reused as collateral for other loans, giving rise to 'collateral chains'³⁹.

In the event of an abrupt decline in prices, a chain reaction can occur as assets serving as collateral are automatically liquidated, thus amplifying the price declines.

Cryptoasset exchanges allow for margin trading that increases leverage: the exchange lends cryptoassets to users, usually against collateral. In these margin trades, a user could borrow cryptoassets worth up to 20 times the collateral value⁴⁰. Some exchanges also offer leveraged derivatives that can achieve leverage multiples of up to 100 times.

Leverage has indeed been a key channel of contagion during recent spells of market turbulence. The collapse of the stablecoin TerraUSD in May 2022 led to heavy losses for highly leveraged cryptoasset hedge funds. As a result, they were unable to meet their margin calls, thereby triggering bankruptcies of cryptoasset lending platforms⁴¹. Also, the insolvency of FTX was caused by lending out client funds to affiliated entities engaged in margin trading⁴².

Implications for the regulation of cryptoasset markets

Risks inherent in cryptoasset markets require preventive regulation

Risks that are inherent in the traditional financial system are also inherent in cryptoasset markets. This requires appropriate regulation – regulation which does not unduly constrain innovation, but that ensures investor protection, financial market functioning, and financial stability.

Providers of services in cryptoasset markets need to comply with basic standards – above all accounting standards. Additional rules apply to providers of financial services: rules on consumer protection, conduct rules, rules preventing money laundering and anti-terrorist financing rules, and microprudential regulation. Ultimately, all these policies lay the foundation for a stable and resilient financial system.

At the current juncture, the size of cryptoasset markets may not pose immediate risks to financial stability. Having said that, financial regulation has an important preventive function.

The OECD's principles of financial regulation state: *"A pre-cautionary approach is warranted in financial regulation; policy makers should pro-actively anticipate and address emerging risks and problems and not initiate reforms solely in response to the onset of a crisis."*⁴³

Therefore, it is important to address potential systemic risks as early as possible through preventive regulation. Economically similar activities and risks require similar regulation and supervision.

Preventive regulation requires monitoring risks in cryptoasset markets

Preventive regulation requires, at a minimum, to carefully monitor cryptoasset markets. Doing so requires significantly improved information.

Atlas, a project of the Eurosystem Centre of the BIS Innovation Hub, will develop a data platform to provide reliable insights into the macroeconomic relevance of DeFi and cryptoasset markets. This open-source data platform will provide information on market capitalisation, economic activity and international flows of cryptoassets⁴⁴.

Competitive effects on the core financial system also need to be better understood. If new entrants facing weaker regulation provide better financial services, competitive pressure on incumbents increases. This can be welfare-enhancing – but it can also imply undue risks which become more difficult to contain once a market segment has grown.

Monitoring based on information that is provided voluntarily by the private sector does not suffice. There is no assurance that such information is regularly available and of sufficient quality. Hence, we need minimum reporting standards for cryptoasset providers that allow for a consistent monitoring of markets and risks.

International initiatives address risks and improve monitoring, while gaps remain

Several regulatory initiatives are ongoing with the aim of monitoring cryptoasset markets, separating cryptoasset markets from the core financial system, and addressing risks in cryptoasset markets.

The Financial Stability Board coordinates international regulatory and supervisory approaches to cryptoasset activities. In 2020, it published recommendations on the regulation, supervision and oversight of global stablecoin arrangements⁴⁵. Updated recommendations are scheduled for publication in July 2023⁴⁶.

As regards the exposure of banks to cryptoassets, the Basel Committee on Banking Supervision (BCBS) adopted a supplement to the Basel Framework in 2022 that sets international minimum standards for the prudential treatment. Two groups of cryptoassets are distinguished:

- Group 1 comprises tokenised traditional assets and certain stablecoins. These are subject to capital requirements based on the risk weights of underlying exposures as in the existing Basel Framework.

- Group 2 comprises all other cryptoassets, including unbacked cryptoassets. These are subject to more conservative capital requirements. A bank's total exposure must not exceed 2%, and should be lower than 1%, of its Tier 1 capital. If exposures exceed 2% of the bank's Tier 1 capital, then the full exposure to assets in Group 2 must be backed by own funds.

Banks have to comply with these rules by 1 January 2025, and implementation will establish reporting requirements for banks.

The European Union is already in the process of implementing new standards, which arguably makes it the first jurisdiction with a comprehensive regulatory regime for cryptoassets and markets⁴⁸. The European Union's Markets in Crypto-Assets Regulation (MiCA) balances incentives for innovation against risks to the financial system and investors through:

- requirements regarding the issuance of cryptoassets and cryptoasset services;
- the authorisation and supervision of issuers of cryptoassets and of cryptoasset service providers;
- capital requirements and governance rules;
- reserve requirements for stablecoin issuers based on the existing regulations for e-money issuers.

MiCA will also impose reporting requirements on entities carrying out cryptoasset activities. Issuers of stablecoins not pegged to the euro with an issuance value of more than €100 million must report certain information.

Providers of trading platforms must make information publicly available, and they must give public authorities access to data. Enhanced monitoring arrangements apply to 'significant' service providers (with at least 15 million active users).

With the international approach of regulation and containment, we are on the right track – but significant gaps remain. Further work in a number of areas is required:

- Address concentration risks: currently, MiCA imposes governance requirements for activities within the same entity but not for activities across an entity or group⁴⁹. Given that risks can arise from the concentration of certain activities within one entity, it needs to be monitored whether MiCA addresses these risks sufficiently or whether an extension is needed.
- Address risks related to banks issuing cryptoassets: risks for banks from issuing their own cryptoassets, such as tokenised deposits, require monitoring and mitigation, as needed. Regarding tokenised deposits, it has not yet been fully clarified whether they would fall under cryptospecific regulation or under traditional banking regulation.
- Limit regulatory arbitrage⁵⁰: service providers from regions that do not implement minimum regulatory standards could be prevented from providing services in well-regulated jurisdictions.

One option would be to prohibit cryptoasset service providers and banks in well-regulated jurisdictions from doing business with providers in non-compliant jurisdictions. Also, a common understanding of the scope of MiCA and the approach to decentralised DeFi applications across Europe is needed.

- Improve reporting: MiCA addresses risks in parts of the cryptoasset market, and it provides improved information. However, cryptoasset activities that are currently not covered by MiCA, such as cryptoasset lending, need to be closely monitored as well.

Moreover, reporting requirements for cryptoasset exposures should be introduced not only for banks but also for other financial institutions. For example, MiCA sets out no reporting requirements for wallet providers or for exposures between trading platforms and issuers. Also, there are no requirements for financial institutions other than banks to report exposures to cryptoassets.

Summing up

Cryptoassets and markets are a relatively recent innovation in finance. It may be too early to draw lessons about how useful they are. But good regulation needs to err on the side of caution. The evidence so far clearly shows the need to monitor and take preventive action against risks in these markets through:

- preventive regulation,
- better reporting systems and good monitoring and
- limiting regulatory arbitrage.

Cryptoassets promise more innovative ways of providing financial services than the traditional financial system, but they also entail risks that are strikingly similar: high market concentration, complexity, common exposures, and high operational risk.

And, in the end, it is not technologies that manage risks but people. The history of finance is ripe with examples of risks that have been shifted to uninformed parties – willingly or unwillingly.

Good regulation is about incentivising risk-taking that is beneficial for society, while preventing risk-taking that is harmful for others.

The first line of defence against innovation that does more harm than good is informed consumers of financial services and strong consumer protection. Currently only a small part of the population invests in cryptoassets⁵¹.

But current developments in financial markets have made us painfully aware that risks to financial stability are real. These risks have effects that go way beyond just the investors in financial assets, including cryptoassets. If things turn sour, it is the entire population that bears the costs – in terms of repercussions to the real economy or costs to the taxpayer.

We clearly need more conceptual work on the risks and benefits of financial innovation. The future use cases of a cryptoasset product are hard to predict, even for its developers. This opens the door for an important research agenda. We need a better understanding of the welfare effects of financial services, of the drivers and mitigants of risk. ■

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Endnotes

1. See Droll and Minto (2022) on the role of law and regulation in shaping technological trends in post-trading, including the use of blockchains.
2. Data from <https://coinmarketcap.com/>, accessed 31 March 2023.
3. See <http://ushakrisna.com/ABS.pdf>, Basel Committee on Banking Supervision (2011) and Bertay, Gong and Wagner (2017).
4. See Allen (2022a).
5. See Deutsche Bundesbank (2022).
6. See Basel Committee on Banking Supervision (2023) [<https://www.bis.org/bcbs/publ/d546.pdf>] and Cornelli, Doerr, Frist and Gambacorta (2023).
7. See McCaul (2023) for a discussion on how to improve the oversight of cryptoasset markets.
8. See Financial Stability Board and International Monetary Fund (2022).
9. Cong, Li, Tang and Yang (2022) estimate the share of 'wash trading' to be as high as 70% of total trading activity in unregulated cryptoasset exchanges. 'Wash trading' describes a type of market manipulation in which investors simultaneously buy and sell the same financial assets in order to create artificial activity in the market. This distorts prices, volumes, and volatility in unregulated marketplaces.
10. See European Systemic Risk Board (2023).
11. See Bremus and Buch (2017).
12. See Adrian and Brunnermeier (2016). CoVaR measures the "Value at Risk" of the financial system, conditional upon an individual financial institution being in distress. A higher value implies higher systemic risk.
13. See Financial Stability Board (2021).
14. See Diamond and Rajan (2009) and Deutsche Bundesbank (2019).
15. See Basel Committee on Banking Supervision (2013).
16. See Financial Stability Board (2021).

17. See <https://www.bloomberg.com/features/2022-lehman-brothers-collapse-plan-repay-after-bankruptcy/#xj4y7vzkg>
18. See Basel Committee on Banking Supervision (2021).
19. See Financial Stability Board (2022).
20. See Gschossmann, van der Kraaij, Benoit, and Rocher (2022).
21. See European Systemic Risk Board (2023).
22. See Financial Stability Board (2023a) for challenges in crossborder payments.
23. See <https://coinmarketcap.com/charts/>, accessed 30 March 2023.
24. See Aramonte, Huang and Schrimpf (2021).
25. See European Systemic Risk Board (2023).
26. See Makarov and Schoar (2022).
27. For the Bitcoin blockchain, which is considered to be fully decentralised, four entities provide more than half of the validation power. See https://blog.trailofbits.com/wp-content/uploads/2022/06/Unintended_Centralities_in_Distributed_Ledgers.pdf
28. Benigno and Rosa (2023) find limited evidence that Bitcoin prices immediately react to monetary and macroeconomic factors when looking at data since 2017. Karau (2023), however, shows that the relationship between Fed policy and Bitcoin prices has evolved over time and that Bitcoin returns respond strongly to FOMC announcements after 2020. Kyriazis et al (2023) also identify a stronger effect on the volatility of Bitcoin and Ether returns in more recent time samples.
29. See <https://defillama.com/chains>, accessed 29 March 2023.
30. Tether, the largest stablecoin by market cap and trading volume, accounts for around 70% of all trading on centralised cryptoasset exchanges. See <https://www.theblock.co/data/crypto-markets/spot/share-of-trade-volume-by-pair-denomination>, accessed 29 March 2023.
31. This figure is a weighted average across the sample of banks reporting cryptoasset exposures. See Basel Committee on Banking Supervision (2023).

32. *The survey was conducted among national competent authorities supervising insurers, banks and financial markets in 28 European Economic Area member states. See European Systemic Risk Board (2023).*
33. *See European Systemic Risk Board (2023).*
34. *See Financial Stability Board (2022).*
35. *See <https://www.sec.gov/news/press-release/2022-219>*
36. *See Animashaun (2022).*
37. *See <https://www.imf.org/en/News/Articles/2023/02/10/el-salvador-staff-concluding-statement-of-the-2023-article-iv-mission>*
38. *See European Systemic Risk Board (2023).*
39. *See Financial Stability Board (2023b).*
40. *See European Systemic Risk Board (2023).*
41. *See <https://www.ft.com/join/licence/efeefef3-0ec1-4aa4-8bf0-0938f8f18097/details?ft-content-uuid=126d8b02-f06a-4fd9-a57b-9f4ceab3de71>, accessed 13 April 2023.*
42. *See Allen (2022b).*
43. *See Organisation for Economic Co-operation and Development (2010).*
44. *See <https://www.bis.org/about/bisih/about.htm>, accessed 03 April 2023.*
45. *See Financial Stability Board (2020). These recommendations are currently under revision.*
46. *See Financial Stability Board (2022).*
47. *Some requirements are stricter than for stablecoins under the European legislation (MiCA). For example, at present, no stablecoin issued on a permissionless blockchain may be classified as a Group 1 asset.*
48. *MiCA also foresees that issuers of e-money tokens, stablecoins referenced to one single currency, should be required to be issued either by a credit institution, as defined in the Capital Requirements Regulation, or by an e-money institution authorised under the revised Electronic Money Directive ('EMD2').*
49. *See European Systemic Risk Board (2023).*

50. Minto, Prinz and Wulff (2021) discuss regulatory arbitrage in financial markets.

51. Various surveys suggest that the vast majority of consumers do not own cryptoassets. An ECB survey conducted in Belgium, Germany, Spain, France, Italy and the Netherlands in November 2021 revealed that 10% of households owned cryptoassets (European Central Bank 2022). A survey conducted in Germany found that 4% of the population held cryptoassets at the end of the year 2021. See *Zahlungsverhalten in Deutschland 2021* (bundesbank.de). An ECB survey covering the entire euro area also found that 4% of the population owned cryptoassets at the end of the year 2022. See *Study on the payment attitudes of consumers in the euro area (SPACE) – 2022* (europa.eu).

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A digital euro: widely available and easy to use

Fabio Panetta argues that making a digital euro both available to everyone and easy to use requires a good design and an adequate regulatory framework

We are now entering the final stage of the investigation phase of the digital euro project. The ECB's Governing Council recently endorsed a third set of design options for the digital euro – design options that we have also discussed in previous hearings.

We have published a report setting out the Eurosystem's views on how people could access, hold and start to use the digital euro. The report also examines how the digital euro could be distributed by intermediaries as well as the services and features it could offer¹.

Our work in recent months has not just been about investigating technical issues. We have also held focus groups to hear from potential users of a digital euro and find out what they think about the different features a digital wallet should have. This will help us in designing a product that meets their needs².

In a modern economy, being able to pay digitally is a basic need for people. With cash, central banks already provide a means of payment that is risk-free, widely accessible and easy to use, and that leaves no-one behind. But the rapid digitalisation of our economies requires us to complement cash with its evolution in the digital sphere: a digital euro.

As a central bank, we need to be ready for future evolutions and make sure that the money we issue maintains its role as a monetary anchor in the digital era, thereby reassuring us that one euro is one euro whatever form it takes and wherever we go. And it cements people's trust in our currency³.

For this monetary anchor to be effective, the digital euro would need to be in line with people's preferences. Everyone across the euro area should be able to use it for day-to-day payments: online, in shops or from person to person.

In my remarks I will focus on how we can ensure that everyone in the euro area would be able to easily access and use a digital euro – if and when they want to, no matter who they bank with or which country they come from. People would have no *obligation* to use the digital euro. But they should always have the *option* to use it. Just like they do with cash today.

In a modern economy, being able to pay digitally is a basic need for people

In my remarks I will look at the digital euro also from a regulatory angle.

Ensuring the digital euro is widely available and easy to use

There is currently no single European digital means of payment that is universally accepted across the entire euro area. It therefore comes as no surprise that Europeans see the ability to pay anywhere as the most important feature of a potential digital euro⁴. In other words, they are keen for one of the key characteristics of euro banknotes to be replicated in the digital realm.

At the ECB, we have been investigating the technical solutions that would enable people to easily make payments in digital euro, anywhere in the euro area⁵. But if we want the digital euro to replicate these cash-like features, we need a proper regulatory framework.

Legislators assigned the legal tender status to euro banknotes in the Treaty⁶, and this is why citizens can use them throughout the entire euro area⁷. They are tangible proof that we share a single currency.

The digital euro could also be given legal tender status by legislators⁸. If introduced, the digital euro would be a public good, and Europeans would expect to be able to access and use it easily, anywhere in the euro area. So, it would be more beneficial and convenient for all users if merchants that accept digital payments were obliged to accept the digital euro as legal tender⁹.

A requirement for merchants to accept digital euro could, in fact, also be seen as an opportunity. For example, it would make European payments more resilient and would enhance competition¹⁰. This, in turn, would help to make payments cheaper, with clear benefits for everyone in the euro area¹¹.

But if we want to make the digital euro widely usable, acceptance is only one side of the coin. The other side is access.

Individuals and merchants will expect to be able to obtain digital euro at their banks¹², just like they do today with cash¹³. It should be simple for people to start using the digital euro, and there should be no need to change bank in order to do so.

In our regular exchanges, consumer associations and merchants¹⁴ have remarked that the best way to ensure broad access for consumers would be to require euro area banks and other payment service providers to make the digital euro available to their customers¹⁵.

Previous attempts at building pan-European payment initiatives have shown that ensuring broad access throughout the euro area has ultimately always required regulatory measures¹⁶.

So, both sides of the coin – widespread acceptance and broad access – are necessary to ensuring the digital euro would be a public good that meets the expectations of consumers and merchants.

These two aspects are also key to achieve other public policy goals. For instance, they are essential to ensure that the digital euro can support financial inclusion and generate opportunities for financial intermediaries.

A digital euro would offer a new platform for innovation that is truly European. It would allow these intermediaries to build services for their customers that are instantly available across Europe. It could help domestic payment providers and new instant payment solutions to scale up and operate at the European level. And it would reduce dependence on a few dominant providers, increasing competition and resilience.

Ensuring a seamless European payment experience

Over the past 20 years euro banknotes have enabled everyone in the euro area to easily recognise and use public money, regardless of what country they are living in, or where they are paying.

The same should be true for the digital euro. People should be able to pay and be paid in digital euro anywhere in the euro area, no matter which intermediary they are using to access the digital euro or which country they are in.

To achieve this, we need a common set of standards – which we call a ‘payment scheme’¹⁷.

The scope of these standards will be limited to what is strictly necessary to establish and offer users a harmonised and convenient payment experience, while enabling and inviting the supervised intermediaries to develop further services and solutions¹⁸.

Even if supervised intermediaries will distribute the digital euro, one should not forget that it will be a liability of the central bank. The Eurosystem, as its issuer, would be accountable to euro area citizens for its correspondence to their payment needs.

The Eurosystem should therefore be able to govern the standards to ensure that using a digital euro in the future is as standardised as using cash today. It would do so by steering consensus among all involved stakeholders – consumers, retailers, banks and non-banks.

Ensuring wide availability through the right economic incentives

Economic incentives should be used to encourage the active distribution of the digital euro and to ensure that it is widely available. We have already proposed a set of four core principles for a digital euro compensation model¹⁹.

- The first principle is that, as a public good, the digital euro should serve society. We believe consumers should be able to use it free of charge for basic day-to-day purposes²⁰.
- Second, intermediaries should be compensated for the services they provide, just like they are for other digital payments.
- Third, legislative safeguards should prevent merchants from being overcharged by intermediaries if they are obliged to accept digital euro as legal tender. While we believe that the digital euro would allow for more competitive fees, this principle would ensure that fees for merchants cannot exceed the current levels for comparable means of payment.
- Finally, the Eurosystem would bear its own costs, for example for settlement²¹ activities and managing the common standards for making and receiving payments in digital euro. This would reflect the public good nature of the digital euro and follow the same logic that currently applies to cash. The savings that arise from the Eurosystem covering its own costs would ultimately benefit the end-users.

The path ahead

The design of the digital euro and its regulatory framework are key to ensuring that it retains its key characteristics as a public good.

It will then be European legislators to decide whether the digital euro will be an inclusive, truly European means of payment – widely usable and accessible across the entire euro area, free for basic use, and offering the highest levels of privacy. The success of a digital euro will be in your hands.

The ECB stands ready to continue discussing all these issues with you during the legislative process. Throughout the next project phase, which is expected to be launched later this year, we will accommodate any necessary adjustments to the design of the digital euro that may emerge from legislative deliberations²². In that phase, we will develop and test the possible technical solutions and business arrangements necessary to provide a digital euro.

These two processes – legislative and design – should advance in parallel so we can be in a position to promptly begin issuing a digital euro, if and when warranted. The possible decision by the Governing Council to issue a digital euro would be taken only after the legislative act has been adopted.

We will take all the necessary measures to ensure that the digital euro would act as a true public good. But all European institutions have to play their part to achieve our common goal of making the digital euro a success.

This is why we are looking forward to the European Commission's legislative proposal. It will be a decisive step forward for the digital euro and put Europe at the forefront of the work on central bank digital currencies among the G7. ■

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Endnotes

1. See ECB (2022), [Progress on the investigation phase of a digital euro](#), September; ECB (2022), [Progress on the investigation phase of a digital euro – second report](#), December; ECB (2023), [Progress on the investigation phase of a digital euro – third report](#), April; and ECB (2022), [Letter from Fabio Panetta to Ms Irene Tinagli on progress reporting on the investigation phase of a digital euro](#), 14 June. The first report covers topics such as the transfer mechanism, privacy and tools to control the amount of digital euro in circulation. The second report focuses on the roles of intermediaries, a settlement model, funding and defunding and a distribution model for the digital euro. The third report covers the Eurosystem's views on accessing the digital euro, holdings, onboarding, distribution aspects, services and functionalities.
2. See Kantar Public (2022), [Study on New Digital Payment Methods](#), March; and Kantar Public (2023), [Study on Digital Wallet Features](#), April.
3. People's trust in money issued by private intermediaries (such as bank deposits) relies on the ability to convert it, on a one-to-one basis, into risk-free central bank money (such as cash). See for example [Central bank digital currencies: a monetary anchor for digital innovation](#), speech by Fabio Panetta, Member of the Executive Board of the ECB, at the Elcano Royal Institute, Madrid, 5 November 2021.
4. Focus groups suggested that people see the ability to “pay anywhere” as the most important feature of a new digital payment instrument. This emerged in all countries and age groups. See Kantar Public (2022), [Study on New Digital Payment Methods](#), March; and Kantar Public (2023), [Study on Digital Wallet Features](#), April.
5. Panetta, F (2023), [“The digital euro: our money wherever, whenever we need it”](#), introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 23 January.
6. See Article 128(1) of the Treaty on the Functioning of the European Union.
7. The fact that euro banknotes and coins enjoy the status of legal tender means that they are a valid means of payment to settle a monetary debt unless the parties have agreed on another means of payment. The definition of legal tender relies on three main criteria: (i) mandatory acceptance; (ii) acceptance at full face value; and (iii) power to discharge from payment obligations.

8. The European Commission is also expected to publish a proposal on the scope of legal tender of euro banknotes and coins in the second quarter of 2023. While the main objective of legislative measures related to cash is to preserve its widespread use and availability, for the digital euro the goal would be to establish its use and availability from scratch.
9. Giving the digital euro legal tender status may help to increase its adoption and use, creating a positive feedback loop of network effects (where the value and utility of a payment system increase as more users join and transact within the network). In other words, the more people use a particular payment system, the more valuable and convenient it becomes for all users.
10. For the merchants, the digital euro, as a true pan European retail payment solution, would allow for enhanced bargaining power in the payments market that is currently dominated by a few dominant providers.
11. See [Written feedback after the 6th Euro Retail Payments Board \(ERPB\) technical session, March 2023](#).
12. Banks are mentioned here as an example of a payment service provider (PSP) that could distribute the digital euro. The Eurosystem believes that all PSPs as defined in the revised Payment Services Directive (PSD2) – ie. credit institutions, electronic money institutions and payment institutions – could distribute the digital euro.
13. Panetta, F (2022), [“Building on our strengths: the role of the public and private sectors in the digital euro ecosystem”](#), introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 29 September.
14. See [Written feedback after the 6th Euro Retail Payments Board \(ERPB\) technical session, March 2023](#).
15. Without this obligation, the digital euro may not be universally accessible to everyone across the euro area. There could be a situation where each euro area country has only a few banks (or even no banks) that offer digital euro accounts/wallets, forcing many customers to open an account with a new bank because their current one does not provide access to digital euro. This would also endanger network effects necessary to the success of a payment solution (see footnote 9).

16. There are lessons to be learned from the delays in achieving pan euro area reach in case of the SEPA Credit Transfers and direct debit schemes and then also the SEPA Instant Credit Transfer scheme. If broad access is to be ensured for the digital euro, the required regulatory measures need to be established at an earlier stage in the process.
17. Panetta, F (2022), [“Building on our strengths: the role of the public and private sectors in the digital euro ecosystem”](#), introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 29 September.
18. To avoid placing an additional investment burden on intermediaries, the digital euro scheme Rulebook Development Group [ECB hosts first digital euro Rulebook Development Group \(RDG\) meeting](#) is investigating how to leverage existing standards and solutions as much as possible, and how to make the digital euro compatible with existing solutions. It will also reflect on present and future regulatory requirements. See as well as [RDG mandate](#) and the related [calls for expression of interest scheme compatibility workstream](#) by experts to participate in workstreams.
19. A compensation model for the digital euro refers to the framework that determines how entities are remunerated for their participation in or use of a digital euro currency. The digital euro compensation model is a four-party scheme with variations concerning three aspects: (i) pricing for private individuals, (ii) pricing for merchants, and (iii) costs for the Eurosystem. The model could also cover factors such as transaction fees, interest rates, incentives and other mechanisms for compensating users. See ECB (2023), [“Compensation model for the digital euro”](#), presentation at the Euro Retail Payments Board, 22 February.
20. ECB (2020), [“Report on a digital euro”](#), October. The scope of digital euro basic services is yet to be defined, but it should be similar in nature to the basic services that banks are required to provide under the [Payment Accounts Directive](#). These basic services could therefore include features such as free-to-open digital euro accounts/wallets, payments between individuals, and the funding and defunding of digital euro accounts/wallets. If consumers had to pay for the basic services, it would also put the digital euro at a disadvantage to some existing digital means of payments.

21. Settlement can be defined as the completion of a payment transaction with the aim of discharging end users' obligations through the transfer of funds. See Panetta, F (2022), "[Building on our strengths: the role of the public and private sectors in the digital euro ecosystem](#)", introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 29 September.

22. In autumn this year, the Governing Council may decide to enter the next preparation and experimentation phase. This is entirely separate from the decision on whether or not to issue a digital euro, which will only be taken once the legislative process has concluded.

This article is based on the introductory [statement](#) delivered at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 24 April 2023.

The shape of things to come

Jon Cunliffe looks at four areas where the tokenisation of money is now being explored, examining the BoE's work to ensure these new forms of money are robust and uniform

I want to concentrate my remarks on payments and money – how we pay for things and what type of money we use. These once dusty and forgotten corners of the financial system have been transformed in recent years. And there are good reasons to believe that even more radical change is on the horizon.

I will discuss developments within in the UK, but much of the trends and the possibility of further technological advances that I will cover are relevant for crossborder payments which have lagged far behind the developments we have seen in recent years in domestic payment systems. And which merits a speech all of its own.

I should start however with a health warning. Central bankers are very used to forecasting the economic future. It is at the heart of what we do. And I can say from experience that, despite the masses of data and our complex mathematical models, it is not an easy task. The future, as the last few years of pandemic and war have shown us, rarely behaves as it should.

However, forecasting the direction and pace of technological innovation - and, crucially, the way it will interact with social and economic trends - is an even more hazardous enterprise. Much lauded innovations prove to be dead ends or fail to be adopted. Unheralded ones emerge at speed. And often it is the unforeseen combination of a number of technological advances that generates radical change.

Against that background, public authorities, like the Bank of England, that are charged with maintaining financial stability and with the regulation of the financial system need to be forward looking, for two key reasons.

The first is that while we cannot be certain how new technologies and social and economic trends will play out, we need to have thought through in advance how the risks might need to be managed and, where the likelihood of major change is high, have the regulatory frameworks and powers in place.

Playing regulatory catch up with new technologies once they become established and adopted at scale can be very difficult – as some of the experience in recent years with social platforms and other big techs has demonstrated. And it generates uncertainty for innovators.

We aim to be forward looking, developing both in developing the regulatory frameworks and in developing public systems and public money necessary so that safe innovation can flourish to the benefit of all

The second is that we want competition and innovation in financial services – it can increase efficiency, functionality and resilience. Setting out the regulatory approach allows those who want to innovate by providing better products and services to understand the risks that need to be managed as they develop those products. It also ensures that innovation is not simply competing by taking higher risks.

This approach has been a key element in the evolution and adoption of innovation in payments in the UK in recent years. Against the background of increasing digitalisation of everyday life, the combination of technological advance and appropriate regulatory frameworks¹ - both to foster competition and to manage risks – has transformed the way we pay. It has also stimulated the growth of the UK Fintech sector which is now the second largest in the world².

Contactless' card payments are now used by close to 90% of people and make up almost a third of all payments in the UK, Nearly a third of UK adults use mobile payment apps such as ApplePay or GooglePay. Seven million consumers and three-quarters of a million SMEs are using Open Banking products. Several digital only challenger banks operate in the UK providing competition and innovation to the UK banking sector.

These changes have not only transformed the way people pay but also the type of money they pay with. Two types of money circulate in the UK today. The first is public money', money issued by the Bank of England in the form of physical cash; the second is 'private money', issued by commercial banks in the form of electronic bank deposits.

Until relatively recently, the great majority of everyday transactions in the UK were made in publicly issued money, notes and coin. Electronic transfers of commercial bank money tended to be reserved for higher value transactions.

However, as the cost of electronic money transactions has come down and the functionality increased, and as our daily lives have become more digitalised, commercial bank electronic money has come to dominate payments in the UK.

Card payments surpassed cash as the most commonly used form of retail payment in 2016. By 2021, 85% of payments were made electronically (either through cards or bank transfers). However, as the experience with contactless and mobile payments shows, innovation in payments will continue as new technologies and business models develop.

The ability to transact in cash, of course, remains very important to a substantial part of the population and often to the most vulnerable. And cash is clearly an important store of value for many in times of stress³. The Bank of England has been very clear that it will continue to issue cash as long as there is any demand for it⁴.

But the recent trend away from publicly-issued, Bank of England, physical money and towards electronic money issued by private sector banks is very clear. And we should expect that trend to continue for a number of reasons.

First, and most obviously, what I have called the digitalisation of everyday life will continue. The growth of internet commerce or use of banking and payments apps, for example is forecast to grow/unlikely to stop.

Second, there are further developments in train within existing payment systems, infrastructure and regulatory frameworks. These include Pay.UK's development of the New Payments Architecture⁵. The Bank of England is well advanced in the build and implementation of a new central bank real time payment system (RTGS), the central rail of the current UK payments infrastructure.

This renewal programme will increase resilience and access, and offer wider interoperability, improved user functionality and strengthened end-to-end risk management of the UK's High Value Payment System. As announced, the government and regulators⁶ will expand the Open Banking framework through making improvements on API performance, improving the provision of information sharing to third party providers and working towards additional functionalities, such as variable recurring payments.

Third, and looking a little further into the future, over the last decade a set of newer technologies have emerged which may have the potential for a further transformation in payments. I am referring here to technologies that have been pioneered and refined in the crypto world, such as tokenisation, encryption, distribution, atomic settlement and smart contracts.

These developments have been much hyped of course, and one could not say it was a certain bet that they will be as transformative as some have claimed. But some have already begun to find their way into conventional finance⁷ and there is a great deal of experimentation and development going on, both in the crypto world and in conventional finance.

They offer the prospect of what is loosely called the 'tokenisation' of financial and other assets – including the 'money' that is used to settle - and thereby a more extensive, faster and more secure programming/automation of transactions. And they offer new ways to record the ownership and the transferring of ownership, of assets - again including the transfer of money – which we generally call 'payments'.

One can certainly think now of possible use cases for such functionality. In the world of wholesale financial transactions, for example, they may make it possible to cut out intermediaries and make trading and settlement

instantaneous. In retail payments, for example, they may enable functionality like micro-payments and more flexible programming of money for everyday uses.

But perhaps more important may be the use cases we cannot see at present. A good illustration of this is the expansion of use cases for the smart phone which I am reasonably sure has far exceeded anything that could have been imagined when the first iPhone and apps were introduced in 2007. At launch the iPhone had just 15 apps, the app store opened the following year with around 500 apps which has grown such that today it holds over 2 million.

The potential tokenisation of money and development of new ways of transferring it in transactions has major implications for the Bank of England. It is not just that we are responsible for ensuring that payment systems work seamlessly and without disruption in the UK, crucial though that is for financial stability.

It is also, and more fundamentally, because we are ultimately responsible for ensuring that each of the monies circulating in the UK – and at present we have around 800 private banks, building societies and credit unions issuing money⁸ - are both robust and uniform.

By robust, I mean that users can have confidence that the money will be useable and accepted in transactions. By uniform I mean denominated in the same currency unit – Sterling – and seamlessly exchangeable for any other money in circulation on demand and without loss of value.

Against that background, I want to look at four areas where the tokenisation of money is now being explored. The first is stablecoins used for payments, the second is the tokenisation of commercial bank deposits, the third is the next stage of the Bank of England's work on issuing a Digital Pound and the last is the Bank's work to ensure to ensure these new forms of money are robust and uniform.

The emergence, in the world of cryptoassets of so-called stablecoins is at the forefront of developments in the tokenisation of money. Stablecoins broadly comprise a digital financial asset that purports, by one means or another⁹, to maintain a stable value, a ledger system, usually a distributed ledger, for recording and transferring ownership. These are supported by exchanges for trading the coins and custody arrangements for storing them.

At present, they are issued by a variety of non-bank entities. So far their use has been confined to facilitating trading and other transactions in the world of cryptoassets but there are proposals to introduce them for other payment purposes in the economy and for crossborder use in competition with money issued by commercial banks and conventional payment systems¹⁰.

Stablecoins offer the possibility of greater efficiency and functionality in payments. But they currently sit outside most of the regulated framework and it is extremely unlikely that any of the current offerings would meet the standards for robustness and uniformity we currently apply both to commercial bank money and to the existing payment systems that transfer commercial bank money between the parties to a transaction.

The Financial Services and Markets Bill will give the Bank powers to regulate operators of systemic payment systems and systemic service providers using 'digital settlement assets', including stablecoins that are used, or are likely to be used, for payments, at systemic scale in the UK.

It will also give the FCA powers to regulate the issuance and custody of fiat-referenced stablecoins for conduct and market integrity. We and the FCA¹¹ plan to consult later this year on the regulatory frameworks we will apply to stablecoins.

The Bank of England's regulatory framework, in line with the legislation, will cover the issuance of stablecoins which are used for payments at systemic scale, the systems for transferring the coins, and also extend to systemic service providers such as custody wallets that are an intrinsic part of the stablecoin arrangement.

It will give effect to two expectations for systemic or likely to be systemic stablecoins that have been set by the Bank's Financial Policy Committee. First, that payment systems that use stablecoins should be regulated to standards equivalent to those applied for traditional payments. And second that stablecoins used as money for payments should meet equivalent standards to those provided by commercial bank money.

It will follow the guidance on the relevant international standards set last year¹², including the requirement that the coins should be redeemable from the stablecoin arrangement, in fiat money, at par value and on demand¹³. This matches the requirement for commercial bank money and is crucial both to ensure confidence in the coins and their uniformity with other sterling money.

Systemic stablecoins will need to be backed with high quality and liquid assets to be able to meet these expectations and standards, as set out by the Financial Policy Committee¹⁴. These could include either deposits at the Bank of England or very highly liquid securities, or some combination of the two. We are currently considering which of these options is most appropriate.

In doing so, we will need to take two important considerations into account. The first is that, unlike commercial bank money which is protected by deposit insurance up to £85,000, it will not be possible – initially at any rate – to give stablecoin holders industry funded protection against failure of the coin.

This reinforces the need to ensure that the backing assets are at all times of sufficient value to meet redemption requests. And it also highlights the potential role of capital requirements.

The second consideration is that the underlying objective of the legislation and the ensuing regulation is to open further the frontier for safe and sustainable innovation and competition in payments. Stablecoin business models should in general reflect this and be grounded in improved payments efficiency and functionality rather than in maturity transformation.

There are other important questions to be resolved, such as whether there should be limits, initially at any rate, on stablecoins used for payments. While, from a public policy perspective, we want competition and innovation in payments we need to guard against rapid, disruptive change that does not allow the financial system time to adjust and could therefore threaten financial stability.

The risks to financial stability from the development of digital money issued outside the banking system has been the subject of extensive analysis. The Bank of England's assessment is that over time, the financial stability risks should be manageable including risks from the impact on the banking system¹⁵.

But we cannot know for certain the extent and the speed at which payment stablecoins might be adopted and we may well need limits, at least initially, to ensure we avoid disruptive change that could threaten financial stability.

Another important question will be whether the requirement to be redeemable in fiat money, on demand and at par and the backing asset model will be sufficient to ensure uniformity of sterling stablecoins with each other and with other forms of sterling money. This will depend to some extent on whether there are frictions in the redemption and interchange process.

It has been suggested that ensuring the uniformity (or 'singleness' of money) requires that all transactions between different monies settle ultimately in central bank money across the books of the central bank.

While it is not clear to me that this should be the case, it is clearly an issue that should be considered carefully in the design of the regulatory regime.

Finally, on stablecoins, it is important to emphasise that powers in the Bill and the Bank's regime will be for stablecoins used for payments. A digital representation of an asset with a generally stable value could be used for other purposes. It could offer a return as an investment product akin to a money market fund. Or it could be part of the credit creation process, with the loans issued in the form of stablecoins.

Neither of these models is likely to fit within the regulatory regime for payment stablecoins, though they may fit within other regulatory regimes. In the first case, to be acceptable as a means of payment at systemic scale, stablecoins will be required to meet redemption at par on demand which is inconsistent with an investment product.

In the second case, the issue of liquid liabilities that can be used as money in return for illiquid debt obligations is the banking business model and issuers of tokenised money who wish to pursue credit creation will need to be regulated as banks.

This brings me to the second area, the issuance by commercial banks of new forms of digital money to be used on new payment rails – in the form of 'tokenised' bank deposits. These might offer some or all of the functionality and efficiency claimed for stablecoins, allowing banks deposits to compete better with non-bank payment coins.

Some banks in the UK and in other jurisdictions have been exploring and investing in the development of tokenised deposits as settlement assets on new forms of ledger (eg. DLT). The majority of this effort appears to have centred on wholesale as opposed to retail financial transactions¹⁶, though there are signs that attention is now being given to tokenisation of retail deposits¹⁷.

In regulatory terms, the tokenisation of bank deposits is a much simpler proposition than non-bank stablecoins. Bank deposits are already uniform, robust money in the UK – indeed they account for 85% of the money in circulation for retail purposes and are generally acceptable for wholesale transactions.

We have a comprehensive regulatory regime, deposit insurance and resolution and insolvency procedures to protect bank depositors. Commercial banks settle between each other in Bank of England money which helps to reinforce uniformity.

Nonetheless, the tokenisation of bank deposits raises some important questions. Currently, money issued by a commercial bank can only be held by someone that has an account at that bank. It is not directly transferable from one holder to another unless both parties have an account at the same bank.

In order to transfer money from the holder of an account at one bank to the holder of an account at another bank, there needs to be a transaction between the two banks which ultimately settles in Bank of England money across our books.

New ledger technology developed in the crypto world could allow tokenised bank deposits to circulate freely as ‘tokenised deposit money’, in what might be thought of as a digital banknote issued by a private bank’. They would

constitute claims on the issuing bank that could be held, for example in a wallet, without the holder having to have an account at the issuing bank.

This raises some difficult issues about how deposit insurance would operate in the event of failure of the issuing bank. Could a bank maintain a single customer view of those who held its liabilities? It also raises questions about the operation of anti-money laundering and other regulation to prevent illicit finance.

An alternative to allowing tokenised deposits to circulate freely and be directly transferable would be to require transactions on new forms of ledger, for example transactions in smart contracts involving tokenised deposits, to be settled ultimately by the adjustment of bank ledgers as happens now.

In other words, a transfer of tokenised deposits on one set of ledgers would trigger the adjustment of individuals' bank account balances and be settled by a transaction between the banks involved. In that case, deposit money issued by a bank could only ever be held in an account at that bank.

It is important that as we develop the regime for payment stablecoins, we also develop the approach for tokenised bank deposits. This will allow banks and non-banks alike, that want to develop payment solutions using new technologies, to understand clearly what is possible and what is required in the respective regulatory regimes. The PRA intends to set out its approach in this area alongside the Bank's consultation on the payment stablecoin regime.

It is of course possible that commercial banks might wish to offer payment stablecoins as opposed to tokenised bank deposits. In such cases, I think we will need to be very alive to the risks of confusion on the part of customers as to protections they are entitled to and confusion of business models within the bank itself.

There are I think strong arguments to keep these two models separate and require banks that wish to issue payment stablecoins under the new regulatory regime to do so through legally remote and otherwise distinct entities.

I want to turn now to the third potential development: the issue of a central bank digital currency either for retail or for wholesale purposes.

As many here may know, the Bank and HM Treasury published a consultation paper in February on the Digital Pound – a Sterling digital currency that would be issued by the Bank of England for general purpose retail use. No decision has been taken to implement the Digital Pound but the Bank and Treasury's assessment is that it is likely to be needed if current trends in payments and money – some of which I have been discussing – continue.

This assessment rests on two main considerations. The first is the need to anchor the value and robustness of all monies circulating in the UK. Physical cash issued by the Bank plays an anchoring role at present in a world in which only commercial banks issue private money.

If future trends continue, cash use is likely decline further and cash itself will become less useable in all everyday transactions, for example if internet commerce grows and if merchants increasingly accept only digital payment.

At the same time, new, non-bank players are likely to enter the scene, issuing private money, such as stablecoins, for payment purposes. In such a world the right of the holder and the obligation of the issuer to be able to convert all private money into Bank of England digital money at par and on demand would secure the anchor currently provided by cash.

The second consideration is to ensure that there can be competition and innovation in the development of new functionalities using tokenised money. Given the network externalities around money and the likely cost of developing robust and risk managed private tokenised money like stablecoins, it is possible that the development of digital settlement assets will converge on a few large players who will dominate and perhaps control innovation in payment services. We have seen a similar dynamic in the emergence of large internet platforms and marketplaces¹⁸.

The Bank and Treasury consultation paper proposes a 'platform' model of the Digital Pound in which the Bank would provide the digital settlement and central transfer mechanism and the private sector would provide the wallets and consumer facing payment services.

The Digital Pound would therefore be available to a wide variety of private sector innovators who wished to develop tokenised payment related services but do not wish or are not able to issue their own tokenised settlement asset.

There are many other extremely important considerations, such as privacy and financial stability, around the possible introduction of the Digital Pound. These are discussed in the consultation paper and I do not want to detail them now.

Rather, I would ask those interested in the payments innovation to read and respond to the consultation and the proposed model – if they have not already done so. In the next phase of the work, which will lead to a decision on whether or not to proceed to launch a Digital Pound, the Bank will work with the private sector on further experimentation, proof of concepts and to develop the technical blueprint.

The Digital Pound is envisaged as a general purpose retail digital currency for use by households and firms in everyday transactions. The Bank is often asked why it is focussing on developing a retail rather than a wholesale digital currency, given the potential for the new technologies I have been discussing to transform wholesale financial transactions and the desirability of settling such transactions in the highest quality settlement asset – ie. central bank money.

There is, bluntly, a misunderstanding here of the Bank's position. We recognise very clearly the potential transformative effect on wholesale financial markets of tokenisation of financial assets, atomic settlement, smart contracts and other emerging technologies¹⁹.

Indeed, the Bill now in Parliament will enable us, with the FCA, to set up a sandbox in which developers can explore ideas like collapsing trading and settlement into an instantaneous smart contract.

And we want for financial stability reasons, wholesale transactions to settle in central bank money to the maximum extent possible. The question is not whether but how we should develop the machinery for tokenised transactions to settle in central bank money – in other words what will provide the most efficient, effective and fastest route to this end, given our current starting point.

One way forward is for the central bank to tokenise the wholesale money, central bank reserves, we issue and to develop a ledger system for transferring the tokens between the wholesale players that have access to the Bank's payment systems. We, like other central banks have been exploring such options.

But there are other options. One would be for a trusted private sector network to hold an account with us and tokenise the reserves and operate the ledgers and transfers within that account. Only changes in the overall balance of the account would need to be recorded in our ledgers.

In 2021 we introduced the option of an 'omnibus account'²⁰ to facilitate the private sector development of such networks and there are private sector proposals in progress to introduce them²¹.

Another possibility would be for a tokenised ledger, including a distributed ledger, to be securely and instantaneously synchronised with our central real-time gross settlement system (RTGS).

That is not possible today in our current RTGS. But we are now well advanced in the implementation of the next generation RTGS, which is scheduled to go live next year. This system will have much greater functionality including the potential for such synchronisation - which we are now actively exploring with the London centre of the BIS Innovation Hub.

At present, given where we are on in the UK on the imminent implementation of a vastly more capable RTGS system these options look to provide a faster route to settlement of tokenised transactions in central bank money and are working with industry on how to best exploit the possibilities of the RTGS system²². But we will continue to remain closely engaged with all the options.

As with retail payments, it is difficult to forecast now what will prove the more successful approaches. It is most likely that, as is not uncommon with technological development, a range of approaches will eventually be implemented and will co-exist.

We have a variety of payment systems, both wholesale and retail, of different vintages operating in the UK today. I would guess that in the future, as new technologies take hold we will see both more innovation and more variety.

Changes in how we pay for things and what type of money we use is an exciting area of possibility for the fintech world. It is also a fundamental issue for the Bank of England – as a regulator, as the provider of the central high value payment rails and the issuer of the highest quality, public money in the UK.

We aim to be forward looking, developing both in developing the regulatory frameworks and in developing public systems and public money necessary so that safe innovation can flourish to the benefit of all. ■

Sir Jon Cunliffe is the Deputy Governor for Financial Stability at the Bank of England

Endnotes

1. Key public sector initiatives include the FCA's regulatory sandbox, the development of Open Banking, the introduction of a mobilisation route for new banks, the forthcoming FMI Sandbox, HMT's consultation on the regulation of cryptoassets and the provisions in the Government's recent White Paper on AI Regulation.
2. As measured by investment ([Innovate Finance](#)). The significance of the UK Fintech Sector has been set out more widely in detail as part of the [Kalifa Review of UK Fintech](#) (2021).
3. See Bank of England: [Quarterly Bulletin 2022Q3](#). While transactional cash use fell during the COVID-19 pandemic, the value of Bank of England notes in circulation increased as cash holdings were used as a precautionary store of value.
4. This commitment has been made, for example, in public statements from Governor Andrew Bailey [here](#), from myself [here](#) and [here](#) and Sarah John, the Bank's Chief Cashier, [here](#).
5. The [NPA](#) is a multi-year project which will allow for real-time payments, be able to handle increasing payment volumes. It will include the rules and standards that make up various payment types, allowing the market to create new products and services as well as allowing for the development of new overlay services.
6. Open Banking's joint regulatory oversight committee consists of the FCA, PSR, CMA and HM Treasury.
7. See for example early stage use-cases of DLT for supply chain finance reported in UCL's Centre for Blockchain Technologies report '[DLT in the Supply Chain](#)'.
8. As set out in [Money creation in the modern economy](#) | Bank of England the majority of money in the modern economy is created by commercial banks making loans.
9. The umbrella term 'stablecoin' has been used to describe a range of instruments with quite different characteristics. In particular, they may be backed by a range of financial assets, commodities or unbacked cryptoassets (which in some cases are supported by algorithmic protocols). The robustness of those backing assets and the wider safeguards for guaranteeing stability of value vary significantly across the products labelled as stablecoins.
10. See for example the Libra White Paper and related Diem [technical papers](#).
11. As set out in the [Regulatory Initiatives Grid](#).

12. Press release: [CPMI and IOSCO publish final guidance on stablecoin arrangements confirming application of Principles for Financial Market Infrastructures](#) (bis.org).
13. Specifically the stablecoin should be convertible into other liquid assets, as soon as possible, at a minimum by the end of the day and ideally intraday, in line with Key Consideration 5 of the [PFMI](#).
14. [Financial Stability in Focus](#) (bankofengland.co.uk).
15. See in particular section 4.6 of [New forms of digital money](#) | Bank of England.
16. See for example the development of JPM coin and Onyx, or the action of a consortium of banks and FMI in founding FxNality.
17. Prominent examples include the [Regulated Liabilities Network](#) and the [USDF Consortium](#).
18. This was set out in particular in the Furman Review - [Unlocking digital competition](#), Report of the Digital Competition Expert Panel - GOV.UK (www.gov.uk).
19. [Innovation in post trade services - opportunities, risks and the role for the public sector](#) - speech by Sir Jon Cunliffe | Bank of England.
20. Bank of England publishes [policy for omnibus accounts in RTGS](#) | Bank of England
21. For example, FxNality, which was recognised late last year as a regulated payment system.
22. The Bank [consulted](#) on the Future Roadmap for the RTGS system in Spring 2022. Earlier this year we issued a [response](#) to that consultation setting out that we will prioritise features supporting innovation and global initiatives, which include synchronised settlement, extended operating hours and non-payment APIs.

I would like to thank the following for their input to and helpful comments on these remarks: Jyoti Shah, Louise Eggett, Laure Fauchet, Morgane Fouche, Adrian Hitchins, Jeremy Leake, Rajan Patel, Rachita Syal and Cormac Sullivan for their assistance preparing these remarks. I would like to thank Andrew Bailey, Charandeep Biling, Sarah Breeden, Emma Butterworth, Victoria Cleland, Philip Evans, John Jackson, Rebecca Maule, Tom Mutton, Sasha Mills and Matthew

Osborne, for their helpful comments and suggestions. This article is based on a [speech](#) given at Innovate Finance Global Summit, London, 17 April 2023.

Lessons from recent times

Andrew Bailey shares a series of recent lessons for monetary and financial stability, looking at how they all fit together and the challenges they pose

want to pick out big issues we face, and try to set out how they fit together and the challenges they give rise to. In recent weeks, we have seen the crystallisation of problems in a few parts of the banking sector. This is against a background of a necessary sharp tightening in monetary policy to bring down inflation from levels that are much too high. All of this has to be set against the most serious global pandemic for at least a century and the most serious war in Europe since 1945.

Let me therefore draw a first set of conclusions and propositions from what is going on.

The post crisis reforms to bank regulation have worked. Today I do not believe we face a systemic banking crisis. When I look at the UK banks, they are well capitalised, liquid and able to serve their customers and support the economy.

This positive assessment of financial stability is important for monetary policy. In our case monetary policy set by the MPC should be able to respond to the macro implications of any dislocation to credit markets to the extent that they influence the outlook for inflation and thus deviations of inflation from target, just as the MPC conditions its policy decisions on asset price and balance sheet developments on all other occasions.

That's natural. But, what we have not done – and should not do – is in any sense aim off our preferred setting of monetary policy because of financial instability. That has not happened.

That outcome depends on having institutional structures governing decisions on monetary policy and financial stability. Internationally the picture remains more mixed on the latter.

Let me next move on to the first stage of what I will call developments in money. Many central banks, the Bank of England included, are now implementing Quantitative Tightening (QT), the reversal of the Quantitative Easing (QE) we had previously used.

One important way to look at the bank versus non-bank world is that in the former there is assurance on the value of money as the main liability of banks, while in the latter the value of investments explicitly and deliberately is not assured

QE has worked through its effects on interest rates and asset prices more generally. Those effects are temporary and their size is state contingent, being larger in times of crisis and market upheaval. We can think of QT likewise, except that we are deliberately implementing it gradually, and not in stressed times.

It is not an active tool of monetary policy, but any effects it does have will be captured in the normal way of monetary policy setting, through realised financial conditions.

What I have just described relates to the use of our central bank assets to deliver monetary policy goals. The liability side of our balance sheet is key to monetary policy setting too, through the setting of interest rates. But our liabilities also play a key Financial Stability role, since the level of reserve account balances held by banks at the central bank is a crucial part of their holdings of liquidity. Before the financial crisis, the level of liquid assets, including reserves, was much too low, and this contributed to the scale of the financial crisis.

Let me now draw the next set of conclusions and propositions. Both sides of the central bank balance sheet matter for our dual objectives of monetary and financial stability.

What is less often said is that post financial crisis, irrespective of QE, a larger central bank balance sheet would have been needed to restore the safe stock of reserves and liquidity buffers.

It follows, therefore, that we will not shrink central bank balance sheets to what they were pre- crisis. But at the moment we don't know with any precision where that level of reserves will be, or what the composition of the assets backing those reserves will be.

One factor bearing on the equilibrium reserve level question depends on the future mix of banks' liquidity protections, as measured by the Liquidity Coverage Ratio. Take the major UK banks as an example.

Currently, they have an aggregate LCR of 149% which means a total liquidity buffer of £1.4 trillion. That buffer comprises £910 billion of reserves and cash and £489 billion of other high quality liquidity assets, mainly government bonds. As QT proceeds, that mix will change as reserves decline.

We can't assume that, going forwards, the current answer on the total size of liquidity protection is the correct one. We saw with Silicon Valley Bank that with the technology we have today – both in terms of communication and speed of access to bank account – runs can go further much more quickly.

This must beg the question of what are appropriate and desired liquidity buffers that create the time needed to take action to solve the problem.

Let me go on to the next stage of developments in money, digital money, how will it change things and is it needed?

We tend to think about money in two ways at least: its uses and its forms. The uses are store of value, means of payment, unit of account. On the forms, we use the terms inside and outside money and commercial bank money and central bank money¹ (Gurley and Shaw 1960; Friedman and Schwartz 1963).

In this language, commercial bank money is inside money, and central bank money is outside money. We regulate banks in good part because money is a public good. Inside or commercial bank money is now the dominant type of money, and that supports the provision of credit in economies.

Now, onto this scene lands crypto and digital money. Note, I did not describe crypto – in its unbacked form – as money. It isn't. For money to fulfil its function as a means of payment it requires stability of value. This is clearly not true of unbacked crypto.

It could be a bet, a highly speculative investment or a collectible, but note that it has no intrinsic value, so buyer be very aware.

More interesting is the creation of so-called 'stable coins' or digital currency, which purport at least to be money as a means of payment. But, as we have seen, they do not have assured value, and in the work we have done at the Bank of England we have concluded that the public should expect assured value in digital money, and confidence in this is needed to underpin financial stability.

For stablecoins to function as money they will need to have the characteristics of, and be regulated as, inside money. Meanwhile, a lot of work is going on to assess the future of digital money, including Central Bank Digital Currency (CBDC).

Digital money is not new. Digital money in the form of commercial bank deposits and commercial bank reserves at the central bank have existed for many decades. What is new is the idea of broadly available retail digital money.

But, this evolution of digital money is about the technology of delivery; it has not ripped up the script of inside and outside money. The question for us all should therefore focus most on is whether we think there will be a demand for retail digital money in the future? And, here we should not suffer a failure of imagination.

If we think the demand will exist, what form should it take? I think it would be preferable not to disturb the existence of both inside and outside money and the broad balance between them. But, this requires a number of things to happen and questions to be answered. It requires banks to be more active in thinking about digital commercial bank money and not leave it to CBDC.

In any event, as we have set out in the CP, we think in this new world a central bank digital currency is likely to be needed to anchor the value of all forms of money, including new digital ones and to ensure the maximum opportunity for innovation in payments services.

Moving on, let me now point to an area where we are at risk of contradicting ourselves. I said that assured value was a key principle of digital money. How does this fit with the idea that we could resolve failed banks and allow deposits (inside money) to take a haircut?

One answer is that it depends on the size of the deposit above a certain threshold. The idea behind deposit protection is to set a level below which the assurance of value holds, and above which it does not. Practice, I would suggest, points to the difficulty of this principle.

In seeking to solve too big to fail we have tackled this problem by requesting an additional slice of subordinated liabilities which can explicitly bear losses by being converted into equity in the event of a resolution.

I'm not talking here about AT1 securities, but what comes further up the hierarchy – what in Europe we call 'Eligible Liabilities'. The point is that for large banks we have reinforced the assurance of deposits by requiring a bigger cushion of loss absorbing liabilities.

But smaller banks find it harder to issue marketable long-term debt securities that can count as Eligible Liabilities. I think the answer here lies in the world of deposit insurance.

The US authorities have announced a review of their deposit insurance system. In the UK, the Bank is also considering improvements to our approach to depositor pay-outs for smaller banks which do not have Eligible Liabilities. Our work has thus far focused on the speed of pay-outs.

Going further and considering increasing deposit protection limits could have cost implications for the banking sector as a whole. As with all things relating to bank resolution, there is no free lunch.

Two issue areas to go. The first is a key part of how we underpin financial stability, namely how we assess and test for stress. One of the important innovations since the financial crisis has been stress testing – it is critical, and needs to be thorough and cannot be side-lined when the consequences may be awkward.

But, there are some difficult issues surrounding how to set the parameters of stress tests – how much stress to assume? We tend to calibrate stress tests on the basis of history plus something, but the something can be hard to judge. As a case in point, this is what we did in the FPC's work on Liability Driven Investment after 2018.

Now, we know that this sort of approach does not pass the Black Swan test, one in which the future is not implied by the past and thus not forecastable.

On its own a stress test is very useful and an essential part of the toolkit. But we know that we cannot envisage and design tests that capture all possible future states of the world, and we should not pretend that we can.

Instead, we must stress up to the point where it is sensible for regulation to create the protection we want, and – this is crucial – we must have other approaches that cover the world of risks beyond that point. These approaches are bank resolution tools, and central bank intervention tools of the type we had to use last autumn.

You will be mightily relieved to hear that we are into the home straight now, but it contains the small issue of non-bank finance. Given the increase in bank regulation required in the aftermath of the financial crisis, it is not surprising that the last decade has seen a relative and absolute increase in non-bank finance.

Continuing the theme developed earlier, one important way to look at the bank versus non-bank world is that in the former there is assurance on the value of money as the main liability of banks, while in the latter the value of investments explicitly and deliberately is not assured.

This is important, but we also have to recognise that the growth of non-bank finance has led to the significant expansion of the landscape of systemic risk since the crisis.

In other words, we have seen that the non-bank world can transmit risk into the bank world, and other parts of the core of the financial system, like central counterparties. Consequently, the relative focus of our financial stability work has shifted to the risks posed by non-bank financial institutions (NBFIs).

Moreover, we have seen a common theme running through incidents that have occurred – the dash for cash in 2020, the Archegos Collapse, the LDI pension fund issue, the nickel metals case – namely that for firms to understand and respond to the full risk implications they would have had to observe and respond to a much larger picture of risks than they did observe, and from that came potentially larger risks.

There is a challenge of breadth and depth in the NBFi world. It is a very large and disparate landscape with many activities and entities. As a result, we have to survey a lot of ground to look out for risks. But in order to understand these risks, we need to get into the detail, hence the depth issue.

LDI was a good case study of this. The LDI fund world comprised 85% of the larger so-called segregated funds, and 15% of the smaller pooled funds. Our stress testing work focussed on the 85%, but the problem arose in the 15%.

In some ways the issues around NBFi bear a striking resemblance to ages old challenges in finance, such as leverage, and inter connectivity with other parts of the financial system, creating the scope for spillovers and systemic consequences.

But the heterogeneity of the landscape means that there is no single magic number for leverage as we have with banks, and the inter connectivity can be hard to map, reflecting the recent incidents.

This helps to explain why at the Bank of England we are conducting a system wide stress exercise involving non banks as well as banks to help us to map out the risks.

This is inherently a cross-border issue. So, we must make progress internationally. This is what the Financial Stability Board work programme is focussed on, and why it is so important. It is also crucial that individual countries take forward and implement these reforms. While the solutions are global, delivering them will necessarily be local.

Finally, there is an important point to pull out of a number of these issues. A common outcome of a shift in the balance from inside to outside money (either through CBDC or banks holding larger reserves at the central bank) or increasing the broader liquidity buffers of banks and non-banks could be to create a constraint on lending and

investment in the real economy. For the UK economy this would go against the need to finance investment to support stronger potential growth, from its current weak level.

This constraint would not appear if the counterfactual was an unstable financial system because solving that instability would have to be the priority. But in a more stable world public policy must still determine the best use of tools – for instance, advocating ever tougher stress tests and larger liquidity buffers in an attempt to cover future Black Swans is not obviously preferable to having tools by which central banks can make temporary and targeted interventions, as we did last October.

This underlines my earlier point that strong institutions of prudential policy (macro and micro) are important to enable these decisions to be made.

Let me end with the short version of the main points:

- 1: I don't believe we face a systemic banking crisis;
- 2: We must ensure that financial stability continues to mean that monetary policy takes into account financial conditions but does not have to aim off for instability;
- 3: This requires robust structures for financial stability policymaking;
- 4: Central bank balance sheets will remain larger than pre-crisis for financial stability reasons;

5: We don't know yet where central bank balance sheet reduction will need to stop in terms of the necessary level of reserves;

6: This will in part depend on the desired future size and make-up of banks' liquidity buffers;

7: Stable coins will need to have the characteristics of, and be regulated as, inside money;

8: The key question on retail digital money is can we envisage a demand for it, but we should guard against failure of imagination; and be able to accommodate it within the regulatory framework?

9: If retail digital money is part of the future, it would be better not to disturb the need to have both inside and outside money – so we cannot rule out a need for CBDC;

10: We will need to revisit the protection of inside money in the form of deposits, especially in smaller banks;

11: Stress testing the financial system is crucial, but stress tests will not always deal with Black Swans – that's why resolution and other policy intervention tools must be in place;

12: Non-Bank Financial Intermediation is a very large and heterogeneous landscape – it presents surveillance challenges of both breadth and depth;

13: NBFI leverage and inter-connectivity can be hard to map;

14: NBFI issues are often inherently cross-border in nature. The role of the FSB is important;

15: Macro and micro-prudential policies need also to support lending to and investment in the economy. ■

Andrew Bailey is Governor of the Bank of England

Endnote

1. Gurley, JG and Shaw, ES (1960) *Money in Theory of Finance*. Brookings, Washington DC. Friedman, M and Schwartz, AJ (1963) *A Monetary History of the United States, 1867-1960*, Princeton University Press.

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Holdings limit will prove central to the digital euro's future

The European Central Bank says its digital currency will not be a store of value, in contrast to global counterparts. Rebecca Christie discusses the ECB's digital euro strategy

As the [digital euro](#) moves closer to reality, one decision more than any other will dictate what role the currency plays in the economy: how many digital euros a single user can hold at one time. The European Central Bank is studying whether to issue a digital euro, with a decision on next steps coming in October 2023. A limit of €3,000 is on the table, which would set the digital euro up as a cash alternative but not a place to keep substantial liquid assets.

In contrast, the Bank of England has said it could allow holdings of [£10,000 to £20,000](#), enough to handle most everyday transactions if the digital pound emerges, while India has emphasised the potential for crossborder [remittances](#).

Worldwide, e-money is evolving rapidly, with more than 100 central banks looking into central bank digital currencies (CBDCs) and a handful, including China, already putting such currency in use.

Vision for the digital euro

Whether or not the European Union really needs a digital euro, many [policymakers](#) seem to have decided they want one. Debate will step up in June, when the European Commission will publish a legislative proposal on principles for the digital euro, ahead of the ECB's decision on whether to advance to an experimental phase.

[Privacy](#), consumer protection and financial inclusion, rather than technical constraints or [international](#) mandates, should be the focus of democratic oversight. The central bank should decide mechanics, including whether and how to pay [interest](#).

So far, the ECB has been firm that its CBDC is not intended to be a store of value. The goal is increased access to safe, secure and low-cost payments without destabilising banks or expanding into direct consumer service. Having

phased out the [€500 note](#) to avoid encouraging money laundering and mattress stuffing, the Eurosystem should not create a new way to sidestep the financial system. Nor should it entertain talk of the digital euro as a potential crisis management tool.

The ECB should consider financial technology opportunities as supporting goals, not a primary driver

Conservative limits on holdings and usage seem the best way to keep the project within scope. The ECB has floated a monthly limit of 1,000 transactions, possibly with a maximum value of €50 each. It should aim to supplement cash, not replace bank accounts, and should help people outside traditional channels take part in the economy even when physical bank notes are no longer practical.

Rising bank turmoil

Recent financial-sector turmoil, combined with the euro area's lack of true joint deposit [insurance](#), may put pressure on the ECB to entertain higher allowances. Already, critics such as Michiel Hoogeveen, vice chair of the European Parliament's economic and monetary affairs committee, wonder if the CBDC could weaken the banking system overnight if customers immediately fill their full allowance.

The ECB needs to engage with those who say a digital euro could serve as a backdoor deposit backstop via increased limits in the middle of a crisis, while making clear that is not the project's objective.

Ignazio Angeloni, former member of the ECB's Bank Supervisory Board, [found](#) that around €1 trillion of deposits could switch out of bank deposits and into digital euro, given the currently proposed limits. This total is unlikely, since any such trend is likely to be gradual, and also in the aggregate would represent only about 10% of total overnight bank deposits. Nonetheless, such moves could destabilise banks that are already weak.

Strategic design

The ECB's digital euro strategy will be built around three main levers: features to reduce excessive usage, a distribution model that encourages intermediation, and an ability to steer liquidity conditions as needed.

Consumers would access digital euro through banks and licensed providers, with no fees for basic use. Costs would instead be born by merchants and payment providers, as with other regulated interchange fees.

Most recently, ECB Governing Council member Fabio Panetta said the [next phase](#) of digital euro exploration would include small towns, not just financial-sector [stakeholders](#).

While the ECB is looking at whether to align its existing wholesale payment platform with emerging CBDC standards, more experimental designs are off the table. For example, Panetta said the digital euro will [never](#) be “programmable money,” in the way that privately managed [decentralised finance](#) technologies can be used to set smart contracts. For now, consumer usage is where the EU focus is.

The ECB should consider financial technology opportunities as supporting goals, not a primary driver. Some central banks have emphasised innovation as motivation to move ahead. Yet private developers will doubtless charge steeper fees for more sophisticated services, serving only a fraction of future CBDC users.

The main point should be to make electronic payments available to all euro area residents, regardless of what country they live, work or travel in. By addressing their needs, rather than plugging every hole in the financial infrastructure with this one new tool, the ECB may be able to create a digital currency that actually works. ■

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Is de-dollarisation happening?

Barry Eichengreen argues that reports of the US dollar's demise as the dominant global currency have been greatly exaggerated

There has been much discussion recently on the prospect of the US dollar losing its global dominance. Among the factors behind the decline are the need for central banks to intervene in foreign exchange markets and changes in interest rates, but there is little evidence of an effect of sanctions. The majority of the shift away from the dollar has been towards non-traditional reserve currencies.

“De-dollarization is real and is happening fast”, began a recent widely shared video post. “Dollar share went from 73% (2001) to 55% in (2020). Went from 55% to 47% since sanctions launched on Russia, now de-dollarizing at 10x faster than the previous two decades.” This video attracted the attention of no less a personage than Elon Musk, who tweeted “If you weaponize currency enough times, other countries will stop using it.”

This question is not new, as readers of VoxEU will be aware (eg. Wyplosz 2020). Answering it requires sober analysis, starting with the facts. The dollar’s share of allocated foreign exchange reserves in 2022 Q4 was 58.4%, not 47%, according to the IMF’s latest Currency Composition of Official Foreign Exchange Reserves (COFER) database. This was virtually unchanged from 58.5% in 2021 Q4, the latest COFER reading prior to G7 financial sanctions on Russia.

Sceptics object that these data are distorted by exchange rate changes. The dollar strengthened through the first three quarters of 2022, which could have pushed up the value of dollar reserves and the currency’s share in reserve portfolios.

But central banks rebalance their reserve portfolios in response to exchange rate changes, which limits the impact of valuations on shares. Figure 1 therefore compares reported COFER shares with exchange rate-adjusted shares.

A decline in the dollar’s share is evident in the exchange rate-adjusted data, from 59% in 2021 Q4 to 57% Q2022 Q4. But a decline is not a collapse. As Figure 1 shows, the dollar’s share of allocated reserves, exchange-rate adjusted,

has been falling by 6/10ths of a percentage point a year, on average, since 1999. The 2 percentage-point drop from 2021 Q4 to 2022 Q4 is three times this large. But equally large drops have occurred before, in 2002, 2005, 2010, and 2015, to cite some examples.

The majority of the shift away from the dollar has been towards non-traditional reserve currencies such as the South Korean won, Norwegian krone, Canadian dollar, Australian dollar, and Singapore dollar

Among the factors underlying these drops in dollar shares is the need for central banks to intervene in foreign exchange markets. The dollar being the most liquid intervention unit, it is widely used when central banks enter the market to purchase their currencies. Hence the decline in dollar reserves.

A prominent instance was 2015, when China, the single largest holder of US dollar reserves, experienced capital outflows and saw the need to intervene. It is no coincidence that the decline in the dollar share of reserves in 2022 coincided with exchange rate weakness in emerging markets.

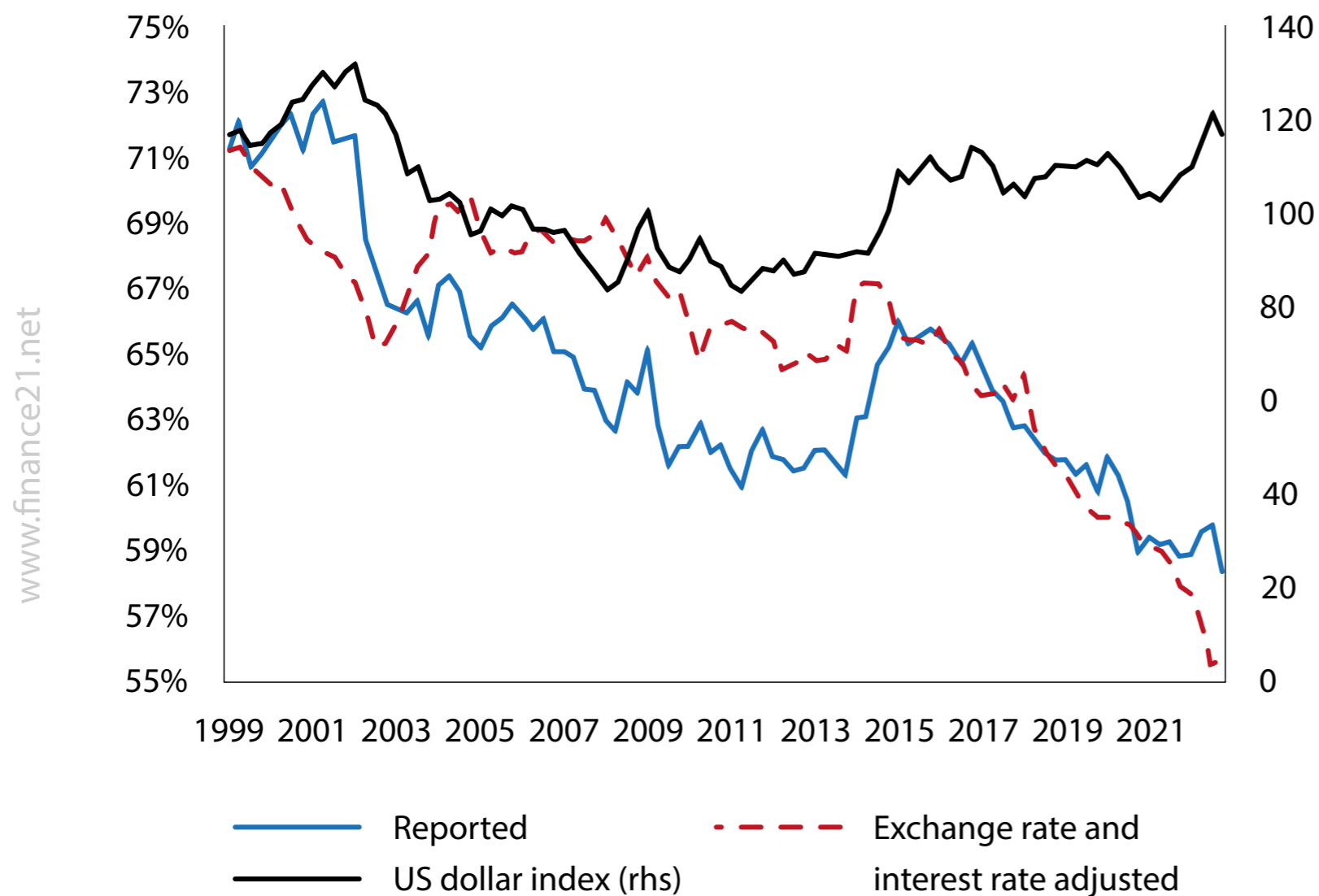
Another mechanism that could generate movements in the dollar share is changes in interest rates, since these affect the market value of bonds, and reserve data are reported to COFER in market value. Because most foreign reserves are held in interest rate-sensitive assets, one might observe a fall in the dollar share if interest rates on dollar bonds rise more sharply than those on bonds denominated in other currencies.

Total return indices on government bonds with a maturity of zero to five years can be used to measure the contribution of interest rates in each jurisdiction. Total return indices capture not just interest payments but also capital gains accruing on a bond portfolio due to movements in interest rates.

The zero-to-five-year range captures the bulk of holdings of US Treasury bonds by official investors, according to Treasury International Capital (TIC) data. Figure 1 again shows that the dollar's share of allocated reserves, now both exchange-rate and interest-rate adjusted, has been on a gradual downward path. To repeat, however, a gradual downward path is not a collapse.

Might financial sanctions play a role in this gradual, ongoing diversification away from the dollar on the part of

Figure 1. US dollar share of global foreign exchange reserves and the US dollar index, 1999-2022 (in percent; index Jan-2006=100)



Source: Arslanalp et al (2022, updated).

central banks? Arslanalp *et al* (2022) examined the role of financial sanctions on the currency composition of reserve portfolios using publicly available data for 80 central banks. They found no evidence of an effect of sanctions on dollar shares.

This is not surprising, in that sanctions imposed by the US have frequently been coordinated with other countries, including countries issuing the other leading reserve and international currencies. As a result, the euro, British pound, and Japanese yen have not constituted safe havens for governments and central banks concerned about 'weaponisation of the dollar'.

Two directions in which central banks seeking a safe haven from sanctions might diversify is towards gold and towards non-traditional reserve currencies. A number of emerging market central banks have been raising the share of their reserves held in the form of gold. That movement accelerated in 2022, which saw the largest net purchases of gold by central banks of any 21st century year.

Arslanalp *et al* (2023) analyse the impact of past financial sanctions on the share of official reserves held in gold for 180 countries. They find a statistically significant effect of sanctions in the current or two immediately preceding years on the gold share of reserves. But the quantitative effect is small – a country targeted by multilateral sanctions raises the share of gold in its reserves by roughly 4 percentage points.

Another conceivable direction of reserve diversification in response to recent financial sanctions is toward the Chinese renminbi, since China has not participated in sanctions against Russia. Figure 2 shows new estimates of the national distribution of renminbi reserve holdings, updated to the end of 2022. The Bank of Russia holds nearly a third of all renminbi reserves reported by central banks around the world.

It has not been possible to update figures for Russia's renminbi reserves, since the Bank of Russia has not reported reserve composition since the end of 2021. But with most of the bank's other currency reserves having been frozen since early 2022, one would not expect significant changes in reserve composition since that time.

COFER data for 2022 Q4 place renminbi reserves at 2.7% of the allocated world total. Remove Russia's share on the grounds that the country faces exceptional financial and geopolitical circumstances, and the renminbi's share falls to roughly 1.6%. This relatively small share is not consistent with assertions that other central banks have been shifting bigtime towards China's currency.

As Zhang (2023) has shown, China's internationally traded assets and liabilities are just 4% of global totals. There are still not enough Chinese assets and liabilities to constitute serious alternatives to dollars, in other words.

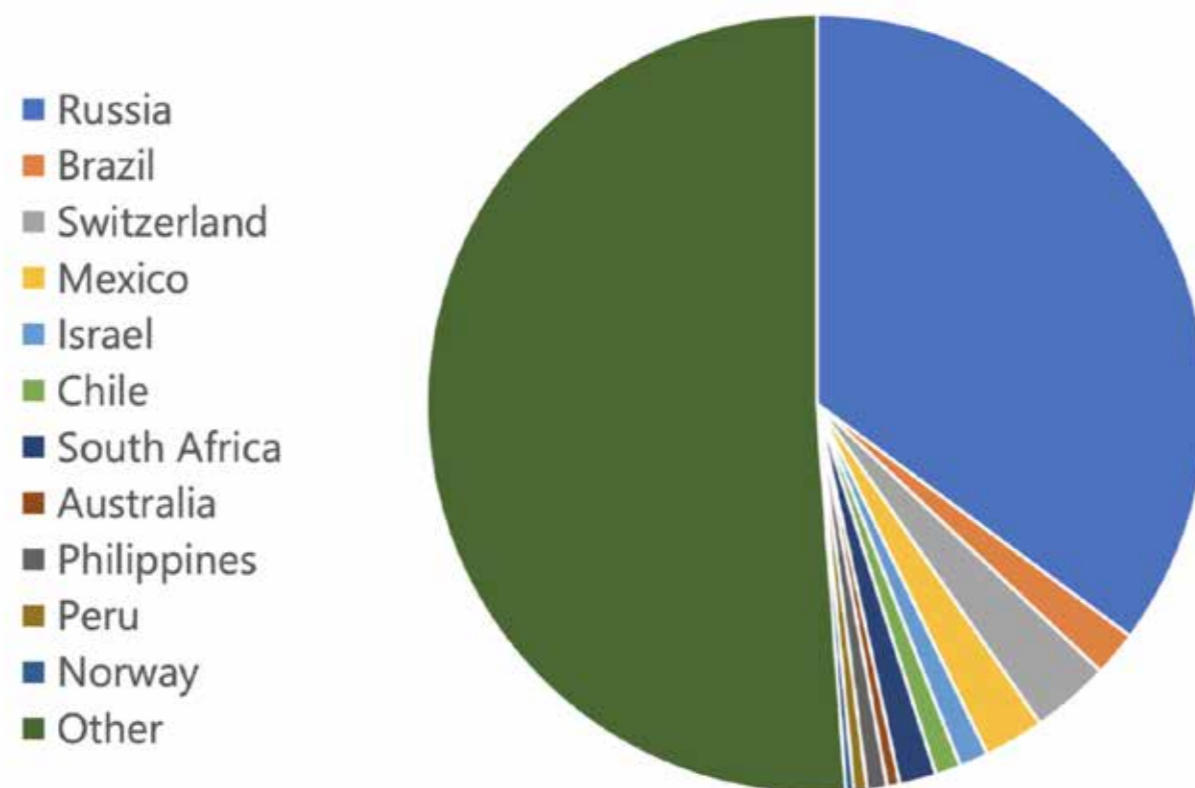
Another perspective derives from the work of Gopinath and Stein (2021), who emphasise self-reinforcing complementarities between the different functions of international currencies. Central banks hold dollar reserves, the authors argue, because banks in their national jurisdiction borrow and lend dollars, and because domestic firms make and accept crossborder payments in dollars.

Crossborder use of the renminbi for global payments remains small, on the order of 2% of total crossborder transactions (Perez-Saiz and Zhang 2023). Evidently, the complementarities supporting a continued global role for the dollar do not provide comparable support for the renminbi. Research on the use of currencies for trade invoicing and crossborder payments suggests continued dominance for the US dollar and, to an extent also, the euro (Boz *et al* 2020).

So where, if not towards the renminbi, have central banks been rebalancing their reserve portfolios? The majority of the shift away from the dollar has been towards non-traditional reserve currencies such as the South Korean

Figure 2. Countries holding Chinese renminbi in reserves (as a share of total RMB holdings, end-2022)

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Note: The chart shows identified countries that hold US\$1 billion or more of RMB in reserve assets. Data for the Philippines, Russia, and South Africa are for Dec 2021, Dec 2021 and Mar 2022, respectively.

Source: IMF COFER, IMF Reserve Data Teample, and central bank annual reports.

won, Norwegian krone, Canadian dollar, Australian dollar, and Singapore dollar. Table 1 shows updated data on the shares of these non-traditional reserve currencies (including the renminbi) in global reserves.

Table 1. Non-traditional currencies in allocated reserves, end-2021

	in billion US\$	as % of total
Total	1,239	100
Australian dollar	221	18
Canadian dollar	287	23
Chinese renminbi	337	27
Swiss franc	21	2
Other	372	30
Korean won	127	10
Swedish krona	50	4
Singapore dollar	84	7
Norwegian krone	51	4
Danish krone	30	2
New Zealand dollar	13	1
Hong Kong dollar	18	1

*Note: The size of 'other' currencies is estimated based on Arslanalp and Tsuda (2014).
Source: IMF, COFER and CPIS.*

In part, the shift toward non-traditional currencies reflected the fact that they offered relatively attractive risk/return profiles in a period when interest rates on traditional reserve currencies were near zero or, in some cases, negative.

Now that interest rates have, in most cases, moved strongly back into positive territory, it is worth pondering whether this trend towards non-traditional reserve currencies will continue or, to the contrary, whether traditional units such as the dollar, now bearing positive yields, will regain favour.

To paraphrase a quip popularly attributed to Mark Twain, one might say that reports of the dollar's demise have been greatly exaggerated. ■

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Money: a question of purpose and trust



Carolyn Wilkins talks about the three main design principles for a CBDC, it should focus on core public policy objectives, identify and mitigate financial stability risks, and set high standards for technology

'Don't let your mouth write a cheque that your tail can't cash'

Attributed to Bo Diddley.

Let me start by saying that these remarks reflect my views and not necessarily those of my Financial Policy Committee or other Bank of England colleagues. Over the past decade, central bank digital currency has evolved from being the topic of interesting research to actual pilots. Today there are over 100 central banks working on CBDCs, and CBDCs are being piloted or have been introduced in 29 jurisdictions¹.

It has also become a hotly debated public policy issue, and for good reason. Money is at the core of any financial system and relies on broad-based trust. A central bank digital currency is no exception.

I strongly support private and public efforts to innovate in payments because they could benefit families and businesses, especially those making crossborder payments².

Many of you would be aware that His Majesty's Treasury (HMT) and the Bank of England recently released a Consultation Paper in which they judged it likely that a digital pound would be needed in the future. By 'digital pound,' I mean a new form of digital money that would sit alongside cash for use by households and businesses. While a final decision has not been taken on whether to actually issue a digital pound, they have moved to the next stage of preparatory design work.

The list of issues that need to be resolved is admittedly daunting. As an external member of the Bank of England's Financial Policy Committee, I am keenly aware that new forms of private or public money could have financial stability implications for the UK and globally – for better and for worse.

The collapse of Silicon Valley Bank earlier this year and the stablecoin Terra last year provide stark reminders that runs against different forms of money are likely to continue to happen, and they could become worse as technology evolves.

That is one reason why HMT and the Bank of England are proceeding carefully and currently consulting widely on their work. I will walk through the three fundamental principles that I think should anchor the economic and technical design of a CBDC:

Money is a matter of purpose and trust, making it too important to be left solely to central bankers

1. Stay focused on the core public policy objectives, and resist mission creep?
2. Identify and mitigate financial stability risks? and,
3. Set a high bar for technology, including with regards to privacy, resiliency and security.

1. Stay focused on core public policy objectives

The first question that people usually ask when the subject of a retail CBDC arises is “*what problem are you trying to solve?*” That is because we already have access to multiple forms of payment, whether it is a bank debit or credit card, a payments service such as ApplePay or GooglePay, or cash. Yes, crossborder payments are expensive and slow, but many consider this to be a problem for the private sector to solve given that central banks are not typically viewed as great innovators³.

While this line of reasoning is intuitive, it misses two important considerations. The first, and most important, is that central bank money is the safest asset that one could hold because it is backed by the full faith and trust in the government that issued it⁴. This lays a sound foundation to a stable monetary and financial system.

In contrast, private money is a liability of a profit-seeking financial institution. It is therefore subject to credit and liquidity risks, however well regulated. Deposit insurance is designed to mitigate these risks for some depositors, but previous estimates indicate that around one-third of deposits at major UK banks are uninsured⁵.

Direct comparisons across countries are limited due to differences in methodology, but recent analysis highlights that the share was nearly 90 per cent or higher for US banks that failed earlier this year⁶.

While UK citizens continue to have access to central bank money through cash, its use at the point of sale is declining (Figure 1). This is in large part due to consumer preferences, but it has been accelerated by the growth of online purchases where cash payment is not possible. In fact, around 85 per cent transactions in the UK do not involve cash.

This consideration is one reason why several central banks, including the Bank of England, have chosen to evaluate a retail CBDC - to ensure that central bank money can remain available and useful in a modern economy in order to support monetary sovereignty and financial stability.

The second missing consideration is that the private sector can, and likely would, contribute extensively to the development and deployment of a CBDC. And the role of CBDC in promoting private sector competition and innovation in payments is useful given that retail payments might otherwise come to be dominated by a small number of firms.

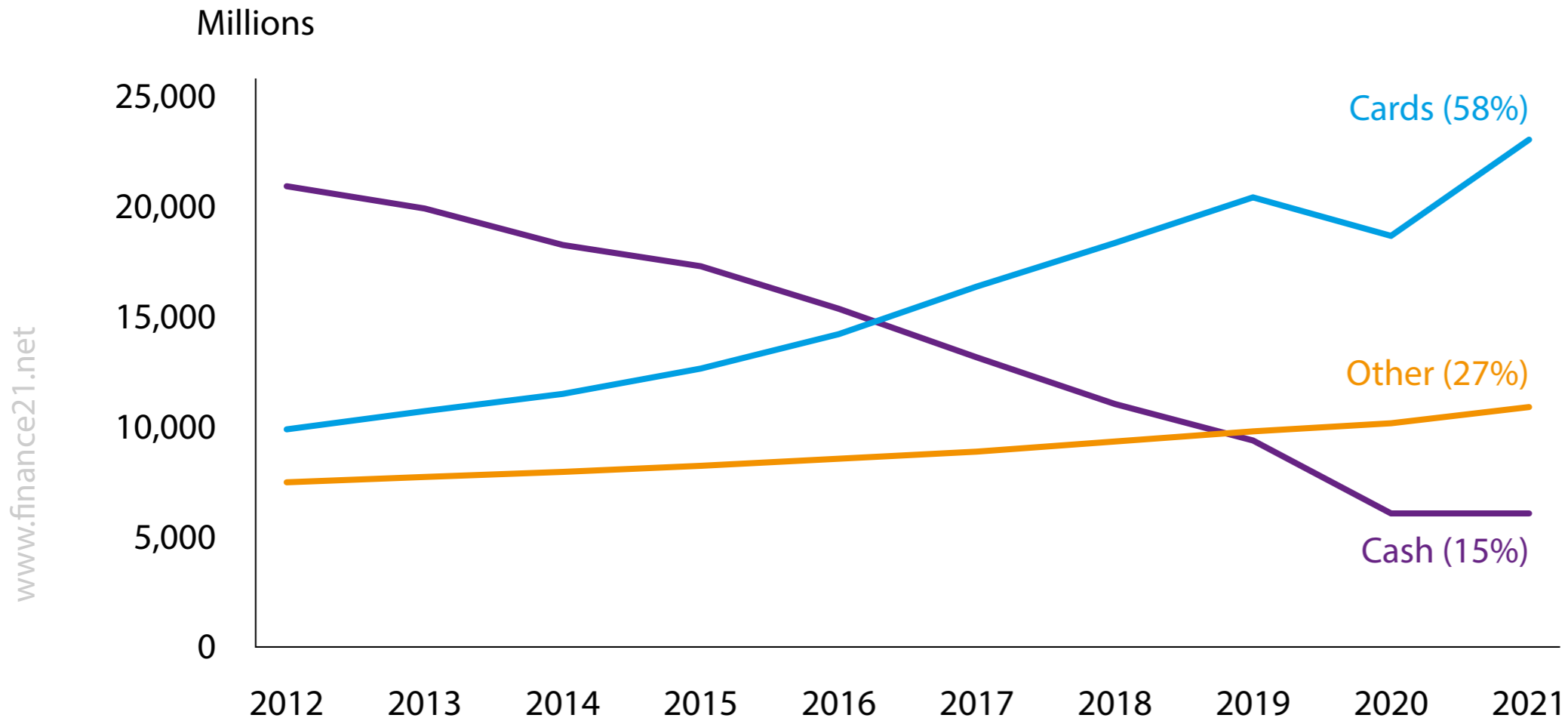
This has prompted many central banks to prefer to distribute CBDC in a tiered manner through the private sector, providing a platform for the private sector to do what it does well – innovate.

That said, there are understandably worries about ‘mission creep,’ even though the UK and many other jurisdictions appear determined to remain focused on core objectives.

Privacy and potential to monitor citizens top the list of worries, which is why HMT and the Bank of England are clear in their Consultation Paper that customer privacy would be protected, with KYC and other safeguards restricted to existing legislative requirements only.

People are also concerned that a CBDC would allow for government-sponsored ‘programmable’ money. For example, like food stamps, a CBDC could theoretically be programmed to be valid for only some purchases.

Figure 1. Cash use in payments has declined while card use has accelerated (a)



Sources: UK Finance and Bank calculations, published in *The digital pound: a new form of money for households and businesses?*, Bank of England and HM Treasury (2023). (a) Payment volumes (millions). Cards comprises debit card and credit/charge/purchasing card.

This would not only be overreach given the core goals of public money, programming could also undermine the uniformity of money which is required to provide a safe base to the financial system. One could easily imagine that a CBDC that had programmed restrictions would become a less preferred means of payment than other forms of money.

It makes sense, therefore, that a digital pound would not include any government or central bank-initiated programmable features, although users could set up their own programmable payments if they wanted.

A final concern that is often raised relates to monetary policy. In theory, a CBDC could allow central banks to implement negative nominal interest rates if required to meet their monetary policy objectives.

There are several reasons to reject this reasoning. For starters, this would only work if cash were no longer available. One in five people in the UK prefer cash as a payment option, and it is an essential option for some people in society. This has led the Bank of England to commit to providing banknotes as long as there is demand for them⁷.

It is therefore no surprise that no central bank with a live CBDC or pilot is remunerating CBDC, and the latest Consultation Paper here in the UK made it clear that remunerating a digital pound to make monetary policy more effective was not a motivation⁸.

It is essential for central banks to stick to the core purpose of money in the design of a CBDC. Governments should consider carefully codifying this purpose in legislation, including restrictions to its design if they are required. This will build trust that mission creep will not appear down the road.

2. Identify and mitigate financial stability risks

Even within this relatively narrow public policy remit, there are a number of hurdles to overcome. Top of mind for me as a member of the Financial Policy Committee are the issues related to financial system stability.

The issues are focused on the possibility of bank disintermediation, which could arise in normal times if there were a large enough shift out of deposits and into holdings of CBDC. This could, in theory, affect the availability or cost of bank credit.

Bank of England researchers attempted to quantify this effect by evaluating a scenario in which roughly 20 per cent of bank deposits flowed into new forms of digital money, both CBDC and stablecoins. They estimate that bank lending rates might rise by about 20 basis points, although they note considerable uncertainty over this result⁹.

A Bank of Canada study using scenario analysis concluded that the largest Canadian banks were well positioned to absorb potential profitability and liquidity effects associated to the introduction of CBDC¹⁰.

A broader enquiry on the implications of a CBDC on bank intermediation and lending has more mixed results – we are economists after all¹¹. But it does tend to point to a number of important factors that drive the results, including the degree of competitiveness in the banking sector.

Introducing a CBDC in a system where banks have some market power in the deposits market may result in higher deposit rates, but not necessarily a contraction in bank lending¹². However, in a perfectly competitive banking system, disintermediation is unavoidable if the CBDC is too attractive¹³.

That is what makes remuneration such an important factor. A high enough interest rate on CBDC can lead to bank disintermediation, with this being much less of a concern in normal times if the CBDC is unremunerated. So again, it is encouraging that UK authorities have made it clear that the digital pound would be unremunerated.

These worries hinge on consumers actually wanting to adopt the CBDC and merchants wanting to accept it. In this regard, many of the CBDC pilots and launches have disappointed, experiencing quite low uptake despite various incentives.

For instance, despite China's CBDC pilot having over 260 million users as of August last year, both total wallet balances and transactions are relatively low¹⁴. Chinese authorities are therefore working on making the e-CNY more appealing and user friendly, in close cooperation with the private sector¹⁵.

While risks of disintermediation in normal times from introducing a CBDC may be overstated, the concern is real when it comes to times of stress. As I said earlier, there is a present and a stark reminder that old-fashioned deposits runs can still happen today.

The recent experience with the run on SVB's UK subsidiary, which experienced deposit withdrawals amounting to some 30 per cent of deposits in one day, is a case in point¹⁶. The concern is not that a CBDC would be the cause of a run; that is typically the result of some underlying problem with the bank itself or contagion from panicked depositors.

Rather, the concern is how the run unfolds, and whether or not the CBDC and accompanying policies, including bank liquidity regulations, will be stabilising forces.

When it comes to dealing with runs, the place to start should not be to axe plans for a CBDC. It should be to make sure that sound regulation and supervision are in place to reduce the chance of a run. While UK banks have robust capital and liquidity positions, it is a good idea to learn lessons from recent events in the US banking system.

The next step should be to increase resiliency of the system in the case of deposit flight, including thinking about stabilising features of CBDC, such as limits. Another potential stabilising force is the set of central bank liquidity facilities to support financial stability.

Central bank currency or not, central banks will always be called on to step in when financial stability is at risk. Our job is to ensure a quid pro quo for access, including strong regulatory requirements, to mitigate moral hazard.

3. Set a high bar for technology

Where the rubber really hits the road in the design of a CBDC is in the choice of technology. Here the bar must be set high, particularly given the central role a retail CBDC would have in the financial system and the reputational implications for the central bank of any flaws.

For the Bank of England and many other central banks, the technological design phase is still very much a work in progress and will involve making policy decisions involving important tradeoffs.

The Bank has said that this phase will take another couple of years, and only then will a decision be taken as to whether to build a CBDC¹⁷.

Of course, the first step in technical design is to decide what exactly needs to be built. As I mentioned earlier, several central banks have chosen a 'platform' or 'two-tiered' model as the basis for their development work.

In the conceptual model proposed in the UK, the Bank of England builds a 'core ledger' to provide the minimum necessary functionality. The Bank would also provide an API layer so that regulated, private firms can access the core infrastructure.

In this model, customer-facing services would be provided by regulated private sector firms including the responsibility to apply KYC, AML and CFT checks (Figure 2). This design would allow for private-sector innovation in areas such as wallets, business analytics, budgeting tools and fraud monitoring.

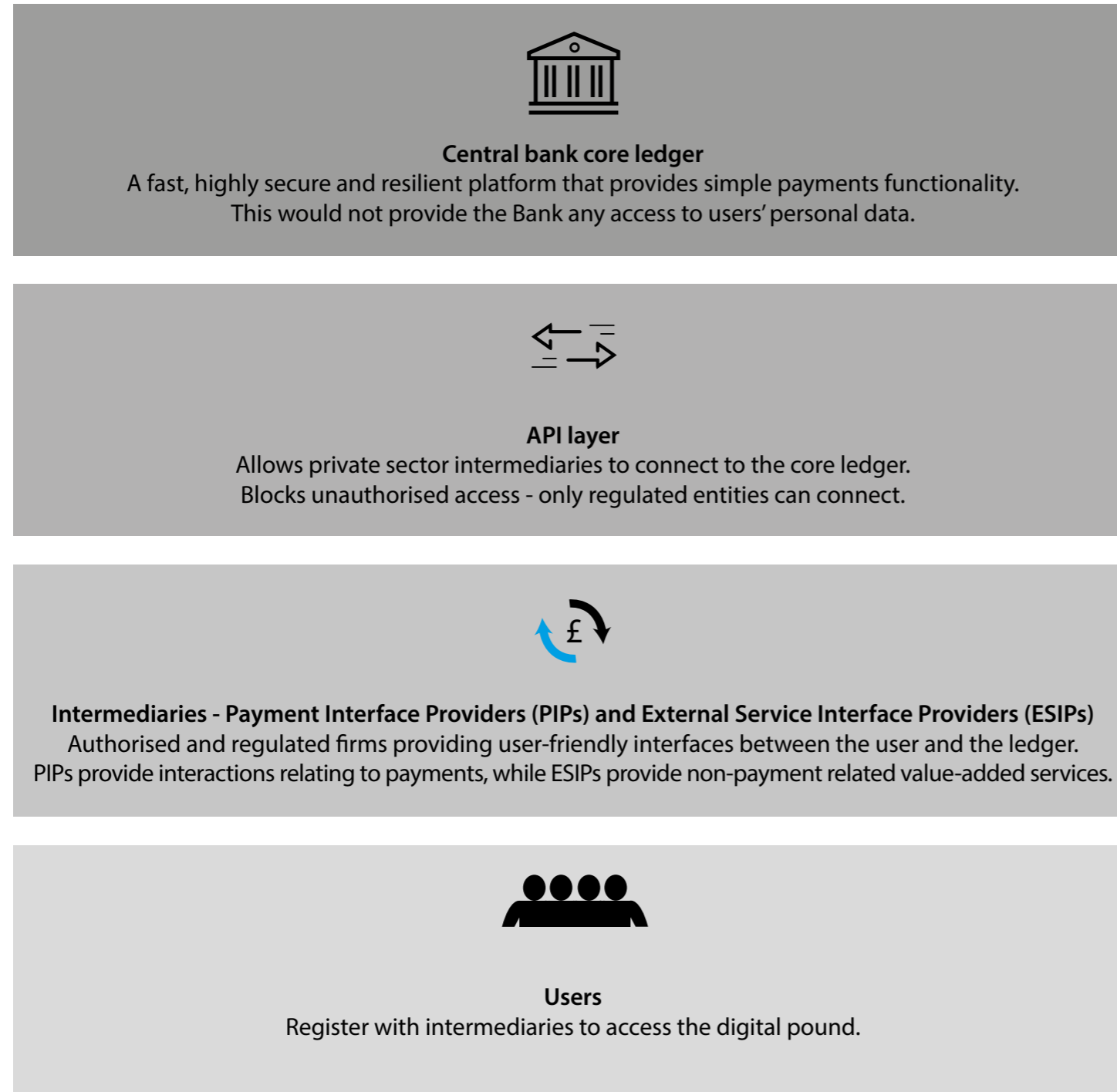
So, what is it that makes the technological design phase of the project so challenging? Let's start with the fact that the core ledger must meet the highest standards with regards to six criteria: privacy, security, resilience, performance, extensibility and energy use.

Meeting each of these individually is already challenging. Take privacy as an example. Privacy-enhancing technologies will likely be used to minimize personal data exposure and maximise security. This will involve mechanisms to anonymise customer and transaction data that the Bank can access and limit the data that payment service provider can access to the legal and regulatory minima.

To up the ante, there are important tradeoffs that need to be faced across the six criteria I mentioned. For instance, security safeguards are needed to support confidentiality and integrity of the data, while making sure that users of CBDC do have continuous access to their funds and that bad actors do not have access to the system.

One challenge is that controls that secure access to data, such as data encryption and user authentication, often also impede performance by slowing down transaction times.

Figure 2. The platform model of the digital pound



Source: *The digital pound: a new form of money for households and businesses?*, Bank of England and HM Treasury (2023)

And, all of these safeguarding mechanisms need to be nimble enough to keep ahead of potential future threats, such as those posed to conventional cryptography by quantum computing.

It is often assumed that distributed ledger technologies (DLT) are the obvious choice for building a CBDC. Decentralisation could have benefits with regards to resilience, redundancy and security of the core ledger.

Still, it has some drawbacks and may not be strictly necessary. First off is that decentralisation may be undesirable for other aspects of the system, such as governance and could introduce unnecessary technical complexity.

It may be possible to achieve some of the benefits of DLT, such as resilience, redundancy and security, via alternative and well-established data management strategies, using distributed, centrally managed databases. Significant engineering challenges remain, so the Bank is assessing all possible approaches, including DLT.

With regards to the API, the Bank is working with the BIS Innovation Hub here in London on Project Rosalind. The project has experimented with a set of API functionalities that could enable a close collaboration between the public and private sector in developing a retail CBDC ecosystem.

There are also many other projects underway to explore CBDC design and use cases. For example, Project Icebreaker is exploring how interlinked retail CBDC systems can support payments across borders¹⁸.

It is too soon to say if all of these challenges can be met. That said, I think work on this should continue even if there's no digital pound in the end. The technologies underpinning digital money are going to be developed in the private sector anyway, so hands on experience will help central banks support safety and soundness in that context.

4. Conclusions

It has often been said that *"it's trust, not money, that makes the world go 'round."* I could not agree more. In fact, trust is likely the biggest hurdle that a CBDC needs to overcome, or any other form of money for that matter.

It is critical that governments and central banks stay focused on the core public policy objectives of a CBDC and take steps to alleviate concerns about mission creep. Before any decision to launch is made, they must be confident that they have mitigated financial stability risks in CBDC policy and design and that they have passed a high bar with regards to the technology.

The UK's transparent and consultative approach to developing a digital pound is consistent with these principles.

Of course, work on CBDC is generating considerable debate. I see that as healthy and would encourage more of it. Money is a matter of purpose and trust, making it too important to be left solely to central bankers. ■

Carolyn A Wilkins is an external member of the Financial Policy Committee at the Bank of England

Endnotes

1. See [Central Bank Digital Currency Tracker - Atlantic Council](#) for ongoing status updates.
2. Domestic payments are already fast and efficient in many jurisdictions, including the UK, but many crossborder payments are not. For further information on the frictions in crossborder payments and international work underway to tackle them, see [Cross-border Payments - Financial Stability Board](#) (fsb.org).
3. For an overview of the work needed across central banks, industry and public authorities to improve crossborder payments see [Rowing in unison to enhance crossborder payments](#) – speech by Victoria Cleland | Bank of England.
4. This backing is credible in jurisdictions with strong rule of law and macroeconomic fundamentals because governments demand that taxes be paid in the fiat money it issues.
5. For example, see analysis presented in Chart 4.1 in the 2021 Discussion Paper on [New forms of digital money](#) | Bank of England which estimated that major UK banks hold £980 billion of insured and £520 billion of uninsured deposits (based on UK resident groups of major UK banks using data at end-2020).
6. Direct comparisons across jurisdictions are limited by differences in classification and methodology. For available US estimates see report by [Visual Capitalist](#) based on analysis undertaken by [S&P Global Market Intelligence](#).
7. See footnote 4 in [The shape of things to come: innovation in payments and money](#) - speech by Sir Jon Cunliffe | Bank of England for links to public statements made by Governor Andrew Bailey, Sir Jon Cunliffe (Deputy Governor for Financial Stability), and Sarah John (the Bank's Chief Cashier).
8. That said, one undesirable consequence could be that an unremunerated CBDC would actually increase the effective lower bound on interest rates as it would be more easily accessible than cash, which has a storage cost.
9. See Section 3 in [New forms of digital money](#) | Bank of England.
10. See [The potential effect of a central bank digital currency on deposit funding in Canada](#) - Bank of Canada.
11. See [Infante, Kim, Orlik, Silva and Tetlow \(2022\)](#) for an excellent review of the literature.
12. See [Andolfatto \(2021\)](#) and [Chiu et al \(2023\)](#).
13. See [Keister and Sanchez \(2022\)](#).

14. See [A Report Card on China's Central Bank Digital Currency: the e-CNY - Atlantic Council](#), [China's digital currency passes 100 billion yuan in spending - PBOC | Reuters](#).
15. From BIS Innovation Summit 2023, panel entitled '[The process of technological innovation at central banks](#)'.
16. See [Letter - SVB UK hearing \(bankofengland.co.uk\)](#).
17. If yes, then a digital pound would only be launched in the second half of this decade at the earliest.
18. [Project Icebreaker: Breaking new paths in cross-border retail CBDC payments \(bis.org\)](#).

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The value added of CBDCs: a view from the euro area



Maria Demertzis and Catarina Martins argue that the ECB is uniquely positioned to help create the global standard, and in the process to help protect the EU's global strategic interests

Executive summary

Different jurisdictions have set out different reasons for creating central bank digital currencies (CBDCs). Some countries, particularly those with already-operational CBDCs for retail purposes, aim to promote financial inclusion. But in countries where most citizens have access to financial services, central banks are interested in CBDCs as an aspect of the increasing digitalisation of finance.

Central banks could also choose to use CBDCs to guarantee in full citizen's holdings (currently, deposits in commercial bank are only partially guaranteed), but this would trigger major changes in the financial system in terms of the role of commercial banks in intermediation and the role of fiat money. So far, central banks have not opted to go this way.

In the euro area, consumers have multiple payment options and a very efficient retail payments system. The currency enjoys high levels of trust and is not challenged by the emergence of private currencies, such as Bitcoin, or by the risk that cash, a monetary system's anchor, will disappear. Therefore, creating a CBDC for retail purposes in the euro area offers little obvious value added, at least for the foreseeable future.

However, there is a strong case for building a CBDC that banks could use for crossborder wholesale purposes (ie. with other currencies). Wholesale CBDCs could revolutionise the way that crossborder, cross-currency payments are made for two reasons.

1. Crossborder payments are currently slow and inefficient. Pilot projects have shown that wholesale payments with CBDCs can generate substantial time and cost savings.

2. Any two central banks that have operational wholesale CBDCs could settle transactions between themselves. This would be very different from the current system, as most settlements today are done via the dollar (and then the euro) infrastructure and use correspondent banks.

The euro area and the United States would have to consider carefully from a geopolitical perspective how wholesale CBDCs might affect their global economic standing. By developing a CBDC for wholesale purposes, the European Union would be able to contribute to developing the global standard.

Wholesale CBDCs have the potential to change the current dollar-based system into one that is more diverse

1 Introduction

Central bank digital currencies (CBDCs), a digital equivalent of cash, are increasingly gaining traction. At least 114 jurisdictions, representing 95 percent of global GDP, are at some stage of developing a CBDC¹. In 11 countries, CBDCs are now a reality and operate in parallel to their physical equivalent. But it is not necessarily easy for the consumer to understand the difference between a euro in coin or note form and a digital euro.

A good starting point in identify the benefits of CBDCs is to understand the problem that cannot be solved through the increasing range of digital payment options provided by the private sector, and which therefore requires the state's intervention. This is important in explaining why the taxpayer might be asked to finance the creation of a CBDC.

We argue that CBDCs do have added value, but this is not the same for every country. In countries with high levels of financial exclusion and where there is a lack of modern and reliable digital payment systems, a CBDC can facilitate access to payments for many people. But in countries with ample payment solutions and where financial exclusion is a second-order problem, the justification is different.

Central banks worry that as finance becomes increasingly digitalised, two things might happen: first physical cash, the anchor of any financial system, will be displaced, and second, private currencies will become popular. Both could reduce the monopoly of sovereign money. Central banks fear this would compromise their ability to maintain monetary and financial stability.

CBDCs will have a dual purpose, just like their physical equivalent: for retail purposes, typically by consumers and small businesses to make daily payments, representing a small part of total payments; and for wholesale (ie. bulk) purposes by banks and other financial institutions, either domestically or cross border. In the euro area, most efforts

to date have focused on how to develop a retail CBDC. Only recently² has there been also an attempt to advance thinking on the wholesale aspects as well.

On the retail side, the arguments for a digital euro put forward by the European Central Bank revolve around the speed of digitalisation of finance and the notion of strategic autonomy. The prospect of finance becoming predominantly and eventually even exclusively digital threatens the existence of sovereign money and compromises the role of its guardian, the central bank.

The ECB also argues that a big part of all payments is managed by foreign players, who collect sensitive information about EU citizens. A pan-European payment method that is very close to cash would help reduce this vulnerability. It would also help homogenise payments in the euro area and, given easier access, may help promote the international role of the euro.

However, these reasons, understandable as they might be, do not make a compelling case for a retail digital euro, at least for now. There is no imminent threat that digitalisation will undermine the role of the physical euro. And there are easier ways, like through regulation, to promote the creation of a uniformly-accepted digital instant payment method in the EU, without having the taxpayer finance a CBDC.

Meanwhile, Europe's vulnerability arising from foreign players being present in the payment sphere is a very delicate argument. Does the EU want to create European payment players at the expense of competition?

Finally, the euro has acquired a very stable international role, second to, and quite far from, the dollar. At best, a digital equivalent can only expand the euro's international appeal at the margins. Other factors that pertain to a more integrated and well-governed European economy would advance more significantly its international acceptability.

There are also several technical choices, including limits on the amount of digital euros that any citizen can hold, or the fact that these deposits will not be remunerated, that also prevent the greater international use of the euro.

In addition, the Eurosystem has a very fast and efficient retail payment system and can still find efficiency gains within the current system. All these make the case for a digital euro even less attractive.

However, the EU and the global financial system can really benefit from developing wholesale CBDCs for making payments outside the euro area. This can generate efficiency gains for all payments made outside the EU. In our view, the creation of CBDCs globally has the potential of revolutionising crossborder payments.

For now, one reason why the dollar is the currency of choice globally is because it offers the infrastructure via which any two parties can settle a transaction. Any two countries that have CBDCs will have in principle the ability to settle transactions between them, bypassing the current dollar-based system.

Before this could happen however, there would have to be a commonly agreed global standard on how to design and use CBDCs. This is a significant barrier as it requires mutual recognition of legal systems and agreement on economic and technical design issues (BIS, 2022).

Global governance will be a major obstacle to this revolution and the euro area and the United States would have to consider carefully how their economic standing globally would be affected.

For example, current sanctions on Russia mean that countries that want to continue economic relations with Russia cannot do so in dollars or euros. Mutually accepted CBDCs between any two countries could allow them to continue trading and therefore bypass sanctions.

This reduces the need for the dollar infrastructure in international settlements and, importantly, raises the threshold for returning to the dollar when the option presents itself in the future. International financial fragmentation encourages the development of CBDCs and may be part of the explanation for their rapid advancement in the past few years.

2 The emergence of CBDCs

We first clarify how CBDCs may differ from physical cash. Figure 1 describes the taxonomy of money. The digital form of a sovereign currency, a CBDC would be legal tender and fully guaranteed by public authorities. This contrasts with deposits in commercial banks which are guaranteed only in part: for example, €100,000 in the euro area and \$250,000 in the US.

As legal tender, CBDCs could not be refused as means of payment or for repaying debts in the respective jurisdictions.

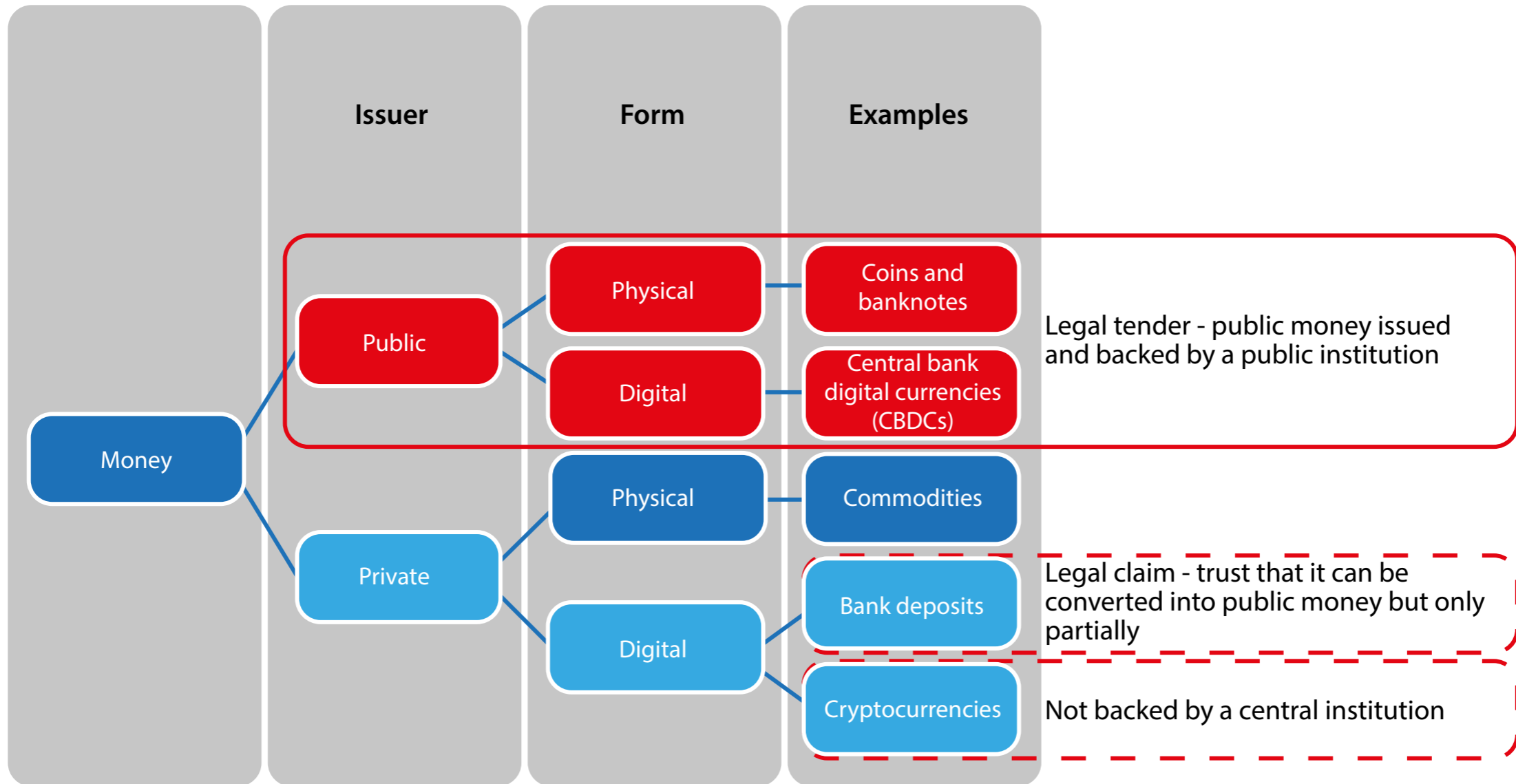
However, legal tender laws are not sufficient to guarantee the acceptability of a new currency, as shown in the literature (Lotz and Rocheteau, 2002). In a two-sided market, acceptability comes not only from take-up by consumers, but also from take-up by merchants, who must invest in the necessary equipment. This has been shown to be an obstacle and would have to be addressed for CBDCs.

Also, CBDCs will be convertible one-to-one into other forms of central bank money – reserve balances or cash. A CBDC will be the closest substitute possible to physical cash, which settles near instantly.

However, while the technology may be able to ensure privacy, CBDCs will not allow for anonymity in the same way as physical cash. Last, holding CBDCs would mean holding a direct liability with the respective central bank, very much like holding a banknote.

Figure 1. Taxonomy of money

www.finance21.net



Source: Adapted from Claeys et al (2018).

Central banks have become interested in the idea of CBDCs for three main reasons:

1. The emergence of cryptocurrencies. The Bitcoin revolution has provided means of payment that are privately issued and managed. If private money were to become successful, especially if it is in principle available to everyone globally, it could displace publicly issued money (cash) and fiat money that is issued by financial institutions but monitored and guaranteed in part by public authorities.

The existence of private money reduces the money base that central banks control, and therefore reduces their ability to control inflation and monitor financial stability. With CBDCs, central banks would provide a digital equivalent of public money that would mimic the technological features of cryptocurrencies.

2. Increasing use of digital payments. The increased digitalisation of payments reduces the role and use of cash in most economies. Cash is often referred to as the anchor of the financial system, providing the necessary trust to the whole system.

The worry is that with decreasing use of cash in everyday transactions, physical cash would disappear, thus eroding trust in the system. A digital equivalent of cash would maintain the anchor while addressing the change in payment preferences.

3. Improve the reach and efficiency of payment systems. In several countries where many people do not have access to the financial system or digital payments, CBDCs offer increased financial inclusion.

This is potentially a game changer, and it is not a coincidence that those countries already using CBDCs, such as Nigeria and the Bahamas, have financial inclusion as a prime motive.

However, even for countries where financial exclusion is a small and isolated problem, there are benefits to improving the efficiency of payments.

This is particularly true for payments across borders, where CBDCs have the potential to create a global standard for international payments that is both efficient and universally accepted. This has the potential to revolutionise the way payments are settled between any two entities anywhere in the world.

While these three reasons are not exhaustive, they are the main arguments put forward by most countries. Other reasons that have been mentioned for developing CBDCs are a more cost-effective issuance and management of physical cash (Reserve Bank of India, 2022), support for the wide application of new technology and innovation, and the strengthening of operational resilience and cybersecurity³.

Central banks worldwide are experimenting with the technology to identify which type of CBDC, retail and/or wholesale, will provide value-added for their consumers and cover their needs.

3 The case for a retail CBDC

Currently, a consumer (payer) who wants to make a payment instructs their bank to make a transfer to the payee's account. The transaction involves an amount moving from one bank to the other and is settled by the central bank.

With CBDCs, however, both the payer and the payee will have accounts directly at the central bank. There will be no commercial banks involved⁴. Both the payment and the settlement will happen via the central bank directly. Furthermore, CBDCs could use new technology, such as distributed ledger technology (DLT), which is being explored.

The motive for deploying a retail CBDC depends crucially on how the three factors we have described in section 2 have impacted a particular jurisdiction. Are cryptocurrencies a threat to traditional forms of payment and possibly a source of financial instability?

Is physical cash redundant, therefore, threatening to de-anchor trust in the monetary system? Are there efficiency gains to be had in payments both for retailers and in wholesale?

3.1 Cryptocurrencies are not taking over payments

The emergence of cryptocurrencies has democratised payments and financial services in that it has provided easier access by removing intermediaries. However, cryptocurrencies have also proved to be very bad means of payment or store of value because their price has been very volatile (Demertzis and Martins, 2023).

In practice, the fear that cryptocurrencies could displace sovereign money has so far proved unfounded. Nevertheless, the experience is not the same around the world, and of course things might change in the future.

Despite its increasing size, the crypto market still represents a small fraction of the total financial system. According to the ECB, the value of all cryptoassets represented less than 1 percent of total global financial assets by April 2022 (Panetta, 2022a). They also represent a small component of the total value of payments.

The *Global Payments Report* (FIS, 2023) noted that cryptocurrencies are used much more for investment purposes than as a means of payment (77 percent compared to 18 percent, according to their survey), and that the value of e-commerce payments using crypto represented 0.19 percent of global e-commerce value in 2022.

Table 1. 2022 Global Crypto Adoption Index

Overall index ranking	Country	Overall index ranking	Country
1	Vietnam	11	Nigeria
2	Philippines	12	Turkey
3	Ukraine	13	Argentina
4	India	14	Morocco
5	United States	15	Colombia
6	Pakistan	16	Nepal
7	Brazil	17	United Kingdom
8	Thailand	18	Ecuador
9	Russia	19	Kenya
10	China	20	Indonesia

Source: Chainalysis (2022).

However, in Africa, Asia and Latin America, cryptocurrencies are increasingly playing a more active role. An index compiled by Chainalysis (2022) tried to capture a broad picture of cryptocurrency adoption by scoring countries on a variety of measures. It ranks only two high-income countries – the US and the United Kingdom – among the top 20 crypto adopters in 2022 (Table 1).

According to White and White (2022), Africa is the fastest-growing cryptocurrency market among developing regions. Between 2020 and 2021, Africa saw a 1,200 percent increase in cryptocurrency payments. Remittances, which are a very important source of income for the continent, have been greatly facilitated by cryptocurrencies (White and White, 2022).

In Nigeria, 10.3 percent⁵ of the population owned cryptocurrency in 2022. The popularity of crypto in Nigeria is explained by financial exclusion, the lack of access to financial services. However, the weakness of the domestic currency and inflation is also a reason for the popularity of crypto alternatives.

A CBDC would help, at least in principle, to reduce financial exclusion, but would not by itself alleviate doubts about the strength of the sovereign currency.

3.2 Cash is still popular

The increased popularity of digital payments, particularly during the COVID-19 lockdowns, has reduced the need for cash. Nevertheless, cash still has an important role in point of sale (PoS) payments, particularly in less-developed regions and it is here to stay at least for the foreseeable future (BIS, 2023; FIS, 2023).

European Central Bank data for the euro area indicates that, despite the reduction in cash payments at the point of sale, from 79 percent in 2016 to 59 percent in 2022, cash remains the most popular payment method, especially for low-value transactions (Figure 2, top panel).

Citizens' opinions on the importance of having the cash option demonstrates that a society without cash is nowhere close. The proportion of people considering cash 'very important' and 'fairly important' is above 50 percent for most euro area countries (Figure 2, bottom panel). This goes against the popular belief that cash will soon be abandoned.

Zamora-Pérez *et al* (2022) argued that, at the global level, the demand for cash has not decreased but rather has increased. This has happened despite the many new innovative solutions that have emerged for non-cash payments.

Some of this increased demand may be related to a precautionary savings motive: a means of storing value in a period of low-interest rates that spanned several years.

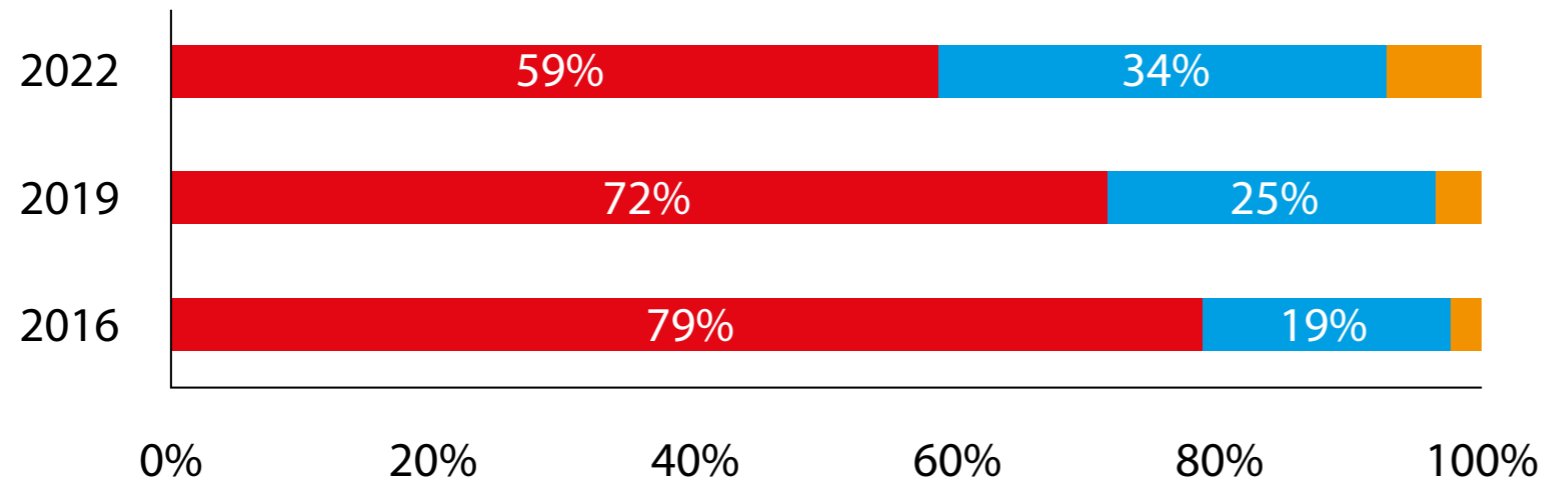
Additionally, even countries like Sweden, that have attempted to go totally cashless, have acknowledged that this might not be possible and that some, even if limited, amounts of cash will always be needed⁶. Armelius *et al* (2020) went as far as arguing that Sweden may be an outlier when it comes to the trend towards a cashless society, and not the trendsetter.

Nevertheless, it is important to acknowledge that the process of digitalisation will mean that the demand for physical cash will continue to decline. It is much more difficult to assess whether it will disappear completely or, like in Sweden, stabilise at a low level⁷.

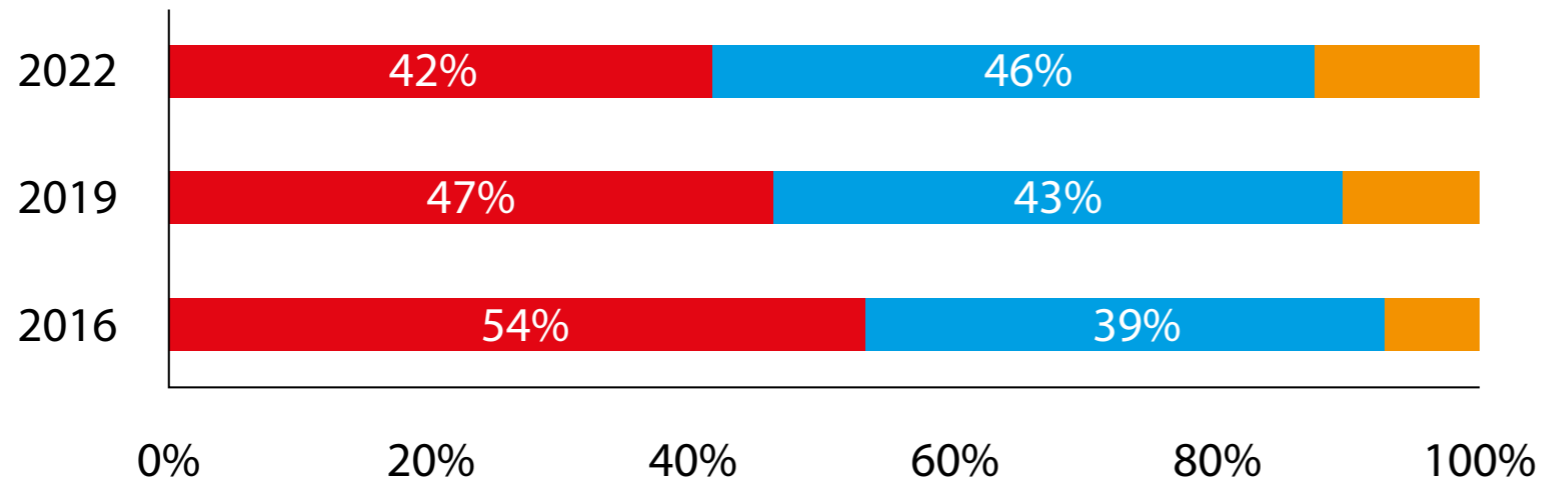
Part of the answer will depend on how well CBDCs, as the closest digital equivalent to cash, can take over the role of cash in providing an anchor for the system. Choices in the design of the CBDC will determine how close to cash CBDCs can be. Privacy and anonymity, the thresholds for consumer holdings of CBDCs and whether it will be remunerated or not will be relevant in this regard.

Figure 2. Payment preferences and the importance of cash in the euro area

Number of transactions

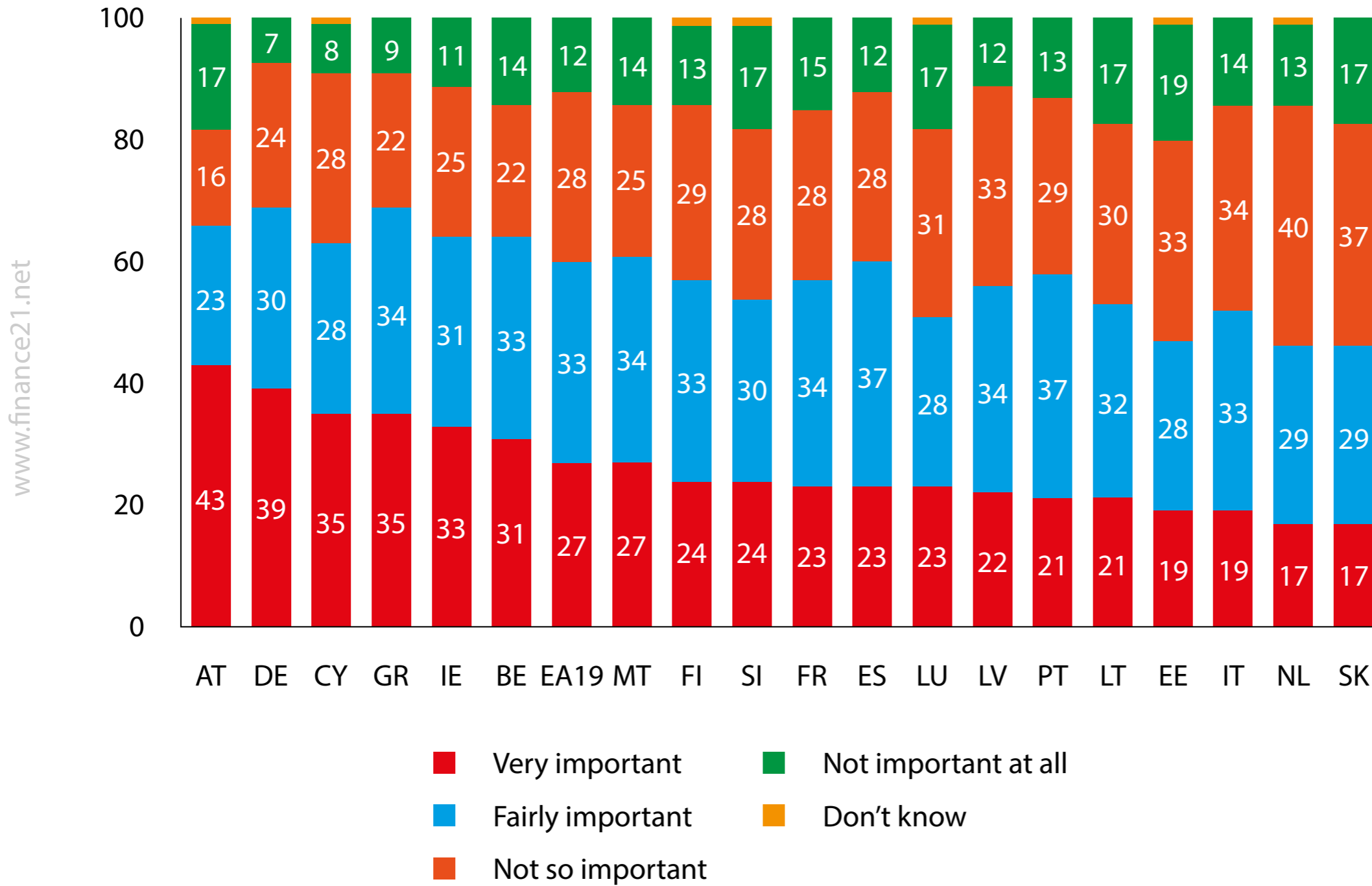


Value of transactions



Cash Card Others

Importance of having the option to pay with cash, by country (%)



Source: Bruegel based on ECB (2022).

3.3 Financial exclusion and the introduction of retail CBDCs

Perhaps the most compelling argument for introducing retail CBDCs is that it will increase financial inclusion. It is therefore not surprising that countries where a substantial part of the population is excluded from financial services were the first to introduce their national currencies in digital form.

Nigeria's eNaira, for example, was launched at the end of 2021, with the aims of increasing remittances, fostering crossborder trade, improving financial inclusion, enabling the government to make welfare payments more easily and making monetary policy more effective⁸.

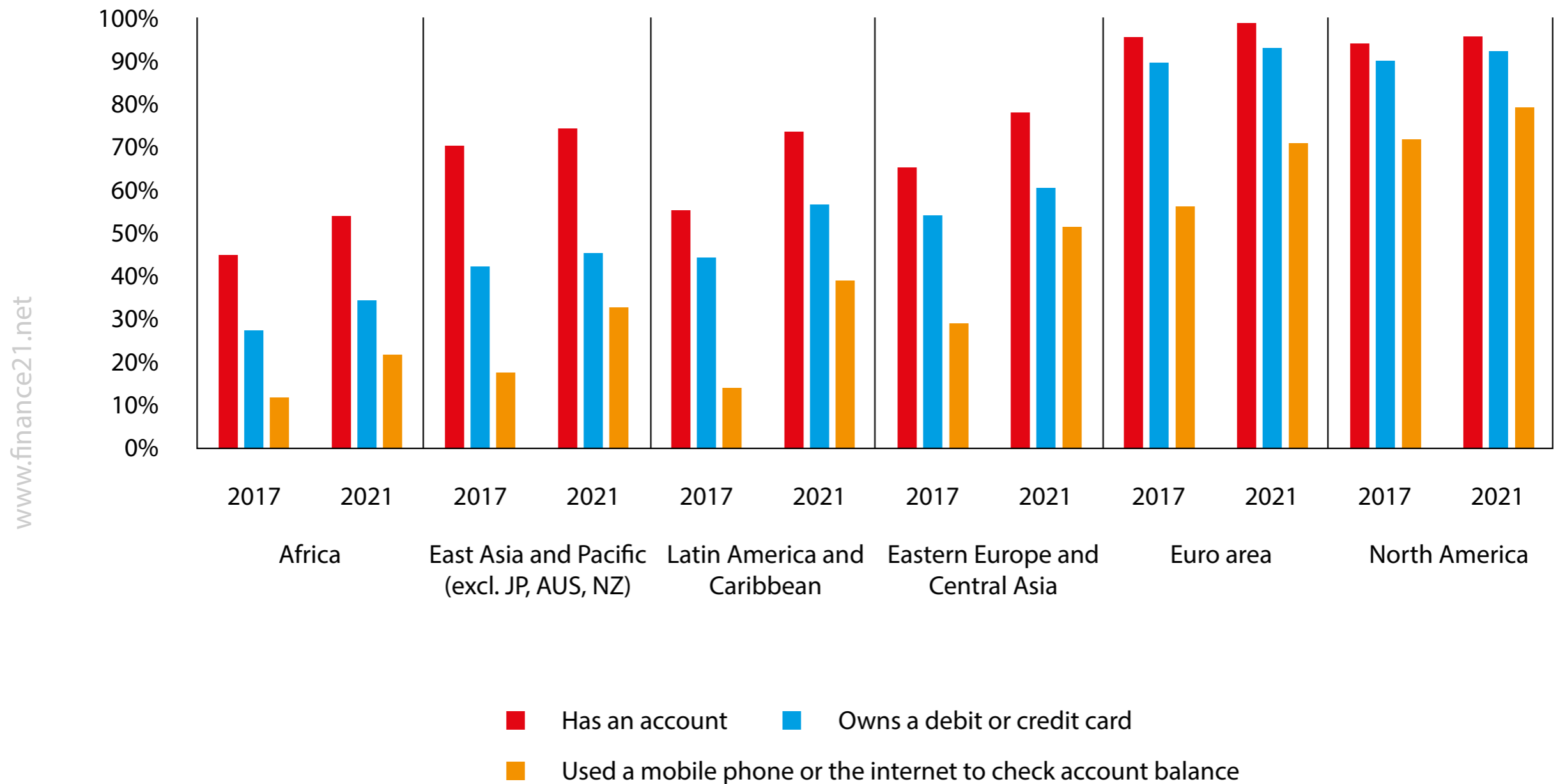
Providing the local population with access to digital payments and through them facilitating crossborder transactions in the form of remittances is particularly important, given the relevance of remittances as a source of income for the country. Figure 3 shows the level of financial inclusion worldwide.

Advanced economies such as euro area countries, the US and Canada have very high levels of financial inclusion. This is not the case for African countries or some Caribbean countries, where CBDCs are already being introduced.

However, a CBDC by itself is not enough to reduce financial exclusion. For CBDCs to be adopted widely there needs to be broad access to internet connection, consumers need to have mobile phones and merchants need to have invested in the equipment to accept payments in CBDCs.

Figure 4 shows that while a large proportion of the African population has access to a mobile phone, access to the internet by contrast is not as widespread (50 percent), which defines the limits of success that the introduction of a digital currency can have.

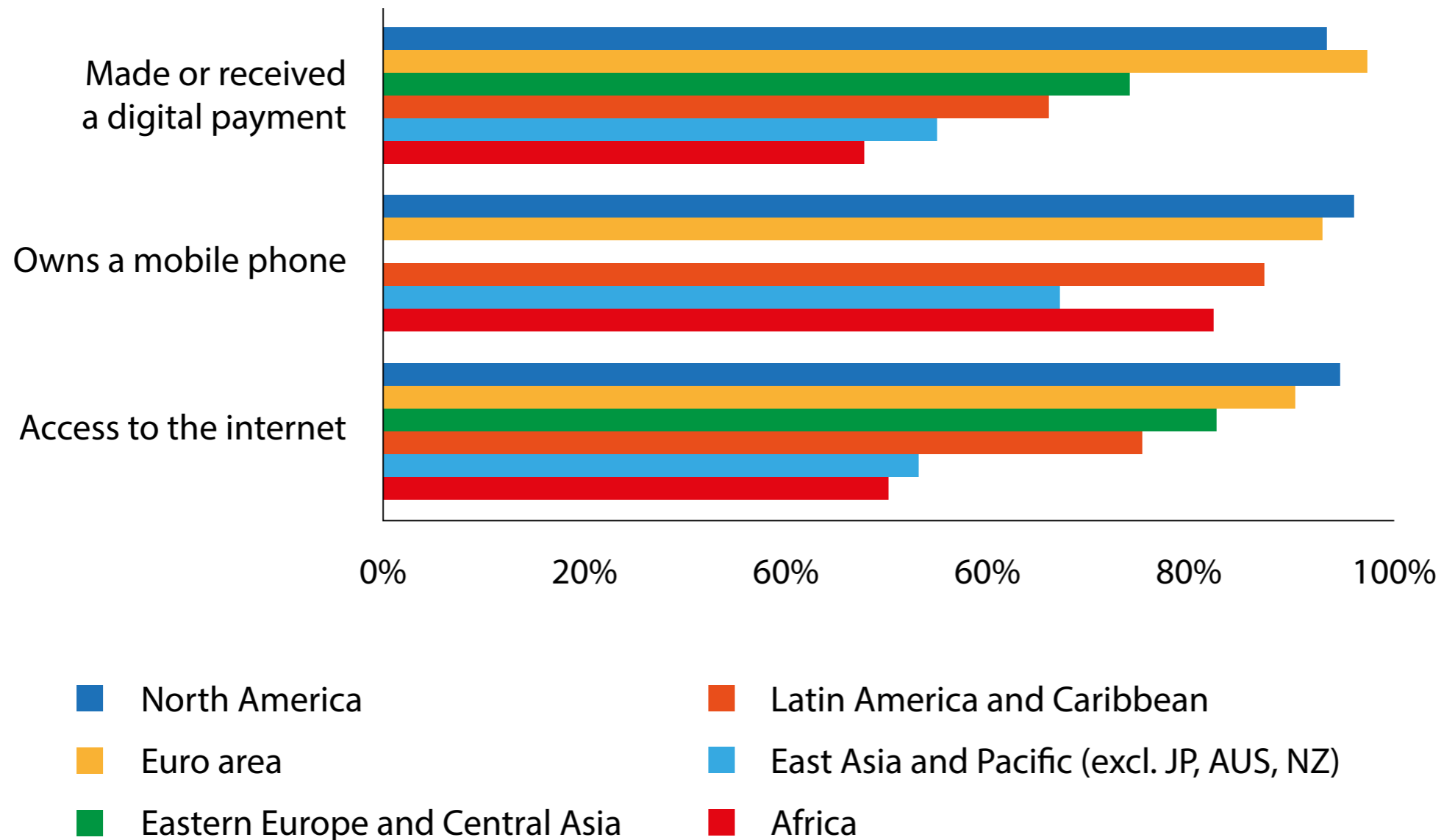
Figure 3. Financial inclusion, three metrics



Notes: JP = Japan, AUS = Australia, NZ = New Zealand.
 Source: Bruegel based on the Global Findex Database 2021.

Figure 4. Digital infrastructure and penetration

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Source: Bruegel based on the Global Findex Database 2021.

It is worth noting that even if there is digital access, it is not immediately the case that the introduction of CBDCs is the only or even the easiest way to improve financial inclusion, as shown by India and Brazil.

Officially launched in 2016, Unified Payments Interface (UPI)⁹ is an Indian instant payment system widely adopted in the country. Given its huge success, it is seeking agreements with other countries to enable its acceptance abroad¹⁰.

The Central Bank of Brazil meanwhile launched a platform for real-time digital payments called PIX which has proved an enormous success. Since the launch, the number of registered users has increased continuously, reaching more than 137 million in May 2023¹¹, which represents more than 60 percent of the country's population.

PIX does not require any exchange of personal data, as the payer just asks for the payee's QR code, and payment transfers happen at very high speed at any time of the day. According to the 2023 *Global Payment Report*, average fees on PIX transactions are 0.22 percent of the transaction cost compared to 1 percent for debit cards and 2.2 percent for credit cards.

It would be very difficult to make a case for introducing a retail CBDC that can provide more value added than this to the consumer, a fact that explains why the Central Bank of Brazil's interest in introducing a CBDC is mainly for wholesale purposes¹².

3.4 How popular are CBDCs?

Admittedly, digital equivalents of sovereign currencies have existed for no more than two years. But their uptake is not as impressive as authorities hoped.

Table 2 shows their uptake level for three countries, Nigeria, the Bahamas and China. Compared to total currency in circulation, CBDCs represent very small amounts and in none of these cases above 0.17 percent of the total.

There are major problems to overcome. For the Sand Dollar, the CBDC of the Bahamas, introduced in October 2020, at least two issues might contribute to its small uptake¹³.

First, the public confuses the Sand Dollar with privately issued cryptocurrencies that are not immediately trusted. After the scandal around FTX, which was based in the Bahamas, the public grew very sceptical about any digital currency.

Second, the Sand Dollar is not readily accepted everywhere. Merchants do not all have the right equipment to accept it (a reason also given for the eNaira), even though they incur no cost for having the equipment.

Table 2. CBDCs in circulation

December 2022 values	Nigerian eNaira	Bahamian Sand Dollar	Chinese e-CNY
CBDC in circulation	3 billion eNaira	303,785 Sand Dollars	13.61 billion e-CNY
% of total currency in circulation	0.01%	0.17%	0.13%

Source: Bruegel based on Central Bank of Nigeria, Central Bank of The Bahamas and People's Bank of China.

This raises interesting questions about how to increase public acceptability. Historical incidents show that legal tender laws are not sufficient to guarantee the acceptability of a new currency (Lotz and Rocheteau, 2002).

In a two-sided market, acceptability comes not only in the form of consumer take-up, but also from merchants who must invest in the necessary equipment. This has been shown to be an obstacle. Zamora-Pérez *et al* (2022) found that providing the status of legal tender is not always the right means of increasing the popularity of a currency, as the cost of building the infrastructure necessary for a currency's adoption must be addressed.

However, Brazil's PIX payment system shows that mandatory participation of certain private players may be enough to create sufficient network effects, necessary for such markets to pick up. Similarly, Chinese public authorities are beginning to pay civil servants salaries in e-yuan¹⁴.

An important reason for low uptake is the lack of trust in the underlying currency. The digital representation of a currency is not sufficient to generate trust. It may allow for easier access but that can only help marginally. This is shown to be an important explanatory factor in the poor adoption of the eNaira in Nigeria¹⁵.

An interesting experiment is taking place in Zimbabwe, where authorities have issued a gold-backed token¹⁶ as a way of improving the trust in the local currency, the Zim dollar. Pegging the currency to a trusted asset is one way of trying to improve its stability and reputation. But it can also prove to be very expensive and ultimately non-credible. It will be interesting to see how far this effort goes to establish trust in the country's CBDC.

3.5 A mixed case for establishing a retail CBDC

We have so far discussed arguments that are regularly made to justify the introduction of a retail CBDC, and the experience of countries that have decided to launch CBDCs.

The process of digitalisation in payments has not made a clear case for CBDCs. If anything, there is still insufficient understanding among the public in countries where they are already in operation, of the difference between CBDCs and private cryptocurrencies.

The most compelling reason in favour of a CBDC is financial inclusion. But even for this, CBDCs are not a solution by themselves. Other elements, like digital infrastructure, need to be available. And the Brazilian example shows that when digital infrastructure is available, there are other solutions to financial inclusion. The key is finding effective ways of creating network effects.

The welfare implications of introducing retail CBDCs remain very understudied. Piazzesi and Schneider (2022) suggested that the emergence of digital currencies could distort the level of competitiveness in payment systems.

This is of relevance in jurisdictions, such as the euro area, where there are plenty of other available private payment alternatives. CBDCs have the potential to prevent useful innovation in private markets, therefore, reducing aggregate welfare.

On the other hand, Williamson (2022) took a different view. Competing with private means of payment, CBDCs will attract safe assets (deposits). This, he argued, is a way of managing safe assets in a better, more welfare-enhancing way compared to how private banks deal with this stock. CBDCs could in theory be a way of bypassing the imperfections of partial deposit guaranteed systems.

However, CBDCs are not the only way of guaranteeing deposits in full. Regulatory adjustments could do this instantly. Importantly, a regime that shifts deposits from private banks to the central bank will necessarily change

the face of retail banking, an action that should not be done lightly. This has never been the motive behind introducing CBDCs and should not be dealt with as a mere unforeseen consequence.

There remain operational risks of introducing a retail CBDC. How will deposit holders retrieve them from private banks and place them at the central bank? Can this happen all at once, or will it trigger a run on the banks? There are also issues of cyber security and no system can be completely secure.

How does technology and the regulation that applies to it ensure financial stability? Finally, there is overwhelming evidence that consumers worry about privacy and anonymity (ECB, 2021; Noll, 2023).

While the technology that the ledger provides may offer novel solutions to a number of issues, the legal framework behind CBDCs is as credible as that of physical currencies and the institutions responsible for their issuance. A digital representation of a currency cannot solve governance shortcomings.

4 What is novel about wholesale CBDCs?

4.1 Improving wholesale payments

In the current system, bank reserves in the central bank available for wholesale transactions are already a form of central bank digital currency.

In other words, payers and payees in the wholesale market – banks – already have accounts at the central bank. This means that, unlike CBDCs for retail purposes, wholesale CBDCs do not need to be created from scratch. Rather, it is about using the most modern technology – distributed ledger technology (DLT) – to operate wholesale transactions.

Then the question is whether this new technology can provide efficiency gains in wholesale payments domestically, or between central banks across borders.

In various advanced economies, domestic payment systems are already very efficient: for example, real-time gross settlement systems such as T2, launched by the Eurosystem in March 2023 to replace the previous TARGET2 system, which settles euro-denominated payments, and the Fedwire Funds Service, which settles dollar-denominated transactions.

The systems are operated by the respective central bank. T2 is already meant to improve cost efficiency, provide greater cyber security and optimise the use of liquidity by harmonising and integrating various TARGET services¹⁷.

Even though wholesale settlement systems are quite advanced in the EU and in the US, the ECB and the Fed are both exploring how DLT can prove more efficient and secure for domestic interbank transfers¹⁸.

However, it is in crossborder and cross-currency transactions that DLT could provide sizeable gains. These transactions are subject to inefficiencies related to the current correspondent banking architecture (Hebert *et al* 2023). International payment systems have not kept up with the scale of crossborder financial flows in an increasingly open world.

The systems used are costly, slow and complex, which means that many participants from emerging markets and the developing world have been left with no access to the global financial system.

In an increasingly interconnected world, the need to improve crossborder payments has been established as a priority by the G20, with the Financial Stability Board leading in coordination of efforts¹⁹.

BIS (2021) provided a flavour of the potential gains from new ways of making crossborder payments. Table 3 summarises the results of such comparisons.

A transaction that currently takes three to five days could be completed in less than 10 seconds. Cost savings could also be significant, but their magnitude would vary between banks and regions. For example, average costs for overseas transactions amount to 2 percent in Europe, while in Latin America such costs amount to as much as 7 percent.

New payment solutions being explored could reduce this cost to as low as 1 percent. Savings would come from removing the network of correspondent banks in the chain of transactions and putting in place instead direct corridors that allow central banks to communicate.

Such efficiency gains were achieved in a pilot project called mBridges (BIS, 2022), in which the following central banks participated: the Hong Kong Monetary Authority, the Bank of Thailand, the Central Bank of the United Arab Emirates, the People's Bank of China, and the BIS Innovation Hub Hong Kong Centre. Using DLT, the project established a multi-CBDC platform via which market participants could make crossborder peer-to-peer payments directly using central bank money.

Along with efficiency and cost gains, the project demonstrated an ability to reduce settlement risk and allow for the use of local currencies for international payments, a move away from having to rely on international tradable currencies like the dollar and the euro. The pilot showed though that several complex choices would have to be made.

Table 3. Efficiency gains from DLT compared to the current payment system

	Current payment systems	New technologies for payments
Transaction time	3-5 days	2-10 seconds
Costs	<2% - >7%	As low as 1%
Accessibility	Via corresponding banks	Peer-to-peer

Source: Bruegel based on BIS (2021).

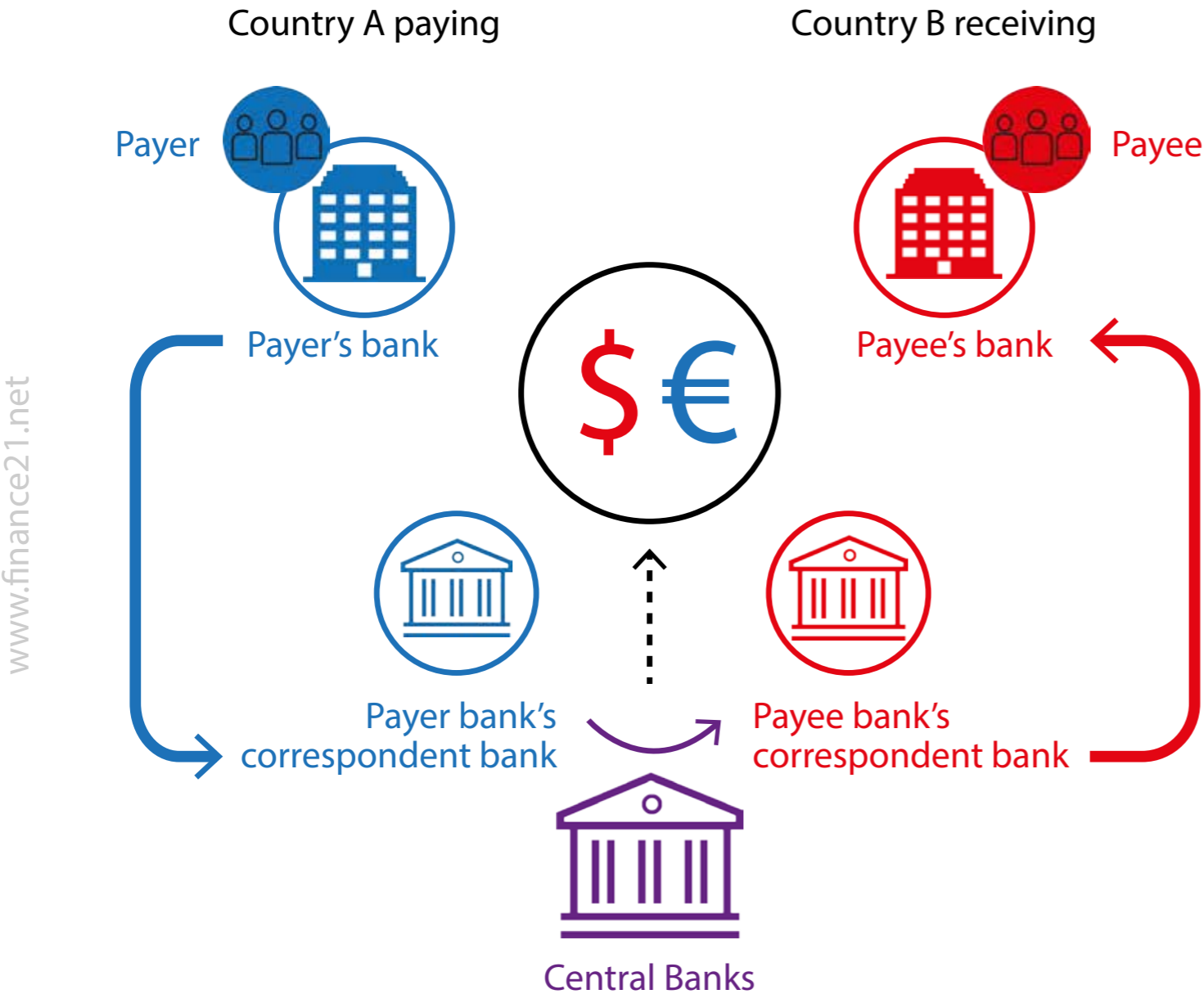
4.2 From a dollar-centric system to bilateral settlements

The international financial system has long relied on the dollar, which has meant having to rely on the dollar settlement system. Figure 5 describes the current system of economic exchange between any two countries.

A company in country A, the payer, instructs its bank to make a payment; the bank then contacts its correspondent bank. The latter will engage with the correspondent bank in country B, which finalises the cycle by contacting the payee's bank and crediting the due amount to the receiver's account.

Depending on the currency in which the exchange is made, the respective central bank will be involved. It is important to note that the dollar is by far the main currency of choice globally in trade invoicing (more than half of global trade) and foreign exchange transactions (almost 90 percent of the total volume) (Moronoti, 2022). This also means that US settlement authorities are involved in finalising most global transactions.

Figure 5. The dollar (euro) based international financial system



Source: Bruegel based on BIS (2022).

Wholesale CBDCs would change this system. Central banks would have dedicated corridors (like the mBridges described above) for settlement directly between themselves. There would be no need for correspondent banks. The payer's bank would have an account directly at the country's central bank, which in turn would communicate directly with the central bank in the payee's country.

This would mean more diversification of currency pairs, with increased liquidity for currency pairs that do not include the dollar. Also, more direct relationships between parties would lead to the de-risking of transactions.

The payer's bank can pay the payee's bank in one of three ways (Figure 6). First, it can hold domestic currency in an account in the domestic central bank, in which case the two central banks will transact using a pre-agreed currency.

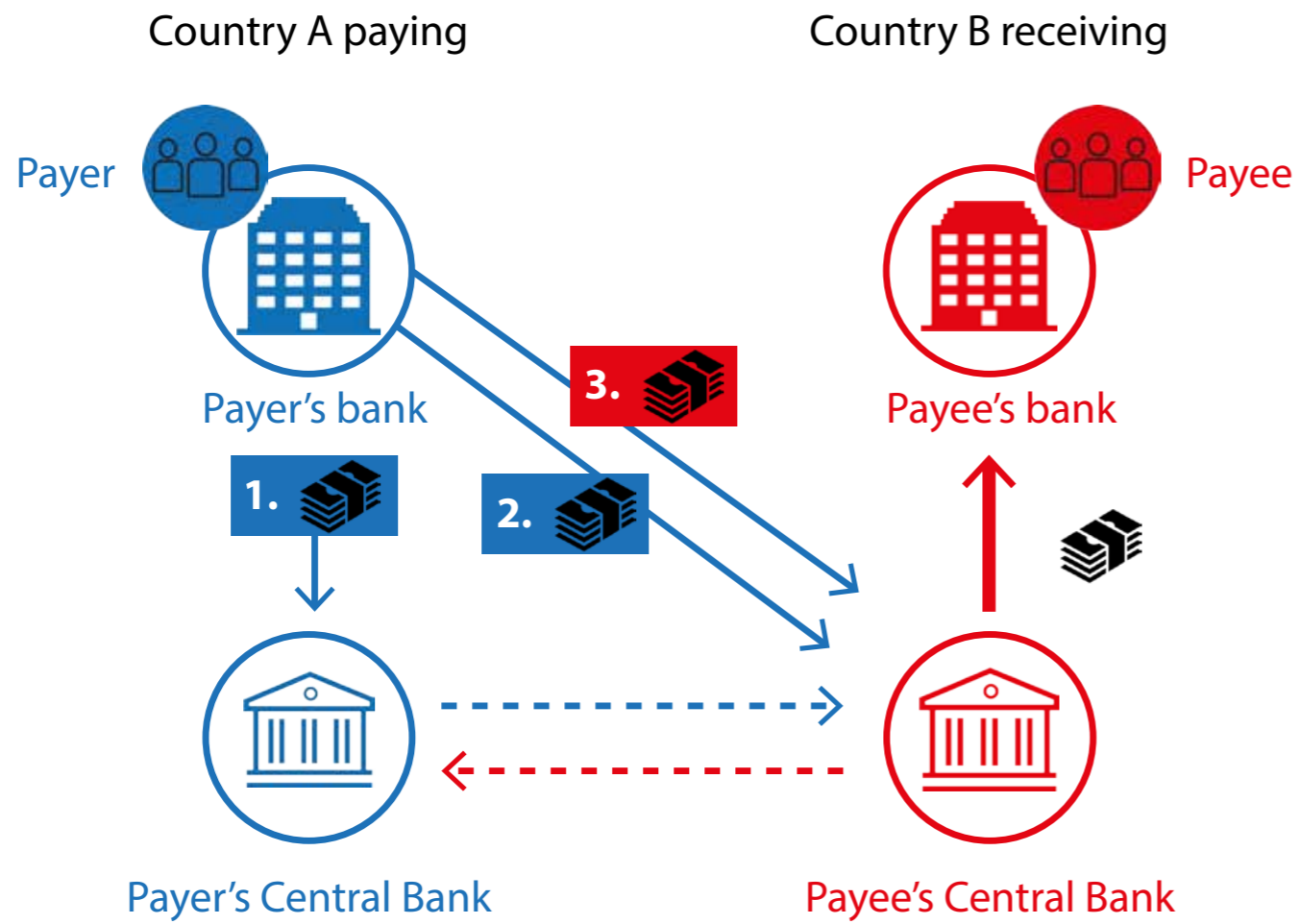
Second, the payer's bank could have a domestic currency account at the foreign central bank and would pay with its domestic currency.

Third, the payer's bank would have a foreign currency account at the foreign central bank and would pay with this.

The first method is closest to what happens today; the dedicated corridors between central banks will allow the settlement of any transaction. The mBridge pilot showed that the third method is the most efficient because it involves the fewest steps between the two transacting parties.

An important issue that DLT solves is interoperability. The current system does not allow for interoperability because communication needs to happen through secure messages. If countries use different systems, they run the risk of not being able to communicate between themselves.

Figure 6. Commercial banks' CBDC accounts at a central bank



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Source: Bruegel.

Blockchain²⁰ technology has provided solutions that allow communication between parties via corridors. But before such dedicated corridors are created, a number of choices need to be made on technical, legal (and governance) and economic issues.

For the system to function, established rules to provide legal certainty are needed. Would current rules for holding foreign securities be sufficient for wholesale CBDCs, or would a new legal framework be needed?

Global coordination on this issue would be preferable and indeed necessary for wholesale CBDCs to challenge the current ways of settling international transactions. Arguably, the governance of wholesale CBDCs will be the most important obstacle to their uptake.

But bilateral recognition of legal systems would also be sufficient for any two central banks to settle transactions between them. Wholesale CBDCs then have the potential to change the current dollar-based system into one that is more diverse. It is not immediately obvious why two countries that trade in dollars would prefer to trade in their own currencies.

However, if one of them was sanctioned by the US, for example, then the dollar would no longer be available to them. A settlement system that is operational between any two central banks would guarantee the continuity of economic activity. While an alternative settlement system by itself does not automatically reduce the appeal of the dollar as the currency of choice, it does reduce the threshold for using other currencies.

Many countries that are thinking about strengthening their resilience will no doubt examine the geopolitical importance of ensuring functioning settlement system. It is no coincidence that so many central banks, including China's, are eager to develop a digital equivalent of their currency.

It is not difficult to imagine CBDCs being weaponised for geopolitical reasons, as central bank reserves have been since Russia's invasion of Ukraine²¹.

However, many issues remain. On the governance side, choices will have to be made on issues including data privacy, preserving anonymity, monetary sovereignty and conflict settlement. The mBridges pilot showed that the most efficient payment method would be for foreign companies to have accounts at the domestic central bank if they trade domestically.

What would that mean for monetary sovereignty? How would potential conflicts be resolved? Equally, economic issues would also have to be decided. How would countries deal with counterparty risk? Would the domestic central bank agree to carry that risk on behalf of foreign institutions?

5 A digital euro: design options and its future

5.1 The ECB's thinking so far

The Eurosystem is considering the introduction of the digital euro for retail use. The digital euro project is at time of writing in the investigation phase, which will come to an end in October 2023 at which point the ECB will decide on the next steps²². Three progress reports have been issued so far (Box 1).

The first progress report, published in September 2022, focused on the functionalities and limits for users. It concluded that the consumer should be able to pay with digital euros online and offline, and that the digital euro should mimic cash-like features as much as possible.

While privacy is to be ensured, the digital will not be fully anonymous because of worries about money laundering. Also, it should be used exclusively for payments and not as a form of investment.

This choice also reflects financial stability considerations, and particularly the prevention of excessive migration of bank deposits to the central bank, which could disrupt the current financial system. To this end, individual holdings should be limited to between €3,000 and €4,000 (Panetta, 2022b).

The second progress report, issued in December 2022, focused on defining the settlement and distribution roles and ensuring an easy conversion between digital euros and cash/private money. The Eurosystem intends to retain full control over the issuance/redemption and settlement of digital euros, but has not decided on the technology to use – traditional, DLT or a combination of both.

The distribution and direct interaction with end users would be the responsibility of banks and other payment service providers. They would develop the interfaces and services – such as wallets – and perform regular anti-money laundering checks.

The third progress report (April 2023) clarified that payments would be done using technology already familiar to most European citizens, for example, contactless or QR codes, through either the existing apps of intermediaries or a Eurosystem app, depending on the user's preference. The April 2023 report also discussed the possibility of access for non-euro area residents.

The primary focus of the initial releases of the digital euro however will be for euro area residents only (individuals, merchants and governments), even though access to non-residents could be possible if they have an account in the euro area. Access for residents of the European Economic Area and selected third countries could be envisaged in later releases of the digital euro.

A last important point made in this report is that the digital euro will not be programmable money. This means that the ECB would not determine or interfere with where, when and for which purpose the digital euro is used.

Early in the second half of 2023, the Eurosystem will present the overall thinking on how to design a digital euro. Box 1 summarises its thinking so far.

The ECB will also investigate cross-currency functionalities as a way of improving the transparency and efficiency of crossborder payments (as endorsed by the G20). This functionality could be implemented by ensuring interoperability between the digital euro and other CBDCs or by relying on a common infrastructure that could host multiple CBDCs.

5.2 Other advanced economies' approaches to CBDCs

Several countries are more advanced than the euro area in this process and have decided not to issue a retail CBDC in the foreseeable future. This is mainly because they do not see CBDCs as offering added value in terms of payment options or to their citizens.

This is the situation in Canada²³, Denmark (Danmarks Nationalbank, 2022), Japan²⁴, Sweden (Swedish Government, 2023) and Switzerland²⁵. In the United Kingdom, the Chair of the House of Lords Economic Affairs Committee argued that a CBDC was *"a solution in search of a problem."*

Similarly to the euro area, the US is still investigating whether to issue a retail CBDC, but is finding it difficult to justify it. In April 2023, Fed Governor Michelle W Bowman said *"it is difficult to imagine a world where the trade-offs between benefits and unintended consequences could justify a direct access CBDC for uses beyond interbank and wholesale transactions"* (Bowman, 2023).

Box 1. The ECB's thinking on the retail digital euro

- Target users: Primarily euro area residents (individuals, merchants and governments). Possible extension of access to non-residents.
- Intended as: means of payment and not form of investment (avoid excessive migration of bank deposits to the central bank). It will not be remunerated.
- Availability: both online and offline solutions envisaged.
- Limits: €1 trillion to 1.5 trillion total, meaning around €3,000 to €4,000 digital euro per capita. Limits apply to individuals, who can have only one account. Merchants would not have digital-euro holdings but would accept payments in digital euros.
- Privacy: the digital euro should replicate as much as possible cash-like features, but no full anonymity. Possibly, greater privacy for low-value low-risk payments.
- Issue and settlement: responsibility of the Eurosystem; digital euro is direct liability of the central bank (convertible one to one with the euro).
- Onboarding, distribution and services: responsibility of banks and other payment service providers (supervised financial intermediaries). These would perform the regular onboarding procedures (eg. anti-money laundering checks) and can develop consumer-oriented services beyond the core mandatory functionalities.
- Access and use: via existing apps provided by the PSPs or via an Eurosystem app. Payments done using technology such as contactless or QR code.

This does not mean, however, that their respective central banks are not investigating and preparing for a possible future launch, should the conditions and assessment change. Importantly, the idea of a wholesale CBDC is being pursued by some.

For instance, Switzerland is participating in various projects focused on better understanding the wholesale potential: 'Project Helvetia', a collaboration between the Swiss National Bank, the BIS and SIX, a commercial infrastructure operator, and 'Project Jura', which the Banque de France has also joined. Other countries, including the UK and the US, have expressed their potential interest in a wholesale CBDC.

It is important to note that the decision to issue a CBDC is ultimately political, mostly taken by the respective governments, rather than the central bank. Governments' positions can change over time, as developments of CBDCs in other countries advance and they gain a better understanding of the operational, legal, financial and economic implications of CBDCs (whether retail or wholesale).

5.3 The future of the digital euro

A digital euro for wholesale purposes has substantial potential for reducing frictions in crossborder (ie. beyond the euro area borders) payments. As explained earlier, these improvements could bring a fundamental change in the international financial settlement system.

Governance will be crucial. Legal issues, economic choices and technical uniformity would all need to be agreed at global level for CBDCs to challenge the status quo in global wholesale payments. But the Eurosystem cannot afford to be left out of this debate.

Moreover, as the ECB has invested in understanding the workings of CBDCs, it is well placed to contribute to setting the global standard and helping promote global coordination. As a standard-setter, the EU could exert influence as societies adapt to an increasingly digitalised financial ecosystem. As an active participant and contributor to the debate, the EU should aim to protect its global interests.

When it comes to using a digital euro for retail purposes inside the euro area, we do not see a compelling case for issuance at this stage. There are many issues to clarify, and a digital euro might bring significant changes to the financial system that need to be considered carefully.

Privacy vs anonymity

In response to the public's concerns about privacy, the ECB has been very clear about protecting consumer data when using the digital euro. However, privacy is not the same as anonymity and the ECB is also clear that transacting in digital euros will not be anonymous. This makes the digital euro only an imperfect substitute for cash.

As 42 percent (Figure 3) of the value of all transactions in the euro area in 2022 was in cash, there is still a great deal of anonymity in the way that payments are made currently. As one of the motivations for launching CBDCs was the need to provide a digital equivalent of cash, this is a clear shortcoming.

Cash as the anchor of the financial system

Would the elimination of cash in the future destabilise the system? It is often argued that cash is the anchor of trust in the financial system. In a world of fiat money, deposits are only partly guaranteed. For the consumer, the only other money guaranteed in full by the sovereign is cash. Being able to revert to cash at any time is what provides trust in the system.

Can a CBDC that is also guaranteed in full provide the equivalent anchor to the system? The answer to this is important and citizens will need to be assured that digital money is at the very least not programmable (ie. money with built-in rules that impose restrictions on how it is used).

Also, it is difficult to see how digital cash can provide the anchor to the system if consumers are allowed to have only limited holdings of CBDCs (see below).

Limited holdings

If the amount of digital euros allowed per person is small, as is currently the intention (between €3,000 and €4,000 per person), then the digital euro risks never taking off. Why would the euro area consumer opt to have one more account, this time at the central bank, if it is only of limited use? The amount allowed would need to be at least equal to the amount in deposits that is currently guaranteed (€100,000) for the consumer to have a motive to switch.

Moreover, the consumer has ample payment alternatives in the euro area. If the worry is that payment alternatives are country-specific, then imposed coordination (like the IBAN system for bank deposits) would provide an adequate solution. Regulation therefore can achieve the same result with much less effort.

If on the other hand, the ECB were to allow unlimited amounts of digital euros to be held in the form of deposits, that could potentially be a game changer. Having all deposits guaranteed by the state is an attractive proposition for the consumer.

But for her to switch, she would still need to see interest paid on these deposit accounts, or she would be left worse off. But interest-bearing deposits at the central bank would transform the roles of both the central banks and financial intermediaries.

Commercial banks, which are currently mainly funded by deposits, would have to find alternative operating models. What would be the cost to the system of providing such a guarantee? Or would the amount of money in circulation necessarily have to decrease?

The ECB and other central banks have not justified their interest in CBDCs as a way of altering the financial system. Rather, their thinking focuses on imposing as small a distortion as possible. With that in mind, digital euro holdings would remain very small.

European strategic autonomy

Last, the ECB also uses the argument of strategic autonomy to justify its interest in the project. What is the risk in current European payment systems that requires intervention? An ECB report on open strategic autonomy from a central banking perspective (ECB, 2023) mentioned that *“non-European payment-related service providers handle around 70% of European card payment transactions.”*

A retail CBDC could address this concern though, as explained above, it might also distort competition and innovation in domestic payment systems. The strategic autonomy argument adds a layer of protectionism that would need to be very carefully justified economically and politically, or risk going against the EU’s own principles.

De-risking is a much better argument: asking the question of how a digital equivalent of the sovereign currency can prepare society for what cannot be controlled (eg. a system that is potentially fully digitalised and where the global appeal of CBDCs is high).

Communication gap

There is still a gap in the public’s understanding of the extent to which a digital euro is a useful innovation. The ECB

needs to take time to explain the reasons for the digital euro in ways that will make a tangible difference to public perceptions.

Without public support, the project will not take off. Evidence from countries that have launched CBDCs highlights the importance of clear understanding among citizens. In the meantime, the efforts the ECB has made to understand the complexities of a digital euro are very useful.

6 Conclusions

With 114 central banks worldwide at some stage of developing a digital equivalent of their sovereign currency, it is difficult to believe that the idea will not take off or that there is no added value in having a CBDC. However, there is a gap between central banks' motivations for launching CBDCs and the general understanding of what that motivation is.

Central banks in countries where financial exclusion is a first-order problem are keen to use CBDCs to provide wide access to payments. But this is not useful if there is insufficient digital infrastructure and penetration in the country.

Moreover, if the underlying sovereign currencies are weak and the institutions behind them lack credibility, the digital representation of the currency is not necessarily the tool for building trust.

Nevertheless, inclusion and protecting consumers from the pitfalls of cryptocurrencies are good societal objectives that can provide visible welfare improvements.

But for countries or jurisdictions (like the euro area) where these problems are much less prevalent, the case for establishing a retail CBDC is not strong. That does not necessarily devalue the efforts to understand the choices and trade-offs that must be considered in the process of creating a CBDC.

Moreover, as an attempt to prepare for a future in which the global financial system is more digitalised or there is a need to rethink intermediation, the ECB's efforts are worthy investments.

However, more efforts should be made in terms of creating wholesale CBDCs to facilitate cross-border payments outside the euro area. There are immediate and sizeable savings to be had in both time and costs. Wholesale CBDCs also have the potential to change the international financial system and therefore the EU's position in it.

From the perspective of the US (and to a lesser extent the EU), as more countries seek to create wholesale CBDCs, the greater the threat of a fragmented global financial system, with other currencies taking a more prominent role.

It may be early days, but the EU must explore how to reap the benefits of new technology in wholesale payments, while protecting the global cooperation from which it benefits. Given the work it has already done on the retail digital euro and the EU's very advanced payment methods, the ECB is uniquely positioned to help create the global standard, and in the process to help protect the EU's global strategic interests. ■

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The EU's strategic dependencies unveiled

Román Arjona, William Connell Garcia and Cristina Herghelegiu find that the EU benefits greatly from its wide participation in international value chains

The EU benefits greatly from its wide participation in international value chains. However, that integration is not exempt from strategic dependencies on products and inputs that are critical for Europe. This column examines the EU's dependencies in traded goods using data from 5,400 products imported between 2017 and 2020.

Foreign-dependent products span various sectors, including energy-intensive industries, health, renewables, and digital. China emerges as the primary source for these dependent products, followed by the US and Vietnam. Policymakers can use these insights to enhance supply chain resilience and mitigate vulnerabilities.

Over the past decades, the world has experienced unwavering changes in the shape of longer-term complex societal challenges: climate change, population ageing, and a massive digitisation of the economy and society.

While some of those have brought about numerous opportunities, others have exerted pressures on Europe's economy, industry, and society. An open-ended 'permacrisis' or 'age of disorder', anchored in relentless disruptions and high uncertainty, has added an additional layer of intricacy to the efforts in place to curb these challenges.

The cumulative impacts of the COVID-19 pandemic, the Russian invasion of Ukraine, and the energy crisis have not only bolstered geopolitical frictions but also induced a deep redefinition of the architecture and dynamics of global supply chains.

While some of the societal costs associated with the refurbishment of global value chains were conceivably unavoidable, others resulted from well-known market failures. These occur when firms prioritise their individual interests, whether financial or otherwise, over broader societal concerns.

For example, an overreliance on ring-fenced geographical areas for strategic inputs such as critical raw materials can induce a sub-optimal outcome from a societal point of view.

Against this backdrop, policymakers around the globe have crafted new policy strategies to spur competitiveness and growth, while addressing the risks stemming from the poly-crisis. Many of those put a focus on uplifting economic and social resilience.

Over recent years the EU has equipped itself with a set of policy measures to curb its strategic dependencies

In the EU, this materialised in a renewed industrial strategy with open strategic autonomy at its core. This new-fangled agenda marries openness to international trade with the creation of domestic capacity in strategic areas (European Commission 2021).

In this column, we present a methodology to measure the EU's dependencies and vulnerabilities. Our approach tracks areas where such dependencies are prone to creating ex-ante risks of supply chain distress and, in doing so, our work complements recent studies (Attinasi *et al* 2022, Baldwin 2022, Benoit *et al* 2022, Inoue and Todo 2022, Martin *et al* 2022, Lebastard *et al* 2023, Schwellnus *et al* 2023).

We also aim at rounding out other studies that analysed global and national product vulnerabilities (Bonneau and Nakaa 2020, Di Comite and Pasimeni 2023, Jaravel and Mejean 2021, European Commission 2021, Reiter and Stehrer 2021, ECB 2023, Schwellnus *et al* 2023).

The departure point of this column is 2021. In that year, the European Commission proposed a bottom-up, data-driven methodology to assess the EU's product dependencies. In a recent paper (Arjona *et al* 2023), we update this methodology by exploiting the novel FIGARO trade dataset by the European Commission that corrects for re-exports in international trade. Lack of treatment of re-exports is a drawback present in prevalent trade datasets that can lead to artificial shrinkages or upsurges in the number of dependent products.

A bottom-up, data-driven method to detect strategic dependencies

Our analysis sets its target on the universe of around 5,400 products imported by the EU from 2017 to 2020. We review and filter those products to identify a sub-set for which the EU experiences foreign dependencies.

To be classified as foreign dependent with our method, a product must meet three criteria: first, the majority of non-EU imports of that product must come from fewer than three foreign countries; second, non-EU imports of the good in question must account for at least 50% of its total EU imports; and third, non-EU imports must exceed total EU exports.

This is then complemented with an assessment of the relative rank of each of the traded goods on the three economic indicators that underpin each of the three criteria above, grouped in a single metric. We then select the top 10% of that distribution.

In short, our methodology permits us to identify those goods which suffer from an excessive concentration on foreign sources, significant scarcity within the EU, and low possibilities for domestic substitution. We subsequently scan goods in sensitive areas such as security and safety, health, and the twin transitions.

Applying the methodology described above to the EU import data, we isolate 204 products as foreign-dependent, under four main blocks. First, dependent products are identified in energy-intensive industries.

These are mostly raw materials used as inputs across many other industrial sectors. Some examples include manganese, nickel, aluminium, chromium, rare earth metals, molybdenum, borates, uranium, silicon, and permanent magnets. In addition, dependencies are identified for traditional energy inputs such as coal or petroleum coke and gases.

Second, within the health industrial ecosystem, dependencies include heterocyclic compounds, alkaloids, medicines, vitamins, and medical instruments (eg. scintigraphic apparatus, mechano-therapy or orthopaedic

appliances). We also observe COVID-19-related goods where major supply chain distress was experienced at the onset of the pandemic, such as surgical gloves or protective garments.

Third, within the renewables industrial ecosystem, dependencies are recognised in raw materials with heavy demand for the green transition, including photovoltaic cells or LED lamps. Fourth, on the digital front, we detect products such as laptops, mobile phones, monitors, and projectors.

These 204 products where the EU experiences foreign dependencies represent around 9.2% of the total extra-EU import value. When it comes to origins, China represents more than half of this value, followed by the US and Vietnam with 9% and 7%, respectively.

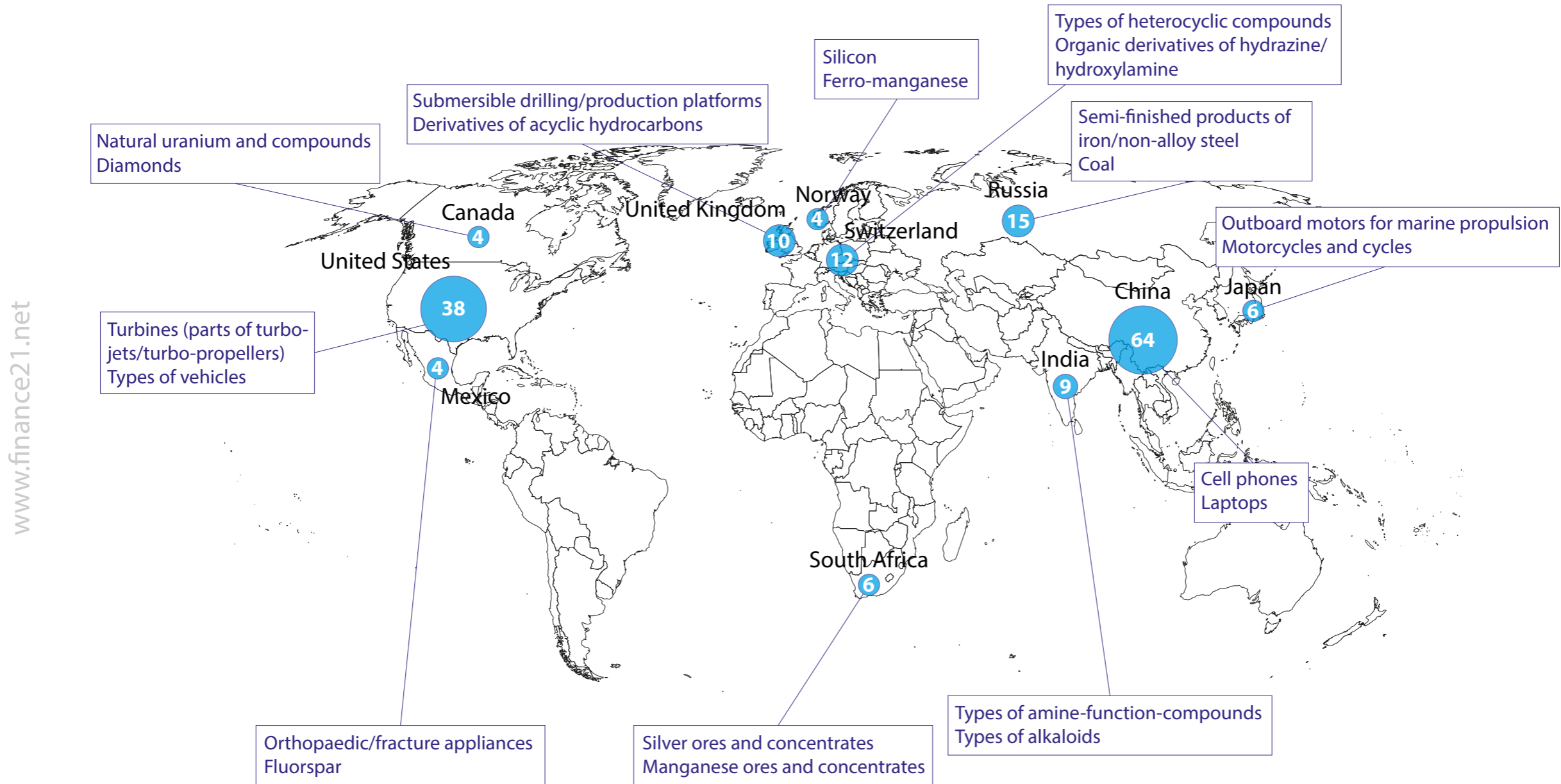
In the number of dependent products, China is the first source for 64 of them, followed by the US with 38 and Russia with 15 (see Figure 1). Examining the number of products rather than the value of imports is crucial since goods, despite facing low import values, may cause significant disruptions to society, as was the case with face masks during the COVID-19 pandemic.

Risks of single points of failure

The list of EU dependencies in strategic ecosystems can be complemented with the main features of the global trade network associated with each of the 204 identified products.

This allows us to detect goods whose production is highly concentrated at the world level and which can be considered highly vulnerable in case of supply chain distress.

Figure 1. Mapping the origins of 204 dependent products, including examples



Source: Authors' computations based on the database - Trade-Figaro-Eurostat.

Our analysis argues that the relative risk of experiencing a global single point of failure (SPOF) for any of the 204 goods is higher when a single exporter is central to a large number of countries within a given trade network, and where world production is likely to be concentrated in a single country.

We calculate the risk of a global SPOF by comparing the relative position of each of the traded goods using the two metrics above. Products with the highest aggregate risk of an SPOF appear in decile 10 of the distribution of all 5,400 HS6 products. Products with the lowest risk of an SPOF locate in the lowest deciles.

Once the relative position of each traded product is identified, we turn back to our identified list of 204 dependencies to inform policymakers when they develop mitigating actions to steer clear of such vulnerabilities.

Out of the 204 EU-dependent products, close to 20% are in the highest decile and thus bear the highest risk of experiencing an SPOF, whereas only 6% are in the lowest risk category.

Those products with the highest risk of an SPOF include goods in the health industrial ecosystem (antibiotics, vitamins, medical apparatus, and COVID-19 goods), digital (laptops and parts, radio-broadcast receivers, and mobile phones), and renewables (LED lights).

Conclusions

Our results imply that the risks associated with EU dependencies cannot be mitigated with a one-size-fits-all policy recipe. Improving our granular understanding of strategic dependencies and global SPOFs would allow, for example, us to differentiate between products where diversification through trade policy instruments is adequate from other products where risk mitigation may instead benefit from EU capacity building.

More precisely, to address EU dependencies on products for which the associated risk of an SPOF is low, EU policies should be able to fully mobilise the power of trade policy instrumentation.

On the other hand, if EU dependencies experience high risks of an SPOF, support for the creation and deployment of novel technologies, stronger R&D, circularity efforts, or stockpiling can appear as more appropriate solutions to support the building of internal EU capacity through industrial and innovation policies.

Against this backdrop, over recent years the EU has equipped itself with a set of policy measures to curb its strategic dependencies. In the case of raw materials, where EU dependencies are prominent, the recently adopted Critical Raw Materials Act (2023) has the goal of fostering the EU's access to a secure, diversified, affordable, and sustainable supply of such materials, supporting a greater EU capacity for extraction, processing, and recycling.

The European Chips Act (2022) and the Net-Zero Industry Act (2023) aim at accelerating the EU's manufacturing capacity in chips and solar panels, respectively. These initiatives secure a central position for accurate and relevant monitoring tools capable of accurately measuring and disentangling strategic dependencies.

Such tools should also be able to identify single points of failure within supply chains and thus provide early warning signals of potential supply chain disruptions. ■

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Supply matters

Financial turmoil will not stand in the way of further rate rises says Andrew Bailey, who stresses that the banking system is in a sound position and well placed to support the economy despite some global jitters

Introduction

The past few years have been a time of macroeconomic upheaval. A series of significant economic events have deeply affected the UK economy. This includes the change in our trading relationship with the European Union, the COVID pandemic with shutdowns of some sectors of the economy and supply chain bottlenecks in others, and the rise in energy prices caused by Russia's brutal war on Ukraine and its people.

These shocks have affected the UK economy in different ways. But they have all eroded the terms on which we trade with the outside world. This has made us poorer as a country; manifesting itself in a rise in the prices we have to pay for the things we buy as consumers.

UK Consumer price inflation is currently at 10.4%. This is much too high, and we need to, and will, bring it back down to the 2% target. That is why last Thursday the Monetary Policy Committee increased Bank Rate at the eleventh meeting in a row, to 4.25%. We have increased Bank Rate by more than 4 percentage points since December 2021.

These increases are being felt by households and businesses across the country.

I am afraid that monetary policy cannot make the shocks to our national real income go away. But what monetary policy can – and must – do is to make sure that the inflation that has come to us from abroad does not become lasting inflation generated at home.

Our most important tool to bring inflation down is Bank Rate. This is the interest paid on reserves held by commercial banks at the Bank of England. Because commercial banks are at the centre of a system of intricately linked financial markets, Bank Rate affects interest rates and yields more widely.

And because those interest rates and yields determine the returns on savings and the cost of credit – including the rates people pay on their mortgages, and the rates businesses pay on loans to finance their investments – monetary policy exerts a powerful influence on spending by households and businesses.

We believe the UK banking system is resilient, with robust capital and liquidity positions, and well placed to support the economy

Monetary policy, in other words, works through the management of aggregate demand in the economy. Simply put, when inflation is too high, we increase Bank Rate to dampen demand; when inflation is too low, we reduce Bank Rate to boost demand.

In reality, things are of course more complicated.

For a start, monetary policy operates with a lag. It takes time for changes in Bank Rate to work through the financial system to loan and mortgages rates, and for those changes to affect consumption and investment decisions by households and businesses.

It then takes time for changes in those spending choices to affect prices in the shops. This means that the Monetary Policy Committee needs to look ahead and focus on the outlook for inflation, as much as on its current level, when deciding the appropriate level of Bank Rate today.

When we look at the outlook for inflation today, we have to recognise that the full effect of the higher level of Bank Rate is still to work its way through financial markets and the real economy.

There is another complication. What actually happens in the economy – to economic activity and inflation – will be determined by aggregate demand and supply. Economic life plays out at the intersection between them, in an economic equilibrium. While it is sometimes useful to focus on one of the two, taking the other as given, we always have to bear in mind that market economies work through the forces of both demand and supply.

For monetary policy, the natural starting point is the demand side. Monetary policy exerts a powerful influence on the components of aggregate demand – on consumption and investment – but it can do little to affect the

supply side – the production technologies and know-how used to make goods and services available for use in the economy.

But ultimately, it is the balance between demand and supply that determines inflationary pressures in the economy. And sometimes shifts in supply can be as abrupt and as important for the inflation outlook as shifts in demand.

We have seen this very clearly in the past three years since COVID hit. Throughout this time, the Monetary Policy Committee has had to play close attention to the supply side of the economy – and make a number of critical judgements about it – for instance, as care for the public's health necessitated a pause in a range of economic activities. That is the reason I would like to focus on supply in my remarks here.

Supply, R* and monetary policy

I will start by making a distinction between the short run and the long run. Monetary policy's inability to influence supply has at times been taken to suggest that monetary policy has no effects on real economic activity at all.

In classical economic theory, for example, monetary policy only affects nominal variables such as wages and prices, not real variables such as the level of production and employment. In this tradition, real business cycle theories have been developed in which supply side disturbances are the main drivers of real activity.

But overwhelming empirical evidence, and many years of practical experience, show that monetary policy affects economic activity and inflation through aggregate demand. In the New Keynesian models that have dominated monetary macroeconomics over the past three decades, monetary policy has real effects because market prices are sticky.

So when nominal interest rates change, the real interest rates that determine real consumption and investment decisions change with them. And markets may operate with 'excess supply' or 'excess demand' for as long as it takes wages and prices to adjust to shifts in either demand or supply.

Rather, it is over longer stretches of time that monetary policy is indeed 'neutral', and that we can think of the level of economic activity as being driven entirely by supply. By facilitating low and stable inflation, monetary policy helps create conditions conducive to economic growth. But other forces will ultimately determine the growth path of the economy.

Economic growth – and with it the prospects for our real national income – will be determined by technological progress, investment and innovation, and by skills and trends in the population.

Equally, both the structure of the economy and the distribution of real national income are beyond the realm of monetary policy. Yes, monetary policy affects asset prices and unemployment over the near term. And yes, excess demand or supply may give rise to sectoral imbalances. But over the longer term, these features of our national economy will be driven by real factors and by structural policies rather than monetary policy.

Over time, even the level of interest rates is determined by such structural factors. While monetary policy steers market interest rates here and now, we do not set Bank Rate in a vacuum. The level of interest rates is anchored in an underlying equilibrium rate of interest determined by economic fundamentals on both the supply and demand side of the economy. This equilibrium rate of interest is the hypothetical interest rate that would sustain demand in line with supply, and inflation at target. We call it r^* .

The equilibrium interest rate is a theoretical concept we can use to organise our thoughts. A useful framework for understanding it was set out by the Monetary Policy Committee back in August 2018. At the core of it is a distinction between the actual level of the equilibrium rate, r^* , which moves around with cyclical factors acting on the economy, and its longer-run trend component, R^* , which moves more slowly with underlying structural factors in the economy. The equilibrium rate, r^* , in other words, fluctuates around its long-run trend, R^* , as a result of shorter-run influences on the economy.

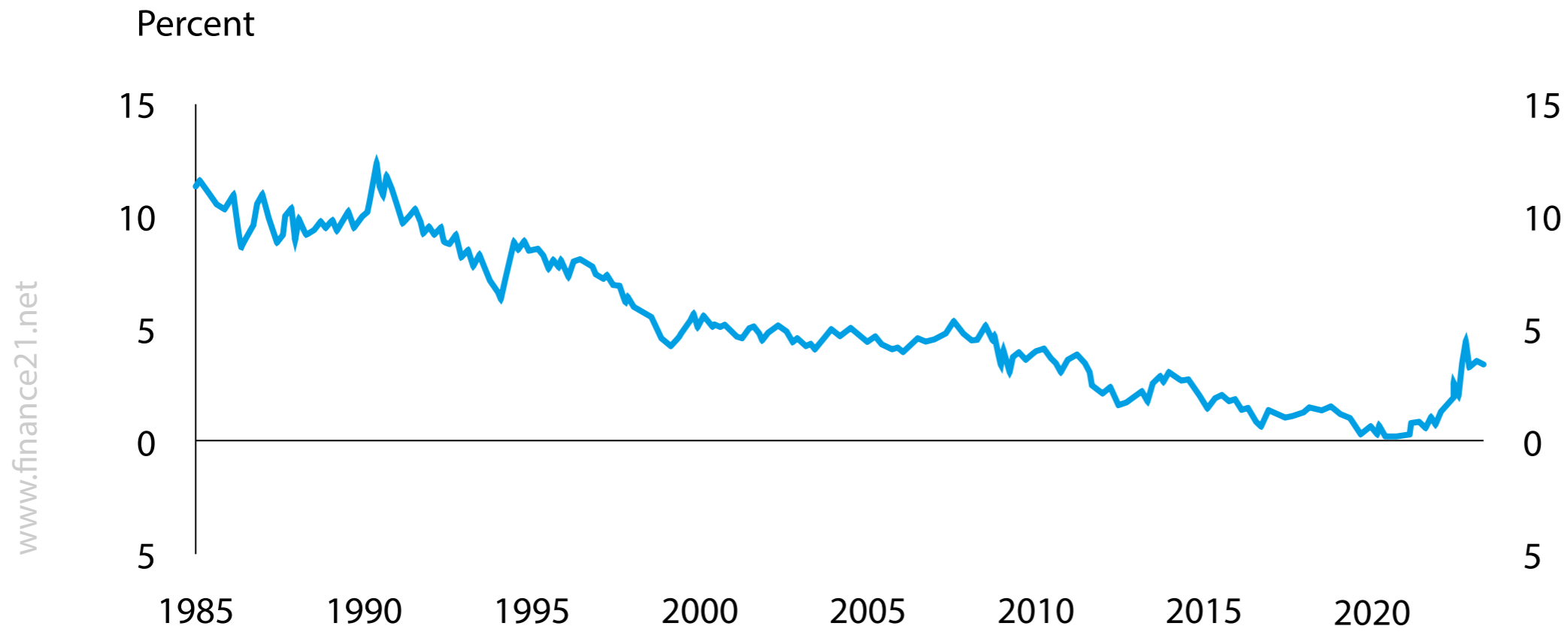
Neither r^* itself nor its trend component R^* can be directly observed, and we cannot use them as direct guides. But to the extent that they can be estimated, they may help us explain the evolution of interest rates over the past and inform our assessment of where interest will go in the future.

Let me explain this in a bit more detail. One of the most striking global trends over the past half century has been an overall decline in the level of risk-free interest rates – risk-free in the sense that they are returns on lending that carries a negligible risk that payment obligations will not be met by the borrower.

Chart 1 shows how, when we look at this over a longer period of time, ten-year UK nominal rates have fallen compared to where they were in the 1980s. Both the very low levels of interest rates we have seen in the years leading up to the COVID pandemic, and their recent rise from those levels, must be seen against the backdrop of that downward trend.

A good part of this decline can be explained by lower inflation itself. It reflects the success of inflation targeting in delivering low and stable inflation over long periods of time. Under inflation targeting, monetary policy makers act decisively to return inflation to target whenever shocks cause prices to rise or fall by too much.

Chart 1. The UK ten-year nominal rate has fallen over recent decades. Ten-year zero coupon yield (spot interest rate) from UK gilts (a)



(a) Sources: Bloomberg Finance L.P, Tradeweb and Bank calculations.

So even if inflation is now high, people can trust inflation to come back down to target. As a result, savers have come to demand a lower premium to compensate for expected inflation.

But it is not just nominal interest rates that have fallen. If we adjust nominal interest rates for inflation and look at real interest rates, we can see that they have fallen too. Chart 2 shows the UK ten-year real interest rate, measured directly from index-linked bond prices.

It is clear that the real interest rate is quite responsive to cyclical events, and that it has risen sharply over the past year. But beneath the volatility, there appears to have been a fairly steady downward trend from the 1990s at least up until the onset of the COVID pandemic.

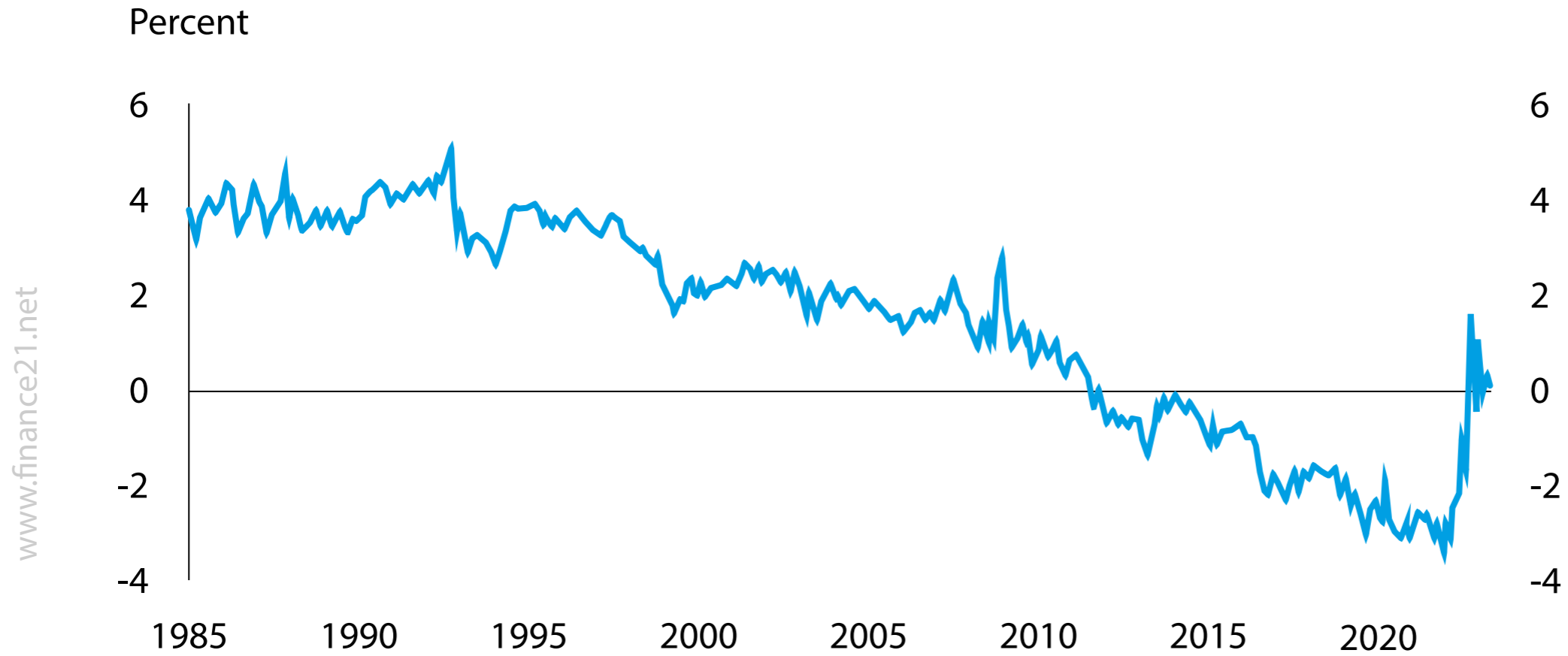
Much has been said about this trend in risk-free interest rates. Chart 3, replicated from a speech I gave last year, shows estimates of the global trend component of the equilibrium real interest rate by Bank staff (in blue) along with other estimates from academic papers. We call this trend component Global R*.

There are wide error bands around the central estimate, but the direction of travel has been clear. Global R* has fallen markedly over recent decades.

As we look deeper into the causes of this, two supply factors stand out: a slowdown in productivity growth and population ageing across advanced economies.

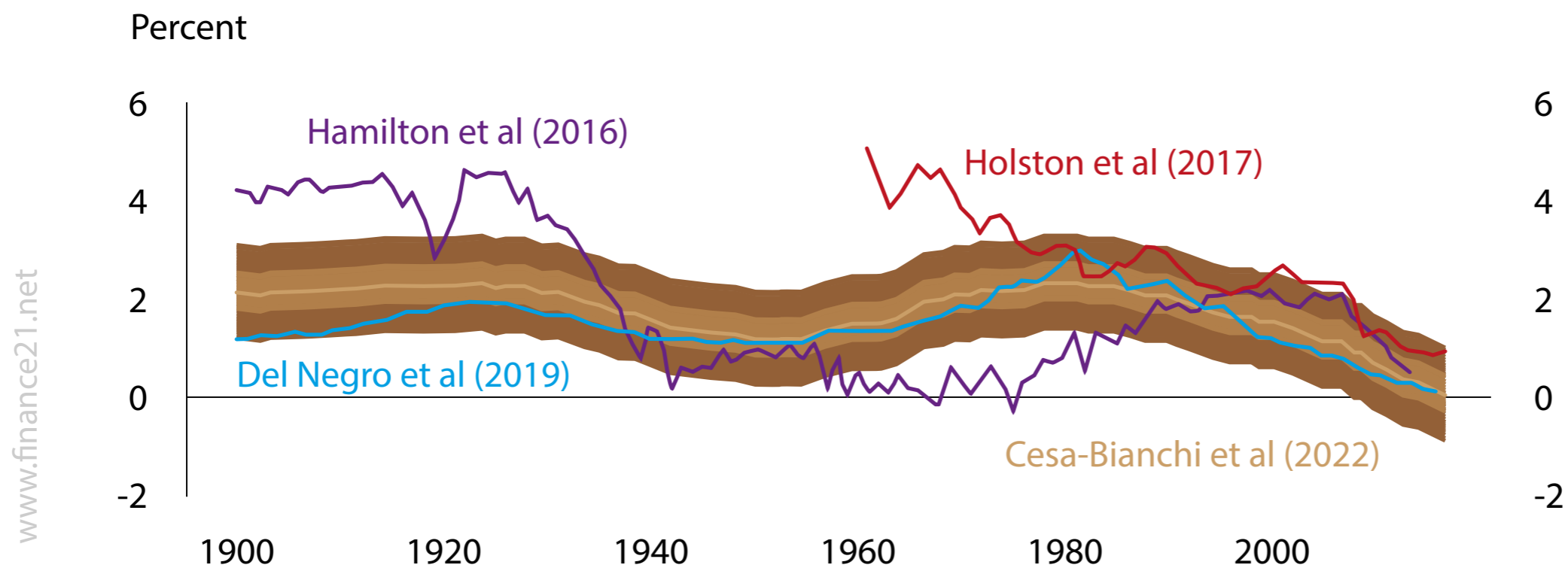
While this is a global story, let me focus on the United Kingdom.

Chart 2. The UK ten-year real rate has fallen over recent decades. Ten-year zero coupon yield (spot interest rate) from UK index-linked gilts (a)



(a) Sources: Bloomberg Finance L.P, Tradeweb and Bank calculations.

Chart 3. Empirical measures of Global R* have fallen in recent decades. Estimates from panel of 31 countries from 1900-2015 (a)



(a) Source: 'The economic landscape: structural change, global R* and the missing-investment puzzle – speech by Andrew Bailey' (with references to academic papers); and 'Structural change, global R* and the missing-investment puzzle', Bank of England Staff Working Paper No. 997 (2022) by Andrew Bailey, Ambrogio Cesa-Bianchi, Marco Garofalo, Richard Harrison, Nick McLaren, Sophie Piton and Rana Sajedi.

Chart 4, reproduced from our latest *Monetary Policy Report*, shows that there has been a marked and sustained fall in productivity growth in the United Kingdom following the global financial crisis in particular.

Looking closer at individual sectors reveals that productivity was significantly boosted by very high growth in manufacturing sector productivity in the decade before the financial crisis, much faster than in the preceding 25 years.

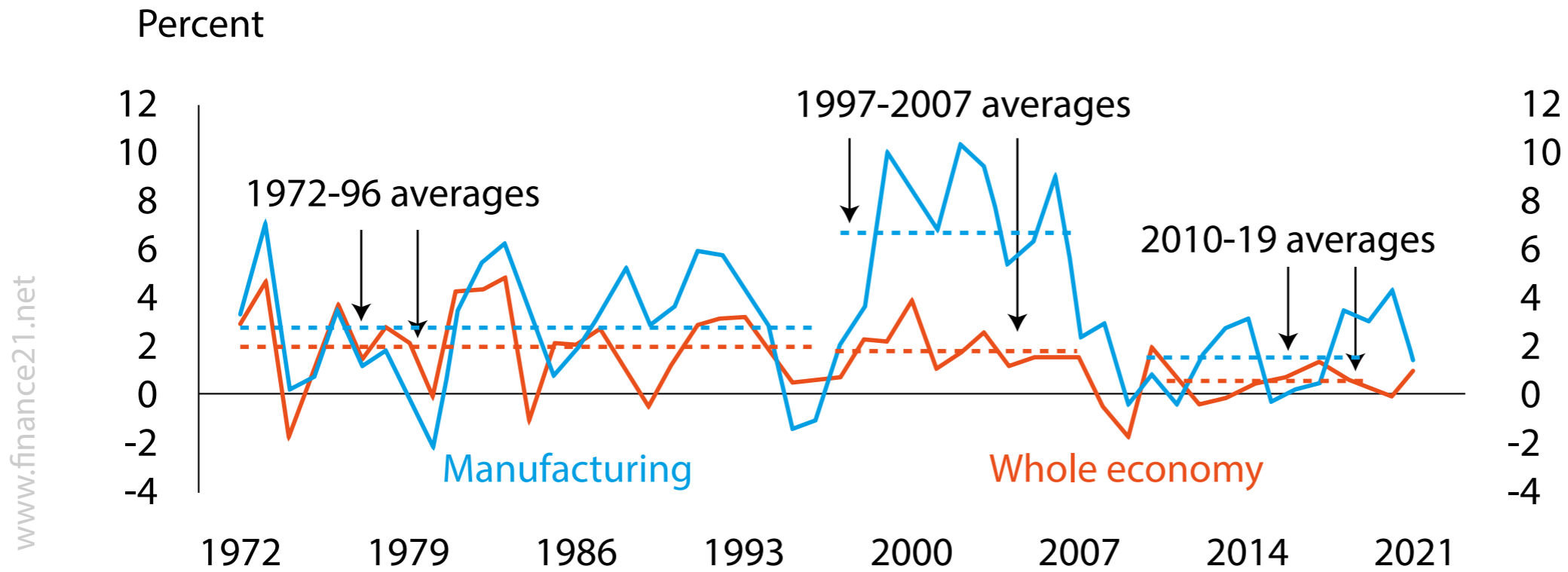
This is the period sometimes referred to as the 'Great Moderation', a period characterised by unusually low volatility in both economic activity and inflation. But following the financial crisis, manufacturing productivity growth fell back sharply. This fall in manufacturing productivity is the main cause of the slowdown.

The reasons behind it are much debated – and productivity may be harder to measure in the modern economy where businesses invest as much in intangible capital, like software and branding, as in physical capital, like buildings and machinery.

Measurement problems could be a big part of this. But much also points to structural change. Perhaps new ideas have become harder to come by, or perhaps technological innovation and specialisation have faded as globalisation slowed.

Whatever the reason, when productivity growth is weak, companies gain less from installing new capital. So weaker productivity growth has meant that firms have sought to borrow less to finance investments at a given interest rate. This reduction in the demand for capital has lowered the equilibrium rate.

Chart 4. UK productivity growth has slowed since the financial crisis. Annual growth in output per hour for the whole economy and manufacturing sector (a)



(a) Sources: ONS and Bank calculations.

The second important factor is population ageing.

Chart 5 shows the age distribution for the United Kingdom. The share of the adult population aged 20-59 has fallen below 65% in the past decade, and it is set to decline further in the coming years. This population ageing has been driven by a decline in birth rates relative to the high levels seen in the years that followed the Second World War – as well as by the happier news that people now live for longer.

As people accumulate savings over their working life to fund their retirement, wealth in the economy increases as the age distribution shifts towards older cohorts (indicated in this chart by bars in different colours).

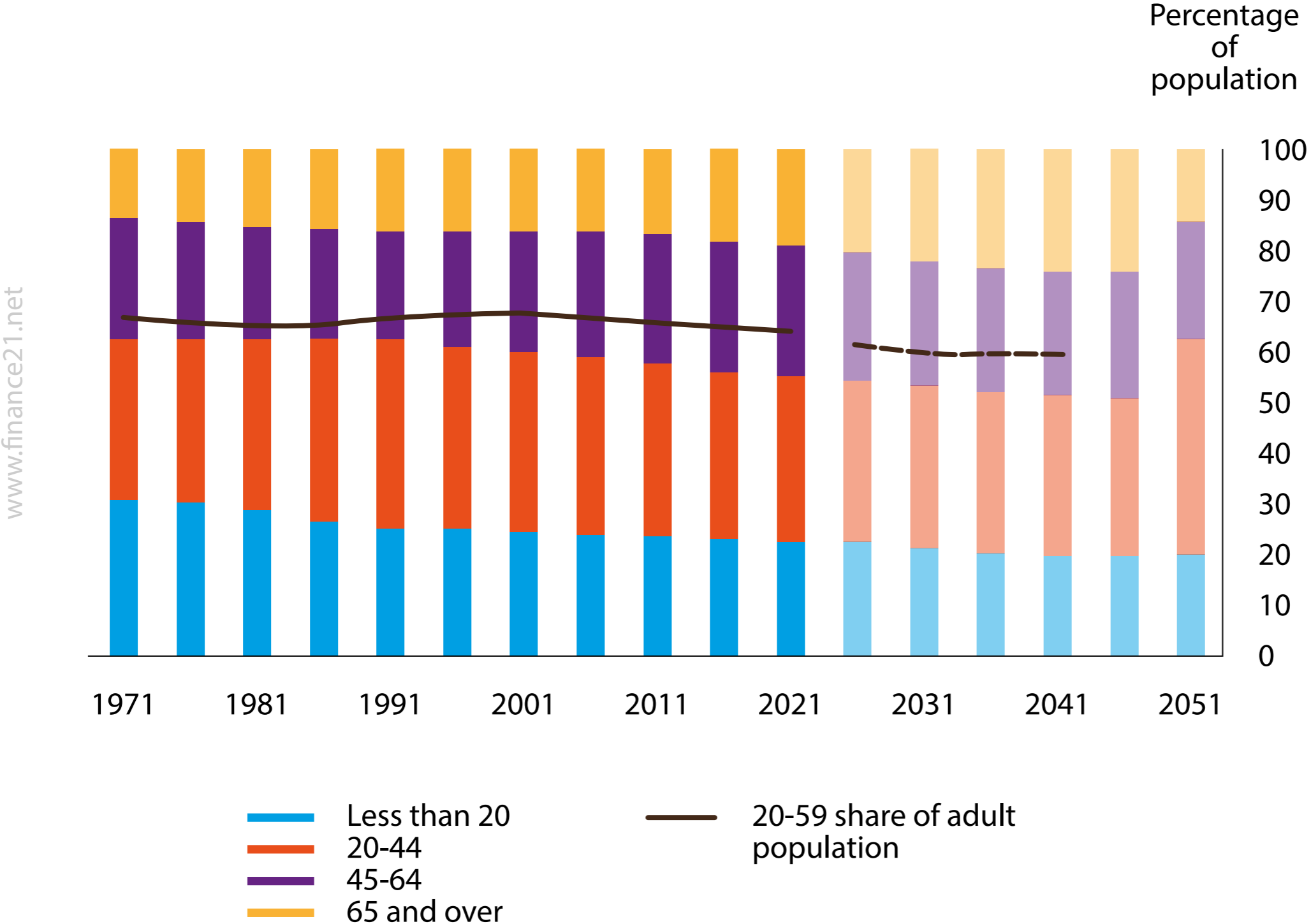
So ageing households have sought to lend more at a time when less productive firms have sought to borrow less. The only way to establish an equilibrium between the supply and demand in the market for investable funds – that is, to incentivise firms to invest this additional wealth into productive capital – has been for the price of those funds, the real interest rate, to fall.

The trend equilibrium rate, R^* , is like a long-term anchor for monetary policy. As R^* has fallen, monetary policy has moved with it. This is an important point. The low level of interest rates over the past few decades reflects deep underlying factors on the supply side of the economy.

As these underlying factors – trends in technology and demographics – only move slowly, it is not unreasonable to expect that R^* will remain low. This means that, even as we now respond to rising inflation by raising Bank Rate, interest rates will not necessarily have to return fully to, and remain around, the higher levels they once had.

But let me add a caveat:

Chart 5. Population ageing is expected to continue. Age distribution in the adult (16+) UK population (a)



(a) Dashed line and hashed bars are calculated using the ONS 2020-based interim national population projections: year ending June 2022 estimated international migration variant. Sources: ONS and Bank calculations.

“It’s important to note that forecasting the future path of R^ is challenging and subject to a significant degree of uncertainty. Economic developments and policy decisions can have unpredictable and complex effects on the economy, and it is difficult to predict their outcomes with complete accuracy.”*

This was not said or written by an economist of the human sort. This is a caveat added by ChatGPT. The ‘artificial intelligence’ underlying it reminds us that technology sometimes progresses in leaps, which can lead to a sudden emergence of productive investment opportunities across the global economy. New rounds of technological revolution are amongst the factors that could shift up Global R^* . Monetary policy would have to move with it.

So even if monetary policy is neutral in the long run, long-run supply does affect monetary policy by anchoring the level for interest rates.

Over the short term, moreover, the actual equilibrium interest rate, r^* , will fluctuate around the trend level, R^* , driven by shorter-term influences from both demand and supply. This is what matters for monetary policy here and now.

Why? Because r^* is the rate at which demand is in line with supply so that there is no output gap – neither excess demand nor excess supply in the economy. Responding to shifts in r^* is what helps keep inflation close to target.

This does not mean that monetary policy should always align Bank Rate exactly to r^* . Sometimes, monetary policy faces trade-offs between inflation and the balance of supply and demand. But it does mean that supply matters for monetary policy also in the short run. By determining the level of demand the economy can sustain without generating excess inflationary pressures, it affects the appropriate level of interest rates, effectively by setting the speed limit for the economy.

And when shocks drive inflation away from target in the way we have seen, monetary policy responds by steering demand to a level – relative to supply – that ensures that inflation returns to target sustainably. Monetary policy cannot affect this level of supply. But the level of supply will affect the appropriate setting of monetary policy.

It matters, therefore, that big shocks to the economy have weighed heavily on supply in recent times.

Chart 6, taken from the February *Monetary Policy Report*, shows that the Monetary Policy Committee's estimated level of potential supply has not yet regained its pre-pandemic level. It illustrates that the Committee based its most recent forecast of the economy on the key judgement that the level would only recover very gradually.

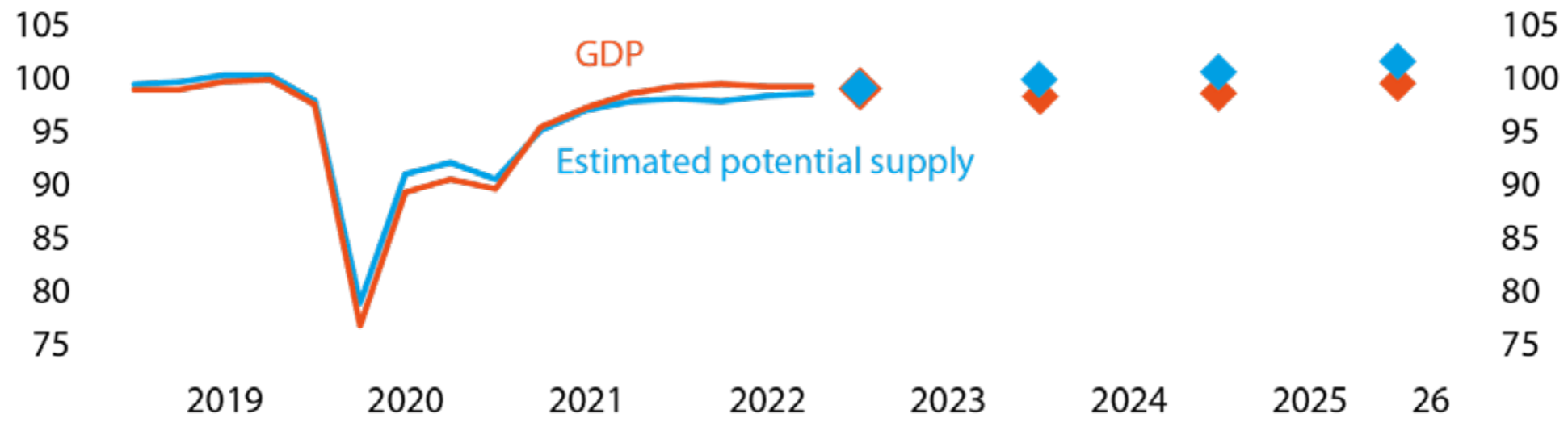
On our latest estimates, the growth rate of the potential of the UK economy – the supply side – is probably now around 1% per annum. This compares to a typical growth rate in the decade leading up to the financial crisis of nearly 2¾%.

To understand these movements in supply, we can dive into its constituent parts. Supply depends on the amount of both labour and capital in the economy. Most simply, it can be thought of as the amount of labour available in the economy and the productivity of that labour in producing goods and services.

There is a lot to be said about both. But let me focus on one of the most noticeable aspects of labour supply.

As COVID hit, labour supply growth came to an abrupt halt. The size of the workforce – that is, the share of the population taking active part in the labour market – declined by 132,000 people, or 0.4%, from the three months to December 2019 to the three months to January this year.

Chart 6. The level of supply remains weaker than its pre-pandemic level GDP and estimated potential supply (a)



Indices: GDP in 2019 Q4 = 100

(a) Diamonds are projections for 2023 Q1, 2024 Q1, 2025 Q1 and 2026 Q1. Diamonds for GDP show MPC projections. GDP in 2022 Q4 is a Bank staff projection incorporating official data to November 2022. Data include the backcast for GDP. Estimated potential supply is derived using the MPC's projection for the level of GDP and the level of excess demand/supply. Both GDP and estimated potential supply are indexed to GDP in 2019 Q4. Source: ONS and Bank Calculations.

That stands in stark contrast to a steady growth rate of around $\frac{3}{4}\%$ per year during the preceding decades. These may sound like small numbers, but even small changes in these small percentages of the whole workforce of nearly 33 million add up to a lot of people.

The primary cause of this reduction in labour supply is an increase in the proportion of the population that does not take part in the workforce either by working or looking actively for a job. As you can see in Chart 7 (white line), such economic inactivity rose noticeably during the pandemic. Unlike moves in employment and unemployment, this rise has not unwound as the economy has recovered.

There are two important factors that account for this increase in economic inactivity.

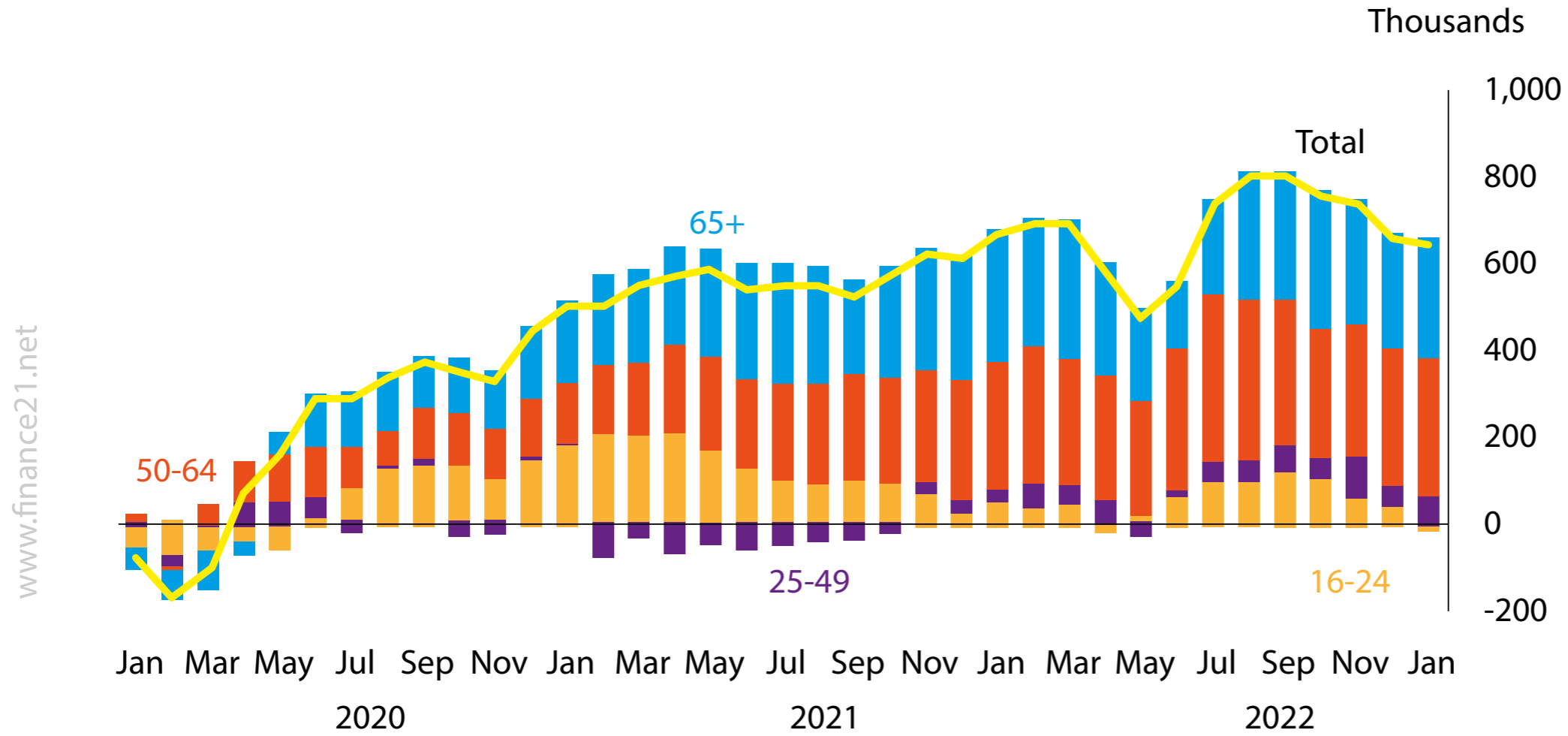
The first is the ageing of the population, which, as we have seen, has increased the share of people who are older than what at least used to be the retirement age. As shown here in blue, that accounts for around a third of the increase in economic activity. It will provide a continuing drag in the coming years.

The second factor is a change in the share of working-age people actively participating in the labour market. Particularly striking is the rise in inactivity of people aged 50-64. When leaving the labour force, many people in this age group say they have retired early, making a choice about the life they would like to live.

At the same time, people who have become inactive seem to have moved further away from the labour market, most commonly, they say, because their health has deteriorated.

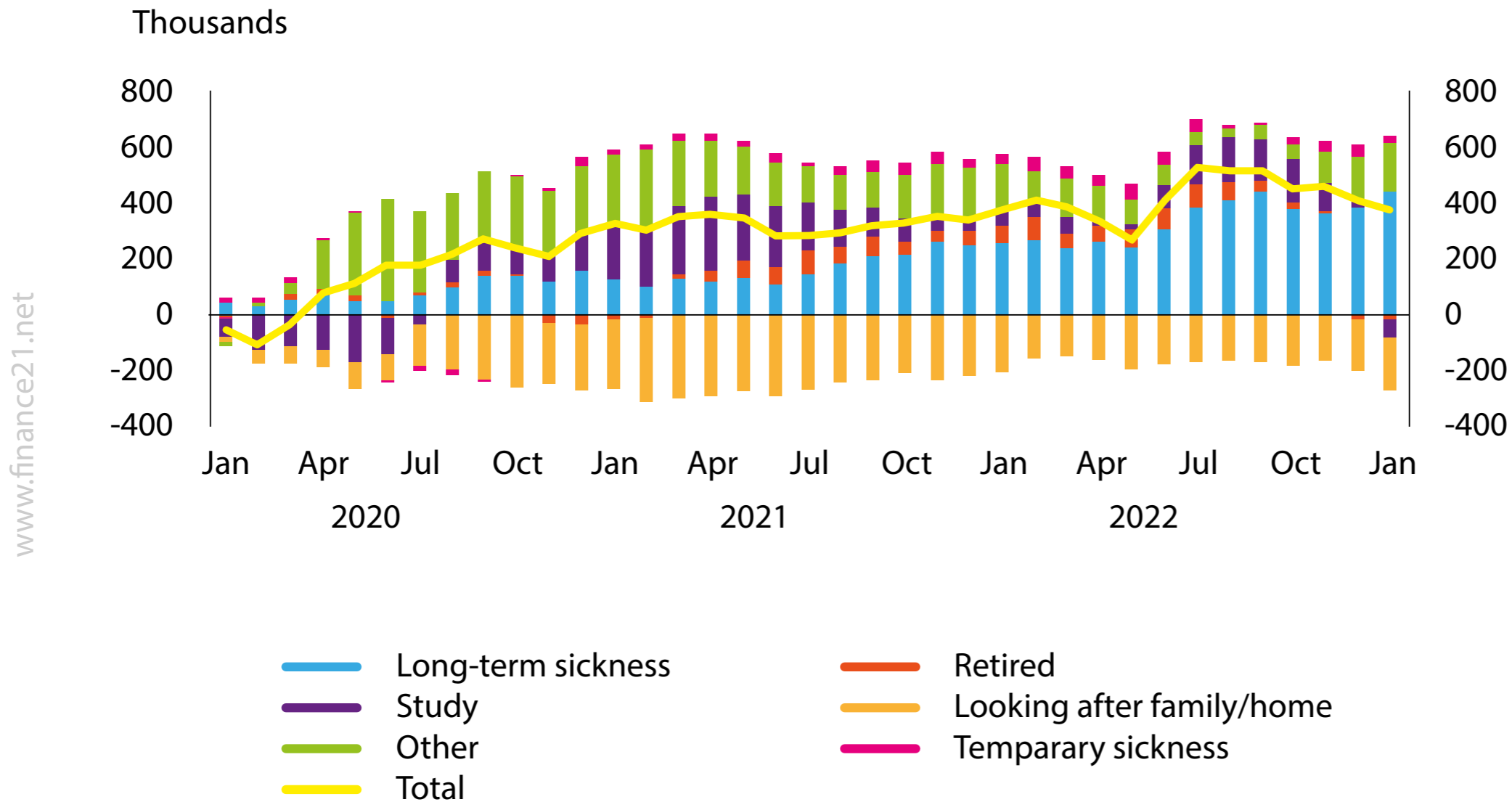
As you can see in blue in Chart 8, long-term sickness has driven much of the persistent rise in inactivity amongst 16 to 64 year olds since the start of the pandemic. That is a striking fact.

Chart 7. Labour market inactivity has risen. Change in inactivity since 2019 Q4 by age (a)



(a) Changes from the three months to December 2019, based on those aged 16+. Sources: ONS and Bank Calculation.

Chart 8. Long-term sickness has driven much of the persistent rise in inactivity. Change in inactivity since 2019 Q4 by reason (a)



(a) Changes from the three months to December 2019, based on those aged 16–64. Other reasons include: discouraged workers; those awaiting the results of a job application; have not yet started looking for work; do not need or want employment; have given an uncategorised reason; or have not given a reason. Sources: ONS and Bank Calculation.

As their number has increased, the inactive population appears more detached from the labour market. More of the inactive people now say that they would not like a job than before the pandemic, and fewer now expect to return to work.

How should monetary policy respond to such a reduction in labour force participation? The first thing to note is that this does not seem to be a case in which participation has fallen in response to weaker economic conditions and a weaker labour market. This is not a fall in participation driven by a shock to demand. So, we should not expect there to be a margin of spare capacity outside the workforce that exerts downward pressure on inflation in a way that would call for a lower level of interest rates to stimulate demand.

Instead, the rise in economic inactivity is a change to the supply of labour, independent of demand, in particular by older workers. If those workers have accumulated enough savings to sustain a desired level of consumption much like the one they had before their early retirement, at least for a while, aggregate demand will not have fallen by as much as aggregate supply. We should expect this to put upward pressure on inflation in a way that would call for a higher level of interest rates to dampen demand.

So while population ageing is very likely to pull long-run R^* down, as I discussed earlier, the effects on shorter-run r^* from a change in labour force participation are harder to assess. In the shorter run, by reducing the productive capacity of the economy, the rise in inactivity driven by early retirement seems likely to have contributed to a rise in cyclical r^* . This is part of the reason why we have had to raise Bank Rate by as much as we have.

Monetary policy in the time of COVID

Let me take a step back and revisit our response to COVID in light of this discussion. This episode is a particularly clear example of how difficult it can be in practice to judge the relative impact of supply and demand.

The pandemic was highly unusual and difficult for many reasons. In terms of the economy, it was unusual for the sudden and extreme fall in economic activity, but also for the almost synchronous and equivalent fall in both aggregate demand and supply.

In most recessions, demand falls much more abruptly than supply. An output gap opens up, creating spare capacity in the economy and usually a rise in unemployment. That is not what happened during COVID.

The reason this unusually synchronous pattern of movements in aggregate demand and supply took place is not hard to find. Government policy on public health, in the face of the most extreme pandemic for at least a century, led to deliberate lockdowns. Much of economic activity simply ceased.

The important question we faced as monetary policymakers was what would happen when the restrictions were lifted as COVID abated. Would a synchronous and equivalent fall in demand and supply simply be followed by a synchronous and equivalent rise?

At the time, I remember being asked quite often if the pandemic would leave scars on the economy: would there be any lasting damage to the economy?

As put, the question was about whether firms would be able to survive the prolonged economic impact of the pandemic, let alone continue to invest in the future – or whether millions would be driven into unemployment as the Government furlough scheme, which remunerated those whose jobs were in effect suspended, was set to end at the end of September 2021.

This was by no means clear at the time. The furlough scheme was unprecedented and had been operating for 1½ years, and even firms were unsure of what the effects on recruitment would be, as they reported to the Bank's Agents at the time.

A key consideration for policy, therefore, was to ensure that supply would come back on stream, and for monetary policy in particular to ensure that there was sufficient demand in the economy to pick it up.

What actually happened was quite different from what we had feared. The situation we found ourselves in over the autumn and winter of 2021-22 was not a looser labour market and an increase in unemployment as the furlough scheme ended. Rather, it was a tighter labour market and a decline in labour market participation. As Chart 6 shows, during this time, supply turned out to be weaker than demand.

In other words, as demand increased after COVID restrictions ended, supply did not follow to the same extent.

At the same time, a rotation in demand away from services and towards goods, in particular in the United States, continued to put strains on global supply chains. And unfortunately, the contraction in the labour force coincided with the most extreme shock of all during this period, the impact, particularly on energy prices, of Russia's appalling and unprovoked invasion of Ukraine.

So the supply side has played a more important and unusual role in recent macroeconomic developments.

Conclusion

Now let me conclude with a few remarks on where we stand with monetary policy today. The economy has been subjected to some very large and overlapping shocks. The largest impact has come from the effect of Russia's

invasion of Ukraine. This appalling act had a massive impact on energy prices last year, and has substantially affected other prices, notably food. For a variety of reasons, particularly in energy markets, those effects are now unwinding.

It is primarily for this reason that we expect to see a sharp fall in inflation during the course of this year, starting probably in a couple of months or so from now.

Growth in the economy has suffered too, as a consequence of the sheer scale of the hit to the terms of trade. There has been a very large impact on national real income, from which I am afraid there is no hiding. But there is better news on that front, the economy has been more resilient of late, helped by the sharp fall in energy prices. The same is true for the world economy more broadly.

What does this mean for monetary policy looking forwards? The remit is clear. The adjustment and response to the shocks we have experienced must return CPI inflation to the 2% target sustainably. We must avoid these very large shocks leading to persistent inflation, and that is why we have raised the official interest rate eleven times, to 4.25%.

Recently, the evidence has pointed to more resilient activity in the economy, and likewise employment; signs that nominal wage growth has been rather weaker than expected; and two months in which there was first some downside news on inflation relative to our expectation and then a bit more upside news. This reminds us that the path of inflation will not be entirely smooth and cost and price pressures remain elevated.

Alongside all of this news, we have seen some big strains in parts of the global banking system emerge. Assessing this would be another speech. Suffice to say that we believe the UK banking system is resilient, with robust capital and liquidity positions, and well placed to support the economy.

We have a strong macroprudential policy regime in this country. With the Financial Policy Committee on the case of securing financial stability, the Monetary Policy Committee can focus on its own important job of returning inflation to target.

We have to be very alert to any signs of persistent inflationary pressures. If they become evident, further monetary tightening would be required. With this in mind, the MPC's response will be firmly anchored in the emerging evidence. ■

Andrew Bailey is the Governor of the Bank of England

I am grateful to Ben Broadbent, Fabrizio Cadamagnani, Kieran Dent, Izzy Doughty, Marco Garofalo, Michael Goldby, Richard Harrison, Karen Jude, Tomas Key, Catherine L Mann, Huw Pill, Dave Ramsden, Andrea Rosen, Martin Seneca, Bradley Speigner, Danny Walker and Laura Wallis for helpful comments and assistance in helping me to prepare for these remarks, and to ChatGPT for its views on R^ . This article is based on a [speech](#) given at the London School of Economics, 27 March 2023.*

The path ahead



Christine Lagarde says dynamic between profits and wages risks continuing to drive up prices, and warns of danger of 'tit-for-tat' inflation

The euro area has been hit by an inflation shock, which is now working its way through the economy. While headline inflation is likely to decline steeply this year, driven by falling energy prices and easing supply bottlenecks, underlying inflation dynamics remain strong.

In such an environment, our ultimate goal is clear: we must – and we will – bring down inflation to our medium-term target in a timely manner. But to achieve this goal we need a robust strategy, which takes into account the high levels of uncertainty we are facing today.

As John Maynard Keynes once observed, *“it would be foolish, in forming our expectations, to attach great weight to matters which are very uncertain.”*

In current conditions, a robust strategy calls for a data-dependent approach to making policy and a clear reaction function so that the public understands the sources of information that will be important to us.

To that end, our future policy path will be determined by three factors: our assessment of the inflation outlook in light of the incoming economic and financial data, the dynamics of underlying inflation and the strength of monetary policy transmission.

At the same time, I have made clear that there is no trade-off between price stability and financial stability. We have plenty of tools to provide liquidity support to the financial system if needed and to preserve the smooth transmission of monetary policy.

In my remarks, I will discuss our policy path so far and what lies ahead. And I will explain the reaction function that will govern our future rate decisions.

The path so far

Last year, inflation in the euro area surged strongly, and spread deeply, because it was driven by two types of shocks which hit the economy at the same time. First, we underwent an unprecedented series of negative supply shocks caused by pandemic-induced supply chain disruptions, Russia's invasion of Ukraine and the ensuing energy crisis. This significantly increased input costs for all sectors of the economy.

Faced with a world that is changing faster than any of us could have imagined, we need to be both focused on our goal and robust in our strategy to achieve it

Second, we faced a positive demand shock caused by the reopening of the economy after the pandemic. That favourable demand environment allowed firms to pass rising input costs through to prices much faster and more strongly than in the past¹.

Our policy stance was starting from highly accommodative levels, having been tailored to the very-low inflation environment of the past decade and the initial deflationary risks of the pandemic. So, we had to adjust, as quickly as possible, a stance that had become inadequate.

This initially placed important emphasis on signalling, ie. demonstrating, through actions and commitments, that monetary policy would cover the necessary ground decisively. That is why we put a great weight on the pace of our actions, hiking rates in large increments.

And we also communicated a clear upward path for rates, so that the public could be confident that monetary policy was on an anti-inflationary path, and that rates would soon leave accommodative territory. In a sense, an emphasis on data dependence was less important because monetary policy had distance to cover across all scenarios.

But as the inflation outlook evolved, it became clear that a pure normalisation of policy – which would imply achieving a broadly neutral stance – would not suffice in itself. The combination of shocks had two effects – on distance and persistence – which warranted further policy action.

First, the shocks increased the distance of inflation from our target. Even though inflation has likely passed its peak, it is descending from very high levels, and it is projected to be too far above our target for too long. The longer inflation is too high, the greater the danger that it remains so.

Second, the shocks also increased the risk that above-target inflation becomes more persistent. In particular, price pressures have broadened and deepened. Measures of underlying inflation tracked by the ECB currently range between 4% and 8%.

In this setting, we needed to bring rates to sufficiently restrictive levels to dampen demand. And, in doing so, we could keep a firm grip on inflation expectations and ensure they remain anchored.

That is a key reason why we committed to raise interest rates significantly and at a steady pace over recent meetings – and why we decided last week that a further 50 basis point hike was necessary.

The policy path ahead

Now a sizeable policy adjustment is already behind us: since July last year we have raised interest rates by 350 basis points. However, inflation is still high, and uncertainty around its path ahead has increased. This makes a robust strategy going forward essential. Such a strategy has three elements.

First, with high uncertainty, it is even more important that the rate path is data-dependent. This means, ex ante, that we are neither committed to raise further nor are we finished with hiking rates. Indeed, as I explained recently, if the baseline scenario in our most recent projections is confirmed, we will still have ground to cover to make sure that inflation pressures are stamped out.

Second, while the European banking sector is resilient, with strong capital and liquidity positions, in view of recent financial market volatility, we are ready to act and provide liquidity support to the financial system if needed and to preserve the smooth transmission of monetary policy.

But it should be clear that there is no trade-off between price stability and financial stability. As we have proven many times, we are able to set the appropriate policy stance to control inflation and at the same time use other instruments to address risks to monetary policy transmission.

We did this when we decided to use reinvestments under the pandemic emergency purchase programme more flexibly, and when we agreed on the transmission protection instrument. These programmes ensured that rate normalisation proceeded smoothly.

The third element of a robust strategy is a clear reaction function. At our last meeting, we clarified our reaction function and the sources of information that will be important to us. The future calibration of the rate path will be determined by – and will require continuous monitoring of – three key inputs, and this is what I will explain now.

The inflation outlook

The first input is our assessment of the inflation outlook in light of the incoming economic and financial data. This will be informed primarily by our staff inflation projections.

Monetary policy must be forward-looking, given the lags with which our policy works. And the staff inflation projections are the best mechanism for distilling incoming economic and financial data into a comprehensive picture of medium-term inflation dynamics. The future rate path will depend on whether we see inflation converging durably to our target in our forecasts, and the level of confidence we have in this convergence as captured by the balance of risks.

Our latest forecasts see headline inflation at 2.1% in 2025 and core inflation at 2.2%, which is a downward revision compared with our last projection round in December. But the confidence band around these forecasts is now unusually wide.

As the cut-off date for the projection round was in early March, the forecasts do not incorporate the effects of the recent financial market tensions. Those tensions have added new downside risks and have made the risk assessment blurrier.

More generally, many of the assumptions in the projections, such as those on fiscal policies and energy and food prices, are volatile. This implies additional uncertainty around the baseline for both growth and inflation.

Some of this uncertainty will recede as the fallout from recent events in financial markets becomes clearer. But faced with overlapping shocks and shifting geopolitics, the level of uncertainty will most likely remain high. To confirm the outlook in our projections over time, we therefore also need to look at additional indicators that can be observed in real time.

Underlying inflation

To that end, the second input we will be drawing on is the dynamics of underlying inflation. Underlying inflation is not a policy target, but measures of underlying inflation can serve as a complementary cross-check of our forecasting process.

Underlying inflation is typically quite inertial and therefore gives us an indication about the persistence of inflation into the medium term. We will be looking to see a sustained downward turn in underlying inflation measures to be confident that the inflation path will converge to our target in the medium term.

So far, we do not see clear evidence that underlying inflation is trending downwards. In fact, we see two forces pushing underlying inflation in different directions.

To the one side, falling energy prices are weakening a key driver of underlying inflation pressures. Imported energy prices have played a central role in pushing up inflation for all economic sectors, given the huge energy shock we have faced. This is why measures of underlying inflation that capture the more persistent effects of energy costs are already showing a decline².

To the other side, increasing domestic price pressures could offset some of this disinflationary impulse. Measures of underlying inflation that capture items sensitive to the business cycle – such as Supercore³ – or items with low import content are still strengthening.

If this continues and aggregate demand picks up from its current compressed levels, we could see a handover from imported to domestic price pressures that keeps overall price pressures high. The key issue in determining which of these forces wins out will be developments in wages.

The euro area has suffered a large terms-of-trade loss owing to rising energy prices, the cost of which must ultimately be shared between firms and workers. And it is important that there is fair burden sharing between them, with both accepting that they cannot fully recover the income that the euro area has paid to the rest of the world and the ensuing loss of output.

So far, real wages have decreased substantially, while firms' profit margins have expanded in many sectors. But the labour market is quite tight, labour shortages are increasing, and the terms-of-trade shock has largely reversed. This is leading workers to use their bargaining power to recoup lost income.

For the seven countries covered by the ECB's wage tracker⁴, collective bargaining during 2022 led to an aggregate wage rise of 4.7% for this year. This is already playing a stronger role in core inflation. While wage-sensitive items⁵ contributed only around 0.5 percentage points to core inflation before the pandemic, that contribution has more than doubled in recent months.

If both workers and firms accept fair burden sharing, and stronger wage growth represents merely a rebalancing between labour and capital, then both wage and price pressures should diminish as this process plays out. But if both parties attempt to unilaterally minimise their losses, we could see a feedback mechanism between higher profit margins, wages and prices.

The risk of such a 'tit-for-tat' dynamic is also heightened by the prospect that labour market tightness will linger. Unlike other jurisdictions, labour participation in the euro area has grown robustly since last year⁶, helping to address part of the soaring labour demand driven by reopening.

But the pandemic has also led to a sharp increase in public employment⁷, reducing the pool of labour available to the private sector. And how much further labour supply can expand overall will depend, among other things, on complex policy questions such as countries' attitudes to immigration and childcare.

At the same time, the unemployment rate is at a historical low and, in some countries, it is so low that it will be increasingly difficult to recruit from the remaining pool of labour.

All this means that we could see a more prolonged cost-push shock coming from wage growth. This is unlikely to prevent goods disinflation, since wages represent only around 20% of direct input costs for manufacturing firms.

But wages make up around 40% of direct input costs for services providers, and services inflation accounts for almost two-thirds of core inflation.

In parallel, firms' profit margins continue to grow, in part because some are taking advantage of supply-demand imbalances to test consumer demand with large price increases – over and above their increase in costs. But in the absence of a persistent rise in market power⁸, this can only continue insofar as demand remains resilient. Otherwise, firms will have to absorb cost increases in margins and price pressures will start to ease.

This is where the third input comes in that we will use to assess the rate path, which is the strength of the transmission of our policy measures in restricting demand.

Policy transmission

We saw a large contraction in domestic demand at the end of last year and the latest data, such as retail sales, suggest that consumption has not yet rebounded. But this has not stopped cost increases from passing through. Short-term measures of momentum in core inflation – for instance the three-month on three-month rate – actually increased in February.

There are two factors which could explain this apparent resilience. The first is the atypical buffers for consumption that households have available in the current environment. They are still benefiting from sizeable fiscal policy support to shield them from rising energy prices, amounting to around €250 billion in 2022 and 2023, and they still have around €900 billion in excess savings built up during the pandemic⁹.

The second factor is the reduced sensitivity of the labour market to slowing growth, which is supporting labour income and households' employment expectations. Faced with labour shortages, firms are responding to weaker demand first by hoarding labour – that is, by further reducing hours worked rather than by cutting jobs.

And now, with energy prices falling and wages rising, household disposable incomes are set to increase. This was reflected – before the recent financial market tensions arose – in our projections for a stronger recovery this year.

So, for inflationary pressures to ease, it is important that our monetary policy works robustly in the restrictive direction. And that process is only starting to take effect now.

The first leg of the monetary transmission process – from policy measures to financing and monetary conditions – is already having a substantial impact. The cost of borrowing is increasing steeply, and loan dynamics look to be contracting faster than during previous hiking cycles. Credit growth to firms has dropped markedly since the third quarter of last year.

We are also seeing a tightening of money, with annual M1 growth turning negative for the first time since the creation of the euro area - although this is also being driven by the shifting of funds from overnight to better-remunerated time deposits in the context of higher rates.

For the second leg of the transmission process – from tighter financing and monetary conditions to demand – there is currently more uncertainty. We know that the full effect of monetary policy on demand will only reveal itself over time. But both the strength and speed of this process could have changed.

Since the ECB last conducted a major hiking cycle, in the mid-2000s, the financial structure of the euro area has evolved. The share of variable-rate mortgages has fallen, slowing the transmission of interest rate increases into debt payments.

Excess savings and the low pass-through to deposit rates might also weaken incentives for households to save more of their income in response to higher policy rates. These factors could mean a weaker pass-through to consumption.

At the same time, we have seen a very sudden shift from low-for-long rates to considerably higher levels – and this is already having an impact on more interest-sensitive demand components like investment. Housing investment has been falling for the past three quarters and business investment also contracted at the end of last year. The greater role today played by sectors that rely on discounted future earnings, such as tech, could also make monetary transmission more powerful.

What we will have to monitor carefully in the weeks and months to come is whether there is a further strengthening of this pass-through. If, for example, banks start to apply a larger ‘intermediation wedge’ – meaning that at any level of the base rate they demand a higher compensation for the perceived risk they are taking on when lending – then pass-through will become stronger.

So, we will be paying close attention to a range of indicators of credit availability and credit pricing, such as the monthly data on money and credit flows, our bank lending survey and our survey on access to finance for small and medium-sized enterprises.

While more restrictive credit conditions are part of the mechanism by which our tightening ultimately reins in excess price pressures and brings inflation back to target, we will make sure that the process will be orderly throughout.

Conclusion

Voltaire said *“Uncertainty is an uncomfortable position. But certainty is an absurd one.”* Faced with new and overlapping shocks, we have no choice today but to deal with uncertainty.

But the public can be certain about one thing: we will deliver price stability, and bringing inflation back to 2% over the medium term is non-negotiable.

We will do so by following a robust strategy that is data-dependent and embeds a readiness to act, but that does not entertain trade-offs around our primary objective.

Faced with a world that is changing faster than any of us could have imagined, we need to be both focused on our goal and robust in our strategy to achieve it. ■

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Endnotes

1. Lagarde, C (2022), [“Monetary policy in a high inflation environment: commitment and clarity”](#), lecture organised by Eesti Pank and dedicated to Professor Ragnar Nurkse, Tallinn, 4 November.
2. This is visible, for example, if one compares the persistent and common component of inflation (PCCI) and the PCCI excluding energy. The former has been declining strongly since the summer of last year, whereas the PCCI excluding energy has only stabilised.
3. For an explanation on different measures of underlying inflation, see Ehrmann, M, Ferrucci, G, Lenza, M and O’Brien, D (2018), [“Measures of underlying inflation for the euro area”](#), Economic Bulletin, Issue 4, ECB and ECB (2021), [“Inflation measurement and its assessment in the ECB’s monetary policy strategy review”](#) Occasional Paper Series, No 265, September.
4. Germany, France, Italy, Spain, the Netherlands, Austria and Greece.
5. Defined as those items in the core inflation basket for which wages account for more than 40% of input costs.
6. According to the labour force survey, the labour force has increased by 2.2 million since the start of last year and remains well above pre-pandemic levels, due to the rising participation of foreign workers (+1.3 million), women and older workers.
7. Employment growth in the public sector has accounted for about half of total employment growth since the end of 2019.
8. Kouvavas, O, Osbat, C, Reinelt, T and Vansteenkiste, I (2021), [“Markups and inflation cyclicality in the euro area”](#), Working Paper Series, No 2617, ECB.
9. However, the concentration of accumulated savings among higher-income households limits the extent to which this buffer can support the recovery in consumption, and the real value of excess savings has declined due to inflation

This article is based on a [speech](#) delivered at the “The ECB and Its Watchers XXIII” conference, Frankfurt am Main, 22 March 2023.

A background image of space featuring the Earth on the left, the Moon in the center, and a bright sun or star on the right, creating a lens flare effect.

Bringing EPGs to the centre of the policy debate

Marco Buti, Alessandro Coloccia and Marcello Messori
argue that a well-functioning economic union needs a
permanent central fiscal capacity

A well-functioning economic union needs a permanent central fiscal capacity. This column argues that European public goods are a promising way for the EU to pursue projects implemented at a centralised level by means of common financing. The authors devise an operational definition of European public goods and lay out ways to fund and deliver them.

Acknowledging that issues remain before such public goods could be launched at scale, the authors propose the upcoming review of the EU Multiannual Financial Framework as an opportunity to place them at the centre of policy debate.

European public goods (EPGs) allow the EU to pursue projects implemented at a centralised level by means of common financing. EPGs have been revived recently in the context of the green and digital transition (Fuest and Pisani-Ferry 2019).

This renewed attention was prompted by the pandemic shock, which convinced the EU member states of the need to create a central fiscal tool, albeit of a temporary nature, in the form of NextGenerationEU (NGEU) and its main component, the Recovery and Resilience Facility (RRF). Many observers believe that the RRF should be transformed into a permanent instrument, thereby creating a European central fiscal capacity.

However, despite its innovative scope, the RRF is characterised mainly by national use of EU financial resources (transfers and loans), as the European Council negotiations led to a reduction in the share of EPGs (Papaconstantinou 2020).

Therefore, making it permanent would be politically controversial, as it could raise concerns that the EU is turning into a 'transfers union'. This risk would be mitigated by focusing on the production of EPGs (Buti and Papacostantinou 2022, D'Apice and Pasimeni 2020).

EPGs are less politically contentious compared to other forms of central fiscal capacity for at least two reasons. First, EPGs weaken the juste retour (or net balance) narrative, according to which each EU country tends to subtract how much it contributed to the EU budget from how much it received back directly.

Second, the production of EPGs would lessen the tensions between alleged 'creditors' and 'debtors' and the consequent risks of opportunistic behaviours linked to transfers to national budgets. From a policy perspective,

To finance and deliver EPGs, it is necessary to put in place a permanent central fiscal capacity because the common EU projects [...] have a medium to long-term dimension

EPGs could help deliver the 'triple transition' (green, digital, social) and promote the role of the EU in international markets, thus helping to reconcile European domestic and global agendas.

Furthermore, EPGs can play an important role in tackling the economic and political fallout from the Russian invasion of Ukraine.

This column is part of a long-standing research stream on EPGs that has addressed their implications for the euro area policy mix (Buti and Messori 2021a, 2022a), the role of the EU in global governance (Buti and Messori 2021b, 2022b), and the future of NGEU (Buti and Messori 2023).

Against this background, in the next two sections, we put forward an operational definition of EPGs and outline a preliminary classification of these goods. We then explain how EPGs could be delivered and financed. The final section concludes.

Key features of EPGs

The EPGs can be interpreted as a specific application of the concept of global public goods utilised by Kindleberger (1973) and many others (Buchholz and Sandler 2021) to extend the theoretical concept of pure public goods (Samuelson 1954 and 1955, Buchanan 1968) to the activities involved in the integration of international markets.

This extension implies that the classical analysis of public goods has been grafted onto other strands of economic literature, namely, the theory of fiscal federalism. It has also weakened some of the original features of the public goods concept.

Being a specific version of global public goods, EPGs require a further operational definition. We thus define three broad rationales for that definition: economic, institutional, and political¹.

According to the economic rationale, a 'pure' public good is characterised by two main features: first, its utilisation by an additional beneficiary has a marginal cost approaching zero (non-rivalrous); and second, the exclusion of a potential beneficiary is either impossible or very inefficient (non-excludable).

These two features have an important implication: market mechanisms tend to supply an insufficient amount of 'pure' public goods because a profit-maximising producer of this type of goods would bear the full costs but could internalise only a portion of the benefits (eg. Stiglitz 1986). Hence, the creation of an efficient amount of public goods requires a direct or indirect public intervention.

At the global level, an undersupply applies not only to 'pure' public goods, but also to goods that satisfy only one of the two criteria above or even just a weak formulation of (one of) these same criteria. In the former case, the economic literature refers to 'mixed' public goods; in the latter, to 'impure' public goods.

Hence, the three types of public goods share the crucial feature mentioned above: that of giving rise to market failures. This feature is strengthened by two related and key characteristics of public goods: their ability to generate economies of scale and spillovers (positive externalities).

Being a specific version of global public goods, EPGs incorporate all these features. Hence, for the purposes of this column, we define EPGs as 'pure', 'mixed', and 'impure' public goods producing positive externalities thanks mainly to centralised public interventions.

As to the institutional rationale for identifying EPGs, two additional specificities emerge. First, the production and financing of a given good or service take place optimally at the EU level, as the added value of this same good or service increases when it is the outcome of a joint design and a common effort of the EU members.

This feature leads to the second institutional aspect of the EPGs: it is in the mutual interest of the member states to exploit the crossborder dimension to prepare, support, and implement the production of these goods and services.

Finally, according to the political rationale, EPGs should benefit the EU as a political entity and not only as the sum of its individual member states. EPGs should strengthen the cohesion across countries and buttress citizens' support of European cooperation.

We label these features as 'beyond subsidiarity' to emphasise their multiplicative effects. Finally, EPGs should be 'mission oriented' by supporting the EU's strategic domestic and international political priorities.

The economic, institutional, and political rationales for EPGs analysed above are 'translated' in the seven features illustrated in Table 1².

Identifying EPGs

Based on the analysis in the previous section, in Table 2 we identify six priority areas: the digital transition, the 'green' transition and energy, the social transition, raw materials, security and defence, and health³.

For each area, we provide a subjective assessment of compliance with the three rationales mentioned above, and we indicate some non-exhaustive examples of specific EPGs that meet their corresponding objectives.

Table 1. Main features of EPGs

Rationale	Feature	Explanation
Economic	Non rivalry and/or non excludability	The existence of these two qualities - or even of one of them, also in a weak form - imply that an EPG would be either a 'pure', 'mixed', or 'impure' public good.
	Economies of scale and scope	Beyond a minimal level, the production costs of additional units of EPGs decreases (economies of scale); the same applies to the joint financing and production of EPGs (economies of scope).
	Positive externalities	The production and utilisation of the EPGs in a given sector or by a given number of EU member states create positive spillovers to other sectors and other member states. Combined with economies of scale and scope, these externalities entail positive multiple effects at the EU level.
Institutional	Mutual interest	EU member states have a mutual interest in jointly designing, financing, and producing EPGs because the availability of these goods is beneficial to each of the participating countries, and the production of these same goods at the national level would be too costly or unfeasible.
	Crossborder dimension	The effective acquisition of EPGs requires the involvement of financial resources from several or all EU member states. Nevertheless, any good financed by EU resources but nationally produced is not included in our definition of EPGs.
Political	Mission oriented	EPGs are key to pursuing the EU's strategic priorities in economic or non-economic areas.
	Beyond subsidiarity	EPGs produce externalities that improve efficiency and effectiveness not only at the national level, but also for the EU as a whole. Hence, the impact of the EPGs cannot be reduced to an assessment of subsidiarity.

Source: Authors' elaboration.

Table 2. A classification of EPGs

Areas	Objective	Rationale			Examples
		Economic	Institutional	Political	
Digital transition	Boosting innovation and reconciling EU domestic and global agendas	XX	XX	XX	Crossborder digital connectivity infrastructure (eg. 5G, backbone networks, and quantum communication infrastructures), R&D
Green transition and energy	Decreasing EU energy dependence and safeguarding the EU's leading role with regard to climate change	XX	XX	XX	Crossborder energy projects (eg. electricity, smart grids, and CO ₂ networks)
Social transition	Rebalancing welfare states towards the re-skilling of human resources	X	X	X	EU platform for skills acquisition and exchanges
Raw materials	Reducing competitiveness gaps increasing strategic autonomy	X	XX	X	Common purchase of critical raw materials
Security & defence	Overcoming different strategic perspectives to ensure protection	X	XX	XX	Borders management, and handling of migration flows
Health	Protection against health catastrophes	X	X	XX	Procurement of vaccines, near-shoring of basic medical facilities, R&D

Source: Authors' elaboration.

The first four challenges pertain to the economic field:

- (1) reaching climate neutrality to preserve the EU's international leadership in terms of low environmental impact and 'circular economy';
- (2) reducing the EU's technological gaps towards the US and China and innovating the EU production model by means of a centralised industrial policy (Buti and Messori 2023);
- (3) improving education and re-skilling as necessary conditions to successfully pursue the double transition without weakening European social protection; and
- (4) buttressing the EU's open strategic autonomy as part of a renewed system of multilateral governance.

These four challenges call for the supply of EPGs in areas such as digital transition (crossborder digital connectivity infrastructure), 'green' transition and renewable energy (crossborder energy projects), labour market and social transition (platforms for skills acquisitions), and the strategic raw materials required for innovative productions.

Additionally, the experience with COVID-19 calls for EU interventions in health, from the centralisation in the purchase of vaccines to the near-shoring of basic medical facilities and the centralisation of innovative medical research.

Finally, the war at the EU's eastern borders and the human drama affecting large parts of Africa and the Middle East point to the need for EPGs in the areas of defence and security. Examples are the inclusive management of migration flows and the protection of the EU's external borders.

In Table 2, we provide a subjective assessment of the compliance of the six areas with the economic, institutional, and political criteria identified in Table 1. A double cross (XX) denotes high potential; a single cross (X) denotes satisfactory potential.

Whilst most projects listed in this Table would qualify as EPGs according to our definition based on the number of crosses, the three areas which emerge as critical for the supply of EPGs are the digital transition, 'green' transition and energy, and security and defence.

Financing and delivering EPGs

To finance and deliver EPGs, it is necessary to put in place a permanent central fiscal capacity because the common EU projects discussed above have a medium to long-term dimension. The creation of a permanent central fiscal capacity raises difficult legal and institutional questions that go beyond the scope of this paper.

According to Tosato (2021), the EU treaties are sufficiently flexible to include a 'recurrent' central fiscal capacity as a tool of managing repeated external shocks. We therefore focus on questions of how to finance and deliver these goods.

NGEU and the SURE programmes offer two different options for the financing of a temporary central fiscal capacity. The former allows the European Commission to issue European bonds in the financial markets on behalf of the EU thanks to the guarantees offered by the headroom of the 'own resources' ceiling.

The latter entitles the European Commission to issue bonds backed by national guarantees that are offered by the euro area member states. However, these direct or indirect guarantees cannot work in the case of a permanent or recurrent central fiscal capacity, as required by the production of EPGs.

The extension of these guarantees to a very long (or even infinite) horizon would imply implicit and growing liabilities for national budgets that would impose binding constraints on national fiscal policies. Hence, the financing of EPGs requires that the central level be endowed with specific tax bases or, in the EU's terminology, new 'own resources'.

This task is fraught with difficulties, as the modest progress in the enlargement of European taxation since the publication of the Monti report shows (Monti et al 2016). The forthcoming proposals by the European Commission on a new corporate taxation basis (BEFIT) offers an opportunity to define more robust new 'own resources'⁴.

Even if it were possible to solve the problem of centralised financing for the EPGs, there would remain the issue of their effective delivery. A pragmatic idea would be to rely on the vehicles offered by EU programmes – either new versions or those already in place.

In this respect, while the RRF and SURE cannot play a role as EPG vehicles – because their projects are implemented at the national level even when centrally financed – there are other EU programmes that can serve the purpose of delivering EPGs.

Some parts of the RePower-EU support common initiatives at the EU level; the same applies to a few programmes of NGEU such as Connecting Europe Facility, InvestEU, and Horizon. European initiatives are also the core of the Innovation Fund and the Hydrogen Bank.

Moreover, if reformed to allow financing via EU resources and devoted to genuinely EU-wide projects, the Important Projects of Common European Interest (IPCEI) would offer a very useful tool.

Finally, it may be necessary to create other EU vehicles, such as the EU Sovereignty Fund put forward by the President of the European Commission in the State of the Union speech in September 2022. This would also serve as a way to bring together the various separate vehicles mentioned above under a unified and visible policy instrument.

Conclusion

A well-functioning economic union needs a permanent central fiscal capacity. Amongst the various options, stepping up the supply of EPGs delivered and financed at the EU level appears the most promising avenue to create a central fiscal capacity in the EU.

We have argued that EPGs should meet a number of criteria at the intersection of the economic theory of public goods, the theory of fiscal federalism, and the specific institutional and political features of the EU.

We have provided a preliminary conceptual framework that helps define and select EPGs. In particular, we have listed a number of characteristics under three main rationales: economic, institutional, and political.

Against this background, we have identified six policy areas (digital transition, green transition and energy, social transition, raw materials, security and defence, and health) that respond to the main challenges the EU is facing. We have listed a number of specific projects and suggested how they could be financed and delivered at the EU level.

Creating EPGs in these areas would help the EU economy tackle the growing innovation gap vis-à-vis the US and China in digital activities and artificial intelligence, buttress its energy autonomy, and hence shift the EU economy onto a more sustainable 'business model'.

In our view, the case for increasing the supply of EPGs is strong. However, the debate on EPGs so far –and, more generally, on a central fiscal capacity – has not taken centre stage for at least two reasons.

First, a large amount of resources remains to be spent following the successful implementation of the national recovery and resilience plans. It is hard to conceive of creating a permanent or recurrent central fiscal capacity without the clear success of the RRF.

Second, the European Commission has decided to strategically decouple the discussion on the reforms of the fiscal rules from the discussion of a central fiscal capacity because it might be easier to agree on new fiscal rules without overburdening an already difficult conversation with further controversial elements.

In the short term, this decoupling is understandable, but in the longer run the credibility and success of a rules-based fiscal framework depends on nesting a central fiscal capacity into the new economic governance model.

The conditions for supplying an adequate amount of EPGs are not yet fulfilled. However, this does not mean that the debate on EPGs should be postponed to an indefinite future. The upcoming review of the Multiannual Financial Framework provides an opportunity for bringing the EPGs to the centre of the policy debate.

The adaptation of a number of EU ‘vehicles’ and the proposal to create an EU Sovereignty Fund should be framed as the initial steps in rebalancing the EU budget from transfers to the supply of EPGs. ■

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Endnotes

1. For a similar attempt to specify EPGs criteria, see Thöne and Kreuter (2020).
2. It should be noted that our analysis of EPGs is focused on ‘material’ public goods (and services), ie. on those EPGs based on investment and production processes. Hence, we leave the crucial issue of the allocation of knowledge as a global public good (Stiglitz 1999) in the background, and we neglect the EPGs mainly due to reforms and ‘immaterial’ outcomes (eg. a positive externality such as financial stability).
3. A partly similar classification was elaborated, before the pandemic, by Fuest and Pisani-Ferry (2019).
4. The lack of an independent source of EU revenue to back the issuance of European bonds to finance NGEU may partly explain the recent underperformance of such bonds in financial markets.

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