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FINANCE

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DANIEL DĂIANU ASKS
IF AI CAN HELP IN
PREVENTING FINANCIAL
INSTABILITY

PATRICK MINFORD
REVIEWS THE ATTEMPTS
TO MODEL FINANCIAL
CRISES

FABIO PANETTA
CONSIDERS THE ROLE OF
THE EURO IN EUROPE'S
STRATEGIC FUTURE

21ST CENTURY FINANCE

Foreword

W

elcome to the Spring edition of **FINANCE21**. This publication has been prepared in response to readership demand for an overview of the financial sector in these turbulent and unique times.

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

CONTENTS

Where are we on the journey towards price stability?

Central banks have embarked on the largest and most synchronised global monetary policy tightening in a generation. Agustín Carstens reflects on the year ahead and the journey towards price stability

Aim far, act now

Growth in the euro area needs to be revitalised. Reinhard Felke, Mirko Licchetta, Nicolas Philipponnet and Maarten Verwey argue that it is essential to boost investment and foster innovation

The economic outlook and monetary policy in the euro area

Luis de Guindos provides an overview of the latest economic developments and discusses the outlook for the euro area economy for the coming months

The role of fiscal policy

The global economy has seen a major financial crisis and a worldwide pandemic. Patrick Minford reviews the attempts to model these events and suggests policy conclusions

When risk models hallucinate

Financial risk models are critical for the operation of the financial system. Jon Danielsson argues that measuring systemic financial risk needs to acknowledge the changed behaviour during periods of market stress

CONTENTS

Can AI prevent financial crises?

Financial markets have inherent instability. Daniel Dăianu considers the role of AI but finds it hard to imagine a complete replacement of human judgment in monetary policy

How AI can undermine financial stability

As AI makes inroads into the financial system it exacerbates existing channels of instability and creates new ones. Jon Danielsson and Andreas Uthemann identify several such channels

Fighting inflation fairly and effectively

A two-tier system of reserve requirements is needed to reduce the size of transfers to banks. Paul De Grauwe and Yuemei Ji answer their critics

New Year's resolutions for bank regulatory policymakers

Michelle Bowman urges a return to regulatory tailoring to avoid the impulse to crank regulatory dials to their highest level for all firms

Supervision with speed, force, and agility

The Federal Reserve's bank supervisory function is integral to a safe and sound banking system. Michael Barr argues supervision must change and adapt with it, just as the banking system changes

CONTENTS

Tailoring, fidelity to the rule of law, and unintended consequences

Michelle Bowman discusses the role of tailoring in the regulation of banks, and how it allows the safety and soundness of the banking system and US financial stability

Banking today in the United Kingdom

Andrew Bailey gives an overview on the state of the banking sector, focusing on the future issues that are important for banks themselves and for broader monetary and financial stability

The path forward for bank capital reform

Michelle Bowman considers the proposed Basel III reforms, and sees a path forward if the proposal was revised to address its two greatest shortcomings: over-calibration and a lack of regulatory tailoring

The real effects of trade financing by export credit agencies

Poorya Kabir, Adrien Matray, Karsten Müller and Chenzi Xu discuss the effect of the effective shutdown of the Export–Import Bank of the US (EXIM) from 2015—2019 on firm outcomes

A framework for geoeconomics

Countries use their economic strength to achieve geopolitical goals. Christopher Clayton, Matteo Maggiori and Jesse Schreger present a novel framework to understand how a hegemon in the international system exerts its power within its economic network

CONTENTS

From the Great Divergence to South-South divergence

The long era of the Great Divergence has come to an end. Ewout Frankema argues that we need to focus on the economic divergence across the Global South

Non-bank risks, financial stability and the role of private credit

Over recent years private credit has become an important source of funding for some corporates. Lee Foulger sets out the FPC's approach to assessing financial stability risks

Heads I win, tails you lose

Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that turning huge remunerated excess bank reserves into zero-yielding required reserves is a tax on banks

Tax incidence and deposit relocation risks

Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that imposing unremunerated reserves on euro area banks would likely push bank intermediation offshore out of the euro area

Carbon leakage: an additional argument for international cooperation

Climate change is a collective action problem that requires substantial international cooperation. Christofer Schroeder and Livio Stracca present new evidence that carbon taxes are undermined by 'leakage'

CONTENTS

A tale of two treatises

In the process towards European economic and monetary union, two reports played crucial roles. Ivo Maes focuses on the *Werner* and *Delors Reports*, capturing the key ideas and debates on the EMU process and the birth of the euro

The first 25 years of the euro: a bird's-eye view

At 25 the euro area has shown extraordinary resilience. Marco Buti and Giancarlo Corsetti articulate a set of reforms to complete the euro area architecture

Beyond money: the euro's role in Europe's strategic future

To ensure the euro's role in Europe's future Fabio Panetta argues that we need effective macroeconomic stability, a fully-fledged banking and capital market union, and a dynamic payments and market infrastructure

Demystifying fears about bank disintermediation

The ECB's Governing Council has decided to proceed with the 'preparation phase'. Ulrich Bindseil, Piero Cipollone and Jürgen Schaaf focus on the debate around the impact of a digital euro on bank funding

From laggard to leader?

Isabel Schnabel emphasises the euro area's strengths in social protection and environmental initiatives, and advocates measure to close the euro area's technology gap

CONTENTS

Can AI change economic logic and bring abundance for all?

Daniel Daianu asks if AI can address imbalances between needs and resources sustainably by bringing about abundance for all?

ETF approval for Bitcoin – the naked emperor’s new clothes

Bitcoin has failed on the promise to be a global decentralised digital currency. Ulrich Bindseil and Jürgen Schaaf argue that the latest approval of an ETF doesn’t change the fact that Bitcoin is not suitable as means of payment or as an investment

Modernising finance: the role of central bank money

The payments system is being transformed. Piero Cipollone argues that central banks need to be at the vanguard of digital transformation to ensure financial stability

Shaping the future financial system in the public interest

Technological change has been fast and foundational. Cecilia Skingsley discusses innovation and the future of central bank digital currencies

Advancing crossborder payments and financial inclusion

Payments are a vital part of the global and interconnected financial ecosystem. Michelle Bowman considers the evolving payments landscape

CONTENTS

Taxing the wealthy

Taxing the wealthy effectively and equitably presents a choice between wealth and capital income taxes. Spencer Bastani and Daniel Waldenström compare the effectiveness of the two forms of taxation

The dollar's international role

The dollar is by far the dominant currency. Christopher Waller does not expect to see the US dollar lose its status as the world's reserve currency anytime soon

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Where are we on the journey towards price stability?

Central banks have embarked on the largest and most synchronised global monetary policy tightening in a generation. Agustín Carstens reflects on the year ahead and the journey towards price stability

Over the past two years, central banks have embarked on the largest and most synchronised global monetary policy tightening in a generation. Now the end of this exceptional tightening is in sight. Most central banks have signalled that their policy rates may have reached their peak. In Switzerland, rates have been on hold since June last year. Central banks in some emerging market economies have already lowered them.

Meanwhile, economic activity has remained surprisingly resilient, bolstering confidence that economies might be posed for a soft – or at least softish – landing scenario.

If that is true, the fight against inflation has come at a remarkably small cost in terms of lower GDP growth or higher unemployment. Had you told most economists in 2021 that key central banks would raise their policy rates by 5 percentage points, they would have predicted a sizeable hit to economic activity, or even a recession.

And, given already high debt levels and the vulnerabilities accumulated during the low-for-long era, it would not have been too far-fetched to also expect a significant increase in delinquencies and bankruptcies, or even a financial crisis.

Fortunately, such dire predictions have not materialised so far. But will this resilience continue? At this juncture, Switzerland's experience can be an encouraging tale. Inflation has already declined below target, while economic activity has remained resilient. Headline inflation stands at 1.7%, half the peak it had reached in 2022. Real GDP growth did slow, especially in the latter part of 2023. Still, at 0.4% in the third quarter, it fared well against expectations and relative to the performance of its peers.

To be sure, this is not the end of the journey. As the Swiss National Bank (SNB) noted in its most recent monetary policy assessment, inflation is likely to rise again somewhat in the coming months due to higher electricity prices and rents, as well as the rise in VAT¹. But the progress in stemming inflationary pressures is clearly there.

Policymakers must heed the signposts and remain steadfast in their commitment to completing the disinflation journey while reinvigorating efforts to ensure sustainable fiscal paths and lift productivity growth

The SNB's decision to raise policy rates in mid-2022, when inflation was at just 3%, played an important role in securing this outcome. So did its willingness to let the exchange rate appreciate.

The experience of the Swiss economy is also tied to robust fundamentals, such as a healthy fiscal position and strong competitiveness – attributes that are not equally shared by other countries. Nevertheless, the Swiss experience can still serve as a valuable guide for others, showing how prudent and credible policy actions can help stir economies out of the post-pandemic inflation surge without major damage to the economy.

Now let me turn to the global picture. My remarks will touch on what underpins confidence that the hiking cycle across the globe may have peaked and that a soft landing is within reach, as well as on what might still go wrong. I will structure my talk in three parts.

- First, what are signposts that we should observe over the next six to nine months to justify the belief that a soft-landing scenario is within reach?
- Second, what do I see as the most significant risks to this path?
- Third, what type of corrective actions might be needed if the soft-landing scenario does not come to pass?

Let me start by describing the four signposts that would confirm we are on the right course.

First, and most importantly, inflation continues to come down. We have seen much progress already. Just as the rise in inflation was a global phenomenon, its decline has also been similar across countries. Advanced economies started 2023 with inflation averaging 7.5%.

Today their average inflation is 3.2%. In emerging markets, excluding a couple of outliers, average inflation dropped from 8.1% to 4.1% over the same period.

Some of the decline reflects lower commodity prices after the very rapid rises seen in 2022 and the post-pandemic normalisation of supply chains. Although welcome, these are easy 'one-off' gains.

Beyond these easy gains, more telling are the recent improvements in the 'stickier' inflation categories, such as services. In major advanced economies, year-on-year price growth in services excluding housing exceeded 5% on average at the beginning of 2023 but has recently come down to about 4%. In major emerging markets, it stood at 9% in early 2023 but fell below 7% towards the end of the year. Disinflation is becoming fairly broad-based.

Crucially, so far we are not seeing evidence of wage-price spirals unfolding. This indicates that households and businesses have not yet started to build an assumption of ongoing high inflation into their consumption, investment or wage-bargaining decisions.

This is, in no small part, because monetary policy is doing its job. As discussed in a recent *BIS Bulletin*, if central banks had not resolutely tightened monetary policy in response to the inflation surge, we would have confronted a much higher risk of entrenched and persistent inflationary dynamics².

But while the trend reduction in inflation is good, lower inflation is not low inflation. Inflation is still above central bank targets in most countries and needs to fall further. Financial markets and professional forecasters suggest that it will, and by the middle of 2025, if not earlier, central bank inflation targets will be within reach.

These expectations are partly underpinned by the notion that monetary policy operates with lags. Therefore, even if central banks were to end the hiking cycle today, the cumulative monetary tightening since the pandemic would still exercise downward pressures on inflation for several months to come. We would then see a continued, steady decline in inflation, including in the services sectors.

Second, economic growth rates level off. Global growth has slowed further in 2023. The rebound in China has been weaker than many had hoped. And Europe skirted recession. Admittedly, the United States has been an important exception. But there, too, activity is expected to soften soon as pandemic-era excess savings are depleted.

Some of the growth slowdown reflects a natural 'payback' for the very rapid growth rates seen in 2021–22. At the same time, demand for goods declined as consumption rotated back to services. Higher energy costs were a further headwind to manufacturing and services activity alike. And importantly, the monetary tightening has materially lifted interest rates – nominal and real – and, as intended, weighed on aggregate demand.

Nevertheless, if all goes according to plan, the slowdown in growth will be shallow and short-lived. Once inflation returns to target, and central banks are able to ease up on the brakes, growth rates should return to their long-run potential levels.

Third, labour markets loosen. A big puzzle over the post-pandemic period is that labour markets in many countries have remained tight despite weakening GDP growth. Unemployment rates continue to hover around historical lows.

As discussed in a recent *BIS Quarterly Review* article, the pandemic disrupted labour supply and distorted labour demand³. On the path to a soft landing, the pandemic legacy would not be long-lasting. Changes in work

preferences in the direction of lower labour force participation and fewer hours worked would be temporary, and labour hoarding by firms startled by the difficulty in hiring workers back during the recovery would dissipate. As a result, job vacancy rates would continue to decline.

In the near term, one would expect Okun's law to reassert itself, so that the slowdown in economic activity should be accompanied by a rise in unemployment. But, as long as growth remains reasonably firm, the deterioration in labour market conditions should be modest. Most countries will be left with labour market outcomes that, from a historical perspective, look more than satisfactory.

Fourth, productivity growth improves. Mechanically, the recent combination of strong labour markets and low GDP growth has implied weak labour productivity growth. Output per hour has stagnated even as employment has expanded robustly.

As labour markets normalise and growth rates converge to potential levels, this pattern should reverse itself. Faster productivity growth would make it feasible for workers to make up for the reduction in real wages many experienced over the past two years, without a significant squeeze in corporate profits. This, in turn, would reduce the likelihood of wage-price spirals emerging.

So, in sum, the path in the next six to nine months should be marked by a continued reduction in inflation, subdued yet stable growth, a modest weakening of the labour market and a gradual pickup in productivity growth. And, eventually, inflation would be back to target and growth rates would converge to potential.

What could derail this proverbial soft landing? My main concern is that inflation rates may not return to target levels as quickly and as firmly as most forecasters expect. As has been said many times, the last mile could still be the hardest.

Services price growth, in particular, may continue to be much higher than goods price growth for some time. The price of services vis-à-vis goods collapsed during the pandemic.

Based on an illustrative exercise by BIS staff, the higher services price growth required to restore pre-pandemic relative price trends would imply inflation rates roughly 1 percentage point above inflation targets over the next three years.

It is in this context that, while central banks have done their job by tightening monetary policy and restraining aggregate demand, the same cannot be said for fiscal policy.

Fiscal deficits, which justifiably widened during the Covid-19 pandemic, have yet to return to pre-pandemic levels – which were already very large. This is adding to aggregate demand, which does not help, given that broader macroeconomic conditions are more resilient than anticipated.

Furthermore, as discussed, it is quite reasonable to expect that real wages will try to catch up. If productivity does not pick up and rather goes back to the sluggish pre-pandemic trends, it will imply higher unit labour cost for a given level of wage inflation, raising the risk of further price pressures.

Upward pressure on prices could also re-emerge if geopolitical tensions continue to rise, with negative repercussions for commodity markets and global trade flows. This risk is vividly illustrated by the ongoing disruptions to global shipping in the Red Sea, which resulted in a doubling of container shipping costs since December.

Recall that the bounce-back in aggregate supply thanks to normalisation of global supply chains has gone hand in hand with disinflation. More broadly, in August 2022 in Jackson Hole, I spoke of a number of secular forces that could lead to structurally higher inflationary pressures going forwards⁴.

In addition to geopolitics, I mentioned deglobalisation and demographics limiting the responsiveness of aggregate supply to aggregate demand. If anything, those forces have intensified since then.

Finally, another key risk to the inflation outlook is that financial markets may start to price in sharper and faster monetary easing than warranted. As long-term rates have fallen recently, stock indices have rebounded, some hitting all-time highs. House prices have also picked up again in several economies and are not far from their peaks. This would lead to a premature easing of financial conditions that could rekindle inflationary pressures.

Besides the risks to inflation, we need to envisage the possibility that the present soft patch in growth could continue, or even intensify. As previously mentioned, monetary policy operates with lags. The full impact of higher interest rates is thus still to be felt and may prove stronger than anticipated.

Financial amplification channels are particularly hard to predict. In several countries, borrowers have been largely shielded so far from the effects of higher interest rates because of fixed-rate loans. But pressures on borrowers will mount when loans reprice and debt gets refinanced. Indeed, borrowers face a 'wall of maturity' in the next few years. The impact on household consumption and firm revenues could be stronger than anticipated, potentially jeopardising the economic resilience that we have experienced so far.

Borrowers' distress will also pose challenges for the financial system via higher delinquency rates, thus compounding the risks to the economic outlook. Indeed, the question is not whether there will be credit losses but rather how large they will be and how well the financial system will be able to take them.

Lower growth could help bring inflation down faster. But that too could take time. In the meantime, central banks could face pressure to ease policy, even before the battle against inflation has been decisively won.

Let me now turn to what all this means for policy. For monetary policy, there can be no let-up on the fight against inflation. The key priority remains to steadily guide inflation back to target levels.

As discussed, there are various forces that could keep adding pressure on inflation – loose fiscal policy, the catch-up in real wages, waning disinflationary factors, and possibly a premature easing of financial conditions.

To be abundantly clear, I see no appetite that central banks would accommodate these pressures. Central banks will do their job and remain vigilant. In fact, if inflation does not continue on its steady decline to target, central banks may decide to keep interest rates as high as needed or even do more.

In this context, it is worth underscoring the challenges that renewed supply shocks would pose – a relevant risk against the backdrop of geopolitical tensions, challenges posed by the green transition, and adverse demographic forces.

In normal times, when inflation hovers around target, central banks would generally be able to see through the temporary increase in inflation triggered by adverse supply shocks. But these are not normal times. After a prolonged period of elevated inflation, letting inflation surge again – even if on the back of a temporary shock – would be a very risky strategy.

Turning to fiscal policy, the time has come to tighten belts. This is not a new message. But we have reached the point where fiscal consolidation is an imperative. Public debt levels are at record highs and fiscal deficits remain way too large in many countries despite the resilience of the economic cycle.

Absent fiscal consolidation and considering age-related spending pressures, public debt levels in both advanced and emerging market economies would grow exponentially, as illustrated in the BIS Annual Economic Report 2023⁵.

Additional fiscal challenges arise from the spending needs related to geopolitical tensions and the green transition, as well as from a possible increase in equilibrium real interest rates. Reducing fiscal deficits is thus essential to preserve macroeconomic stability in the medium term and would also support the ongoing process of disinflation.

Policymakers must also remain vigilant to potential financial stability risks. The high level of interest rates will continue to put pressure on borrowers. And there is also a risk of market dysfunction, especially if demand for liquidity soars as distressed loans rise.

So far, financial conditions have proved remarkably resilient, notwithstanding the episodes we witnessed in late 2022 and early 2023 in several advanced economies.

The substantial improvements in loss-absorption capacity for the banking sector since the 2008 financial crisis have clearly played an important role in bolstering resilience and helped ensure that the period of banking stress we saw last year was contained to a small number of institutions.

Timely and forceful deployment of a number of crisis management tools also helped curb systemic risks. This included actions by central banks. For instance, the Federal Reserve established the Bank Term Funding Program, offering loans to banks that pledged qualifying government securities, valued at par and thus above market value.

This complemented lending through the Federal Reserve's discount window. In Switzerland, the central bank pledged significant liquidity support to back the emergency takeover of Credit Suisse.

That said, the surprisingly buoyant activity and strong labour markets, and perhaps even luck, have also played a role. As the economy cools, it would be complacent to rely on this continuing to be the case. It is essential that supervisors and regulators are ready to take prompt and preventative action to preserve financial resiliency when signs of distress emerge. Such early actions can minimise the likelihood that emergency measures, like those deployed in March 2023, will be required.

Last but not least, policymakers should re-energise the structural reform agenda. This is key to ease the burden placed on monetary and fiscal policy, which are too often called on to provide economic stimulus in a context of persistently sluggish productivity growth.

Achieving higher and sustainable growth can only be accomplished by boosting productive potential through measures enhancing the supply side and boosting innovation. This requires renewed efforts to design and implement structural reforms in product and labour markets, which have slowed considerably over the past two decades.

To conclude, I think recent developments allow us to look at the future with cautious optimism. Decisive action by central banks has prevented inflation dynamics from becoming entrenched, while economic activity and financial stability have proved to be remarkably resilient.

But the job is not complete yet, and considerable risks remain. The success we have had so far must not breed complacency. Policymakers must heed the signposts and remain steadfast in their commitment to completing the disinflation journey while reinvigorating efforts to ensure sustainable fiscal paths and lift productivity growth. ■

Agustín Carstens is the General Manager of the BIS

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Aim far, act now

Growth in the euro area needs to be revitalised.
Reinhard Felke, Mirko Licchetta, Nicolas Philiponnet
and Maarten Verwey argue that it is essential to boost
investment and foster innovation

High energy prices and rising unit labour costs continue to put euro area export competitiveness under pressure and call for policy attention. Despite the decline in headline inflation in 2023, careful policy coordination is needed to support smooth disinflation and maintain conditions for a gradual recovery.

Given the green and digital transitions and rising risks of geo-economic fragmentation, more investment, innovation and deepening of the Single Market and the Capital Markets Union are required.

The euro area economy is slated for a soft landing, but it is not out of the danger zone. Since its peak in autumn 2022, headline inflation has declined steadily on the back of falling energy inflation, the rapid rise of interest rates, and the orderly tightening of financial conditions (IMF 2023).

At 2.2%, euro area inflation is projected to be back close to target by 2025, according to the European Commission's Autumn Forecast¹ (European Commission 2023a). At the same time, employment remains strong, and financial markets absorbed the reversal of interest rates without much disruption. So far, so good!

Yet, the growth momentum weakened at the turn of the year, core inflation is still elevated, and inflation differentials remain across euro area member states. It is therefore too early to claim victory. In particular, higher energy prices and rising unit labour costs continue to put export competitiveness under pressure and call for policy attention.

Furthermore, old and new structural forces weigh on competitiveness and productivity growth going forward. In addition to demographic change and a high level of legacy debt, weak investment and innovation, the imperative green transition, and a fragmenting geopolitical landscape are posing threats to productivity and potential growth.

In line with the latest recommendations to the euro area (European Commission 2023b), we argue that, in the short term, careful policy coordination is needed to support the smooth disinflation under way and to keep in place the conditions for a gradual recovery of the euro area economy.

Greater use of the Single Market's potential and more coordinated industrial strategies offer possibilities to accelerate economic growth and bolster competitiveness in the euro area

At the same time, more investment and innovation are essential to spur long-term growth and enhance productivity and competitiveness in the ongoing green transition. Substantial supply-side reforms and deeper euro area integration are critical in that respect. In particular, a deeper Single Market and progress towards a Capital Market Union hold huge potential for the euro area economy.

Careful policy coordination to ensure continued disinflation and recovery of competitiveness in the short term. Ensuring the return of inflation to the European Central Bank's target remains an immediate priority. Continuing to ensure a consistent monetary and fiscal policy mix is critical. Consistent with the new set of fiscal rules agreed by EU economy and finance ministers on 20 December 2023, public debt should be kept at prudent levels or put on a downward trend.

At the same time, fiscal policy should contribute to disinflation. In this vein, delivery on the overall restrictive fiscal stance as envisaged in the 2024 budget plans will be important. Phasing out energy support measures adopted in light of the energy price shock of 2022 will support fiscal consolidation efforts.

To avoid lasting divergences across the euro area, these efforts should be more ambitious in countries that face higher risks of entrenched inflationary pressures.

Differences in inflation across euro area countries declined but remain sizeable (Figure 1), contributing to concerns about cost competitiveness vis-à-vis intra- and extra-euro area trading partners. Differences in the energy intensity of the economies explain most of the country-specific impact of the 2022 common energy price shock on inflation (Coutinho and Licchetta 2023).

Although energy prices receded, divergences in core inflation and unit labour costs remain a concern. Unit labour cost accelerated strongly in 2023, especially in the Baltics and Slovakia, on the back of significant nominal wage increases and stagnant or falling productivity growth.

At the other end of the spectrum, unit labour cost growth was contained in Greece, Italy, and Spain, where it helped re-balance pre-existing weaknesses in cost competitiveness.

Going forward, the relative evolution of unit labour costs will become increasingly important to ensure that today's relative cost disadvantages do not become entrenched. In accordance with national practices and respecting the role of social partners, it is therefore important that further wage increases continue to restore lost purchasing power, especially for low-income earners, taking account of the underlying competitiveness dynamics.

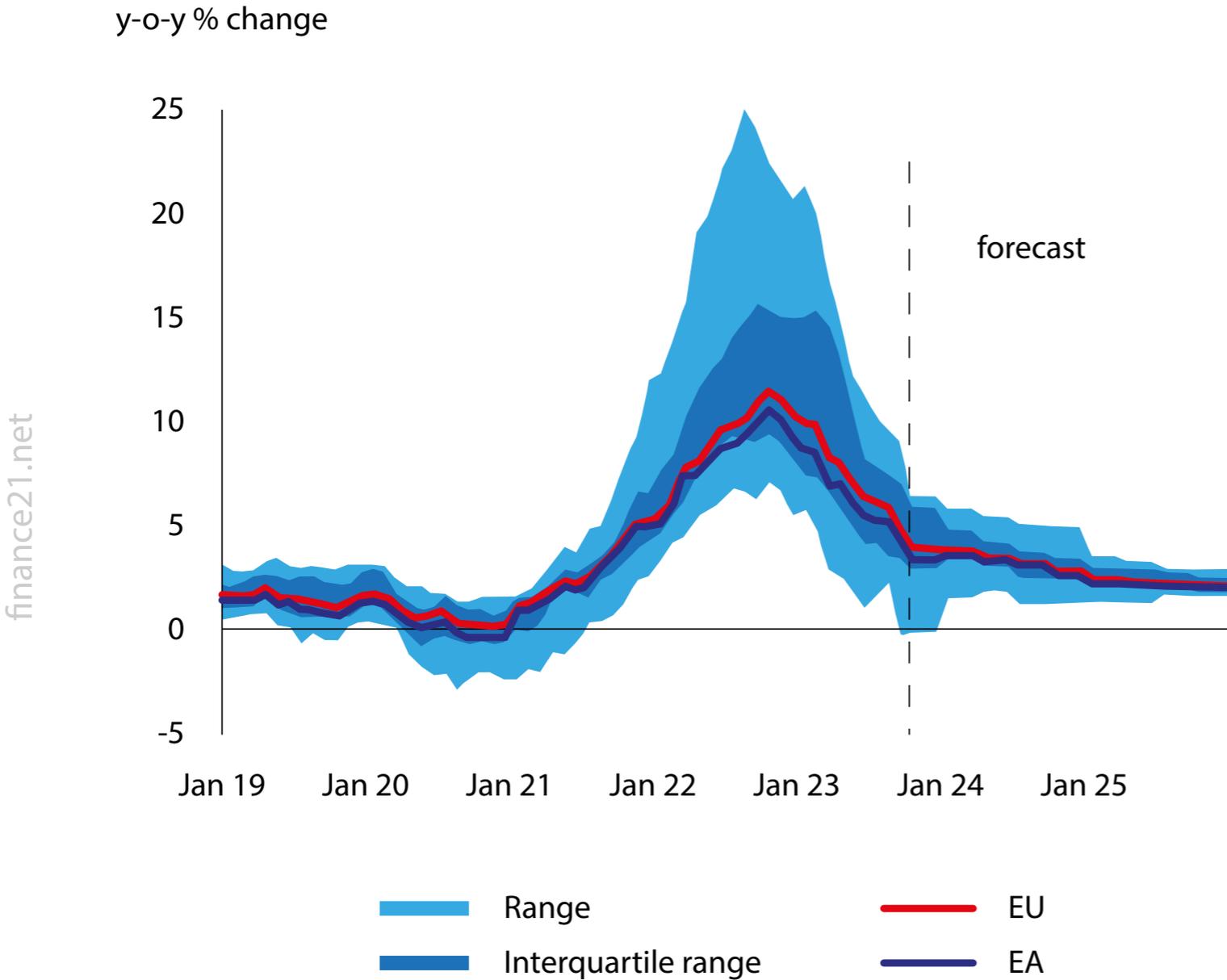
More investment and innovation are needed to strengthen competitiveness

Addressing the structural impediments to competitiveness and growth in a durable way requires a broad set of supply-side policies. Let's start with energy.

Energy prices have come down considerably compared to their peak but are expected to stay structurally higher than before Russia invaded Ukraine. Until major progress is made in renewables, energy will remain considerably more expensive in the euro area than in the US and many other trading partners.

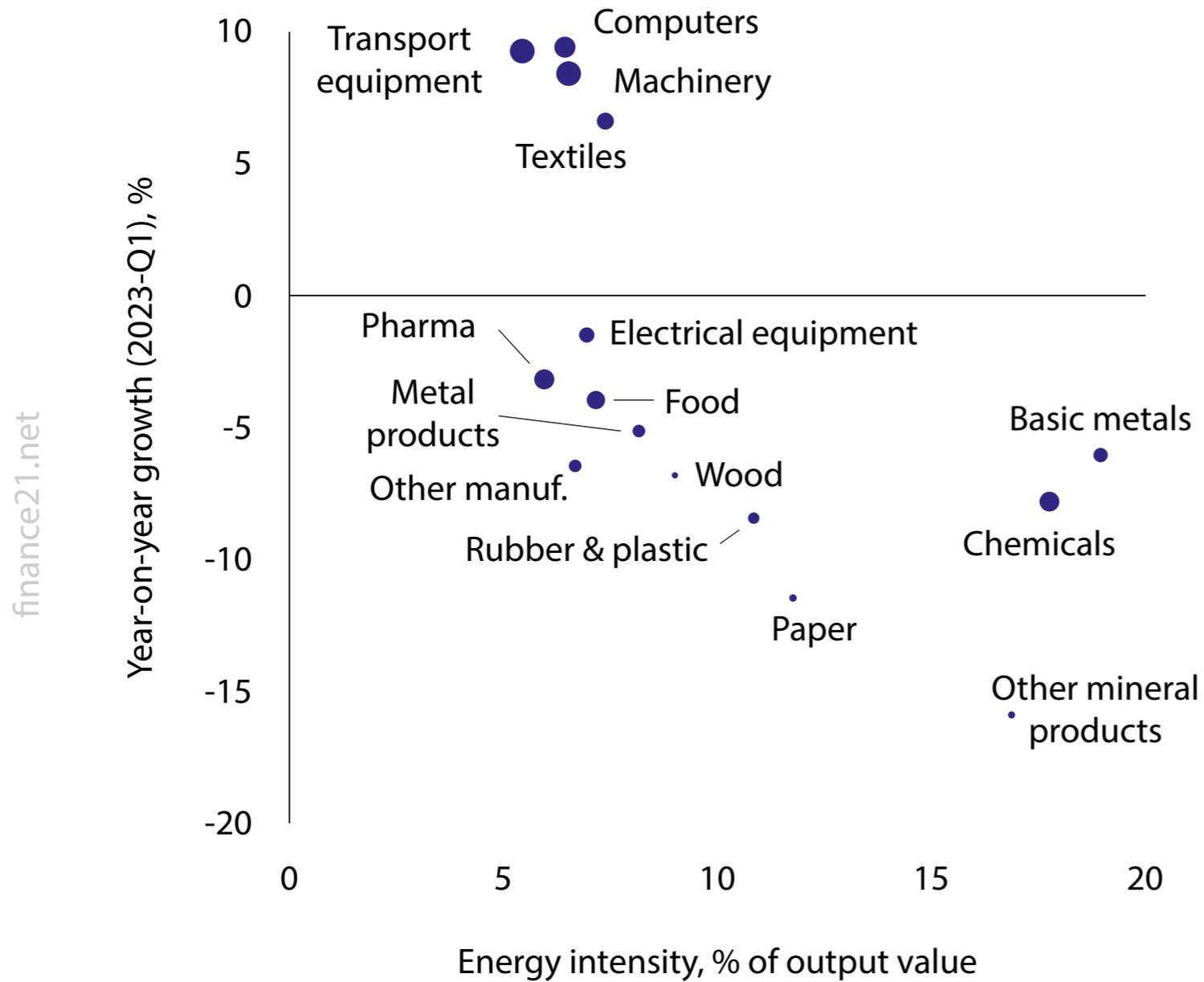
The relative depreciation of the euro in 2021 and 2022 provided only a temporary respite. It is therefore not surprising that energy-intensive sectors, such as chemicals, have seen their trade performance deteriorate (Figure 2) and euro area companies more broadly rate their competitiveness at an all-time low (European Commission 2023c).

Figure 1. Range of annual harmonised index of consumer price inflation rates among EU member states



Source: Eurostat.

Figure 2. Energy intensity and euro area export growth by sector



Source: Eurostat.

Beyond the recent increase in energy prices, the euro area suffers from a protracted weakening of productivity growth and lack of innovation. Total factor productivity in the euro area has been trailing that of the US economy for many years. More concerning, productivity has been floundering in sectors that are driving aggregate growth, including most notably in the ICT sector (manufacturing of computers and electronics, IT services).

While the decline of the euro area's active population makes labour-augmenting technological progress all the more important, innovation – measured both through the size of the research efforts or through its output in terms of patents – remains weak.

Amid deep economic transformation due to the green and digital transition, the euro area needs substantially more investment. Greater investment boosts labour productivity and drives innovation, enhancing overall productivity (McMorrow *et al* 2010).

Compared to the euro area, the US has seen a much faster increase in capital intensity per worker over the past 25 years (Figure 3) and contributed to strong potential growth in the US.

Since 2019, investment spending on equipment and infrastructure in the euro area has held up, supported by solid corporate balance sheets. Still, major challenges to investment persist, including a shortage of skilled labour and increasing energy costs (Figure 4).

Administrative hurdles, linked in particular to permitting, also undermine investment in the green transition. Going forward, the higher interest rates are set to weigh on investment, particularly on projects with a long time horizon such as research and development. This calls for proactive policies to further support investment, both public and private, in the euro area.

Public investment received a significant boost from the EU through the Recovery and Resilience Facility (RRF), REPowerEU, and cohesion policy funds. The RRF, which is at the heart of the NextGenerationEU recovery instrument, makes available €723 billion in grants and loans to member states until 2026 to support investment and reforms.

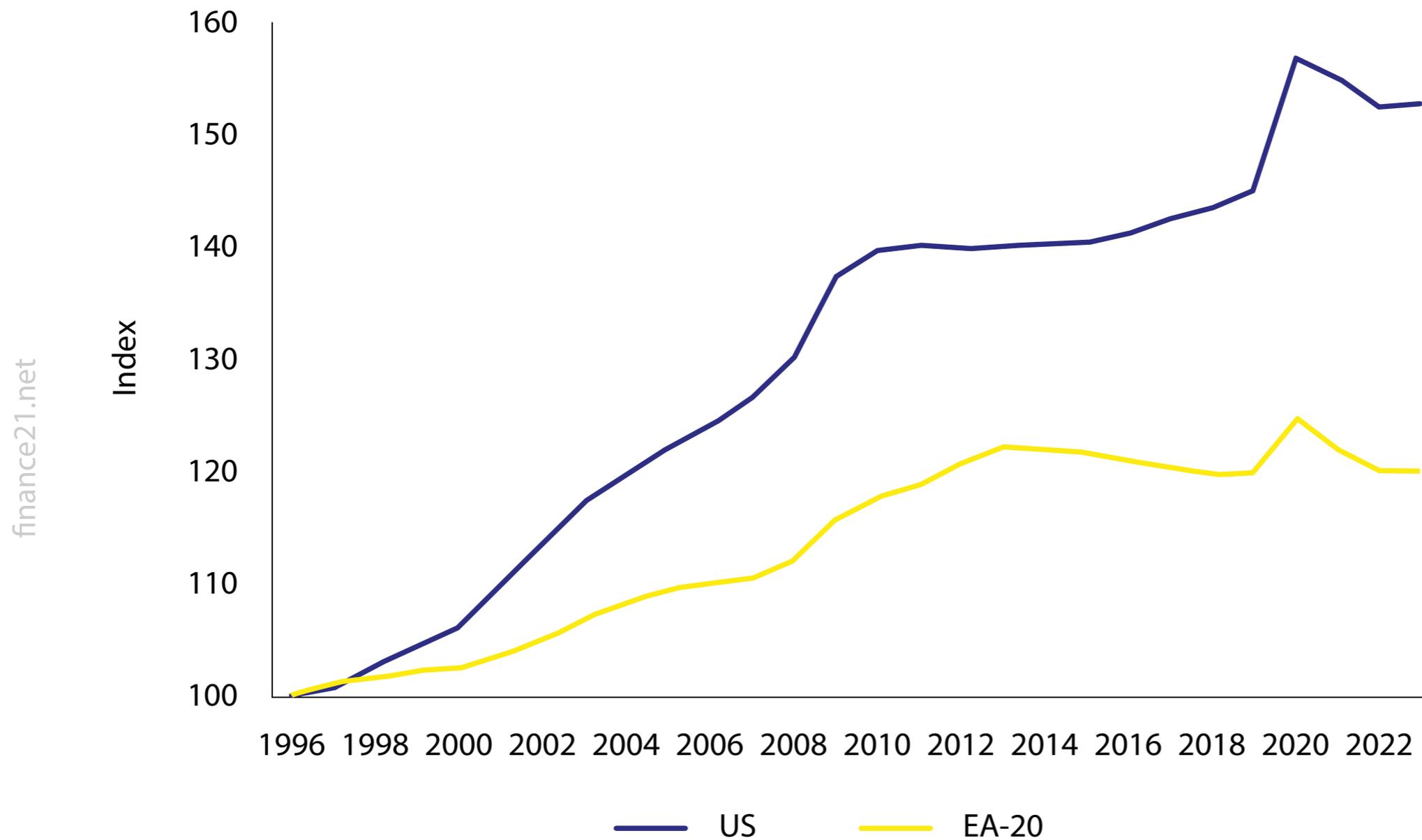
It helps reconcile fiscal consolidation and public investment needs across the euro area. Two years into implementation, the RRF has contributed to the recovery in public investment (Figure 5), including deployment of green technologies, modern digital infrastructures, and green and digital skills development. About €220 billion have been disbursed under the RRF to euro area member states until now. The RRF is also expected to crowd in more private investment (Pfeiffer *et al* 2023).

Cohesion policy funds are a more lasting form of EU support that provides member states with an additional €392 billion to invest in the green and digital transitions over 2021–2027. Along with investment in physical capital, national recovery and resilience plans also support human capital accumulation. Some plans support up- and re-skilling workers that can boost productivity and support the green and digital transition while reducing skills shortages and mismatches.

Concrete progress towards a true Capital Markets Union would help boost private investment and finance innovation. The lingering fragmentation of European capital markets along national lines hinders access to finance and, in turn, innovation and competitiveness (European Commission 2023d).

Fragmented capital markets imply lower competition among financial institutions, high liquidity premia, and eventually a higher cost of funding. There is a strong correlation between greater access to capital markets and lower cost of funding.

Figure 3. Capital intensity in the euro area and the US

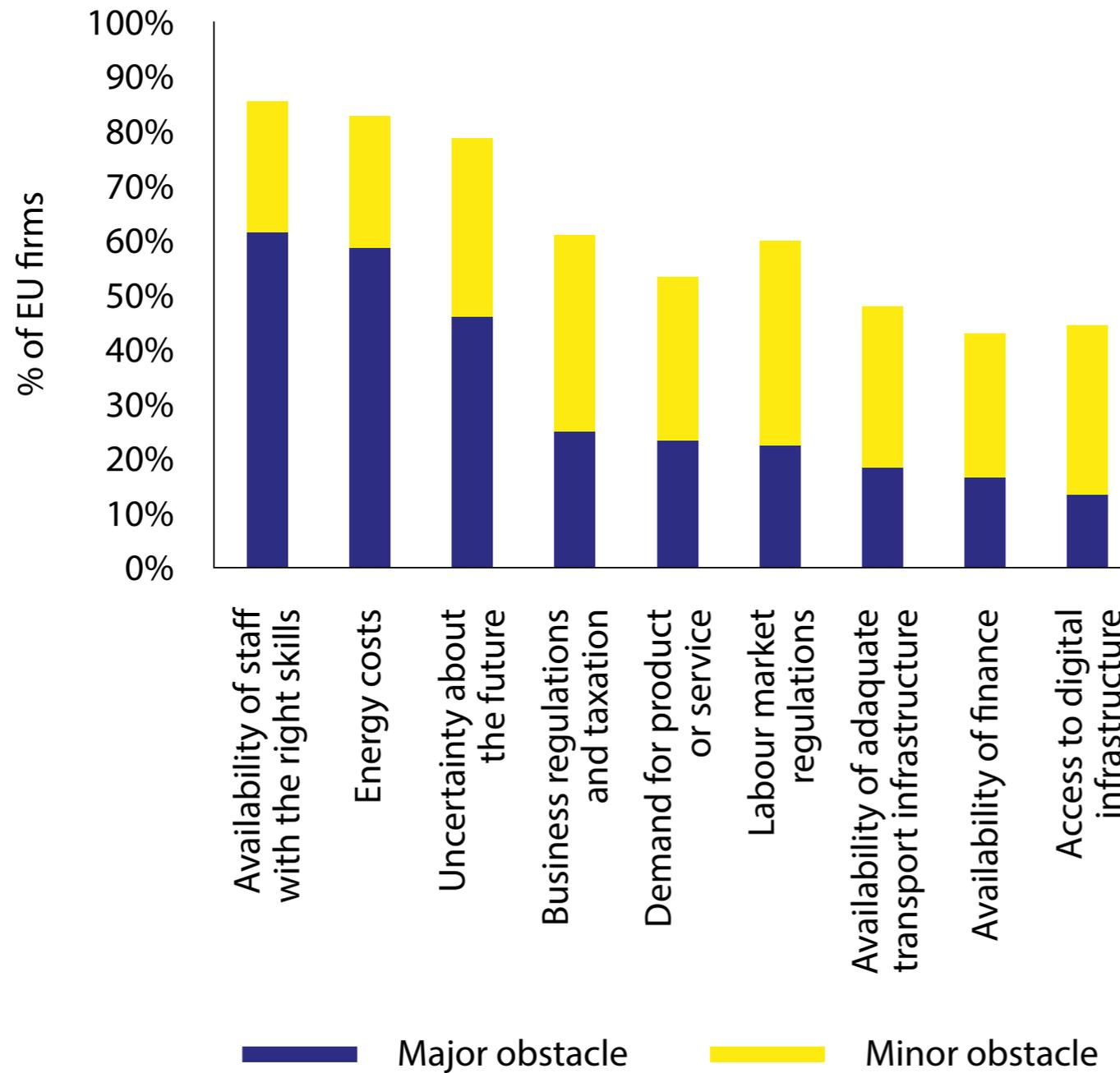


Note: Net capital stock at 2015 prices per person employed; total economy.

Source: AMECO.

Figure 4. Perception of long-term barriers to investment (% of EU firms)

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Notes: (1) Survey answers for question: 'Thinking about your investment activities, to what extent is each of the following an obstacle? Is a major obstacle, a minor obstacle, or not an obstacle at all?' (2) Data for all surveyed firms from all sectors; data for answers for 'no obstacle' and 'don't know/refused' are not shown.

Source: European Investment Bank Investment Survey (2022).

Robust and liquid capital markets can provide alternatives to bank financing, in particular for innovative companies and start-ups. A deeper Capital Markets Union would thus support private investment while minimising the need for government support.

More generally, deepening the Single Market would provide opportunities to unlock growth and strengthen competitiveness. More than 30 years after the creation of the Single Market, the EU still needs to take full advantage of its sheer size – 450 million citizens, larger than the US population of 330 million – and its potential to increase private investment and innovation (European Commission, 2023e).

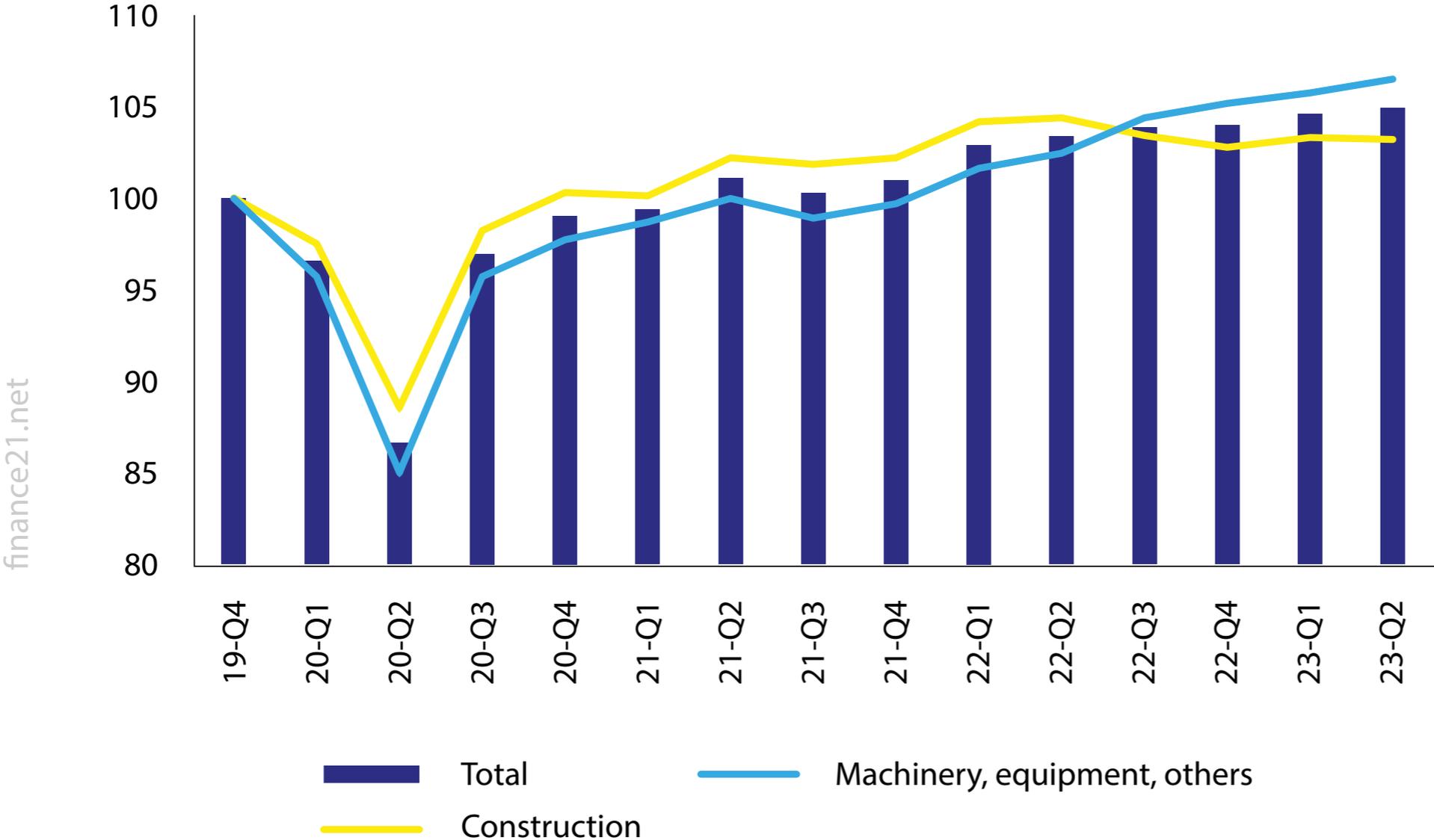
Intensifying EU integration and reducing remaining barriers within the internal market would lead to substantial welfare gains for the euro area and the EU (Baba *et al* 2023). As risks of geopolitical fragmentation increase (Gaal *et al* 2023), deepening the Single Market would also increase the euro area's resilience.

Given its greater trade openness, the euro area has much to lose from a reversal of the global integration of the past decades. In that context, the EU's large and diverse membership, including advanced and emerging market economies, provides the scope and scale to build European-based supply chains.

Greater coordination of member states' industrial policies, building on EU instruments, would help companies reap the benefit of the Single Market. In response to the COVID-19 and energy crises, member states have stepped up support to companies, including in the form of state aid.

However, the proliferation of national schemes runs the risk of destabilising the level playing field within the Single Market. Absent some coordination in industrial strategy, larger member states or those with greater fiscal

Figure 5. Investment sectoral breakdown, euro area (volumes, 2019 = 100)



Notes: (1) Public and private investment volumes are calculated based on total investment deflator. (2) Public investment includes aggregates of general government gross fixed capital formation (GFCF) and GFCF financed with RRF grants.

Source: European Commission.

space may have greater scope to support companies, to the partial detriment of other euro area countries and the integrity of the Single Market (Gopinath 2023).

Not fully exploiting the economies of scale at the EU level is also a missed opportunity. Coordinating EU-wide financial support for business investment, as through the Commission's proposed Strategic Technologies for Europe Platform (STEP), would allow a more consistent industrial policy across the euro area.

Conclusion

In the short term, careful policy coordination is crucial to continue supporting the smooth disinflation process and to keep in place the conditions for a gradual recovery of the euro area economy. At the same time, in a year of elections for the EU and as the euro celebrates its 25th anniversary, an ambitious economic agenda is called for to restore the euro area's competitiveness and spur long-term growth.

Boosting investment and fostering innovation are essential to support productivity and achieve the ongoing green transition. Greater use of the Single Market's potential and more coordinated industrial strategies offer possibilities to accelerate economic growth and bolster competitiveness in the euro area. ■

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Endnote

1. According to the European Central Bank Macroeconomic Projection (December 2023), headline harmonised index of consumer prices (HICP) inflation is expected to decrease from 5.4% in 2023 to an average of 2.7% in 2024, 2.1% in 2025, and 1.9% in 2026.

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The economic outlook and monetary policy in the euro area

Luis de Guindos provides an overview of the latest economic developments and discusses the outlook for the euro area economy for the coming months

Over the past two years, economic developments in the euro area have been shaped by the easing of pandemic-related supply constraints and by the energy price shock in the wake of the Russian invasion of Ukraine. Before that, inflation had been low and monetary policy accommodative, but the surge in inflation to unprecedented levels in 2022 prompted the ECB to normalise and tighten monetary policy.

In December 2021 we announced a gradual reduction in our asset portfolio and in July 2022 we increased our key interest rates for the first time in 11 years. This was followed by nine consecutive hikes that raised interest rates by a total of 450 basis points by September last year.

In 2023 a lot of progress was made in curbing inflation. However, more needs to be done to ensure a timely and sustainable return of inflation to our 2% medium-term target.

In my remarks I will provide an overview of the latest economic developments and the rationale behind the monetary policy decisions that we took in December. I will then discuss the outlook for the euro area economy for the coming months.

Inflation

2023 ended with an inflation rate of just below 3% in December, which was good news. The uptick from November was widely expected, reflecting base effects and the withdrawal of energy support measures. Euro area inflation had been above 10% in October 2022 and at 8.6% at the start of 2023. The decline in 2023 affected all the main components of headline inflation, confirming a broad-based disinflationary process that gained momentum in the second half of the year.

Food inflation has declined substantially from its peak of over 15% in March 2023, but remained high at just above 6% in December. Energy inflation remained deep in negative territory in December, recording the eighth consecutive decline since May 2023.

Sustainable and investment-oriented fiscal policies aimed at promoting the energy transition, strengthening the resilience of supply chains and increasing euro area productivity are supportive of our price stability goal

Another important aspect is that core inflation entered a clear downward trajectory, continuing to decline to 3.4% in December. Services prices have been slower to recede, but they fell sharply in November and remained stable in December.

Taken together, these trends reflect the indirect effect of falling energy prices, the easing of supply bottlenecks and the increasing pass-through of our monetary policy tightening to demand. However, high wage pressures, the outcome of upcoming wage negotiations and intensifying geopolitical tensions add on uncertainty around the future path of inflation.

The rapid pace of disinflation that we observed in 2023 is likely to slow down in 2024, and to pause temporarily at the beginning of the year, as was the case in December 2023. Positive energy base effects will kick in and energy-related compensatory measures are set to expire, leading to a transitory pick-up in inflation, similar to what has happened with Spanish headline inflation in recent months.

Inflation in Spain peaked in July 2022, reaching 10.7%, and disinflation set in earlier than in other euro area countries, with the rate coming down to 1.6% in June 2023. Since then, the large drop in energy prices has fallen out of the calculation and inflation increased by an average of 3% between July and December.

Economic activity

By contrast, growth developments are more disappointing. Economic activity in the euro area slowed slightly in the third quarter of 2023. Soft indicators point to an economic contraction in December too, confirming the possibility of a technical recession in the second half of 2023 and weak prospects for the near term.

The slowdown in activity appears to be broad-based, with construction and manufacturing being particularly affected. Services are also set to soften in the coming months as a result of weaker activity in the rest of the economy.

The labour market continues to be particularly resilient to the current slowdown. The euro area unemployment rate stood at 6.4% in November, broadly unchanged from October and close to its historical low.

However, we are seeing the first signs of a correction taking place in the labour market. The latest data on total hours worked show a slight decline in the third quarter, the first since the end of 2020. This is mainly driven by the reduction in the average hours worked offsetting the increase from the rise in employment.

The continuous decline in job vacancy rates, which marginally decreased again in the third quarter, suggests that the ongoing labour market adjustment may also weigh on the number of jobs.

Financial and monetary conditions

With regard to financial and monetary conditions, our past interest rate increases continue to be transmitted strongly to financing conditions, with lending rates for business loans essentially unchanged in November, at over 5%, and mortgage rates increasing to 4%. The tight financing conditions are propagating through the economy, dampening demand and helping to push down inflation.

Before taking its December decisions, the Governing Council closely considered their implications in terms of fragmentation risk and financial stability. Government bond markets are stable, sovereign yield spreads have been resilient to the normalisation of the Eurosystem's balance sheet, and investors have been able to absorb the extra securities released by the reduction in the asset purchase programmes.

Euro area banks have proven resilient, boasting comfortable levels of capital and strong profitability which make them well equipped to withstand adverse shocks. Despite these strong fundamentals, bank valuations remain compressed, pointing to concerns about the long-term sustainability of bank earnings amid weak growth prospects, increased downside risks from deteriorating asset quality, lower lending volumes and higher funding costs.

Direct and indirect links between banks and the lightly regulated non-bank financial sector also pose risks to the financial system as a whole and highlight the need to boost non-bank resilience going forward. The overall outlook thus calls for vigilance and macroprudential policy remains the first line of defence against the build-up of financial vulnerabilities.

Monetary policy

At its December meeting the Governing Council decided to keep the three key ECB interest rates unchanged. This decision was based on the overall assessment of the economic and inflation outlook, as well as the effects of our monetary policy. We believe that the current level of interest rates, maintained for a sufficiently long duration, will make a substantial contribution to the timely return of inflation to our target.

At the last meeting we also decided to advance the normalisation of our balance sheet. We intend to continue to reinvest in full the principal payments from maturing securities purchased under the pandemic emergency purchase programme (PEPP) during the first half of 2024.

Over the second half of 2024, the PEPP portfolio will decline by €7.5 billion per month on average. We discontinued asset purchase programme reinvestment of redemptions in July 2023 and we expect to discontinue the reinvestments under the PEPP from 2025.

The key ECB interest rates are our primary tool for setting the monetary policy stance. Our future decisions will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction.

Conclusion

The events of the last two years have significantly shaped economic developments in the euro area, pushing up inflation to levels not seen since the introduction of the euro. In response, we started a gradual reduction in our asset portfolio and we increased our policy rates by a total of 450 basis points.

Our strong reaction was key to prevent a de-anchoring of expectations and to curb inflation. In terms of economic activity, the slowdown has so far been contained and gradual. However, the incoming data indicate that the future remains uncertain, and the prospects tilted to the downside.

The inflationary shock that we were confronted with following the energy crisis has been particularly challenging: it occurred in an already difficult environment, with the world economy recovering from the pandemic and global supply chains still disrupted.

Furthermore, supply side shocks are particularly difficult to manage using monetary policy instruments. In this context, sustainable and investment-oriented fiscal policies aimed at promoting the energy transition, strengthening the resilience of supply chains and increasing euro area productivity are supportive of our price stability goal. Structural reforms and investments to enhance the euro area's supply capacity can help reduce price pressures in the medium term.

In this regard, we very much welcome the agreement on the EU's economic governance framework reached a few weeks ago. It is a powerful signal to markets as it reduces uncertainty about fiscal rules in the EU.

The reformed framework will help strike a balance between sustainable public finances and sufficient debt reduction on the one hand and room for reforms and investment on the other, while supporting countercyclicality of fiscal policies.

Achieving this balance turned out to be less straightforward than we might have hoped. It is now crucial that the new fiscal framework is implemented properly and without delay. ■

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This article is based on a [speech](#) delivered at the 14th edition of Spain Investors Day, Madrid, 10 January 2024.

The role of fiscal policy

The global economy has seen a major financial crisis and a worldwide pandemic. Patrick Minford reviews the attempts to model these events and suggests policy conclusions

Recently estimated models of major economies, which have been extended to allow for banking, the zero lower bound on interest rates (ZLB), and varying pricing strategies, can account well for recent macroeconomic behaviour. These models imply that active fiscal policy can contribute to macroeconomic stability and welfare by reducing the frequency of hitting the ZLB. Fiscal policy can also share the stabilisation role with monetary policy, whose effectiveness under the ZLB is much reduced.

1. Introduction: recent empirical evaluations of macro models and the implications for macro policy

Recent decades have seen a major financial crisis and a worldwide pandemic, together with large-scale responses from fiscal and monetary policy. A variety of attempts have been made to model these events and policy responses empirically.

In this piece I review these modelling attempts and suggest some policy conclusions. I will argue that a new class of models in which there is price-setting but for varying lengths of time can account for the shifts in macro behaviour from pre-crisis times up to the present day; these models also prescribe a key role for fiscal policy - ie. the deliberate use of public sector surplus or deficit - in stabilising the economy and preventing its slide into the zero lower bound.

This implies that fiscal rules should limit debt in the long term and not stymie fiscal policy, as happens with many short term fiscal rules now in use, such as in the UK and the EU.

Since the crisis, a number of economists have argued for a more central role for fiscal policy, given the enfeeblement of monetary policy with interest rates at the zero lower bound (ZLB). Prominent advocates of stronger fiscal stimulus for economies battling low inflation and weak demand have included Romer, Stiglitz, and Solow in Blanchard *et al* (2012); also Spilimbergo *et al* (2008), Lane (2010), though with opposition from Alesina and Giavazzi (2013).

This viewpoint has seemed highly persuasive on broad qualitative grounds. However, credible quantitative assessments of the role and effects of fiscal policy have been harder to find. This is what I attempt to do in this article, drawing on recent models that can claim to match data behaviour rather accurately.

We have found that DSGE models based on New Keynesian principles extended to allow for banking, the ZLB and varying price duration can account well for recent macro behaviour across a variety of economies, whether large and approximately closed like the US or small and open like the UK

2. Models and their empirical evaluation

In the past three decades, since the rational expectations revolution and the understanding of how ubiquitous were its implications, economists have rebuilt macro-economic models to ensure that they had good micro-foundations - that is to say, their assumptions were based on the actions of households and firms to meet their objectives, using rational expectations (ie. evaluating their prospects using available information intelligently).

These models assume simplified set-ups where consumers maximise stylised utility functions and firms maximise stylised profit functions. Most models assume representative agents; more recently they assume heterogeneous agents to deal with such issues as inequality and growth.

Much effort has been devoted to making these set-ups as realistic as possible and calibrating the resulting models with parameters that have been estimated on micro datasets. The models are usually labelled as 'Dynamic Stochastic General Equilibrium' (DSGE) models since they aim to capture how shocks affect people's dynamic behaviour in market equilibrium.

Sometimes it has seemed as if the economists creating these models have assumed this 'micro realism' was enough to create a good macro model; and that therefore we should treat their models as simulating the true behaviour of the economy.

However, a moment's reflection reveals such assumptions to be self-deluding. Even the most realistic set-ups require bold simplifications simply to be tractable; they are after all models and not the 'real world'. Furthermore, these models are intended to capture aggregate behaviour and there is a great distance between aggregated behaviour and the micro behaviour of individuals; even heterogeneous agent models do not accurately span the variety of individual types and shock distributions.

The reasons for this gap between aggregated behaviour and the micro behaviour of individuals are manifold. One is the fairly obvious one that aggregate actions are the weighted sum of individual actions, yet we cannot be sure of the weights, which themselves may change over time and across different shocks.

Effectively we choose one constant set of weights but we need to check its accuracy. Another less obvious but important reason is that there are a host of ancillary market institutions whose function is to improve the effectiveness of individual strategies by sharing information; these include investment funds, banks and a variety of other financial intermediaries, whose activities are not usually modelled separately but whose contribution is found in the higher efficiency of those strategies.

Hence empirical work is needed to check whether these models do capture macroeconomic behaviour. It would be reassuring if well micro-founded models mimicked actual data behaviour. Then we would know that the simplification is not excessive and the aggregation problems have been conquered.

More broadly macro-economic modelling remains highly controversial even among 'mainstream' macroeconomists on empirical grounds: for example, Romer (2016) has argued that these DSGE models are useless for basing advice to policymakers because they fail to capture key aspects of macro behaviour.

To settle such debates we need a tough empirical testing strategy, with strong power to discriminate between models that fit the data behaviour and those that do not. The merits of different testing methods have been reviewed in Le *et al* (2016) and Meenagh *et al* (2019, 2023).

In this paper we review what we know about the empirical success of different models. We restrict ourselves to DSGE models because these are the only causal macro models we have that satisfy the requirements that people obey rational expectations.

We consider the results of empirical tests for DSGE models of the economy. Inevitably, given its size and influence, our main focus is on models of the US economy. However, we also review results for other large economies, viewed similarly as large and effectively closed.

We also review models of various open economies, such as the UK and regions of the Eurozone. What we will see is a general tendency for fiscal policy to make an important stabilising contribution according to these models.

We need a testing method that has enough power to discriminate between the models that succeed and the models that should be discarded. The method we propose is 'Indirect Inference' where a model is simulated in repeated samples created from historical shocks by a random selection process known as 'bootstrapping'; this simulated behaviour is then compared with the actual behaviour we observe in the historical data, to see how closely it matches it - the model is rejected if the match is poor.

The procedure first finds a suitable way to describe the data behaviour; suitable in the sense that this behaviour is relevant to and revealing of the model's accuracy. Usually we will use the 'time-series' behaviour of the data, that is a relationship between the data and its lagged values.

The most general such relation is a 'Vector Auto Regression', or VAR, where all the data variables are related to the past values of all of them. In practice we generally use three such variables, such as output, inflation and interest rates which are central to the economy's behaviour.

As explained in Le *et al* (2016) and Meenagh *et al* (2019, 2023) cited above, the power of this test is extremely high, and for this reason the test needs to be used at a suitable level of power where it is efficiently traded off against tractability. Too much power will mean the rejection of all good models; while weak power gives much too wide bounds on the accuracy of the model which is what we want to assess.

In using these tests, we have found that a three-variable VAR is about right for getting the right amount of power for the test. We use this in the tests we report in what follows.

3. DSGE models of the US economy

The most widely used DSGE model today is the New Keynesian model of the US constructed by Christiano, Eichenbaum and Evans (2005) and estimated by Bayesian methods by Smets and Wouters (2007). This model and the US data it is focused on makes a good starting point for our model evaluations.

In this model the US is treated as a closed continental economy. In essence it is a standard model of general market equilibrium (ie. where all markets clear) but with the addition of sticky wages and prices so that there is scope for monetary policy feedback to affect the real economy- this last being the 'New Keynesian' addition. Smets and Wouters found that their estimated model passed some forecasting accuracy tests when compared to unrestricted VAR models.

Le *et al* (2011) applied indirect inference testing to the Smets-Wouters model, first investigating their New Keynesian version and then also investigating a New Classical version with no rigidity. They rejected both on the full post-war sample used by Smets and Wouters, using a three-variable VAR1 (output, inflation and interest rates, with only one lag). They concluded that this model of the US post-war economy, popular as it was in major policy circles, must be regarded as strongly rejected by the appropriate 3-variable test.

They then found that there were two highly significant break points in the sample, in the mid-1960s and the mid-1980s. They also argued that there are parts of the economy where prices and wages are flexible and it therefore should improve the match to the data if this is included in a 'hybrid' model that recognises the existence of sectors with differing price rigidity (Dixon and Kara, 2011, is similar, with disaggregation).

Finally, after estimation by indirect inference they found a version of this hybrid model that matched the data from the mid-1980s until 2004, known as 'the great moderation'; no such version (or any version) could match the earlier two sub-samples. The later sample showed very low shares for the 'flexible sectors'.

However, when it was extended to include the period of financial crisis up to 2012, these shares rose dramatically and became dominant. The high rigidity of the great moderation period seems to have reflected the lack of large shocks and the low inflation rate of that period; once the shocks of the financial crisis hit, with sharp effects on inflation, this 'rigidity' mostly disappears. Nevertheless there is normally some rigidity.

A DSGE model in which rigidity is shock-size-dependent is non-linear. We have the tools to solve such models. Since the financial crisis there has also been the arrival of the zero bound on interest rates and the use of Quantitative Easing (QE, aggressive purchase of bonds for money by the central bank) under the zero bound.

Le *et al* (2021) estimated such a model, complete with a banking sector and a collateral constraint that made narrow money creation effective by cheapening collateral. They found that this model finally could match the data behaviour over the whole post-war sample; in effect the shifts in regime due to the interaction of the ZLB with inflation and so with the extent of price rigidity manage to mimic the changing data behaviour closely.

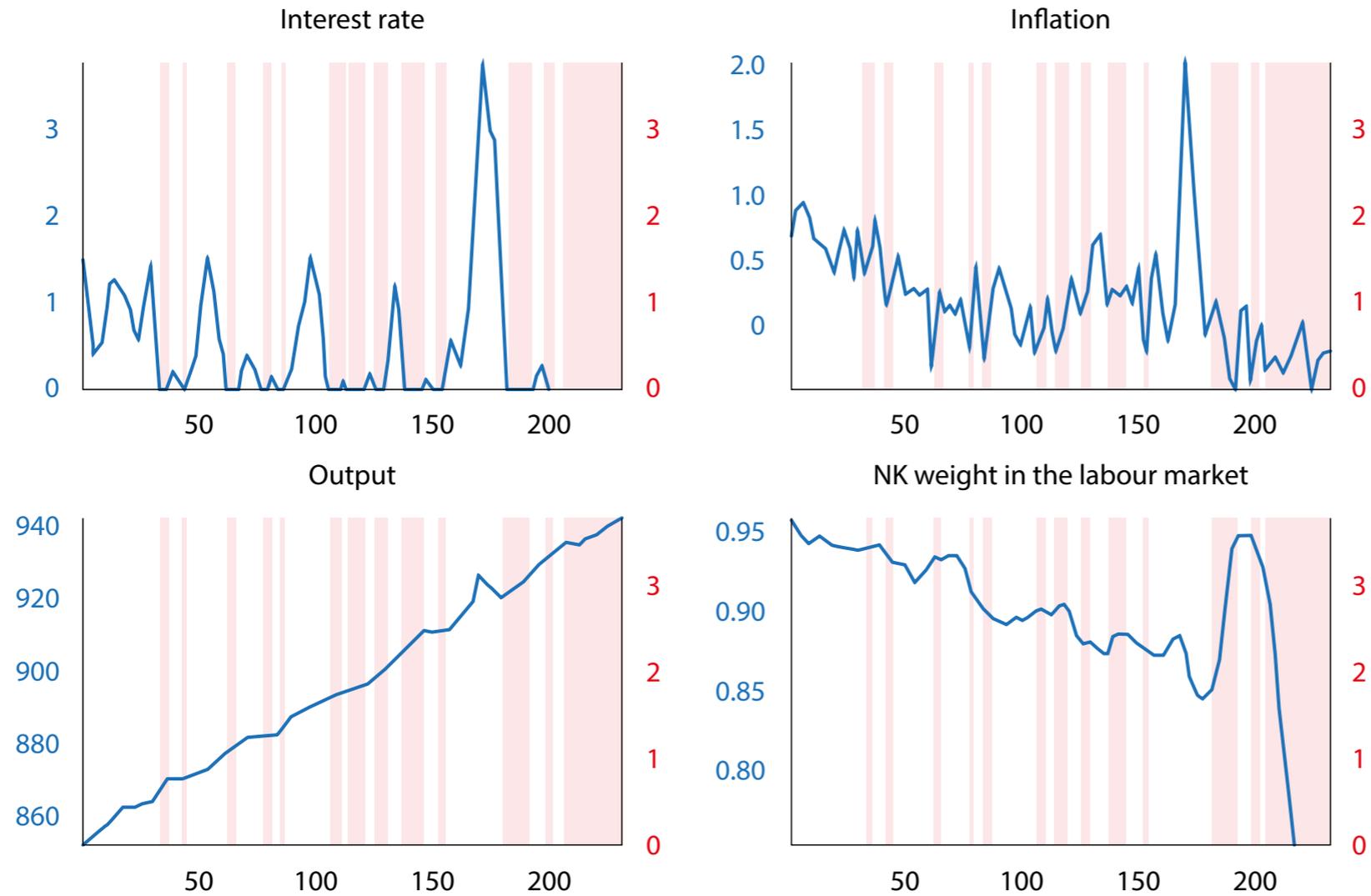
However, they found that this interaction of the ZLB and price rigidity created considerable inflation variability, as the ZLB weakened the stabilising power of monetary policy on prices and this extra inflation variance in turn reduced price rigidity, further feeding inflation variance.

This process is illustrated in Figure 1, a simulation (no 15) of the model in which the ZLB is repeatedly hit (the shaded areas), with both inflation and interest rates gyrating sharply, and both output and the share of the relatively rigid-price sector (the NK weight) responding.

Figure 1. Bootstrap simulation (all shocks) of US model

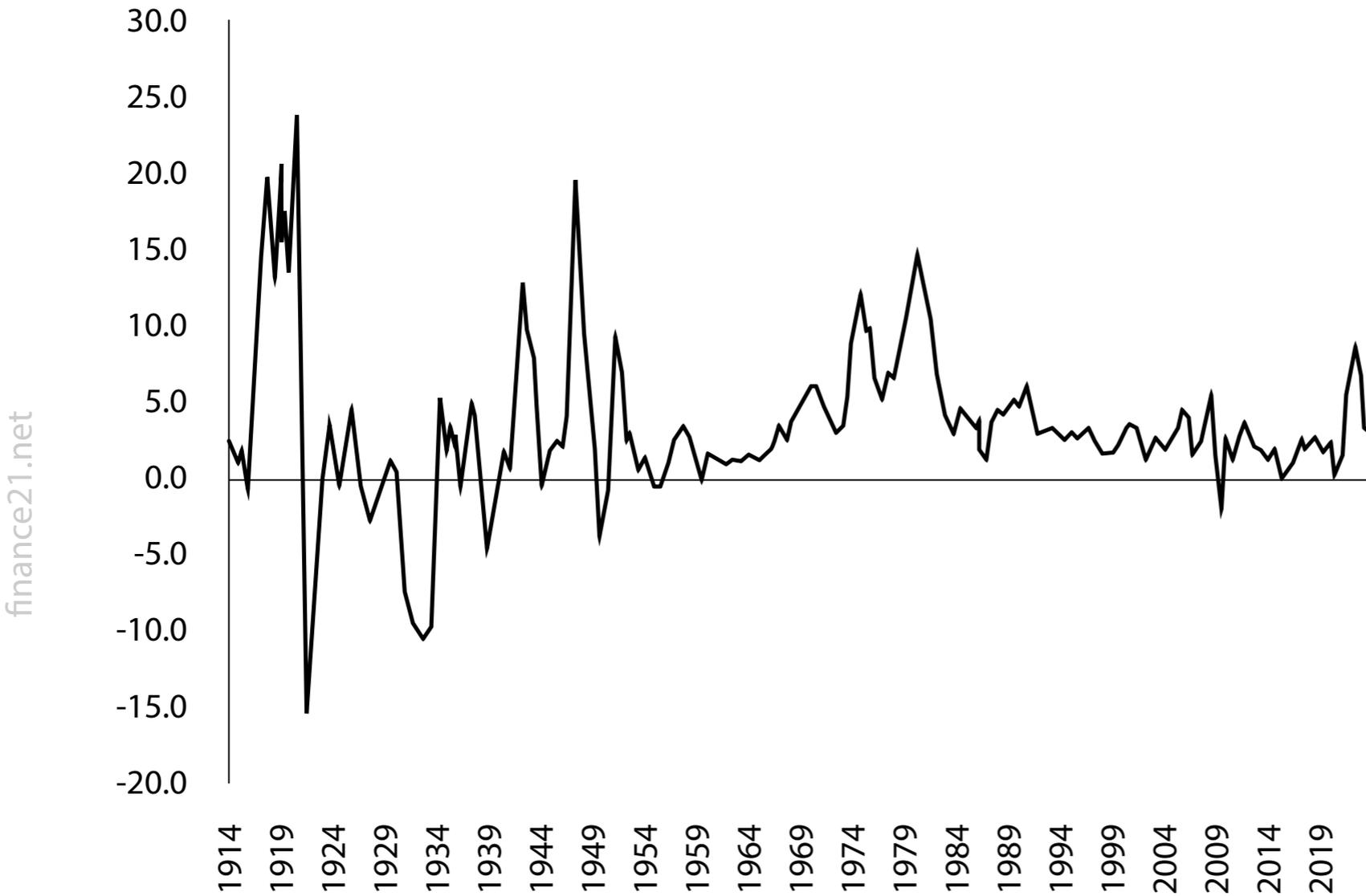
Simulation 15

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Source: Le, Meenagh and Minford (2021).

Figure 2. US inflation for all urban consumers



Source: St Louis Fed

In this prediction of soaring inflation variance after the onset of the zero bound, this model has proved eerily correct - as the chart in Figure 2 of US inflation testifies. After going negative in 2010 and then settling at low rates initially in the 2010s, in 2023 inflation leapt upwards in a way reminiscent of the 1970s, in turn forcefully ending the ZLB with the sharp interest rate response currently playing out.

To cut into this inflation variance feedback loop, Le *et al* (2021) found that there were benefits from both new monetary rules and from stronger fiscal feedback rules. Specifically, they found that substituting a Price Level (or Nominal GDP - NOMGDPT) target for an inflation target in the interest-rate-setting rule could greatly increase stability - because a levels target requires much more persistent interest rate changes which are anticipated by agents, thus giving much more 'forward guidance'.

They further found that fiscal policy has an important role to play in keeping the economy away from the ZLB; with a strongly stabilising fiscal policy that acts directly to prevent the ZLB occurring they found a big increase in both output and inflation stability.

4. Work on other economies

Work on the UK found that a similar model fitted UK data behaviour before and after the financial crisis, from 1986 to 2016 (Le *et al* 2023a). Like the US model, it implies that fiscal policy can contribute to stability by limiting zero bound episodes.

For the eurozone, in a model that divided the zone into two separate regions, North and South, Minford *et al* (2022) found that it matched eurozone data well over the first two decades of the euro's existence; they modelled the zero bound indirectly by assuming the central bank rule targets the commercial credit rate with its repertoire of instruments, including QE. As in the other models just reviewed fiscal policy can increase stability substantially.

Similar results are found for Japan - Le *et al* (2023b). Growth in Japan has been notoriously weak, even though monetary policy has been stimulative for several decades. Fiscal policy has been intermittently stimulative between contractionary episodes where consumption taxes were raised; the simulation results show that a fiscal rule consistently exerting countercyclical pressure would have stabilised output more around a rising trend.

5. Conclusions

In this review of the recent empirical evidence on macro modelling, we have found that DSGE models based on New Keynesian principles extended to allow for banking, the ZLB and varying price duration can account well for recent macro behaviour across a variety of economies, whether large and approximately closed like the US or small and open like the UK.

Related models can also account for macro behaviour in Japan and the eurozone. These models all find that a contribution from active fiscal policy increases macro stability and welfare, essentially by reducing the frequency of hitting the ZLB, and sharing the stabilisation role with monetary policy whose effectiveness under the ZLB is much reduced.

All this implies that fiscal rules must allow fiscal policy to operate, instead of preventing it as UK and EU rules currently do. These rules must be refocused on long term solvency. ■

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When risk models hallucinate



Financial risk models are critical for the operation of the financial system. Jon Danielsson argues that measuring systemic financial risk needs to acknowledge the changed behaviour during periods of market stress

Financial risk models are critical for the operation of financial institutions and financial regulations. Surprisingly, however, little is known about their accuracy. Generative artificial intelligence (AI) models, such as chatGPT, are designed to always provide answers, even if they know little or nothing about what is being asked, a phenomenon known as AI hallucination (Taliaferro 2023). For AI hallucinations to matter, they need to sound credible to the human user.

What about more traditional risk models? Do they also hallucinate, and if so, are the risk forecasts seen as credible?

How risk models are created

When we see a number expressing financial risk, such as volatility, tail risk, credit risk, or systemic risk, it is not the result of a measurement, such as temperature or price, but rather the output of a model.

This is what I called a Riskometer in a column from 2009 (Danielsson 2009). The reason is that risk is a latent variable that can only be inferred from historical price swings instead of being measured like temperature or prices.

Even forward-looking risk metrics conveying market sentiment, such as VIX and credit default swap (CDS) spreads, are not much different because similar models inform them.

Consequently, we cannot get an unambiguous measurement of risk. Instead, there are infinite alternative risk numbers for the same outcome to choose from because there is an infinite number of models one could create to estimate risk. We cope by selecting risk techniques via consensus mechanisms that prefer simple models informed by readily available data.

Ultimately, the question of model choice boils down to the words of George Box: *“All models are wrong; some are useful,”* suggesting we should undertake some analysis of risk model accuracy. Every person who learns statistics is taught from the very beginning about the importance of confidence bounds. Why not include confidence intervals for risk forecasts?

It is simple to ask a model to generate probability estimates for any outcome we wish, even when the model was not trained on such data. However, that is just a risk model hallucination, even if many users take those numbers as credible

It isn't that simple. We can use standard techniques, but only if we assume the model is true, which, of course, is never the case. As Danielsson and Zhou (2015) argue in a VoxEU column titled *Why risk is hard to measure*, it is not easy to evaluate the reliability of risk forecasts.

What risk models actually measure

As it turns out, the risk forecasts aren't all that accurate. While the financial markets generate an enormous amount of data, petabytes daily, most of that is simply the high-frequency evolution of asset prices. A common method for obtaining risk forecasts is to feed relatively high-frequency data, such as daily prices, into a statistical model designed to represent the stochastic process of prices. Figure 1 shows what actually happens.

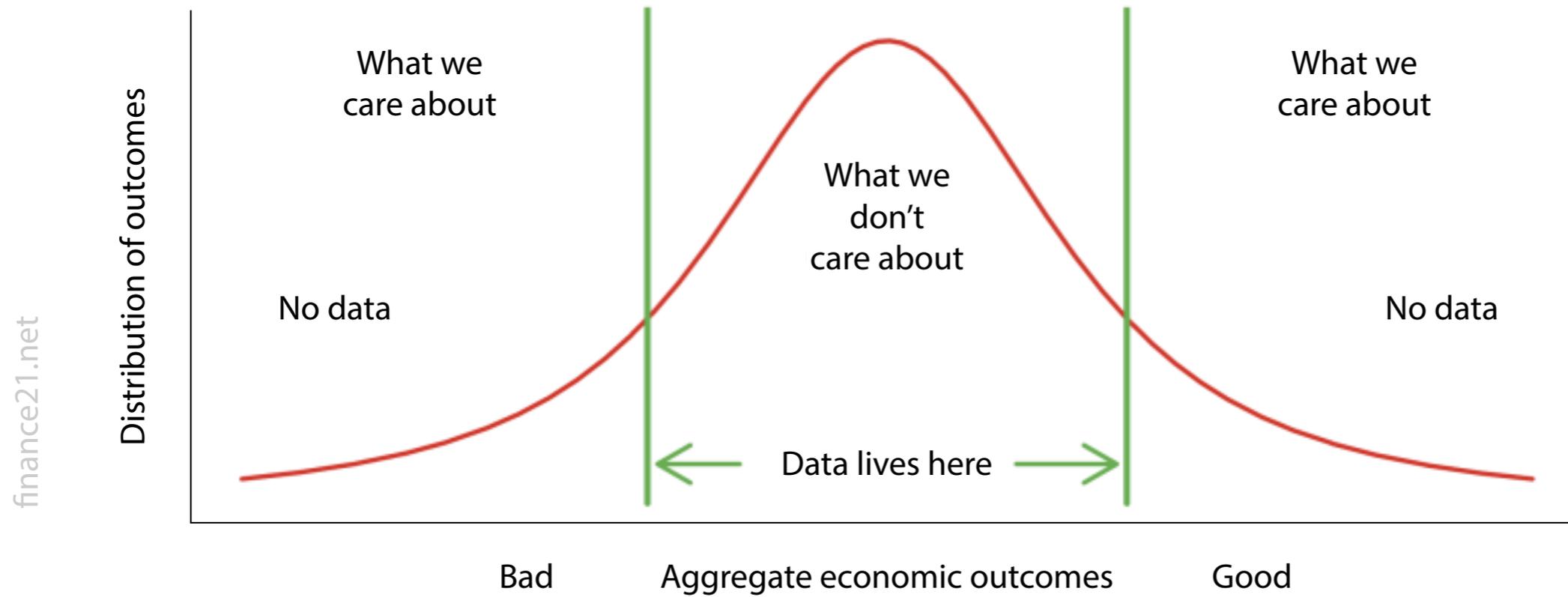
The data used to estimate the model are the day-to-day fluctuations in the middle of the distribution, but those day-to-day events are usually not that important. What matters is the tails, the left for large losses and crises and the right for profit and economic growth. But that is not where data lives.

When the models hallucinate

Suppose we ask the risk models to provide an analysis of what happens less frequently. Perhaps a once-in-a-decade stock market crash, a financial catastrophe, a bank failure, or the possibility our pension will not be as good as advertised.

That analysis comes from the left tail of the distribution shown in Figure 1. However, there is little to no information about such tail events. To accurately assess the risk of a once-in-ten-year stock market meltdown, we require ten-year stock return data. Because the minimum sample size is in the hundreds, we would require millennia of data.

Figure 1. Data generation and distribution of outcomes



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The reason is that when calculating the risk of something, we need a sufficiently large sample of tail events, much greater than the sample size required for the analysis of more common events.

That is not possible because we do not have the data, so in practice, we use high-frequency observations from the middle of the distribution to first estimate the stochastic process governing the data and then use that to calculate the risk of the extreme events we are concerned about.

That is very easy to do. We only need to input a probability into the model, and the corresponding event appears. We capture once-a-month events, as well as those that happen yearly, over a century, and even once per millennium.

Unfortunately, because the algorithm was not trained on data drawn from such dramatic events, it simply makes up the numbers. The model is hallucinating. Generative AI does so because they are trained to answer however badly supported that answer is. Statistical models are just the same.

Endogenous and exogenous risk, and the 'one day out of a thousand' problem

Financial risk can be divided into two categories: exogenous and endogenous, according to Danielsson and Shin (2003) and Danielsson *et al* (2009). Exogenous risk is predicated on the idea that the likelihood of market outcomes comes from outside the financial system, similar to the possibility of an asteroid hitting Wall Street.

Endogenous risk assumes that interactions among its economic agents drive financial system outcomes.

Risk measurement is straightforward if risk is exogenous, as we only need historical prices to estimate the data generation process. Not surprisingly, almost every risk model in use today implicitly assumes risk is exogenous.

The reason is that it is much easier to model exogenous risk, and such models are well-suited to regulatory and compliance processes.

That is usually not a major worry. The aggregate outcome of the decisions of a large number of heterogeneous market actors resembles random noise most of the time. Provided they have specific needs, circumstances, and obligations that evolve relatively independently, then their decisions will also be independent, and the aggregation of a large number of them will be almost unpredictable and, hence, indistinguishable from noise. Under these circumstances, risk can safely be assumed to be exogenous.

Unfortunately, this assumption fails at the worst possible time. Classifying extreme outcomes as random, as is required if we are to treat risk as exogenous, is wrong. Extreme outcomes are not random. Instead, they have logical explanations, and the risk of them happening can be assessed.

The explanation is related to the motivations of market participants. Profit is usually what matters most, perhaps 999 days out of a thousand. However, on that one last day, when great upheaval hits the system, and a crisis is on the horizon, survival, rather than profit, is what they care most about – the ‘one day out of a thousand’ problems.

When financial institutions prioritise survival, their behaviour rapidly shifts. They begin hoarding liquidity, choosing the most secure, liquid assets, such as central bank reserves, leading to bank runs, fire sales, credit crunches, and other undesirable behaviours associated with crises. There is nothing untoward about such behaviour, and it cannot be easily regulated.

The survival instinct is the strongest driver of financial turmoil and crises. That is precisely when endogenous risk becomes most relevant since it reflects the risk of market players’ interactions, which no longer resemble random

noise. Instead, market participants act a lot more harmoniously. Buying and selling the same assets at the same time.

The shift in behaviour from profit maximisation to survival causes a structural break in the stochastic process of financial market outcomes. Figure 2 illustrates the problems of risk measurements across financial turmoil.

The blue line shows a typical price bubble. Prices increase at an ever-faster rate and then suddenly collapse - up the escalator, down the lift. The red line indicates perceptions of exogenous risk. It initially falls because volatilities typically drop as we go up price bubbles. However, the actual endogenous risk increases along with the bubble and falls with it.

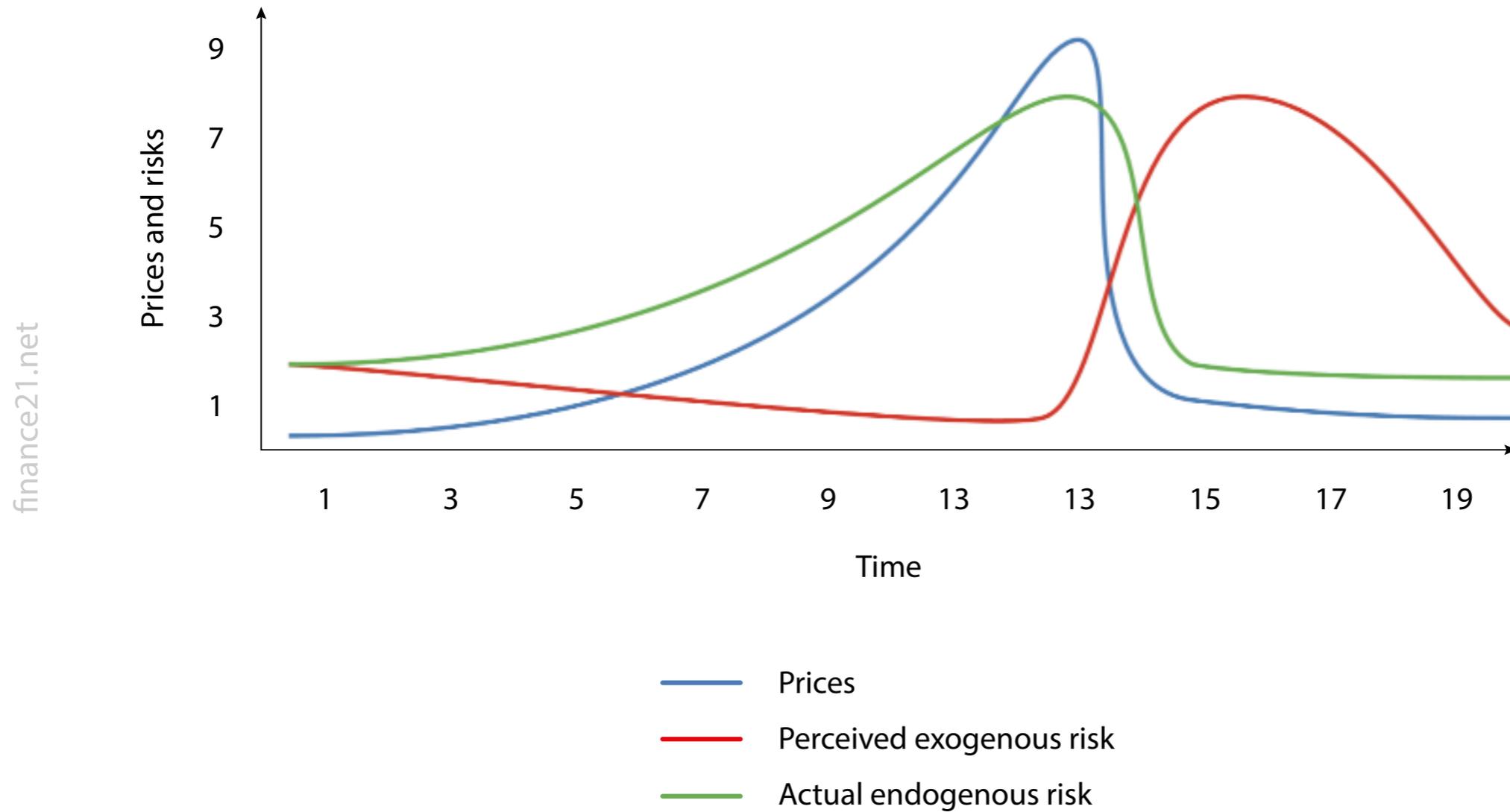
How do we measure extreme risk?

We should not use a stochastic process estimated with day-to-day observations to produce predictions about more extreme events. All we end up with is risk model hallucinations.

The problem of extreme consequences must be addressed differently. Start by acknowledging that extreme events capture what happens when the convenient assumption of exogenous risk collapses. Any sensible analysis considers the underlying drivers of market stress: the survival instinct fuelled by leverage, liquidity, and asymmetric information.

When we examine how financial institutions behave during times of stress, we have ways to map the composition of their portfolios to their behaviour. When we aggregate this across the system, we can get a measurement of systemic financial risk and, more importantly, learn how to develop resilience. At least in theory.

Figure 2. Endogenous versus exogenous risk



There are two main reasons why that might not happen. The first is that it is technically far more difficult. Instead of merely feeding past prices into an algorithm and asking it to generate risk for events we care about, we must delve deeply into the structure of financial institutions and the system to understand how they interact. Much harder to do.

Furthermore, such analysis is more subjective and difficult to formalise and, hence, not very conducive to either financial regulations or compliance.

There is a conflict between requiring rigorous analysis and just demanding a number. The second approach is easier because it is simpler to communicate, and the users do not need to understand how the numbers were obtained or what they mean.

I think there is often a wilful desire not to know how risk numbers are made up, as that creates plausible deniability. It is much easier to get the job done if the numbers are seen as true.

Conclusion

The financial system creates a massive amount of data, which might suggest that it is relatively easy to estimate the distribution of market outcomes accurately. Then, we can safely ignore the impact of individual activities and treat the aggregate behaviour of all market players as random noise. In other words, if we assume risk is exogenous.

Unfortunately, that disregards the incentives of financial institutions, profit in normal times and survival during crises. Such a behavioural change causes structural breaks in the stochastic process of asset markets, which means that a model estimated in normal times is not very informative about stress outcomes.

It is simple to ask a model to generate probability estimates for any outcome we wish, even when the model was not trained on such data. However, that is just a risk model hallucination, even if many users take those numbers as credible. We get numbers that have a tenuous connection, at best, to reality, undermining the decisions taken on the basis of those numbers.

Risk model hallucination is especially significant in applications that deal with extremes, such as pension funds, reinsurance, sovereign wealth funds, and, most crucially, financial regulation. ■

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Can AI prevent financial crises?

Financial markets have inherent instability. Daniel Dăianu considers the role of AI but finds it hard to imagine a complete replacement of human judgment in monetary policy

In another text, I argued that artificial intelligence does not alter economic logic/rationality, nor does it eliminate competition, income and wealth disparities among individuals and groups of people, or between societies/states¹. What public policies aim to do is to mitigate such disparities and derived social tensions within economies.

Internationally, interventions are carried out by specialized international financial bodies such as the IMF, while in the EU, various stabilization mechanisms and structural and cohesion funds operate.

A related question is whether AI can prevent financial or economic crises. The almost automatic answer is no. Because AI does not change economic logic or rationality, and competition does not disappear. In other words, business/economic cycles do not vanish, whether we consider short and medium-term fluctuations in economic activity or longer-term ones generated by investment cycles and major technological breakthroughs that induce technological cycles.

And yet, can't AI reduce/eliminate judgment errors, improve models and algorithms so that decisions are as close to full optimality as possible, leading to market stability even if asymptotically? Markets, of course, are dynamic.

This question makes sense when we consider that there are more or less adequate models, more or less effective algorithms used by market participants. This leads us to the great dispute regarding the interpretation of financial markets' functioning: the 'efficient markets hypothesis' put forward by Eugene Fama (1965) vs. Hyman Minsky's 'financial instability hypothesis' (*Stabilizing an unstable economy*, 1986), the latter following a path initiated by Irving Fisher and John Maynard Keynes in the interwar period of the last century. Keynes spoke of 'animal spirits' in financial markets, of 'multiple equilibria' in the economy, and the need for stabilization interventions.

The global financial crisis that erupted in 2008 further proved that financial markets have inherent instability, that the internal drivers that move autonomous expansion and contraction of credit (financial flows) cannot be eliminated, leading to cycles of boom and bust.

Here we find the rationale for the re-imposition of financial market regulations after 2009 (following the wave of deregulation that began in the City of London in the 1980s and continued through similar measures in the USA), the introduction of macroprudential measures aimed at limiting excessive lending, financial flows, and requiring banks to hold higher capital and liquidity reserves.

*AI cannot prevent financial (and economic) crises,
but it could help mitigate their negative effects*

Unfortunately, the non-bank financial system is still insufficiently regulated, with inconsistencies in this regard. And how much capital and liquidity reserves should be adequate remains a controversial topic – despite the fact that common sense suggests that more reserves should make the system more robust.

AI can amplify 'herd behaviour' even if new technologies, algorithms, process much more information (big data), and the models used by banks and investment funds to manage risks would be more sophisticated. It is worth remembering that those who managed the LTCM risk fund benefited from super-sophisticated models (two Nobel laureates worked there), but they were thrown off track by extreme events, by non-linearities. And other similar failures occurred.

AI can indeed facilitate fraud, although it could also aid authorities in detecting them.

AI cannot eliminate contagion in markets, which is a form of chain reaction, a 'herd effect', and it often necessitates state intervention (by the central bank) as a lender of last resort. This was seen in the United Kingdom in 2022 after misguided decisions by the Truss government, which affected the stability of the pension system; it was also seen in the United States with the fall of Silicon Valley Bank and other turbulence in the banking system, which compelled the Fed to intervene through new lines of financial assistance and revision of regulations.



No matter how much we would like to believe that AI can improve internal prudence and optimize decisions at the microeconomic level, it is worth considering that:

a) decisions cannot be entirely put on autopilot (and even if they were, it still wouldn't solve the issue of avoiding critical moments, crises) and

b) micro-level rationality does not ensure macro-level stability because of compounded effects leading to fluctuations in economic activity, panic. Thus, we return to Minsky, Keynes, Fisher, etc.

The thesis of those who advocate the elimination of the state (and central banks) from the economy to prevent financial crises is more than heroic; it is fundamentalist and has been invalidated by history. The emergence of central banks was precisely demanded by the need to prevent moments of great financial stress, to halt panic.

In the United States, for example, it was demanded by the main protagonists in the financial markets, including JP Morgan. The fact that central banks can make mistakes is another story because no institution is infallible.

However, no matter how much criticized, for example, quantitative easing measures (QE), without them, the financial crisis would have been much more acute, similarly during the Pandemic. On the other hand, it can be argued that for many years (during the Great Moderation period with low inflation and low unemployment), large central banks underestimated the exceptional nature of certain conditions (including the impact of globalization) and tolerated the creation of speculative bubbles.

This is what, ironically, Alan Greenspan, the former Fed chairman, called 'irrational exuberance'. Robert Shiller, also a Nobel laureate in economics, has dedicated many analyses to behavioural excesses in financial markets. And Greenspan himself, in congressional hearings on the causes of the financial crisis, noted that a wrong paradigm dominated the Fed's monetary policy, which, by the way, as the issuer of the world's main reserve currency, allowed the US government to consistently run large budget deficits.

The role of fiat money in economic dynamics can be discussed, especially considering that some central banks seem to have sought to prevent any recession through excessively lax monetary policies – as mentioned in the

previous paragraph; this is a frequent reproach made by the BIS (Bank for International Settlements) to some central banks.

This leads us to a relevant discussion about whether AI could 'optimize' monetary policies. However, monetary policies depend on paradigms (the set of assumptions), be it about the very functioning of financial markets, the role of economic agents' expectations (rational expectations or not), the illusion of equivalence between price stability and financial stability, the role of the non-banking financial sector, etc.

AI could also assist in better figuring out what is R^* , the natural rate in the economy, an unobservable variable but that indirectly guides the monetary policy conduct; similarly, regarding the financial (in)stability real interest rate, R^{**} , which is the level of the central bank's real policy rate that could trigger financial instability (O Akinci *et al* 2021).

However, it is hard to imagine a complete replacement of human judgment in monetary policy decision-making and macroprudential policy (which primarily concerns financial stability).



AI cannot eliminate the distinction between micro and macro, with theoretical and practical implications. Individual and firm-level behaviours can be rational (pursuing net gain in relation to various constraints, including ecological ones), increasingly less subject to emotions through the use of algorithms (AI), while economic activity cannot avoid economic fluctuations, whether small or large in scale.

The question is whether there is a basis for central authority (government, central bank) to intervene in attempting to reduce significant fluctuations, stabilize economic activity, and prevent large-scale crises. If the answer is yes, then it can be discussed whether these interventions can be assisted by AI.

And thus, we arrive at macroeconomic models and forecasts, rules and principles used by governments and central banks, by international financial organizations – by governments in formulating budgetary policies, by central banks in monetary and macroprudential policies, by international financial organizations and interstate groups as facilitators of policy coordination among states (eg. the G20 had such a role in the collective response to the Global Financial Crisis).

Central banks have long been granted operational independence to avoid being influenced by whims and pressures from governments. The presumption is that decision-makers adhere to sound standards of policy conduct for a central bank.

It is worth repeating that this does not mean central banks operate with magic tools, not least because there are many nontrivial uncertainties in monetary theory and practice, and often the sagacity and experience of decision-makers come into play, can make a difference.

The emergence of independent fiscal councils (national IFIs) in OECD countries, in the EU (especially after the sovereign debt crisis), aims to ensure that principles of fiscal prudence are adhered to by governments, thereby promoting the sustainability of public debts.

However, it should be noted that from the standpoint of a country's financial situation, private indebtedness is no less important than public indebtedness. Balance of payments crises thoroughly prove this.

Consider also that in the US, in EU countries etc. public budgets have taken over private debts (of banks) to save financial systems – beyond unconventional operations by central banks. Furthermore, fiscal rules are not God given; they must be adapted according to circumstances.

IV

It can be inferred that attempting to avoid any recession in the economy invites excesses and imbalances (not only through moral hazard) and leads to larger debts, both public and private. This is an empirically verifiable observation.

Therefore, regulations and public policies should not destroy the market entry and exit mechanism, which gives vitality to the economy and stimulates innovation. The budget constraints of countries (hard budget constraints, in Janos Kornai's meaning) should differentiate between good and less good, bad companies in the markets, rewarding superior performance and vice versa.

However, regulations and public policies have the role of mitigating behavioural excesses that can lead to overall economic breakdown, preventing abuses of power and fraudulent behaviour in markets.

At the same time, public policies must strike a rational compromise between the need for economic balance and the imperative of fairness, inclusive development (which involves education for all citizens, 'equal opportunities').

A lesson in good practice in this regard is provided by Scandinavian countries (consider their public debts as a proportion of GDP, much below the EU average; public spending on education and healthcare).

Civilized capitalism and social insurance instruments, significant social expenditures, do not necessarily imply ever-rising public and private debts. To prevent debts from overwhelming economic systems, sober management of public policies is needed, opposition to rampant populism and demagoguery, resistance to pressure from interest groups. Visionary thinking, understanding of immediate challenges and long-term ones is also necessary. Courageous leaders who speak the truth are needed as well.

It must also be emphasized that financialization has exacerbated economic instability, speculative behaviour, and economic inequalities; it has favoured major financial crises, which have required interventions by states and central banks, leading to the socialization of losses.

A lesser instability in economies would require a reconfiguration of financial systems, a de-financialization, and simplification; the increasing complexity of financial systems does not foster economic stability.

It is not by chance that the idea of 'narrow banking' is sometimes brought up (here the development of non-bank financial entities that offer banking services must be examined).

A good, more stable economy requires also 'good citizens'; incentives cannot obliterate the need for citizens with good conduct (Samuel Bowles, *The Moral Economy*, Yale University Press, 2016). Bowles aligns his reasoning with Adam Smith (*Theory of Moral Sentiments*), Kenneth Arrow, Amartya Sen, who all emphasized the importance of morality, ethics, in economic life. However, economic motivations ultimately define human behaviour; the struggle for economic survival is visible at every level of human life.

Conclusion

AI cannot prevent financial (and economic) crises, but it could help mitigate their negative effects. Nonetheless, as some anticipate, AI could lead to the destruction of more than 40% of current jobs worldwide. Without a considerable, compensatory creation of new jobs, we would witness widespread destruction with very serious economic and social implications, including financial ones – not the 'creative destruction' as Joseph Schumpeter would say.

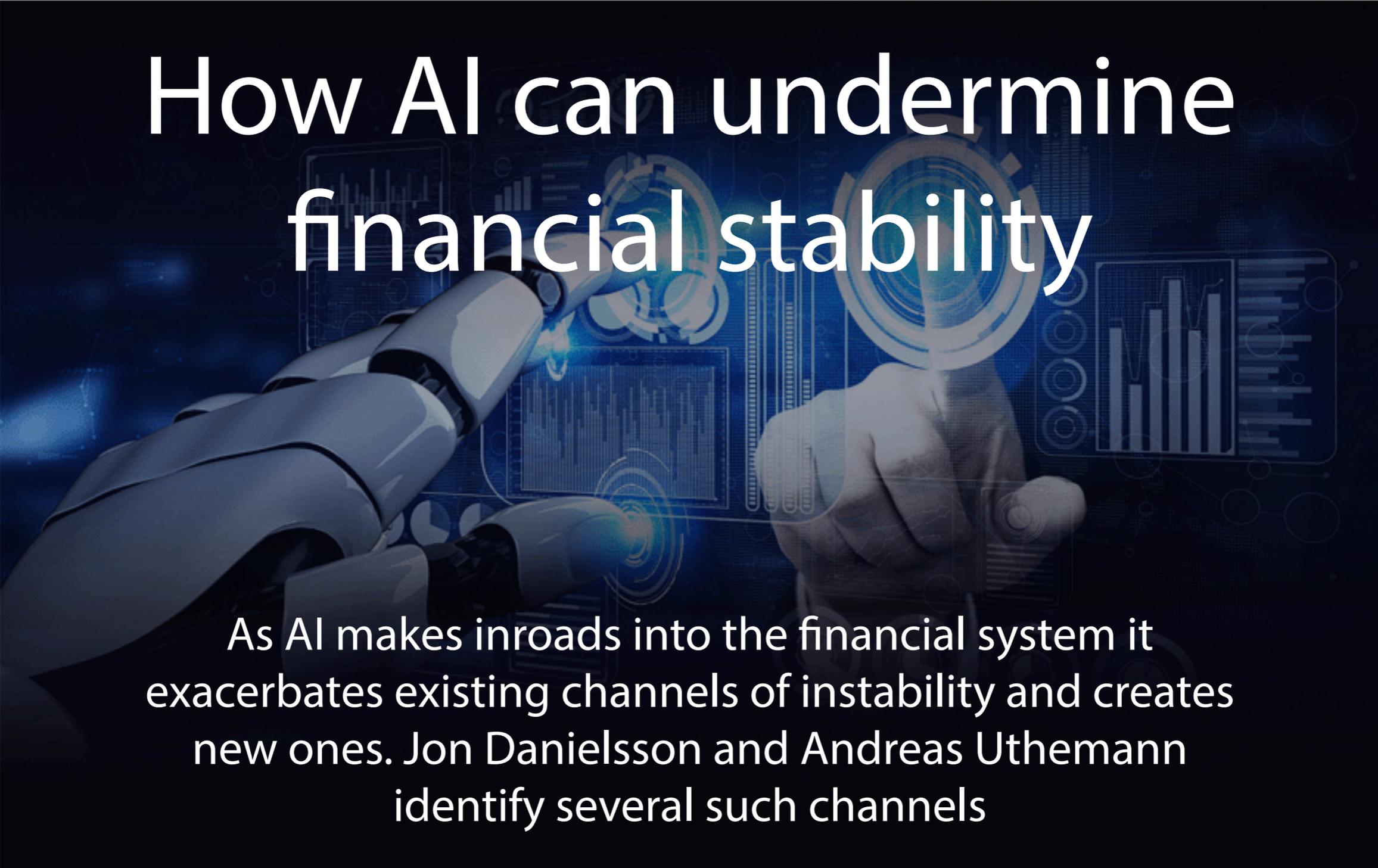
Not to mention that, as noted by Nouriel Roubini (*Project Syndicate*, February 5, current year), stupidity in the world is overwhelming and could easily nullify the benefits of AI. ■

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Endnote

1. ['Can AI change economic logic?'](#) Hotnews and Contributors, January 28, current year.

How AI can undermine financial stability



As AI makes inroads into the financial system it exacerbates existing channels of instability and creates new ones. Jon Danielsson and Andreas Uthemann identify several such channels

The rapidly growing use of artificial intelligence (AI) promises much improved efficiency in the delivery of financial services, but only at the expense of new threats to financial stability. While there is no single notion of what AI is, it is helpful to see it as a computer algorithm performing tasks usually done by humans. AI differs from machine learning and traditional statistics in that it not only provides quantitative analysis but also gives recommendations and makes decisions.

Norvig and Russell (2021) list a number of possible definitions of AI. Among these, AI as a rational maximising agent resonates with the economic notion of utility maximising agents, and hence is particularly helpful in the analysis of AI use in the financial system.

AI is seeing widespread use in the financial system. The private sector applies AI to tasks such as risk management, asset allocation, credit decisions, fraud detection, and regulatory compliance.

The financial authorities are already employing AI for low-level analysis and forecasting, and we expect them further to expand their use to the design of financial regulations, the monitoring and enforcement of regulations, identification and mitigation of financial instabilities, and advice on resolving failing institutions and crises.

While the increased use of AI will be broadly beneficial, improving the delivery of financial services and efficiency of financial regulations, AI also creates new avenues of instability.

The identification of those channels motivates our work in Danielsson and Uthemann (2024), which builds on the existing work on AI safety (Weidinger *et al* 2022, Bengio *et al* 2023, Shevlane 2023), identifying societal risks arising from AI use, including malicious use, misinformation, and loss of human control.

We augment those with sources of fragility recognised in the economic literature, such as incentive problems, incomplete contracting, and strategic complementarities.

It is the vicious interaction of the AI and economic instability channels that is the biggest concern about AI use in the financial system.

While concerns about how AI can destabilise the financial system might make us careful in adopting AI, we suspect it will not

Malicious use of AI

The first channel is the malicious use of AI by its human operators, a particular concern in the financial system because it is replete with highly resourced profit-maximising economic agents not too concerned about the social consequences of their activities.

Such agents can bypass controls and change the system in a way that benefits them and is difficult for competitors and regulators to detect. They may even deliberately create market stress, which is highly profitable for those forewarned.

These agents either directly manipulate AI engines or use them to find loopholes to evade control. Both are easy in a financial system that is effectively infinitely complex.

Such activities can be socially undesirable and even be against the interests of the institution employing the operator of the AI engine.

We expect the most common malicious use of AI will be by employees of financial institutions careful to stay on the right side of the law. AI will likely also facilitate illegal activities, such as rogue traders and criminals, as well as terrorists and nation-states aiming to create social disorder.

Misinformed use of and overreliance on AI

The second channel emerges when the users of AI are both misinformed about its abilities and strongly dependent on it. This is most likely when data-driven algorithms, such as those used by AI, are asked to extrapolate to areas where data are scarce and objectives unclear, which is very common in the financial system.

AI engines are designed to provide advice even when they have very low confidence about the accuracy of their answer. They can even make up facts or present arguments that sound plausible but would be considered flawed or incorrect by an expert, both instances of the broader phenomenon of 'AI hallucination'.

The risk is that the AI engines will present confident recommendations about outcomes they know little about, and to overcome that, the engines will have to provide assessment of the statistical accuracy of their recommendations.

Here, it will be helpful if the authorities overcome their frequent reluctance to adopt consistent quantitative frameworks for measuring and reporting on the statistical accuracy of their data-based inputs and outputs.

AI misalignment and evasion of control

The third channel emerges from the difficulties in aligning the objectives of AI with those of its human operators. While we can instruct AI to behave like we would, there is no guarantee it will actually do so.

It is impossible to pre-specify all the objectives AI has to meet, which is a problem since AI is very good at manipulating markets, and being incentivised by high-level objectives such as profit maximisation, it is not concerned with the ethical and legal consequences of its actions unless explicitly instructed.

An example is AI collusion, as noted by Calvano *et al* (2019), who find that independent reinforcement learning algorithms instructed to maximise profits quickly converge on collusive pricing strategies that sustain anti-competitive outcomes.

It is much easier for AI to behave in this collusive way than humans, as such behaviour is very complex and illegal. AI is much better at handling complexity and is unaware of legal nuances unless explicitly taught or instructed.

Scheurer *et al* (2023) provide an example of how individual AI can spontaneously choose to violate the law in its pursuit of profit. Using GPT-4 to analyse stock trading, they told their AI engine that insider trading was unacceptable. When they then gave the engine an illegal stock tip, it proceeded to trade on it and lie to the human overseers. Here, AI is simply engaging in the same type of illegal behaviour that many humans have done before.

The superior performance of AI can destabilise the system even when it is only doing what it is supposed to do. This is particularly problematic in times of extreme stress when the objective of financial institutions, and hence the AI working for them, is survival, amplifying existing destabilising behaviour such as flights to safety, fire sales, and investor runs.

More generally, AI will find it easy to evade oversight because it is very difficult to patrol a nearly infinitely complex financial system. The authorities have to contend with two opposing forces. AI will be very helpful in keeping the system stable but at the same time aids the forces of instability. We suspect the second factor dominates.

The reason is that AI attempting to evade control only has to find one loophole to misbehave, while the supervisors not only need to find all the weak points but also monitor how AI interacts with each of them and then effectively implement corrective measures.

That is a very difficult computational task, made worse by the private sector having access to better computational resources than the authorities. The more we use AI, the more difficult the computational problem for the authorities becomes.

Risk monoculture and oligopolies

The final channel emerges because the business model of those companies designing and running AI engines exhibits increasing returns to scale, similar to what we see in cloud computing.

AI analytics businesses depend on three scarce resources: computers with the requisite GPUs, human capital, and data. Not only are all of these in short supply, but they also positively reinforce each other. An enterprise that controls the biggest share of each is likely to occupy a dominant position in the financial AI analytics business.

All of these push the AI industry towards an oligopolistic market structure dominated by a few large vendors. The end result is amplified procyclicality and more booms and busts as multiple financial institutions relying on the same AI engine drives them to similar beliefs and actions, harmonising trading activities.

If the authorities also depend on the same AI engine for its analytics, which seems likely, they may not be able to identify the resulting fragilities until it is too late because they are informed by an engine with the same view of the stochastic process of the financial system as the private firms that inadvertently caused the fragility.

In other words, the oligopolistic nature of the AI analytic business increases systemic financial risk.

It is a concern that neither the competition authorities nor the financial authorities appear to have fully appreciated the potential for increased systemic risk due to oligopolistic AI technology in the recent wave of data vendor mergers.

Conclusion

Both the private and public sectors are rapidly expanding their use of AI due to the compelling efficiency and cost advantages it offers. Unfortunately, this increased use of AI also exacerbates existing channels of financial instability.

By interacting societal threats identified by AI researchers with fragilities documented in the economic literature, we identify four channels of instability: malicious and misinformed use of AI, coupled with misalignment and the evasion of control, amplified by risk monoculture and oligopolies.

While concerns about how AI can destabilise the financial system might make us careful in adopting AI, we suspect it will not. Technology is often initially met with scepticism, but as it comes to be seen as performing better than what came before, is increasingly trusted.

AI earns trust by successfully executing those tasks best suited for it, the ones with ample data and immutable rules. The resulting cost savings lead to it being used for increasingly critical and poorly suited tasks, those based on limited or even irrelevant historical data.

We do not want to overemphasise these issues. We suspect that the benefit of AI will be overwhelmingly positive in the financial system.

However, the authorities must be alive to these threats and adapt regulations to meet them. The ultimate risk is that AI becomes both irreplaceable and a source of systemic risk before the authorities have formulated the appropriate response. ■

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A piggy bank with a smiling face, surrounded by Euro banknotes and coins. The piggy bank is white with a pink face and a yellow flower on its side. It is surrounded by several Euro banknotes, including a 20 Euro note and a 10 Euro note, and a large stack of Euro coins. The background is dark and slightly blurred.

Fighting inflation fairly and effectively

A two-tier system of reserve requirements is needed to reduce the size of transfers to banks. Paul De Grauwe and Yuemei Ji answer their critics

As part of its policy of fighting inflation, the ECB and the central banks of the Eurosystem transfer large amounts of money to banks. At this moment this transfer amounts to €140 billion a year. This is almost as much as total yearly spending by the EU which amounts to €168 billion.

The latter is the result of an elaborate political decision process; the former has been decided 'in smoke-filled rooms' without any political debate. In addition, EU spending is loaded with conditions that recipients have to satisfy, whereas the transfers to banks have no strings attached. Similarly large transfers also exist in the US and the UK.

Such a large transfer of money to bankers raises issues of fairness. We have proposed to introduce a two-tier system of minimum reserve requirements (MRRs) that would allow policymakers to reduce the size of these transfers while at the same time enhancing the effectiveness of its monetary policies in reducing inflation (eg. De Grauwe and Ji 2023, 2024).

Our proposal has been subject to criticism by several observers, which we believe reflects popular views in the financial sector and may concern policymakers. Four points of criticism have been raised: (1) imposing unremunerated minimum reserves is an unfair tax on banks; (2) this tax will lead to large displacements of bank activities; (3) due to the heterogeneity of banking sectors, our proposal will be felt very differently in different countries; and (4) minimum reserve requirements affect the transmission of monetary policies and may weaken its effectiveness in fighting inflation. In this column, we intend to answer these criticisms.

Imposing minimum reserve requirements is an unfair tax on banks

Bofinger (2023) and McCauley and Pinter (2024a) claim that imposing unremunerated minimum reserve requirements is an unfair tax on banks. The essence of the argument runs as follows.

In the context of quantitative easing (QE), banks sold government bonds to the central banks because they expected future increases in the interest rate on bank reserves that they accepted to hold in exchange for the bonds. Thus, if today the central banks were to decide to stop remunerating these bank reserves, they would unfairly 'tax' the banks.

The EU struggles to find funding for Ukraine, for the energy transition, and for compensating farmers who are hit by the need to change farming to reduce global warming

The fact that these transfers now take vast proportions is perfectly all right to these authors because this large increase in the interest rate since 2022 was expected by the bankers during 2015-19 when quantitative easing was at its height and conditioned their willingness to sell the bond to the central banks at that time. It would be unfair to the bankers to deprive them of this €140 billion, even if this deprivation were only partial, as we proposed in our contributions.

The problem with this argument is that there is no evidence that, during the periods of quantitative easing (2015-19) and (2020-2021), bankers, or anybody else, were expecting dramatic increases in the interest rate that we have seen since 2022.

In Table 1, we notice that, during 2015-2021, yields of the long-term government bonds for most euro area countries were below 1%. For example, the average German government bond yield was 0.03%. This implies that from 2015 to 2021 the forecasts in financial markets of the short-term interest rates for the next ten years were close to zero.

Bankers sold the bonds to central banks freely because the central banks offered a high price for these bonds, making these transactions profitable for the banks even under the prevailing expectations that the interest rates would remain low during the duration of these bonds.

The unexpected increase in the interest rate since 2022 therefore created a large windfall profit of €140 billion for banks (on a yearly basis), at the expense of the taxpayers. It is therefore quite misplaced to suggest, as McCauley and Pinter do, that the central banks won twice ('heads I win, tails you lose'), while the bankers lost in both cases.

Table 1. Ten-year government bond yields 2015-2021 (%)

Country	2015	2016	2017	2018	2019	2020	2021	Average
Belgium	0.84	0.48	0.72	0.79	0.19	-0.15	-0.01	0.41
Germany	0.50	0.09	0.32	0.40	-0.25	-0.51	-0.37	0.03
Ireland	1.18	0.74	0.80	0.95	0.33	-0.06	0.06	0.57
Spain	1.73	1.39	1.56	1.42	0.66	0.38	0.35	1.07
France	0.84	0.47	0.81	0.78	0.13	-0.15	0.01	0.41
Italy	1.71	1.49	2.11	2.61	1.95	1.17	0.81	1.69
Netherlands	0.69	0.29	0.52	0.58	-0.07	-0.38	-0.33	0.19
Austria	0.75	0.38	0.58	0.69	0.06	-0.22	-0.09	0.31
Portugal	2.42	3.17	3.05	1.84	0.76	0.41	0.3	1.71
Finland	0.72	0.37	0.55	0.66	0.07	-0.22	-0.09	0.29

Note: Greece is not included as it was not qualified for the QE programme (2015-2019)

Source: Eurostat

The bankers sold the bonds to the central banks and made a profit doing so, otherwise they would not have engaged in such a transaction. When the interest rates increased unexpectedly, bankers collected the manna that fell from heaven and won a second time.

To argue the opposite without providing any empirical evidence, like the authors do, is surprising. It leads to the equally surprising conclusion that a 'tax' on banks would be unfair to the bankers and their shareholders.

But let us accept that our proposal of only remunerating part of the bank reserves is an unfair tax imposed on the banks. Banks routinely do not remunerate the demand deposits held by their customers (except for big holders of these demand deposits).

If the non-remuneration of the deposits held by commercial banks at the central bank is an unfair tax, then the non-remuneration of demand deposits issued by banks and held by the non-banking sector is an equally unfair tax. And a larger tax because the size of these demand deposits is larger than the bank reserves.

Why is it unacceptable that central banks 'tax' the banks by not remunerating their deposits and is it acceptable that banks 'tax' their customers by not paying interest on their demand deposits? In both cases, the services provided are the same. The central banks provide a highly liquid asset to the banks, and the latter provide a highly liquid asset to the non-banking sector.

There is a difference, though. The liquid asset provided by the central bank is not only the ultimate liquid asset but also the safest possible one; safer than the demand deposits provided by the banks to the non-banking sector. If anything, the demand deposits should be remunerated more than the bank reserves because they are riskier than bank reserves. Today this is not the case in the euro area.

Minimum reserve requirements and footloose banks

Bofinger (2023) and McCauley and Pinter (2024b) argue that the imposition of unremunerated MRRs would lead to large-scale displacements of banking activities.

In particular, euro area banks that would face larger unremunerated MRRs would move the deposits held by their customers to countries with no, or lower, MRRs and perform their lending activities from these countries. This would have dramatic effects on the banking sectors in the euro area.

First, some empirical perspectives. There is a long tradition of the use of MRRs in Europe. Prior to the creation of the euro area, several countries like Germany, France, and Italy used MRRs, sometimes exceeding 10% of deposits. No such terrible displacements of banking activities took place. Today, Switzerland uses a 2.5% MRR (in contrast to the 1% used in the euro area) and one is still waiting for the large displacement effects.

Second, every regulation leads to attempts to evade these. Is this a reason not to impose the regulation? Take the example of minimum capital ratios. Most economists agree that minimum capital ratios are essential for maintaining a stable banking system. But, bankers dislike minimum capital ratios, and therefore also try to evade this regulation.

That does not mean that we should abstain from imposing minimum capital ratios. What we should do instead is to design a regulatory system that minimises the evasion. Here is how to do this.

If these displacement effects following the imposition of a two-tier system of MRRs were to occur, the ECB could easily counter these by using an asset-based system of reserve requirements (Schobert and Yu 2014). This would consist in computing minimum reserves as a percent of total bank reserves.

Thus, if bank A has total bank reserves of 100 and bank B of 200, the ECB could tell these banks that, say, 20% of these bank reserves are unremunerated MRRs. For bank A this would mean that 20 of their 100 of bank reserves would be MRR and unremunerated, and for bank B this would be 40. No amount of displacement of deposits to London, or elsewhere, would help these banks in reducing their unremunerated MRRs.

Heterogeneity of the banking sector

It has been noted by some observers (Deuber and Zobl 2023, Kwapil 2023, and Standard & Poors 2023) that the use

of a two-tier system of reserve requirements in an environment of heterogeneity of the banking sector could create liquidity problems for some banks that have relatively few bank reserves.

These would be forced to borrow funds in the interbank market to satisfy the minimum reserves. In this connection, these observers have pointed at Italian banks that could face liquidity difficulties.

We do not think there would be a systemic problem under reasonable MRRs. We show the evidence in Table 2. This presents the minimum required reserves (that today are 1% of outstanding deposits) as a percent of the total reserves of the euro area banks. We observe indeed heterogeneity in the distribution of bank reserves across countries in the euro area.

If the MRR were to be raised from 1% to 10% (quite a large increase) all euro area countries (except Malta) should have enough reserves to satisfy the MRR while maintaining some excess reserves.

Take the case of Italy. In 2022, these minimum reserves represented 9.2% of total bank reserves of Italian banks. If the MRRs of outstanding deposits were raised to, say 5%, this would imply that these minimum reserves would represent 46% of the total reserves of Italian banks. The Italian banks would still have 54% of their bank reserves as excess reserves.

Hence, we can conclude that as long as the MRRs remain below 10% of outstanding deposits Italian banks would have enough reserves to satisfy these minimum requirements. As long as there are excess reserves in the system as a whole, borrowing liquidity by a few banks to satisfy MRRs does not create a systemic issue.

But if it turned out that significant numbers of banks (in Italy or elsewhere) were to experience serious liquidity problems to satisfy MRRs, the ECB could define these MRRs on an asset base as defined in the previous section.

Table 2. Minimum required reserves as percent of total reserves (at 2022 level)

Country	(MRR=1%)	(MRR=5%)	(MRR=10%)
Austria	5.6%	28.0%	56.0%
Belgium	3.3%	16.5%	33.0%
Cyprus	2.9%	14.5%	29.0%
Germany	5.6%	28.0%	56.0%
Estonia	6.6%	33.0%	66.0%
Spain	7.5%	37.5%	75.0%
Finland	3.4%	17.0%	34.0%
France	4.7%	23.5%	47.0%
Greece	5.7%	28.5%	57.0%
Ireland	5.5%	27.5%	55.0%
Italy	9.2%	46.0%	92.0%
Lithuania	8.8%	44.0%	88.0%
Luxembourg	6.1%	30.5%	61.0%
Latvia	6.6%	33.0%	66.0%
Malta	14.9%	74.5%	149.0%
Netherlands	5.0%	25.0%	50.0%
Portugal	7.4%	37.0%	74.0%
Slovenia	5.3%	26.5%	53.0%
Slovakia	4.8%	24.0%	48.0%

Note: MRR is defined as the percent of deposits issued by banks that have to be held as required reserves at the respective central banks.

Source: ECB, Disaggregated financial statement of the Eurosystem. We use the reserve level of each national banking system in 2022 as the total reserve base.

In such an asset-based system, banks would be told to keep a given percent of their total bank reserves in the form of unremunerated minimum reserves. All banks would be able to satisfy such a requirement without encountering liquidity problems. An asset-based system would solve both the foot-loose and the heterogeneity problems.

Minimum reserve requirements and the transmission of monetary policies

Clearly, the use of unremunerated minimum reserve requirements will influence the transmission of monetary policies. The question is in which direction this influence goes.

Prima facie, one would expect that adding an increase of unremunerated MRRs to an interest rate hike to fight inflation would strengthen the effectiveness of such a policy compared to a policy of just increasing the interest rate. But that is not how some observers see this (eg. Kwapil 2023).

These observers note that an increase in unremunerated MRRs (now 1% in the Eurosystem) could weaken the transmission of monetary policies. The reasoning is as follows. A higher unremunerated MRR raises the margin between loan and deposit rates, leading banks to raise the loan rates and to lower the deposit rates.

The former strengthens the monetary transmission towards a reduction of inflation; the latter does the opposite as it leads agents to save less. If the latter effect is larger than the former, unremunerated MRRs may reduce the effectiveness of monetary policy in the fight against inflation.

This analysis has led to a perception that the use of the unremunerated MRRs has ambiguous effects on the transmission of monetary policies, which in turn has led policymakers to be cautious about the use of unremunerated MRRs.

In a letter to the European Parliament, Christine Lagarde, President of the ECB, cautioned the parliamentarians against the use of unremunerated MRRs (Lagarde 2023) and wrote: *“Limiting the remuneration on reserves held in the deposit facility could thus affect the effective transmission of the monetary policy stance,”* without specifying whether the monetary policy stance would be reinforced or weakened by the use of unremunerated MRRs. The president of the ECB promised to study the issue.

In fact, there is little ambiguity about how unremunerated MRRs affects the transmission of monetary policies, for at least two reasons. First, if a raise in the unremunerated MRR leads to a decline in the deposit rate, its (positive) effect on aggregate demand is likely to be small compared to the (negative) aggregate demand effect of an increase in the loan rate.

Low-liquidity households, typically borrowers, suffer from two effects following an increase in the loan rate. The first is a direct (substitution) effect: a higher interest rate leads them to borrow less. The second is a debt burden effect: an interest rate increase raises their debt burden, which also leads them to reduce their borrowing.

Both effects reinforce themselves and lead to a negative effect on aggregate demand. The situation is different on the deposit side. For high-liquidity households, typically creditors, there are also two effects.

The decline in the deposit rate leads to a direct (substitution) effect, inducing these creditors to reduce their deposit holdings and to spend more. But at the same time there is an income effect working in the other direction: these creditors experience a decline in disposable income leading them to consume less.

Both effects work in opposite direction, weakening the potential positive aggregate demand effect of the deposit channel (Holm *et al* 2021) who analyse this more formally). We conclude that the increase in the loan rate and the decline in the deposit rate induced by an increase in unremunerated MRRs is likely to reduce aggregate demand.

Second, when the central banks raise the interest rate while remunerating bank reserves, they increase the transfers to banks, thereby increasing bank profits and improving the banks' equity position. With a higher equity ratio, banks will be more willing to supply loans to households and firms. (For an analysis of this 'equity effect' on bank loans see Shin 2015, Gambacorta and Shin 2016, Vanden Heuvel 2002).

As a result, the expected negative effect of a rate hike on loans is (partly) offset by the positive equity effect on bank loans when bank reserves are remunerated. The transmission mechanism is made less effective, ie. increases in the policy rate have a lower effect on the loan supply and ultimately on inflation.

Conversely, by not remunerating bank reserves, this 'perverse' equity effect is eliminated, and the monetary transmission mechanism is made more effective. This theory has been confirmed empirically by Frick *et al* (2023) and De Grauwe and Ji (2024), leading to the conclusion that the use of unremunerated MRRs increases the effectiveness of monetary policies to fight inflation.

Conclusion

The EU struggles to find funding for Ukraine, for the energy transition, and for compensating farmers who are hit by the need to change farming to reduce global warming. The EU spends about €50 billion on Ukraine (2024-27) and €50 billion a year on the farmers. Lots of conditionality is imposed on recipients of these funds.

In the meantime, the bankers in the euro area now receive €140 billion in one year, no strings attached. It is surprising that this extraordinary priority given to bankers over farmers and Ukraine remains relatively unnoticed both in political circles and in the media.

It is equally surprising to find economists who defend the large transfers to bankers with the argument that the bankers are entitled to these transfers, and that taking away, even only a fraction, would be unfair.

A two-tier system of reserve requirements proposed in De Grauwe and Ji (2023, 2024) reduces these transfers and makes the fight against inflation both fairer and more effective. We have addressed the different points of criticism regarding this proposal in this column.

Some of these criticisms make more sense than others, but all can be overcome relatively easily. The obstacles to implementing our proposal, or other proposals that aim at fighting inflation more fairly, are not technical. They have to do with vested interests and the political power these exert. ■

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New Year's resolutions for bank regulatory policymakers

Michelle Bowman urges a return to regulatory tailoring
to avoid the impulse to crank regulatory dials to their
highest level for all firms

will focus my discussion on monetary policy, bank regulatory reforms, the evolving standards in bank supervision, and new developments in the payments system. As we kick off the new year, it's also a good time to look back on 2023 and consider a few New Year's resolutions for the coming year.

Before discussing bank regulation and supervision, I'd like to offer my thoughts on the economy and monetary policy. Our Federal Open Market Committee (FOMC) meeting in December left the target range for the federal funds rate at 5-1/4 to 5-1/2 percent and continued the run-off of the Fed's securities holdings.

Inflation data over the past six months indicate that the Committee's past policy actions are having the intended effect of bringing demand and supply into better balance. This continued progress on lowering inflation reflects a restrictive policy stance with the most recent 12-month total and core personal consumption expenditures inflation readings through November at 2.6 and 3.2 percent respectively.

Employment data, though often significantly revised, continue to show signs of a tight labour market with reports of healthy job gains. The average pace of job gains has slowed over the past year, which may be a sign that labour market supply and demand are coming into better balance. The economy has remained strong even with the pace of real gross domestic product projected to moderate from the third quarter 2023 strength.

Considering this progress, I voted to maintain the policy rate at its current level while we continue to monitor the incoming data and assess the implications for the inflation and economic outlook. And based on this progress, my view has evolved to consider the possibility that the rate of inflation could decline further with the policy rate held at the current level for some time.

Should inflation continue to fall closer to our 2 percent goal over time, it will eventually become appropriate to begin the process of lowering our policy rate to prevent policy from becoming overly restrictive. In my view, we are not yet at that point. And important upside inflation risks remain.

To the extent that both food and energy markets remain exposed to geopolitical influences, they present upside risks to inflation. There is also the risk that the recent easing in financial conditions encourages a reacceleration of growth, stalling the progress in lowering inflation, or even causing inflation to reaccelerate.

My concern is that an overbroad application of requirements—requirements that are not tailored—could become a characteristic of future regulatory reforms

Finally, there is a risk that continued labour market tightness could lead to persistently high core services inflation. While I do not tend to take too much signal from one report, last Friday's employment report showed continued strength in job gains and wage growth, and the labour force participation rate declined.

Given these risks, and the general uncertainty regarding the economic outlook, I will continue to watch the data closely—including data revisions, which have increased in magnitude and frequency since the pandemic—as I assess the appropriate path of monetary policy. I will remain cautious in my approach to considering future changes in the stance of policy.

It is important to note that monetary policy is not on a preset course. My colleagues and I will make our decisions at each meeting based on the incoming data and the implications for the outlook.

While the current stance of monetary policy appears to be sufficiently restrictive to bring inflation down to 2 percent over time, I remain willing to raise the federal funds rate further at a future meeting should the incoming data indicate that progress on inflation has stalled or reversed. Restoring price stability is essential for achieving maximum employment and stable prices over the longer run.

Twenty-twenty-three was a particularly busy year for banking regulators. Before I dig deeper into bank regulation, I'd like to recap a few of 2023's notable banking industry events. And since we are embarking on a journey into the new year, I will conclude by offering a few ideas for New Year's resolutions for regulators to consider prioritizing for 2024.

These resolutions borrow heavily from principles that I have discussed publicly a number of times in the past, but they continue to be critical in guiding my thinking and approach to regulation. And I encourage my colleagues in banking regulation and supervision to consider these ideas as we begin 2024 with a full regulatory agenda.

Key developments in 2023

Twenty-twenty-three brought many significant developments in bank regulation and supervision, beginning with speculation about the now-issued proposal to finalize the Basel III 'endgame' capital rules.

The Basel III capital rules were designed to apply only to the largest banks with significant crossborder activities, so much of the speculation early last year focused on scope—which banks would be subject to the rules under the new proposal—and calibration, how the capital requirements would change—whether they would increase, decrease, or remain the same.

On the question of calibration, much of the speculation centred around whether regulators would propose significant increases to aggregate capital requirements or adopt a 'capital neutral' approach by refining standards but keeping aggregate capital levels largely the same. The objective of having a 'capital neutral' proposal seemed reasonable to many, based on the understanding that a holistic review of the capital framework was in process at the Federal Reserve Board.

In March, however, priorities and focus changed. The failures of Silicon Valley Bank (SVB) and Signature Bank resulted in the exceedingly rare steps to invoke the systemic risk exception to guarantee all depositors of Silicon Valley Bank and Signature Bank¹, and to create the Bank Term Funding Program².

These were significant emergency actions to support and stabilize the banking system. It is important to note that the Bank Term Funding Program is scheduled to expire in mid-March of this year. Understandably, the bank failures led regulators to take a hard look at what may have been missed in our supervision and what had driven regulatory and supervisory priorities leading up to these bank failures.

Several post-mortem reviews were conducted in the immediate aftermath of the failures to identify and analyse the circumstances and factors that contributed to the bank failures. Many of these reviews suffered from serious shortcomings, including compressed timeframes for completion and the significantly limited matters that were within the scope of review.

Nevertheless, these reviews were, and continue to be, singularly relied upon as a basis for resetting regulatory and supervisory priorities. The findings of these limited reviews have also continued to influence proposals that had long been in the pipeline, especially those related to capital reforms.

I view the remainder of last year as something akin to a regulatory tidal wave, in light of the sheer volume of regulatory initiatives considered, published, and finalized. Many were undertaken or expanded with the purported goal to help address root causes of the bank failures and banking system stress.

But this also included a rulemaking agenda that at times had little to no nexus with the root causes of the failures. Without a doubt, it was a challenge to support the regulatory agenda this past year.

The published capital rulemaking proposal incorporated an expansive scope, a notable shift in approach, pushing down new Basel capital requirements to all banks with over \$100 billion in assets, regardless of their international activities³.

At the same time, the capital proposal would substantially increase regulatory capital buffer and minimum requirements for the covered firms. In close succession, the agencies proposed new 'long-term debt' requirements. This long-term debt proposal would require firms with over \$100 billion in assets to issue debt at the top-tier parent

level that could better absorb losses during bankruptcy, which only becomes relevant after the bank fails, not in order to prevent a failure.

In part, these proposals were characterized as helping to address the root causes of the bank failures. As I've noted in the past, I think there are reasons to question whether these proposed revisions are effective and appropriately targeted and calibrated, particularly when considering that bank management and supervisory shortcomings more directly contributed to the bank failures than regulatory shortcomings.

The banking agencies simply cannot regulate better or more effective supervision. We must appropriately manage our supervisory programs and teams to ensure that effective and consistent supervision is implemented within each firm and that it is effective and consistent across our regulated entities.

For community banks, two of the most important developments last year were the finalization of revisions to the Community Reinvestment Act regulations, and the proposal to amend the debit interchange fee cap in the Board's Regulation II.

Many in the banking industry have expressed concern with the amendments to the CRA regulations, noting among other things the increased cost and burden associated with a number of the proposed revisions and new data systems required for compliance.

In addition, many raised concerns about the potential adverse consequences of the rules, which include the possibility that these rules will reduce the availability of credit in some underserved markets if banks cut back lending activities due to revisions made to assessment areas defined in the new rules⁴.

Similarly, the proposed revisions to Regulation II have generated concern from banks directly subject to the rules, but also from exempt banks concerned that the practical effect will be to push lower interchange fees down to all debit card issuers⁵.

Of course, supervision also saw significant changes in 2023, with the publication of new guidance on third-party risk management applicable to all financial institutions, without tailoring or guidance to assist the smallest banks in compliance⁶, and climate guidance that on its face applies only to institutions with more than \$100 billion in assets⁷.

In 2023, many banks also reported very material shifts in bank examinations, with a renewed focus on interest rate risk, liquidity risk, and management, and banks continue to see ongoing changes in supervisory expectations.

Many of these examination-related shifts have received little public acknowledgement or attention, in large part because the rules designed to protect confidential supervisory information frustrate visibility into structural shifts in the supervisory process.

As you all know well, changes in supervisory expectations frequently come without the benefit of guidance, advance notice, or published rulemaking, and in the worst-case scenario these shifts, cloaked by the veil of supervisory opacity, can have significant financial and reputational impacts.

Resolutions for 2024

The new year provides a prime opportunity to reflect on the past 12 months and think about how the Federal Reserve can improve our approach. I'm sure many of us took the opportunity to reflect on recent experiences as we rang in 2024.

I see the new year as a perfect time to think about how the banking regulators can implement some recent lessons learned. This very brief snapshot of the past year does not cover all of the important developments in the banking system, and the bank regulatory framework, that occurred in 2023. But it is a helpful starting point for considering the year ahead. So now, I'd like to offer three new year's resolutions for bank regulators.

Prioritize safety and soundness

First, safety and soundness should be renewed as the highest priority supervisory concern. This is a regulator's greatest responsibility and ensures the safe and sound continuous operation of the financial system.

Last year's stress, precipitated by the spring bank failures, validated the tenet that supervision, when implemented effectively and appropriately, is the single most effective tool to support a safe and sound banking system.

In the case of SVB, supervisors failed to appreciate, appropriately identify, and mitigate the known significant, idiosyncratic risks of a business model that relied on a highly concentrated, uninsured base of depositors, and the buildup of interest rate risk without appropriate risk management.

But as every banker in this room knows, concentration risk and interest rate risk are not novel or unique risks, and these good old-fashioned risks can create vulnerabilities fatal to individual institutions if not appropriately anticipated and managed.

Banking regulators and supervisors at all levels of our dual banking system have long focused on these risks. Therefore, I recommend that regulators collectively resolve to renew the focus on these and other longstanding and fundamental risks to banks and the banking system.

So, what should bank regulators do differently to prioritize safety and soundness? In my view, the problems in 2023 resulted from a failure to identify and prioritize the appropriate areas of risk. Instead, the focus was on broader, more qualitative, more process- and policy-oriented areas of risk. This focus resulted in a disproportionate emphasis on issues that distracted from the fundamental risks to the bank's balance sheet.

Regulators often identify evolving conditions and emerging risks before they materialize as pronounced stress in the banking system. But too often, regulators fail to take appropriately decisive measures to address them.

Regulators can also fall into the trap of getting distracted from core financial risks, and instead focus on issues that are tangential to statutory mandates and critical areas of responsibility.

Focusing on risks that pose fewer safety and soundness concerns increases the risk that regulators miss other, more foundational and pressing areas that require more immediate attention.

In my view, the new climate guidance introduced by the federal banking agencies last year effectively illustrates this lost focus. While perhaps well-intended, this guidance mandates a diversion of limited supervisory resources away from critical, near-term safety and soundness risks.

Setting aside differing views about the appropriateness of the content of the guidance, the fundamental question is whether climate change is a core, present-tense risk to safety and soundness—not whether climate change is an important public policy issue. And here, the evidence suggests that climate change is not currently a prominent financial risk to the banking system.

This lack of attention and focus on the most material safety and soundness risks may result from intentional policy preferences, or simply may be the product of allowing ourselves to be distracted from known, longstanding risks over calm periods of banking conditions.

Whatever the cause, it comes at a significant cost, as both banks and regulators shift resources and supervisory attention away from the most pressing risks.

Renewed commitment to tailoring

Second, is a renewed commitment to our Congressionally mandated obligation to tailoring. The current bank regulatory framework relies upon a risk-based, tailored approach, which strives to fulfil the congressional mandate to tailor the prudential regulatory framework for institutions with more than \$100 billion in assets by aligning regulation with risk⁸.

As we engage in ongoing regulatory reform, we must not lose sight of the virtues of this approach, for institutions of all sizes. Tailoring helps regulators prioritize the allocation of supervisory resources to focus on the most important risks and emerging threats to the financial system.

Tailoring regulations does not mean that regulators can or should ignore safety and soundness issues at smaller institutions, or that the standards for smaller institutions should not be robust. As this audience knows well, all banks are subject to periodic examinations, capital requirements, and regulatory reporting requirements, and have regular engagement with bank examiners at the state and or federal levels.

Starting with an approach that acknowledges the importance of tailoring helps us avoid the impulse to simply crank regulatory dials to their highest level for all firms (or 'up to 11,' like the amplifiers in the classic film, This Is Spinal Tap)⁹.

This type of approach overlooks fundamental differences in business model and asset size, while tailoring ensures that we appropriately calibrate regulations and expectations to the size, complexity, and business model of institutions.

The existing capital framework provides a well-reasoned model for how this tailored approach results in appropriate requirements based on firm characteristics. The largest firms are divided into four categories based on size and complexity, with the largest and most complex firms being subject to the most stringent requirements.

Regional banks, with \$10 billion to \$100 billion in assets, are subject to a somewhat more streamlined capital framework. And finally, the simplest rules are reserved for community banks that rely on a less complex, relationship-based business model.

As this example illustrates, incorporating graduated requirements not only helps to effectively allocate limited supervisory resources, but it also avoids creating regulatory incentives that could unintentionally alter the banking landscape.

For example, without tailoring, it is likely that the requirements for the largest and most complex banks would be pushed down to smaller banks that have simple, straightforward business models, either directly through changes to regulation, or indirectly through opaque supervisory expectations.

This environment would create overwhelming incentives for industry consolidation, since a bank with a simple business model would be subject to and expected to comply with requirements designed for larger and more complex banks, and consolidation creates economies of scale that make it more cost-effective to comply with these requirements.

My concern is that an overbroad application of requirements—requirements that are not tailored—could become a characteristic of future regulatory reforms. The Basel capital proposal highlights this concern. While the comment period is still open until January 16, much of the feedback shared with me so far has focused on two prominent concerns: (1) that the increases to capital requirements would be significantly higher than stakeholders anticipated, and (2) that the proposal would largely ‘flatten’ the regulatory requirements for all banks over \$100 billion, creating a severe cliff effect for firms approaching or crossing that threshold.

Banks within this asset range are already carefully considering the ongoing viability of remaining at an asset size near that threshold. Firms just above the threshold will face strong pressure to shrink below the threshold or to merge to achieve economies of scale to comply with the breadth and complexity of the new requirements. Firms just below the threshold will need to be very intentional about approaching it and may consider revising business strategies and activities to remain below the threshold.

While the capital proposal does not directly apply to regional and community banks, all banks are affected when policymakers shift away from or deemphasize tailoring. When we fail to recognize fundamental differences among firms, there is a strong temptation to continually push down requirements designed and calibrated for larger and more complex banks, to smaller and less complex banks that cannot reasonably be expected to comply with these standards.

As we look to the future and the anticipated regulatory agenda for 2024, the critical role of tailoring must be incorporated as a foundational element of these regulatory reforms.

Increase transparency

The third and final resolution is increasing transparency in supervisory expectations. While policymakers may have different views on the decisions embedded in the regulatory framework, such as where thresholds should be set,

and the calibration of different requirements, one virtue of regulation is that the requirements are spelled out in public, in advance, and in some specificity and granularity. If you are a bank, you know which regulations apply to your business model.

But is this true in practice? As a banker, do you always know the standards to which you will be held prior to the examination? One of the concerning trends in 2023 were reports, including from state banking regulators, that some supervisory actions were excessive in light of the risks posed by some smaller institutions.

It seems reasonable that the banking system stress played a role in tightening supervisory expectations. But we must also ensure that supervisory expectations and the resulting actions are appropriately calibrated and based on existing conditions, rather than driven by premature judgments and uncertain or unsupported supervisory predictions or assumptions.

Transparency allows bankers to understand supervisory expectations in advance and work to meet those expectations. As you know, bankers have a deep commitment to operate safely and soundly but have no ability to look inside the mind of an examiner to divine that expectations have shifted. Opaque shifts in expectations can create unwelcome surprises in the examination process.

These 'surprises', in the form of ratings downgrades, can create significant issues for banks: they can disrupt business plans, including bank mergers and acquisitions, and create pressure on a bank to divert resources away from serving customers to addressing non-critical supervisory matters.

The increasing trend of supervisory 'surprises' we saw in 2023 suggests to me a shortcoming in supervisory transparency. This by no means suggests that banks should not be held to high standards. To the contrary, it means

that we should hold banks to standards that are known and identifiable, and when those standards inevitably evolve over time, we should give advance notice to our regulated institutions so they can manage their businesses accordingly to ensure continued compliance.

Closing thoughts

We are entering the new year at a time when significant changes to the banking system and bank regulatory framework are actively being considered. Many of these changes will have a lasting impact on banks of all sizes and their current and future customers, how banks run their businesses, and the broader US economy.

My hope is that bankers and other interested stakeholders play an active role in this process, by sharing your views and concerns broadly, including with regulators directly. This input provides valuable insights into the specific impacts—intended and unintended—of changes to the bank regulatory framework.

Voicing your concerns enables us to identify, and where needed, address, the real-world consequences of regulatory and supervisory reforms. I certainly don't need to remind you that the stakes are extremely high.

My sincere hope for 2024 is that policymakers have the humility to acknowledge the intended and unintended consequences of these and upcoming regulatory reform efforts, and the courage to change course, when necessary, to mitigate and minimize these consequences. The future of the banking system and the ongoing strength of the US economy depend on it. ■

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Endnotes

1. See 12 U.S.C. § 1823(c)(4)(G).
2. See 12 U.S.C. § 343.
3. See dissenting statement, [“Statement by Governor Michelle W. Bowman”](#) on the proposed rule to implement the Basel III endgame agreement for large banks, news release, July 27, 2023.
4. See dissenting statement, [“Statement on the Community Reinvestment Act Final Rule by Governor Michelle W. Bowman,”](#) news release, October 24, 2023.
5. See dissenting statement, [“Statement on Proposed Revisions to Regulation II’s Interchange Fee Cap by Governor Michelle W. Bowman,”](#) news release, October 25, 2023.
6. See dissenting statement, [“Statement on Third-Party Risk Management Guidance by Governor Michelle W. Bowman,”](#) news release, June 6, 2023.
7. See dissenting statement [“Statement by Governor Bowman on Principles for Climate-Related Financial Risk Management for Large Financial Institutions,”](#) news release, December 2, 2022.
8. Economic Growth, Regulatory Relief, and Consumer Protection Act, Pub. L No. 115-174, 132 Stat. 1296 (2018).
9. *This Is Spinal Tap*, directed by Rob Reiner (1984).

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 South Carolina Bankers Association 2024 Community Bankers Conference, Columbia, South Carolina, January 08, 2024.



Supervision with speed, force, and agility

The Federal Reserve's bank supervisory function is integral to a safe and sound banking system. Michael Barr argues supervision must change and adapt with it, just as the banking system changes

It has been nearly a year since the sudden failure of Silicon Valley Bank (SVB) and ensuing turmoil in the banking system, events which prompted important questions about how banks manage risks and how we at the Federal Reserve supervise that risk-taking. It is a fitting time to share some reflections on the importance of the day-to-day work of bank supervision and the steps we are taking to improve the speed, force, and agility of supervision.

Review of Silicon Valley Bank

Let me begin by summarizing my review of the failure of Silicon Valley Bank. This was the first major bank failure since the Global Financial Crisis, and it necessitated a deep, unflinching review of what went wrong. So, following the failure, Chair Powell and I determined that it would be appropriate for me to lead a review on the conditions that led to SVB's failure.

Experienced and well-respected staff from around the Federal Reserve System who were not involved in SVB's supervision conducted the review. The review found that, first and foremost, the bank's management failed to manage the bank's risks, and its board failed to oversee management¹. But the review also found that Federal Reserve supervisors did not identify issues quickly enough, and when we did identify risks, we were too slow to act with sufficient force to change management behaviour.

The SVB report identified the need to improve the speed, force, and agility of supervision to align with the risks, size, and complexity of supervised banks. To do this, the report identified several areas of focus, including intensifying supervision at the right pace, encouraging timely supervisory action and escalation, and improving agility of supervision. We are taking many steps to strengthen supervision, some of which have immediate influence on our work and some which will bear fruit over the long term.

The goal of supervision

Let me start by explaining the goals and benefits of supervision. The mission of bank supervision is to promote a safe, sound, and efficient banking system to support a strong economy². As I have spoken about many times before, banks play a critical role in the economy by providing deposit products, credit, and other financial services to individuals and businesses.

We need to get regulation right, so that the baseline level of resilience in the system is strong enough

The nature of banking—and the interconnectedness of the system—pose vulnerabilities to individual banks and to the banking system. Deposit insurance and other forms of governmental support help to protect depositors, banks, and the broader economy, but also add to moral hazard, in that banks do not internalize the full costs of their risks.

Regulation and supervision help to make it more likely that banks manage their risks prudently given the costs that their failure can pose on society, and that banks have the capacity to support the economy through good times and bad.

Through regulation, the Federal Reserve Board sets the minimum requirements for banks³. These regulations require banks to have systems to manage their risks, and to maintain capital and liquidity in light of those risks. Regulations are tiered depending on bank risks, with the larger, more complex banks subject to more stringent requirements.

We need to get regulation right, so that the baseline level of resilience in the system is strong enough. The requirements set in regulation, however, may not be sufficient for banks with activities or profiles that are different from or are riskier than a typical bank. Supervision helps to fill in these gaps.

Supervisors do not manage banks. Instead, a supervisor's job is to evaluate a bank's material risks in light of its operations, and to help make sure that the bank has sufficient governance and controls, capital, and liquidity to operate their firm, both in normal times, and in stressful ones.

Supervisors focus on the unique risks of the bank and also bring perspectives of risk across similar firms in the banking system. These two complementary perspectives help supervisors to identify and prioritize key areas of risk and to focus management's attention on addressing the most important issues.

The goal of supervision is not to prevent all bank failures. In a market economy, poorly run firms should go out of business. Similarly, the goal of supervision is not to tell a bank that its business model may not work; the market will do that.

The goal is to help bank managers and boards focus their attention on weaknesses in their risk measurement and management practices, compliance with law, and the sufficiency of the bank's capital and liquidity resources given its risk profile.

Proactive supervisory action helps firms address issues before they grow so large as to threaten the bank, and earlier intervention means that firms may have more options to fix their problems.

Supervision can also help to mitigate systemic risk. A bank's failure can lead to broader instability in the banking system by imposing direct credit losses on other banks, and if the failing bank is forced to sell assets in a fire sale, depressing prices and leading to additional losses at banks holding those same types of assets.

Bank risks can cascade through the financial system because of these types of interconnectedness. Contagion from a failing bank can also happen when it is not clear to market participants and depositors whether other banks have similar risks that have not yet fully come to light.

Inadequate capital, insufficient liquidity, weak risk management practices, and even cybersecurity failures can not only harm individual banks, but also threaten the stability of the system as a whole.

Through supervision, we attempt to focus the most attention and apply heightened standards to firms with the greatest potential to pose systemic risk. But knowing in advance which firms may pose systemic risk is not an exact science.

The benefits of supervision

There is strong evidence that supervision has significant benefits for individual banks, as well as the entire banking system. Economic research on supervision's impact shows that more intensively supervised banks are safer and no less profitable than their peers⁴.

Supervisory enforcement actions have been shown to result in reduced risk through decreased leverage and safer loan portfolios⁵. Of course, there are costs of supervision on a bank, and supervision is most effective when its intensity is proportionate to the risks the bank poses to the financial system.

More broadly, more intensively supervised banks have less volatile income and lower loan losses, especially during periods of stress, precisely when the risk of contagion is heightened⁶. Since weakness in the banking system can amplify economic downturns, actions that promote stronger banks during such times bring benefits that extend well beyond individual banks and the banking system. American households and businesses depend on banks, and on bank supervisors, to help to ensure banks are operating safely and soundly.

Taken up a level, a systemwide perspective—often referred to a 'macroprudential perspective'—is critical for understanding risks to financial stability and thus to the banking system's ability to provide critical lending, payments, and intermediation services to consumers and businesses. It is an important complement to the 'microprudential' supervision of individual banks.

Speed, force, and agility of supervision

Since SVB's failure, we have focused on improving the speed, force, and agility of supervision, as appropriate to the situation. This means that supervisors take timely action as risks build up; that supervisors deploy supervisory tools and escalation effectively; and that supervisors are able to take account of changes in market, economic, and

financial conditions, both to reprioritize examination activity as well as to draw supervisory conclusions based on new and different patterns of risks.

In all cases, supervisory action must be appropriate to the situation. Because supervision is often uniquely specific to an individual institution, the necessary response should depend on the nature and extent of the risk, size and complexity of the institution; its role in the financial system; and the potential for fire sales, cascades, or contagion.

And of course, our findings must be grounded in fact, credible, and consistent with the law. Supervision should also strive to be efficient in the sense of getting the desired supervisory intensity at the lowest cost to supervisors and banks, to the extent practicable and consistent with the overarching objectives of a resilient banking system.

The past year has been busy for Federal Reserve supervisors. The banking system is sound and resilient, and supervisors have been on the frontlines to help ensure it remains that way. Supervisors have brought their understanding of individual banks' operations and strategy and an understanding of local conditions to assess bank risk.

We also have focused on the macro-prudential, systemic perspectives, to form an understanding of the condition of the banking system broadly. And supervisors have worked closely with banks to improve the resilience of banks so that they can effectively serve their customers and provide credit to the economy. Let me now walk through our efforts over the past year.

Intensifying supervision at the right pace

As noted in the SVB report, supervision should intensify at the right pace as a bank grows in size and complexity. Much of the build-up of risk at SVB occurred while the firm was supervised within the regional bank program, which covered firms with assets between \$10 billion and \$100 billion⁷.

Based on this experience, for large and more complex regional banking organizations, including firms that are growing rapidly, we are assessing such a firm's condition, strategy, and risk management more frequently, and deepening our supervisory interactions the firm. At the same time, smaller and less complex firms will see little difference from the current state.

In addition, we have been working to introduce more coordination between the regional bank and large bank supervisory programs. As a regional bank grows in size and complexity, the firm's management should be investing in the firm's ability to manage its risk, so that the firm's capabilities are growing commensurately with the firm's risk.

If this happens, application of standards for larger banks should not require significant changes in a firm's risk management capabilities because the bank should have been making these investments along the way.

So for regional banks that are approaching the \$100 billion threshold, we are working to improve coordination between supervisory teams and to share the range of practices at large banking organizations just over the \$100 billion threshold.

The goal is that the transition to heightened supervision for fast-growing banks is more of a gradual slope and not a cliff. For large banking organizations, we are planning to conduct more horizontal, or cross-firm supervisory examinations, to put our assessment of an individual bank in context and improve the consistency in how we look across banks.

Timely supervisory action and escalation

As noted in the SVB report, once issues are identified, they should be addressed more quickly, both by banks and supervisors. Over the past year, supervisors have taken many steps to better ensure that banks are appropriately managing their risks, including interest rate risk and liquidity risk, and are prepared were they to experience stress⁸.

SVB failed in part because of its mismanagement of interest rate and liquidity risks. While SVB was an outlier in many ways, its failure focused attention on other banks in the system with large unrealized losses and high concentrations of uninsured deposits. Examiners have been conducting additional targeted examinations for firms with large unrealized losses or other vulnerabilities.

During these exams, we engage extensively with the banks to understand the firm's financial and operational health. And we work closely with our state regulatory partners; they provide important insights into the banks and the banking environment, and we value their continued partnership.

Where there are weaknesses in how firms are managing these risks, examiners are requiring firms to take steps to address these weaknesses and encouraging them to bolster their capital position, reduce their liquidity risk, or mitigate their interest rate risk, as appropriate. For a small number of banks with a risk profile that could result in funding pressures for the firm, supervisors are continuously monitoring these firms.

Let me turn to supervision of a specific risk: commercial real estate (CRE). The reduced demand for office space and higher interest rates have put pressure on some CRE valuations, particularly in the office sector.

Supervisors have been closely focused on banks' CRE lending in several ways: how banks are measuring their risk and monitoring the risk, what steps they have taken to mitigate the risk of losses on CRE loans, how they are reporting their risk to their directors and senior management, and whether they are provisioning appropriately and have sufficient capital to buffer against potential future CRE loan losses.

Stepping back, because of the heightened risk environment and heightened supervisory attention, the Federal Reserve has issued more supervisory findings and downgraded firms' supervisory ratings at a higher rate in the past year.

In addition, we have increased our issuance of enforcement actions. These actions do not represent a change in policy; they reflect the impact of the changing economic, interest rate, and financial environment on a bank's financial resources. We want and expect supervisors to help banks focus adequate attention on the areas that matter most for the particular bank, whether that is interest rate risk, CRE, or cybersecurity vulnerabilities, to name a few.

As noted in the SVB report, we continue to evaluate whether we should temporarily require additional capital or liquidity beyond regulatory requirements where the firm has trouble in managing its risks. Higher capital or liquidity requirements can serve as an important safeguard until risk controls improve, and they can focus management's attention on the most critical issues. Other supervisors use these types of tools, and we can draw from these experiences as we consider what may be appropriate for our supervised banks⁹.

Improving the agility of supervision

Another area of focus has been to improve the agility of supervision. Supervisors must be able to make judgments on a forward-looking basis built on imperfect information, while remaining fair, evidence-based, and consistent. In the case of SVB, supervisors delayed action to gather more evidence even as weaknesses were growing. This delay meant SVB's problems persisted past the time when it had options to address them, and those problems got worse.

Drawing from this experience, we have been looking to enhance our supervisory programs so that we correctly balance a strong process with the need to act based on imperfect information, and tools that speed up and strengthen the consequences for supervisory findings.

As I mentioned previously, supervisors do not manage firms; they communicate to firms where there are weaknesses in firm practices and escalate those concerns where appropriate. So here, supervisors should be issuing supervisory findings in a timely way, focusing on the important issues, aligning findings with the severity of the issue, and communicating findings to firms clearly.

Once supervisory findings are communicated, supervisors should appropriately assess supervised institutions' remediation of findings, and when the firm fails to adequately address issues, escalate findings in a timely way to more stringent actions.

As part of this effort, we are working on our enforcement processes to provide consistency and the appropriate speed, force, and agility in the recommendation, development, and escalation of enforcement actions. In addition, we are working to improve our processes for identifying potential developments or trends in risk that could negatively affect individual banking firms or the banking system, and better connecting this analysis to supervision.

Where risks are emerging, this analysis may help to bolster the basis for forward-looking supervisory assessments. Where risks are underappreciated, the analysis may help to challenge supervisors' assessments and foster meaningful action.

It is also critical that we look beyond the risks we see today to keep the banking system strong and resilient into the future. Supervisors should be encouraged to consider a range of potential shocks and vulnerabilities, so that they think through the implications of unlikely 'tail' events with severe consequences.

Most people are skilled at pattern detection, but often have trouble contemplating the consequences of events outside of our historical experience. It is important to find ways to break these strictures and think more critically

about scenarios that could lead to acute distress at firms. This requires us to have the right tools, expertise, and supervisory approaches for a given firm and environment.

Conclusion

The Federal Reserve's bank supervisory function is integral to a safe and sound banking system. And just as the banking system changes, the Fed's supervision must change and adapt with it. We need to continuously explore new models of financial risk.

We should bring together multiple perspectives to challenge supervisory judgments and build organizational frameworks that institutionalize this practice. And we must appropriately adjust supervision when we see changes at a firm or in the financial sector, especially in these times of great innovation and technological change.

But we also must be humble about our challenges; the failure of Silicon Valley Bank one year ago revealed our own failures. It showed that in some cases, such as when banks grow rapidly or take on new risks, that supervision can lack the speed, force and agility required to keep up with those changes.

Since that time, we have been hard at work to address those issues. And while this work will take time, I am committed to getting the job done properly. Supervisors around the Federal Reserve System have stepped up to the challenge, and I am grateful for their continued good work. ■

Michael S Barr is the Vice Chair for Supervision of the Board of Governors of the Federal Reserve System

Endnotes

1. Board of Governors of the Federal Reserve System, [Review of the Federal Reserve's Supervision and Regulation of Silicon Valley Bank \(PDF\)](#) (Washington: Board of Governors, April 2023).
2. For more on bank supervision, please see the Federal Reserve's website: [Understanding Federal Reserve Supervision](#).
3. In this speech, references to 'banks' includes banks, as well as their holding companies. Bank holding companies constitute the largest segment of institutions supervised by the Federal Reserve, but the Federal Reserve also supervises state member banks, savings and loan holding companies, foreign banks operating in the United States, and other entities. The Office of the Comptroller of the Currency (OCC) and the Federal Deposit Insurance Corporation (FDIC) also supervise national banks and state non-member banks, respectively. State banking agencies also supervise state-chartered banks.
4. Beverly Hirtle and Anna Kovner, "Bank Supervision," *Annual Review of Financial Economics* 14 (2022): 39–56.
5. Allen N Berger, Jin Cai, Raluca A Roman, and John Sedunov, "Supervisory Enforcement Actions Against Banks and Systemic Risk," *Journal of Banking and Finance* 140 (July 2022).
6. Beverly Hirtle, Anna Kovner, and Matt Plosser, "The Impact of Supervision on Bank Performance," *Journal of Finance* 75, no. 5 (2020): 2,765–2,808.
7. Prior to SVB's collapse, firms with assets of less than \$100 billion were supervised using approaches developed for community banking organizations, and supervisory engagement with the firm was limited to an annual examination and targeted examinations as needed.
8. See, eg. Board of Governors of the Federal Reserve System, [Supervision and Regulation Report \(PDF\)](#), (Washington: Board of Governors, November 2023); and Board of Governors of the Federal Reserve System, [Supervision and Regulation Report \(PDF\)](#) (Washington: Board of Governors, May 2023).
9. Regulators in Europe and the UK impose additional capital and liquidity buffer requirements on firms through their Pillar 2 framework. In addition, the OCC's framework enables the OCC to impose higher individual minimum capital requirements (IMCRs) via an enforcement action. See 12 C.F.R. 3.403.

The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board. This article is based on a [speech](#) delivered at the Annual Columbia Law School Banking Conference, New York, February 16, 2024.

Finance21 is pleased to announce that Deloitte Isle of Man has been awarded the Best Professional Services Provider Isle of Man 2024.

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Tailoring, fidelity to the rule of law, and unintended consequences

Michelle Bowman discusses the role of tailoring in the regulation of banks, and how it allows the safety and soundness of the banking system and US financial stability

would like to frame the discussion by offering my views on a key element underpinning the US bank regulatory framework: the role of tailoring. While the principle itself is simple—setting regulatory priorities and allocating supervisory resources in a risk-based way—the consequences of tailoring (or not) can reverberate throughout the banking system, the broader US financial system, and the economy. I see a clear nexus between tailoring and fidelity to the law, including a targeted focus within our statutorily mandated prudential responsibilities.

Tailoring as a grounding principle

I have long been a proponent of tailoring and continue to consider it a strong foundational principle upon which to apply bank regulation and supervision. This approach ensures a focus on the most critical risks over time, avoiding the over-allocation of resources or imposition of unnecessary costs on the banking system.

When we approach rulemaking with a commitment to tailoring, and to our broader prudential mandates, the public can judge our actions by how well they serve these ends, and they should rightly be concerned when regulatory actions seem to serve other goals.

In this sense, tailoring keeps policymakers grounded and facilitates appropriate prioritization. Tailoring also allows us to allocate limited supervisory resources to most effectively support safety and soundness of the banking system and US financial stability.

In accordance with the law, the Federal Reserve, both in its monetary policy function and in the execution of its bank regulatory and supervisory responsibilities, is meant to operate independently and apolitically. But banking regulators have a responsibility to act in a way that proves this independence is warranted. We earn the right to operate with this independence when we consistently follow the law and achieve our prudential objectives.

One of the most effective ways we accomplish this goal is through the appropriate prioritization of risks in the financial system. Regardless of the approach to bank regulation and supervision, bank regulators should be subject to oversight and accountability, to both Congress and the public.

The principles that guide the execution of prudential responsibilities matter, especially when they further efficiency and effectiveness. Congress has embedded the concept of tailoring within the Federal Reserve's regulatory mandates, including the Economic Growth, Regulatory Relief, and Consumer Protection Act, commonly referred to as S. 2155¹.

Regulatory costs that are disproportionate to a firm's risk create incentives for activities to migrate out of the banking system entirely, which we have seen as a consequence of past regulatory reform efforts

This law revised provisions of the Dodd-Frank Act, amending the *threshold* for tailored application of enhanced prudential standards on certain regulated institutions².

Notably, S. 2155 did not *introduce* tailoring to these standards; it merely modified tailoring thresholds and mandated the Board implement this approach. To be clear, tailoring is not a pretext for deregulation but rather a principle that allows regulators to pursue required statutory objectives in the most efficient and effective way.

Does tailoring need a defender?

I suppose one could view my support for tailoring as merely setting up a straw man; surely everyone agrees with tailoring in principle? On a superficial level, it is hard to argue with the principle that regulatory tailoring—matching regulation and supervision to risk—is a prudent approach for bank regulators.

And yet the rhetoric supporting tailoring and risk-based supervision often does not match regulatory reform efforts or supervisory approaches. The criticisms rarely manifest as scepticism of the principle itself. Rather, they are implicit in the approach to regulation and supervisory guidance or are disguised as a criticism of the *execution* of tailoring.

Both the pending capital reform proposals and the final climate guidance illustrate how regulatory actions can deviate from the principle of tailoring without any express recognition of this effect.

The federal banking agencies have proposed several reforms to the capital framework, among them the Basel III ‘endgame’ and new long-term debt requirements that would apply to all banks with over \$100 billion in assets.

I have expressed concern with both of these proposals on the merits, in terms of striking the right balance between safety and soundness and efficiency and fairness, and out of concern for potential unintended consequences.

Another concern is whether these proposals show fidelity to the law, which requires regulatory tailoring above the \$100 billion asset threshold.

In 2019, the Board published its regulatory tailoring rule and included a compelling visual that depicts in table form how a series of requirements—capital, single counterparty credit limits, liquidity, and the requirement to form a US Intermediate Holding Company for foreign banking organizations—worked collectively to establish a tiered framework³.

If you superimpose the pending capital reform proposals on the table, there is a ‘flattening’ of requirements in the capital bucket. Of course, this simple exercise does not reflect the unknown end state of the bank regulatory framework, and the current desire among some policymakers to modify liquidity requirements.

These individual efforts highlight the hazard of piecemeal reforms, especially those that are closely related in their end-state operation, like capital and long-term debt requirements. When regulators pursue reforms by creating separate rulemaking silos, we limit our capacity to not only ensure fidelity to tailoring but also fidelity to our prudential mandates. Even when proposals have concurrent comment periods, the danger is that the final regulations will be miscalibrated and not appropriately tailored.

Tailoring underpins not only effective regulation, but also effective bank supervision. The effectiveness of the interagency principles used by the Federal Reserve, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency for the management of climate-related financial risks could be evaluated as a supervisory tool through the lens of tailoring, which requires us to consider both the regulatory threshold for applicability and the content of the guidance⁴.

One approach to evaluate the merit and effectiveness of these principles as a supervisory tool is through the lens of tailoring, which requires us to consider both the regulatory threshold for applicability and the content of the guidance.

On its face, it applies to banks with \$100 billion or more in consolidated assets. What does this threshold mean in practice? Guidance serves the role of illuminating supervisory priorities and expectations. These informal communications help bridge the divide between regulators and regulated entities.

When guidance notes that *“all financial institutions, regardless of size, may have material exposures to climate-related financial risks...”*⁵ my intuition is that banks will take little comfort from the nominal carveout in light of this language. Apart from the general concern with the ‘cliff effect’ threshold at \$100 billion, I question whether any size threshold will apply in practice⁶.

The content of the guidance—and its expectations for larger banks—suggests that the motivation behind the principles is neither prudential considerations nor to further regulatory tailoring, as it has a somewhat tenuous connection to core safety and soundness considerations and seems destined to trickle down to smaller firms over time.

Banks have long been exposed to climate- and weather-related financial risks and have long been required to manage all of their material risks, including these. But the principles seem oriented toward contributing to a policy matter that extends well beyond prudential bank regulation—namely how the US and other governments around the world should address climate change.

And the principles seem focused on highly uncertain risks well outside the normal temporal horizon of a bank supervisor. One could reasonably ask, do the principles result in appropriate, risk-based prioritization of supervisory concerns?

It is possible that they prioritize risks that may not be the most relevant for safety and soundness and may effectively influence credit allocation decisions through regulations that are not driven primarily by prudential considerations.

Bank regulators can acknowledge the importance of questions around climate change while also hewing to their statutory responsibilities. Promoting safety and soundness and US financial stability is a weighty enough task without taking on other causes.

The current regulatory agenda includes many other examples where similar arguments can be made that regulatory reform proposals lack sufficient attention to regulatory tailoring and thereby fail to further statutory directives to tailor certain requirements and, more importantly, to address the condition of the banking system.

Apart from substantive deviations from regulatory tailoring, there are also indirect attacks on the value of tailoring as a principle to guide bank regulatory reforms. For example, one prominent argument raised shortly after the failure of Silicon Valley Bank, and which has become a driving force in regulatory reform efforts, is that the Board's *approach* to tailoring was to blame for the bank failures and broader banking stress⁷.

The argument is that a major factor contributing to the bank failures was the implementation of S. 2155, the statutory mandate to tailor regulation and an accompanying shift in supervisory policy.

As I have noted many times in the past, I find little evidence to support this claim. While couched as a critique of the *execution* of tailoring, this argument also seems to challenge the *value* of tailoring, asserting that a simple solution would be to unwind regulatory tailoring and eliminate risk-based tailoring in supervision.

Taking ownership and accountability of the supervisory issues that significantly contributed to the banking system stress last spring enables us to look critically at the approach to regulation and supervision in the lead-up to these failures, and appropriately address the shortcomings.

Why does tailoring matter?

Before thinking about tailoring for smaller, simpler firms, I think it's helpful to think about the largest, most complex firms. Additional regulation and heightened supervisory attention are warranted and necessary for larger firms, particularly global systemically important banks (GSIBs) with additional size, risk, and complexity.

This principle is so well-established that it was not only a core precept of S. 2155, it was a central theme of the Dodd-Frank Act⁸. We need not rely on past views about the virtue of tailoring—what was once conventional wisdom—to believe in its ongoing relevance.

One critique of tailoring may be with what underlying 'problem' it is designed to solve, particularly as it relates to the allocation of finite resources both for banks and for regulators. Are regulatory and supervisory resources actually limited, and if so, what are the practical constraints on these resources?

At a basic level, the quantum of regulatory and supervisory resources is a policy decision—as regulatory and supervisory demands grow, so too can the staffs and budgets of the federal banking agencies. The US financial

system is expansive and regulators have the capacity to expand supervisory resources as needed (or as perceived) to address safety and soundness concerns.

Of course, there are practical constraints on an ever-expanding and stricter bank regulatory framework. First, the funding of regulatory and supervisory expansion imposes costs not only on US taxpayers but also on banks, and indirectly, bank customers.

While the banking system has many advantages—including the use of insured deposits as a source of financing banking activities—at some point, this structural advantage will erode under the cumulative burden of the regulatory framework and will result in a shift of activities from banks to nonbanks and the broader shadow-banking system.

The contours of the financial system, where products and services are offered, does not exist according to the bright line of federal regulatory authority. We would be well served to recognize the limitations of a regulatory perimeter that pushes activity outside of the banking system and beyond this authority.

Unintended consequences

As we consider the merits of tailoring, we should consider the consequences of not adhering to this principle in regulation and supervision, and related reform proposals.

As a threshold matter, a bank regulatory approach that disregards tailoring can manifest in different ways, such as uniformity in approach—failing to differentiate among institutions based on their size, risk, and complexity—or by adopting regulatory ‘cliffs’ clustered around thresholds that insufficiently distinguish among institutions based on

these factors. In both cases, deviating from tailoring could result in fundamental changes to the structure of the U.S. banking system.

One risk of uniform requirements is the consolidation pressure it creates. Apart from the shortcomings I've discussed in appropriate risk-based prioritization within the bank regulatory framework, this approach encourages consolidation, as institutions seek operational economies of scale to gain competitive advantage over their peers.

In this scenario, the benefits of being large, risky, and complex become a driving force in the organization of the banking industry. I think we should consider the implications not only for regulatory efficiency, but also whether this approach represents waving the white flag in fighting against the assertion that certain institutions are 'too big to fail'.

Even where standards are not uniform, a lack of sufficient tailoring can reshape the banking industry, simply through the cliff effects created around particular regulatory thresholds. For example, capital reform and climate regulation would establish \$100 billion as the key regulatory threshold, lending additional gravity to the decision to cross, or even approach it, with the consequence of reducing the number of institutions around that threshold. Institutions *above* the threshold will face strong incentives to grow larger to achieve economies of scale.

Institutions *below* the threshold will face strong incentives to manage their size to avoid the significant intensification of requirements that apply as they approach \$100 billion in assets. This scenario also has significant implications for the too-big-to-fail issue, as well as for industry competition over the long term.

Regulatory costs that are disproportionate to a firm's risk create incentives for activities to migrate out of the banking system entirely, which we have seen as a consequence of past regulatory reform efforts. In my view,

implicit in the statutory mandate to promote safety and soundness, and financial stability, is that we allow banks to continue serving their role in the US financial system and in support of the economy.

Fidelity to the law does not require regulators to create a bank regulatory framework that eliminates risk: banking is inherently about managing, not eliminating, risk. ■

Michelle W Bowman is a Member of the Board of Governors of the Federal Reserve System

Endnotes

1. *Economic Growth, Regulatory Relief, and Consumer Protection Act*, Pub. L. No. 115-174, 132 Stat. 1296 (2018).
2. Pub. L. No. 115-174, § 401(a)(1), amending 12 U.S.C. § 5365.
3. See Tailoring Rule Visual, [“Requirements for Domestic and Foreign Banking Organizations \(PDF\)”](#), October 10, 2019.
4. Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, [“Agencies Issue Principles for Climate-Related Financial Risk Management for Large Financial Institutions,”](#) news release, October 24, 2023.
5. 88 Fed. Reg. 74,183–184 (October 30, 2023).
6. See Michelle W. Bowman, [“Reflections on the Economy and Bank Regulation \(PDF\)”](#) (speech at the Florida Bankers Association Leadership Luncheon Events, Miami, Florida, February 27, 2024).
7. See Board of Governors of the Federal Reserve System, [“Review of the Federal Reserve’s Supervision and Regulation of Silicon Valley Bank \(PDF\)”](#), (Washington: Board of Governors, April 2023), introductory letter by Michael S Barr, (concluding that “[t]he Board’s tailoring approach in response to the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) and a shift in the stance of supervisory policy impeded effective supervision by reducing standards, increasing complexity, and promoting a less assertive supervisory approach.”).
8. Pub. L. No. 111-203, 124 Stat. 1376, 1423, § 165 (July 21, 2010).

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 Harvard Law School Faculty Club, Cambridge, Massachusetts, March 05, 2024.

Banking today in the United Kingdom



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MONTH/YEAR

Andrew Bailey gives an overview on the state of the banking sector, focusing on the future issues that are important for banks themselves and for broader monetary and financial stability

I am going to focus on banking, and particularly on issues that, looking forwards, are important both for banks themselves and for broader monetary and financial stability. I am going to start with an important and very positive point. The last four years have seen major macroeconomic disruptions that we have had to work through. But they have not created disruptions to the UK banking system, and thus to financial stability, of the sort that we have seen in the past.

This time the banks have supported the economy through lending not the other way round, and that's how it should be. So credit where it's due – sorry for the pun.

This point on lending to support the economy is important. In his 1986 Loughborough Lecture, Robin Leigh-Pemberton concluded that: *“The detailed study of liquidity and of the development of credit are essential elements in judging financial conditions, even though they cannot be, and never have been, the sole elements.”*

So, what has been going on recently in terms of UK credit conditions? Going back to early 2020 as COVID broke out, among companies there was an extraordinary, but understandable, increase in demand for liquidity and credit, often as a precaution in the face of hugely uncertain and worrying conditions.

This need was – rightly in my view – met by a combination of the commercial banks, the Government and the Bank of England, with the banks, rightly, first in line, and the public authorities coming in only as the full and unprecedented magnitude of the economic shock became clearer.

Turning to the present-day picture, large parts of the precautionary draw-down of credit during the early COVID period are being repaid, consistent with the unwinding of the COVID shock. But to judge the current effectiveness of the banking system, we need to look at whether gross new lending is getting to those who need it.

For both small and large firms, gross lending is back to around the 2019 average in nominal terms. Our regional agents tell us that this picture is broadly consistent with what they hear, but they caution us that there remain businesses that find it difficult to access working capital. Of course, all lenders have to take the risk of borrowers into account.

There have been major reforms to bank capital regulation since the financial crisis. Those reforms are almost fully done, and before we call them done we should check that the UK system is appropriately competitive on an international basis

In the household sector, consumer credit appears to be robust, while secured lending remains weaker but with some early signs of strengthening based on more forward-looking measures such as mortgage applications and approvals.

In our latest Quarterly Credit Conditions Survey, lenders expect demand for both secured and unsecured credit to increase over the next three months. Our assessment of lenders is that they are well placed to meet such a pick-up in lending.

This period of time has been the first big test of the post Global Financial Crisis (GFC) banking reforms, and the system in this country has come through effectively. But, there is a puzzle expressed often by banks. If it is a good news story, why are the valuations of banks so much in the doldrums?

On the subject of bank valuations, let's start with some facts, and particularly comparisons to the pre-GFC period. I am going to use the major UK banks as the evidence base. This is not because I am uninterested in the mid-tier and small banks, but simply because it is easier to make the data comparisons for the major banks to the pre-GFC period.

Today, the average price-to-tangible book ratio for the major UK banks (how the market values them relative to their book or accounting values adjusted for intangibles such as goodwill) is 0.7. In other words, the market values them at a discount to the accounting values.

In the two years leading up to the failure of Northern Rock in September 2007, the equivalent figure for the then group of major UK banks was 3.4. The paradox is starkly apparent – a period when banks were valued by markets at

more than 300% of tangible book value ended in disaster. Today's greater stability looks the better place to be, but not for market valuations.

That leaves us with the puzzle. Let's bring in some more data. Today, the average return on assets for the major UK banks is 1%, and for the three years pre financial crisis it was also 1%. But in the period of low interest rates after the financial crisis, average return on assets fell to around 0.4%. There is therefore a link between the level of interest rates and returns on assets for banks. I will come back to this point.

The story on returns on equity is at first sight rather different. For the three years prior to the financial crisis, average return on tangible equity for the major UK banks was 27%. For the post-crisis low interest era it was around 6%. On the latest figures for the third quarter of last year, it was 13%.

A back of the envelope adjustment¹ for the increase in capital requirements post-crisis would suggest that the equivalent pre-crisis return on tangible equity would be 18 percentage points lower. So, given return on assets is the same, most of the decline in return on tangible equity of UK banks since before the GFC can be attributed to reduced levels of leverage, as banks are now capitalised appropriately.

Banks are a lot less levered than pre-crisis – the tangible book value of their equity has increased by more than 200% whereas assets increased by only around 70%. Of course, having little capital pre-crisis turned out to be not smart, and the rest is painful history.

Except, that is not the end of the story. We need also to look at the return investors demand for the risk they take, often referred to as the cost of equity. We cannot observe the cost of equity directly, but Bank of England staff

estimates give a plausible range of around 10% to 15%, across the pre-crisis period, the post-crisis low interest rate period, and the latest numbers today².

What is immediately apparent is that the cost of risk – the return equity investors demand – does not seem to have fallen in line with what appears to be greater stability and lower risk per unit of equity. The cost of equity remains at pre-crisis levels even though it was clearly mispriced before the crisis.

Maybe this is because investors don't accept the story of greater stability? I would give two responses to this. First, I can accept that it takes time to build up the story of greater stability and for it to be put to the test, but I think we have now seen banks coming well through some pretty extraordinary times.

Second, it's useful to go back briefly to the arithmetic. Capital for banks is on the liability side of the balance sheet, as such it is part of the funding of the assets. There is a hierarchy of loss absorbency within the funding structure of the liabilities, but for the most part this does not determine the risks faced by banks.

So, if more of the funding liabilities take the form of equity and the risks faced by the bank remain the same, you might expect the cost of equity per unit of capital to fall. This is because, other things equal, each £1 of equity is then exposed to less risk.

There is a puzzle here, in terms of the market valuations of banks. But there are two arguments I do want to rebut.

First is the notion that the post GFC reforms have required banks to hold too much capital. Capital is funding that stands first in line to bear losses. Requiring more capital, as we have done, does not on its own increase, or reduce,

the likelihood of losses. But it does increase the protection of depositors, by raising that first in line buffer. And this greatly benefits the stability of the financial system.

Second it is sometimes asserted that the capital rules, and requirements differ across national jurisdictions, and this influences valuations. I don't agree with this argument. Capital requirements for banks are shaped by international agreement – the Basel process.

There will be differences in implementation at the edges, reflecting national features, but the outcomes are broadly aligned. This alignment is important both to limit system-wide risk and to ensure appropriate competitiveness among banks.

Currently, we are implementing what should be the last leg of the post financial crisis capital reforms – known as Basel 3.1. Given the advances made by the UK authorities in increasing the safety and soundness of the banking system after the GFC, we expect that Basel 3.1 will have a relatively marginal impact on the overall level of capital for UK banks.

The key thing here is that across jurisdictions it is implemented faithfully, neither more nor less. And, as we get near to finalising the post-crisis reforms this is the moment to check whether we have achieved a broad alignment of capital requirements across countries. I say this because now is the important moment in time to carry out this check.

To conclude on this issue, banks should be able to make decisions on risk taking unconstrained by concerns about the capacity of their balance sheets to support that risk in a wide range of plausible states of the world. That is where we are today, and the approach has served us well over the events of recent years.

I am going to stay with bank liabilities and funding costs for the next issue. This concerns the rates paid on deposits and the net interest margin or NIM. The last year has illustrated well how central the NIM is to the returns that banks make, and also how important it is to the public's perception of banks and competition among them.

I will start with some history which is important to understanding what has gone on with NIMs. Starting again before the financial crisis, when the Bank Rate was in what can be described historically as more normal territory – ie. above near zero rates – it was typical for the average funding cost of banks to be a bit below the official Bank of England Rate. The average NIM for the major banks pre-crisis was 3.1%.

For the decade between the end of the financial crisis and the onset of COVID, the average NIM was 2.8% and the average return on assets for the major banks was 0.4%. The lower NIM may have reflected several forces at work.

One of the main ones, if not the main one, was that when Bank Rate fell to near zero as the economic effects of the financial crisis took hold, average deposit rates did not fall by as much, and so the effective cost of deposits moved from being somewhat below to somewhat above Bank Rate, but without being fully offset in lending rates.

We can now answer the question what has happened to these relationships as the Monetary Policy Committee has raised Bank Rate back up into the range that was more typical before the financial crisis? The answer is that the old relationship whereby deposit rates averaged below rather than above Bank Rate has been re-established. NIMs are currently around where they were in late 2005, immediately before the financial crisis at 3.2%.

On the face of it, more normal conditions have returned. But let me end this section with two comments on the current situation. First, this reversion to past patterns does imply that overall deposit rates have risen by somewhat

less than Bank Rate. Bank Rate has risen by 5.15% since we started to increase it in December 2021, and on average overall effective rates on interest-bearing deposits have risen by 2.5 percentage points.

That is not, however, the end of the story, because more has gone on under the surface. If we split deposits into fixed-term and instant access or sight deposits, we see two very different parts to the story. On average, fixed term deposit rates have risen by 3.7 percentage points since December 2021.

But the effective rates on interest-bearing sight deposits have risen by less, on average by 2.1 percentage points. Why has this happened, and what is the consequence of it? Regulation plays a part here. One of the important regulatory responses to the financial crisis was to create a liquidity regulation framework, including the Net Stable Funding Ratio, which incentivises banks to take relatively more term deposits which cannot run as quickly.

This was a deliberate choice to increase stability. My conclusion is that the incentive to take more stable deposits has been carried through into pricing. The second conclusion, again consistent with the incentives, is that there has been a notable shift from holding sight to holding term deposits. The evidence indicates that the share of deposits held in time deposits has increased by 8 percentage points since the start of the tightening cycle.

Let me finish this section with a short answer to the question, what happens next for net interest margins, and thus for returns to banks? It depends no doubt on quite a lot of things. But the answer to what should happen is that competition within the banking system should exercise the strongest influence on returns.

The subject of deposit runs brings me to the next issue I want to cover this evening. While I said that the UK banking system has to date come through recent economic shocks well, and I expect it to continue to do so, last year did

see some major events among banks elsewhere. March last year was quite a month. It reminded us never to take stability for granted, and pointed to how some of the features of bank problems have evolved.

The most prominent, I think, was the speed and scale of bank runs. Traditionally, if we can use that word about bank runs, banks have not lost, say, 25% of their deposits in one day. As a case in point, Northern Rock lost on average around 5% in one day.

Sadly, for those of my age anyway, in *Star Trek* Mr Spock never said *"It's life Jim, but not as we know it."* But for someone like me who has seen a few bank failures, last March had that sort of feeling to it. Except that, of course, it is life, and we do now know it.

It's life with digital technology – both digital banking and payments and digital communications. Confidence in a bank can be lost, and runs can be affected and spread at a speed that was unknown in the past. Queuing in the street is not required.

So, bank liquidity and runs are subjects of the moment again. I want to step back briefly at this point and try to answer the question, but is liquidity really the issue in such cases, isn't the solution to be found elsewhere? Yes and No is my answer to that.

The question of whether bank failures are caused by liquidity or solvency problems is as old as the hills, and has chicken and egg like characteristics. I remember the CEO of a bank experiencing a run telling me that their bank was the best capitalised in the country, to which my response was to ask in that case why the depositors were heading for the doors? In my experience, runs mostly point to a solvency problem, though it may be one ahead rather than one visible today, that is the nature of a loss of confidence.

But beyond that, even if a run is a symptom, it has to be dealt with in order to stabilise the problem and allow a solution to be put in place, as to do that requires some time, which also reinforces the need for liquidity buffers.

As part of the post financial crisis reforms, the second plank of the reformed liquidity policy was put in place, namely the Liquidity Coverage Ratio. The Liquidity Coverage Ratio requires banks to hold a sufficient stock of high quality liquid assets in normal times to survive a significant stress scenario lasting 30 days, combining idiosyncratic and market wide shocks.

The Net Stable Funding Ratio intends for banks to maintain a stable funding profile in relation to the composition of assets and off-balance sheet activities, including limiting overreliance on short-term wholesale funding.

The two planks are meant to reinforce each other, with the Net Stable Funding Ratio focused on the maturity mismatch between assets and liabilities, and the Liquidity Coverage Ratio focused on the holding of high-quality liquid assets that can easily be turned into cash to meet outflows.

The numbers involved are sizeable. The major UK banks today hold £1.4 trillion of high-quality liquid assets, which corresponds to an average of 149% of their LCR. The NSFR is 135%. In other words, the banks are holding excess liquidity above the requirements in both cases. But the world moves on, as we saw last spring.

These ratios were calibrated after the financial crisis, in response to the runs and liquidity losses we saw then. What we have now seen is a much more powerful version of that experience.

So, does that make the calibration inadequate, and in need of supplementing? A simplistic answer would be yes. More money can go out of the door more quickly, hence it must follow.

I don't think the answer is that simple. This would amount to saying that banks should self-insure more. But it would move banking significantly towards a narrow bank model which would disrupt the process of credit creation – lending – in the economy, with negative economic consequences. Supporting economic activity is an important part of so-called fractional reserve banking, in which only part of deposit liabilities are backed by banks in highly liquid assets.

Changing this arrangement does not strike me as the right way to go. The alternative, and better way I think, is to supplement the existing liquidity regime with more ready access for banks to liquidity insurance at the Central Bank, which is appropriately priced and risk managed.

This could be alongside more targeted adjustments to the liquidity regime, perhaps aimed at firms with more vulnerable business models, and for banks to be prepared to access liquidity insurance to monetise assets at speed.

Now, a Governor of the Bank of England cannot make a speech on this subject without invoking the spirit of Walter Bagehot, it's just not done. It was Bagehot in his book *Lombard Street* written in 1873, who chastised the Bank of England for the hesitancy of its approach towards advancing liquidity.

I'm going to use two quotes from Bagehot if you don't mind. I say this not just because I like reading Bagehot, which I do; or just because of the quality of his prose, he wasn't Editor of the *Economist* for nothing; but because in substance the principles and lessons haven't changed. So, here is Bagehot on liquidity crises of the nineteenth century.

“And though the Bank of England certainly do make advances in time of panic, yet as they do not do so on any distinct principle, they naturally do it hesitantly, reluctantly, and with misgiving. In 1847, even in 1866 – the latest panic, and the

one in which on the whole the Bank acted the best – there was nevertheless an instant when it was believed the Bank would not advance on Consols [gilts as we now know them], or at least hesitated to advance on them. The moment this was reported in the City and telegraphed to the country, it made the panic indefinitely worse. In fact, to make large advances in this faltering way is to incur the evil of making them without obtaining the advantage. What is wanted and what is necessary to stop a panic is to diffuse the impression, that though money may be dear, still money is to be had.”³

And here, more briefly, is Bagehot on the liquidity management of the joint stock banks of his day:

“Not only did they keep their reserve from the beginning at the Bank of England, but they did not keep as much reserve as they would have kept if there had been no Bank of England.”⁴

Bagehot’s thinking is just as relevant to the situation we face today. The panics are not telegraphed out to the country, they get there by digital means at much greater speed, but the essence is the same.

The second point that remains the same is that unless the response is convincingly robust, to use Bagehot’s words you incur the evil without the advantage.

Finally, Bagehot’s conclusion, that there is a balance to be struck between the self-insurance of commercial bank liquidity and the insurance that comes from the central bank, remains just as true today. However, two points are worth emphasising here, one of which we must credit to Bagehot, and the other of which is new.

The new point is that Bagehot lived well before deposit insurance and formal bank resolution tools came into existence. So, there is now a third and fourth form of protection. Deposit Insurance means that more focus, in terms of calibrating defences, should be put on uninsured deposits as more run prone.

But we can only downplay insured deposits for this purpose if we can all be confident that our bank accounts are continuously available to us, for instance to make and receive payments. That's where bank resolution tools are crucial, and I think that here over recent times the UK has a good story to tell.

The much older Bagehot point is also crucial. He was very clear that central bank insurance should appropriately reflect and price the risk of the lending and should be at an appropriate penalty rate. This is a principle that we must stick to – it echoes my second quote from Bagehot, namely that with a central bank playing the role he described, there is an incentive for banks to reduce their self-insurance. That is one reason why today we have both liquidity regulation for banks and central bank insurance, it can't be an either/or.

This brings me to the conclusion on how to respond to last year's events. If we want to preserve the benefits of fractional reserve banking for credit creation in the economy, the answer should substantially be to ensure that the assets created by the credit process are available for re-discount at the central bank in greater scale and under a process that can be operated very quickly.

That's what we have done in recent years. The adjusted market value of the total collateral held in all pools at the Bank of England has increased by £310 billion since the start of 2011, from £205 billion to £515 billion at end-2023. This is welcome progress, but there is more to do on this front.

The last issue I want to cover is also highly relevant today and relates to the reserves banks hold at the Bank of England, just as in Bagehot's day. Why is this a relevant issue now?

Central bank reserves are the most liquid asset in the system – they are in effect cash in the sense of central bank money. They are an essential anchor to financial stability. They also play a second key role in today's system. They

are remunerated at the official Bank Rate, and as such they provide the anchor for ensuring that the MPC's decisions are put into effect – they pin down the near-end of the interest rate curve. There are other ways of operating as a central bank for monetary policy purposes, but all involve reserves to some degree or other.

The question of what degree or scale of reserves there should be in the system is important. We can produce two answers to this question – one for monetary policy, and one for financial stability purposes, and the overall answer should be the higher of the two. But that doesn't tell us the answer, just how the question needs to be answered.

Before the financial crisis, the major UK banks held £10 billion of reserves at the Bank of England. Today, they hold £467 billion, a substantial part of the stock of high-quality liquid assets. It's fair to say that the pre-crisis number did not adequately take account of financial stability needs.

Today's number includes reserves created as a product of so-called Quantitative Easing. By undertaking QE, the Bank increased the supply of reserves for monetary policy purposes. QE is an asset swap – the central bank provides cash reserves or money in return for buying less liquid assets. We thus increase the liquidity of the financial system and its capacity to support activity in the economy.

QE therefore increased the stock of reserves for monetary policy purposes, but it's important to remember that there is another reason for banks to hold reserves, namely financial stability.

The question then is what is that steady state number for reserves? The trite answer is higher than pre-crisis and probably lower than today. Thanks for that observation you might say, the gap left seems pretty large.

I expect the future level of reserves to fall from where it is today (£467 billion), and to settle at a point which is likely to be determined more by the financial stability demand for reserves – the traditional Bagehot point. Pre-positioning assets at the Bank of England will make that level lower than otherwise as Bagehot said, but not below a certain point.

I will go a bit further and say that my best guess today is that the demand for reserves by the banks will settle at a level higher than we would even in the recent past have expected. That may be for more than one reason, of which one may well be the lessons of last year.

To sum up: UK banks have come through the turbulence of the last four years in sound health, and that has enabled them to contribute to maintaining financial stability and to support the economy and their customers during these difficult times. That was not always the case in the past.

There have been major reforms to bank capital regulation since the financial crisis. Those reforms are almost fully done, and before we call them done we should check that the UK system is appropriately competitive on an international basis. My sense is that the system is competitive but as we come to the end of the reforms we should check again.

One remaining puzzle is the market valuation of the large UK banks, which by the way is not uniform unsurprisingly. With interest margins restored to more normal levels, and loan impairments subdued by historical standards, this puzzle deserves further study.

Last year we did see strains in banks elsewhere, and this has raised questions about appropriate liquid asset buffers as digital technology appears to increase the potential speed and potency of bank runs. I have set out two views on what follows from this, which are closely linked.

First, I think the answer is more for banks to supplement their liquid asset holdings with efficient and extensive access to the liquidity facilities provided by the Bank of England.

Second, those liquid asset holdings will, however, most likely mean that banks hold larger reserves at the Bank than was the case before the financial crisis. ■

Andrew Bailey is Governor of the Bank of England

Endnotes

1. Banks' CET1 ratios are estimated to have risen roughly three times from around 5% to around 15% over this period on a risk-weighted basis. This simple calculation holds all other factors constant.
2. These staff estimates are based on (1) a capital asset pricing model, which estimates the cost of equity based on the estimated sensitivity of bank equities' daily excess returns to market-wide excess returns, market-wide equity risk premia, and a measure of risk-free rates; and (2) a dividend discount model, which models banks' equity prices at a given point in time as the sum of all expected future dividends (based on analyst expectations where available, grown forward in line with long-run nominal GDP growth forecasts) discounted by the implied cost of equity.
3. Lombard Street P64
4. Lombard Street P253

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The path forward for bank capital reform

Michelle Bowman considers the proposed Basel III reforms, and sees a path forward if the proposal was revised to address its two greatest shortcomings: over-calibration and a lack of regulatory tailoring

// *More is better.* This axiom often holds true in many respects, but experience also teaches us that there are limits. I'm happy to talk about proposed changes to bank capital rules in the United States and to probe the limits of the notion that *"more is better"* when regulators seek to apply it to bank capital requirements.

In July 2023, the federal banking agencies proposed changes to implement the Basel III 'endgame' capital reforms¹. The published capital rulemaking proposal incorporated an expansive scope and a notable shift in approach by pushing down new Basel capital requirements to all banks with over \$100 billion in assets, regardless of their international activities.

The proposal would substantially increase regulatory capital buffer and minimum capital requirements for the covered firms. The comment period closed January 16th. We've seen a robust response from commenters, with a large number of comments submitted during the latter part of the comment period.

As a policymaker, I am pleased to see the careful attention stakeholders have paid to this proposal and the thoughtful feedback that has been provided during the comment period. Public input should help to improve the efficiency and effectiveness of the proposal.

From my perspective, given the significant response from a number of industries and perspectives, as a bank regulatory policymaker, the agencies are obligated to think carefully about the best path forward for this proposal.

This should include making substantive changes to address known deficiencies with the proposal and giving the public an opportunity to comment on any reformulated proposal, to ensure the best possible outcome for the Basel capital reforms. That path should ensure that sufficient consideration is given to the wide-reaching consequences of capital reform to the US banking industry, the US economy, and, importantly, US businesses.

We should consider trade-offs in addressing scope, calibration, and tailoring. And we should appropriately adjust the excessive calibrations and eliminate regulatory overreach in the proposed rule.

I'd like to briefly discuss what I see as the consequences of miscalibration of capital reforms—and testing the 'more is better' principle—through a discussion of the impacts of finalizing the proposed capital reforms without significant revisions.

In considering a reform, we have a greater capacity to understand and assess the true costs, including both the direct costs to banks and their customers, but also the potential harm to US bank competitiveness in the global economy

I will then outline ideas for a path forward and highlight what I see as the two most pressing problems in the proposal, issues that we must address before finalizing these and other pending rules.

And finally, at the risk of lulling those to sleep who do not eat, drink, and breathe bank capital rules 24/7, I will identify a few important technical issues for resolution because they lead into the two overarching problems that I referenced a moment ago.

Considerations in capital policy

Capital plays a critical role in the US banking system, promoting the safe and sound operation of banks and supporting confidence in the broader banking system. Capital helps banks provide financial products and services, including credit, that support American businesses.

I think we can all agree that higher levels of capital enhance financial resilience—up to a point. At the time of a bank's failure, capital—especially common equity capital, as the first type of funding to absorb losses—protects depositors and other creditors. Capital allows banks to continue providing products and services, promoting a well-functioning financial system, even during times of stress.

But capital is not costless. Capital does not come into existence only at the point of failure—capital is an ongoing requirement, and an ongoing cost, for all banks. The cost of capital—both the required minimum amount of capital and buffers and the market price of capital—influences every aspect of the business of banking, including the business lines a bank pursues, the products and services it offers, and the cost and availability of those products and services.

Banks are not obligated to offer the same financial products or services over time. Banks also are not obligated to maintain the same costs of products and services. Indeed, it would be irresponsible for a bank to ignore the cost of capital in managing its business, just as it would be irresponsible for a bank to ignore market preferences and forces when choosing its lines of business.

Increases to the cost of capital do not simply evaporate on a bank's balance sheet, they are passed through to customers in various ways, including in the form of higher costs for financial services or in reduced availability of services available in the market.

The cost of bank capital also influences *where* activities occur, either within the regulatory perimeter of the banking system or in non-bank entities and the broader shadow-banking system. When the cost of a bank engaging in an activity exceeds the cost of performing the same activity in a non-bank, that cost differential creates pressure that over time leads to a shift in these activities to non-bank providers.

Where does that leave us? Achieving good policy requires acknowledging and balancing the benefits and costs of capital requirements, since it is one of the most important inputs policymakers can use to enhance the safety and efficiency of the banking system.

Relying simply on the 'more is better' approach downplays or ignores these critically important trade-offs. When policymakers consider changes to the capital framework, particularly increases of the magnitude contemplated in the proposal, we must carefully weigh the benefit of increased safety from higher capital levels, with the direct costs to banks, and the downstream effects on consumers, businesses, and the broader economy.

We must also consider the broader regulatory landscape and how changes to capital regulations may complement, overlap, or conflict with other regulatory requirements. And importantly, we must consider the broader implications for the structure of the US financial system and for financial stability.

While these considerations may caution us against capital increases of the magnitude contemplated in the proposal, I do see a potential path forward for capital reform.

The path forward

As I consider next steps, I am cautiously optimistic that policymakers can work toward a reasonable compromise, one that addresses two of the most critical shortcomings of the proposal: over-calibration and the lack of regulatory tailoring.

Public feedback has also assisted in identifying the aspects of the proposal that result in the most severe unintended consequences. In my mind, it will be necessary for policymakers to modify the proposal to mitigate these issues and concerns as we move forward.

Calibration

First, I would like to address calibration. The costs of this proposal, if implemented in its current form, would be substantial. As the proposal describes, Federal Reserve staff estimates these changes to result in an aggregate 20 percent increase in total risk-weighted assets across bank holding companies subject to the rule, although some commenters have projected much greater effects on some firms².

While the actual impact on binding capital requirements will vary by firm, it is apparent even with the incomplete information available today that this will represent a large increase in capital requirements.

In October of 2023, the Federal Reserve launched a data collection to gather more information from the banks affected by the Basel III capital proposal³. The purpose of this quantitative impact study was to help better understand the estimated effects of the proposal.

My understanding is that the Federal Reserve will release its analysis of those findings and some aggregated information for comment. And just as for the initial proposal, stakeholder feedback on this quantitative impact study and staff analysis will be very instructive as we seek to analyze and understand the expected impacts of the proposed capital reforms.

Based on the information available, increasing capital requirements as initially proposed could result in significant harm to the US economy through the impact on US businesses, while failing to achieve the intended goals of improving safety and soundness and promoting financial stability.

Much of the public feedback and concern focused on the calibration of the proposal and the corresponding impact across a number of industries. Farmers, ranchers, and agricultural producers that use derivatives to hedge price risks in agricultural supply chains have noted that the increased costs of providing these services from the proposal could lead banks to limit their availability in the marketplace⁴.

Small-business owners (including builders, manufacturers, restaurant owners, and others) have indicated that the proposal could *"make borrowing costs unaffordable and capital inaccessible."*⁵

These real-world examples only scratch the surface of the harmful effects of this proposal as described by a broad range of stakeholders noting the impact on a wide array of businesses. My initial observation is that, in the aggregate, the comments reflect a spectrum of concerns that are largely driven by calibration.

These well-founded concerns and the risks they highlight are not surprising in light of the scale of the proposed capital increase. In addition, this direct independent feedback provides a new lens through which to view the proposal, enabling us to specifically identify and confront the predictable effects: higher costs of capital for banks and services for customers, less availability and narrower selection of services, and increased concentration in the providers of financial products and services.

These consequences could disproportionately harm underserved markets, businesses, and communities, as bank customers will bear the cost of these increased capital requirements.

In addition to the direct impacts of excessive calibration, policymakers must also consider international comparability and competitive disadvantages. A key element of the Basel capital rules is to promote greater international comparability, a goal that is frustrated when US regulators over-calibrate requirements, at a level in excess of international peers and not supported by proportionate levels of risk.

Significant banking activities occur in the international and crossborder context, and we know that financial stability risks can spread throughout global financial markets. One approach to mitigate the spread of financial stability risks is to promote minimum standards across jurisdictions that not only improve competitive equity in banking markets but that also make the financial system safer.

The capital proposal reflects elements of the agreed upon Basel standards, but it far exceeds those agreed standards. Adjusting the calibration of the Basel capital reform proposal would have the important secondary benefit of enhancing this international consistency.

To address this issue of calibration, policymakers must develop and work toward a target, a top-line aggregate capital level that would best promote safety and soundness and one that has a broad consensus among policymakers.

Earlier efforts on the Basel proposal would have resulted in something closer to ‘capital neutrality’—with essentially minimal top-line change in aggregate capital requirements across the US banking system⁶.

I would note that the UK approach contemplates an average increase in the low single digits⁷. I look forward to learning more about stakeholder views on calibration from the comments we have received.

Tailoring

Next, I will turn to the role of tailoring in bank capital reform efforts. The US banking system is now much better capitalized than after the 2008 financial crisis, with substantially more liquidity. The current capital framework represents a risk-based, tailored approach, with the goal of aligning regulation with risk.

The largest firms are divided into four categories based on size and complexity, with the largest and most complex firms subject to the most stringent requirements. Regional banks, with \$10 billion to \$100 billion in assets, are subject to a somewhat more streamlined capital framework. And finally, the simplest rules are reserved for community banks that rely on a less complex, relationship-based business model.

Despite the past success in this approach, tailoring has recently come under attack in regulatory reform efforts and applications⁸. Some have argued that the bank stress last spring was the result of changes Congress made several years ago to promote risk-based and tailored supervision⁹.

The theory is that following the implementation of tailoring rules, regulators adopted a less assertive supervisory approach, and that regulators should instead move toward a regime that imposes uniform standards to firms with significant variability in size, risk, complexity, and business model—shifting back to a one-size-fits-all regulatory approach.

I have still not seen compelling evidence that removing tailoring is a productive regulatory approach. To the contrary, the existing capital framework demonstrates how the tailored approach can help support appropriate requirements based on firm characteristics.

In my mind, the failure to apply tailoring is a fundamental flaw of the Basel capital reforms as proposed, and one that must be addressed. The application of today's capital requirements can be illustrated as an incline, with different or enhanced requirements kicking in at specific levels of size and complexity¹⁰.

By contrast, if you were to superimpose the current Basel proposal on the tailoring framework, you would see something in the capital space that looks more like a single step, with a broad set of capital requirements kicking in at the \$100 billion threshold.

It is easy to see the difference between a slope and a cliff, and it is reasonable to expect that this cliff effect could become even more pronounced if we abandon tailoring in other areas, like liquidity regulation and long-term debt requirements.

As I have noted in the past, incorporating graduated requirements not only helps to effectively allocate limited supervisory resources, but it also avoids creating regulatory incentives that could unintentionally alter the banking landscape.

Capital requirements are a prime example of a regulatory requirement that could have a transformative effect on the structure of the banking system. Banks near the \$100 billion asset size are already carefully considering the ongoing viability of remaining at an asset size near that threshold.

Firms just *above* the threshold will face strong pressure to shrink or to merge with other firms to achieve economies of scale to comply with the breadth and complexity of the existing and proposed requirements. Firms just *below* the threshold will need to be very intentional about approaching the \$100 billion threshold, and it would be reasonable to expect that they may consider revising business strategies and activities to remain well below.

While these distortive effects on the banking system may be unintended, they are a predictable consequence of pushing down requirements designed and calibrated for larger and more complex banks to those that are smaller and less complex.

The critical role of tailoring must be incorporated as a foundational element of these regulatory reforms. In practice, I think this requires us to take a hard look in a more granular way at the banks that should be subject to different elements of the capital requirements—such as market-risk and credit valuation adjustment (CVA) requirements, credit and operational risk requirements, and the revised treatment of accumulated other comprehensive income (AOCI).

Splitting out elements of the rule—thinking about the appropriate application of each—can result in more targeted revisions that improve the effectiveness of the capital framework, while minimizing unnecessary burden and costs.

Technical areas of change

I would also like to highlight a few important technical issues that should be addressed in ongoing reform efforts. To be sure, this is not an exhaustive list, but as policymakers consider the path that lies ahead, these are areas in the proposal where I see room for significant improvement.

Recognizing the benefits of diversification, particularly in operational risk. Diversification in revenue streams can enhance the stability and resilience of a financial institution, and excessive capital charges for these revenue-generating activities could create incentives for banks to roll back the progress they have made to diversify revenues. Basel capital reforms should not penalize noninterest and fee-based income through the proposed operational risk requirements. There are a number of different approaches that could effectively address this concern.

Calibration of the market risk capital rule. Based on the information presented in the proposal, the revisions to the market risk rule alone will increase risk-weighted assets from \$430 billion to \$760 billion for Category I and II firms and from \$130 billion to \$220 billion for Category III and IV firms. These increases are significant, with broad-based impacts, affecting business and municipal bond issuance and other forms of debt financing, risk management, hedging of foreign exchange and interest rate risk, or managing the risks of fluctuating commodity prices through hedging activities. The calibration of these changes could have a disproportionate impact on important derivative end-users: the farmers, manufacturers, small businesses, and others who rely on financial products to hedge some of their production cost and other business risks. While this calibration point may be a mere subset of the broader calibration concerns about Basel III, the significance of the capital charges in this area warrants attention.

Address redundancy or 'over-calibration'. I have heard some interesting philosophical debate about how to characterize the interaction of the Basel III capital proposal and stress testing. Are there elements of 'overlapping'

requirements, which implies redundancy in capital charges? Or are these rules seeking to identify and mitigate different risks, with stress testing focusing a narrower subset of tail risks? This debate, while interesting, seems to miss the broader calibration point. When looking at both the global market shock as applied in stress testing and the calibration of elements of the market risk rule that capture similar risks, the aggregate calibration is simply too high to accomplish the goals of capturing baseline risks and tail risks.

Better alignment of risk weights and credit risk. Credit risk weights should correspond to underlying credit risk—this matching of credit risk and capital requirements helps to promote safety and soundness. I think there are a number of areas where the proposal missed the mark in meeting this objective, including credit risk weighting for privately held companies and small businesses, residential real estate, and retail credit exposures.

Looking beyond Basel III: leverage ratio requirements. Capital requirements are intended to be complementary—risk-based capital rules require banks to hold capital against more granular and specific risks, while leverage requirements operate as a backstop in the ordinary course of business. This arrangement works by design, but we have seen some cracks emerge, particularly around the impact of the 5 percent leverage ratio that applies to US global systemically important banks at the holding company, commonly referred to as the enhanced supplementary leverage ratio (or eSLR). While risk-based and leverage capital requirements are intended to be complementary and promote the safe and sound operation of the banking system, the eSLR can disrupt banks' ability to engage in Treasury market intermediation, which we saw occur in the early days of market stress during the pandemic. I consider reform of the eSLR to fall in the category of 'fixing what is broken'. This is an issue that would be prudent to address before future stresses emerge that could disrupt market functioning.

Closing

Bank capital policy involves trade-offs and policy decisions, and as you all know, policymakers have different

views about how to strike the right balance. But as I view the landscape today, I do not view these differences as insurmountable obstacles to achieving a more effective and efficient set of Basel capital reforms.

Unlike many other areas of reform, the impact of changes to bank capital can be analyzed and understood, which provides a much better ability to compare and reconcile the trade-offs of specific reforms. In many ways, this is one of the empowering aspects of capital reform.

In considering a reform, we have a greater capacity to understand and assess the true costs, including both the direct costs to banks and their customers, but also the potential harm to US bank competitiveness in the global economy.

The impact data collected from financial institutions subject to this rule describing effects directly linked to the proposed capital reforms will allow us to consider the combined and aggregate impact, to help us avoid a capital 'end state' that is overlapping, inefficient, contradictory, and potentially harmful to banks, their customers, and the broader economy.

As I have noted, my understanding is that the Federal Reserve will release its analysis of its findings and some aggregated information for comment. The data collected and released should help public commenters and policymakers assess the impact of the proposal. It should also serve as a guide to assist in shaping the next iteration of this proposal, whether that be in the form of a re-proposal or significantly revised final rule. ■

Michelle W Bowman is a Member of the Board of Governors of the Federal Reserve System

Endnotes

1. See dissenting statement, [“Statement by Governor Michelle W Bowman” on the proposed rule to implement the Basel III endgame agreement for large banks](#), news release, July 27, 2023.
2. See, eg. Financial Services Forum, American Bankers Association, Bank Policy Institute, and Securities Industry and Financial Markets Association, [“Comments on Regulatory Capital Rule: Large Banking Organizations and Banking Organizations with Significant Trading Activity \(PDF\)”](#) (December 22, 2023), (noting that for the largest US firms, the proposal would result in a greater than 30 percent increase in capital requirements, and a greater than 33 percent increase in risk-weighted assets).
3. See Board of Governors of the Federal Reserve System, [“Federal Reserve Board Launches Data Collection to Gather More Information from the Banks Affected by the Large Bank Capital Proposal It Announced Earlier This Year,”](#) press release, October 20, 2023.
4. See National Council of Farmer Cooperatives, Commodity Markets Council, National Cattlemen’s Beef Association, National Grain and Feed Association, American Farm Bureau Federation, National Milk Producers Federation, National Pork Producers Council, American Cotton Shippers Association, Farm Credit Council, [“Comments on Regulatory Capital Rule: Large Banking Organizations and Banking Organizations with Significant Trading Activity and Regulatory Capital Rule: Risk-Based Capital Surcharges for Global Systemically Important Bank Holding Companies \(PDF\)”](#) (December 11, 2023).
5. 10,000 Small Businesses Voices, [“Comments on Regulatory Capital Rule: Large Banking Organizations and Banking Organizations with Significant Trading Activity \(PDF\)”](#) (November 21, 2023).
6. See Randal K Quarles, [“Between the Hither and the Farther Shore: Thoughts on Unfinished Business”](#) (speech at the American Enterprise Institute, Washington, DC, December 2, 2021), (“A major issue that we are grappling with is how to implement these [Basel III endgame capital] reforms, which reduce the role of bank internal models on bank capital requirements, while maintaining the overall level of aggregate capital requirements.”) (emphasis added).
7. See Bank of England, [“The PRA Publishes the First of Two Policy Statements for the Implementation of the Basel 3.1](#)

Standards,” press release, December 12, 2023, (“Based on its latest data, the PRA estimates that the impact of Basel 3.1 requirements will be low and result in an average increase in Tier 1 capital requirements for UK firms of around 3 percent once fully phased in....”).

8. See Michelle W Bowman, “[Statement by Governor Bowman on Advance Notice of Proposed Rulemaking on Resolution Requirements for Large Banks and Application by US Bancorp,](#)” press release, October 14, 2022.

9. Economic Growth, Regulatory Relief, and Consumer Protection Act, Pub. L. No. 115-174, 132 Stat. 1296 (2018).

10. See Board of Governors of the Federal Reserve System, “[Federal Reserve Board Finalizes Rules That Tailor Its Regulations for Domestic and Foreign Banks to More Closely Match Their Risk Profiles,](#)” press release, October 10, 2019; [Tailoring Rule Visual \(PDF\)](#) (October 10, 2019).

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 Protect Main Street sponsored by the Center for Capital Markets at the US Chamber of Commerce, Washington, DC (virtual), January 17, 2024.



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The real effects of trade financing by export credit agencies

Poorya Kabir, Adrien Matray, Karsten Müller and Chenzi Xu
discuss the effect of the effective shutdown of the Export–Import
Bank of the US (EXIM) from 2015—2019 on firm outcomes

Exports are often seen as boosting economic growth. But exporting internationally requires upfront financing. Recognising this, around one hundred countries around the world have set up export credit agencies to provide subsidised trade financing to support their country's exporters. Today, such subsidies are the predominant tool of industrial policy around the world, especially in advanced economies (Juhasz *et al* 2022).

The rationale behind subsidising export financing is that international trade is complex and involves substantial frictions. For example, exporters need working capital for the period between the production of a product to its final sale. They also face a risk of non-payment from customers in foreign countries after a product is shipped, and these customers may need credit to finance a purchase.

This demand for financing creates a role for intermediaries in supporting exporters, and shocks to these intermediaries can potentially shape trade patterns over long periods of time (Xu 2022).

However, the same frictions limit the pool of institutions able to provide trade financing. As a result, the private market for trade financing is specialised and concentrated (Niepmann and Schmidt-Eisenlohr 2017), which could result in the under-provision of funds.

The role of export credit agencies

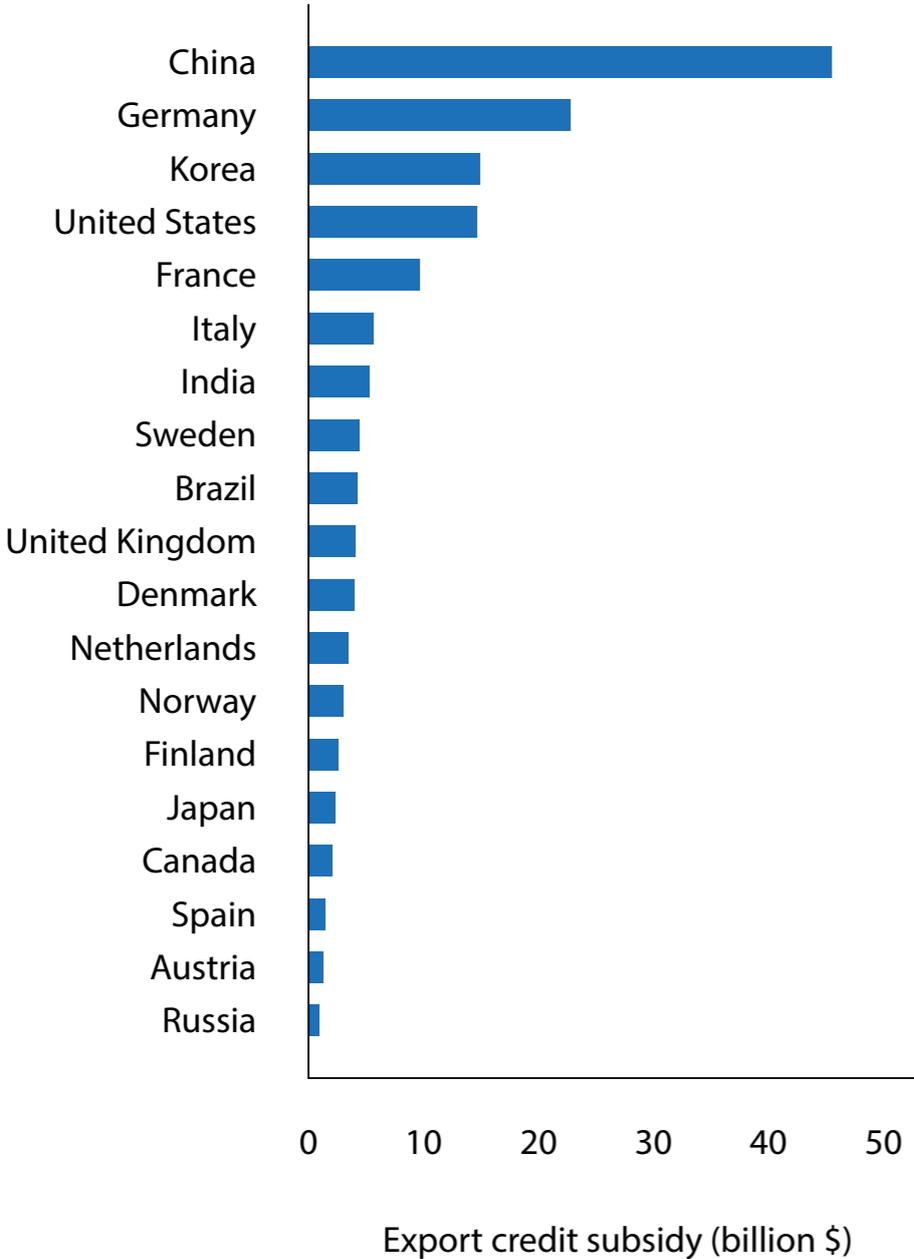
Export credit agencies (ECAs) are private or quasi-governmental institutions that act on behalf of national governments to issue insurance and guarantees for financing to exporters. Depending on their mandate, export credit agencies lend directly to exporters or their customers, or provide credit guarantees or insurance to lower the cost of financing of exporters or their customers.

In absolute terms, China, Germany, Korea, and the US spend the most on these programmes. The Scandinavian countries, as well as China and Korea, are among the heaviest users of export credit agency support relative to their exports as we show in panel B of Figure 1.

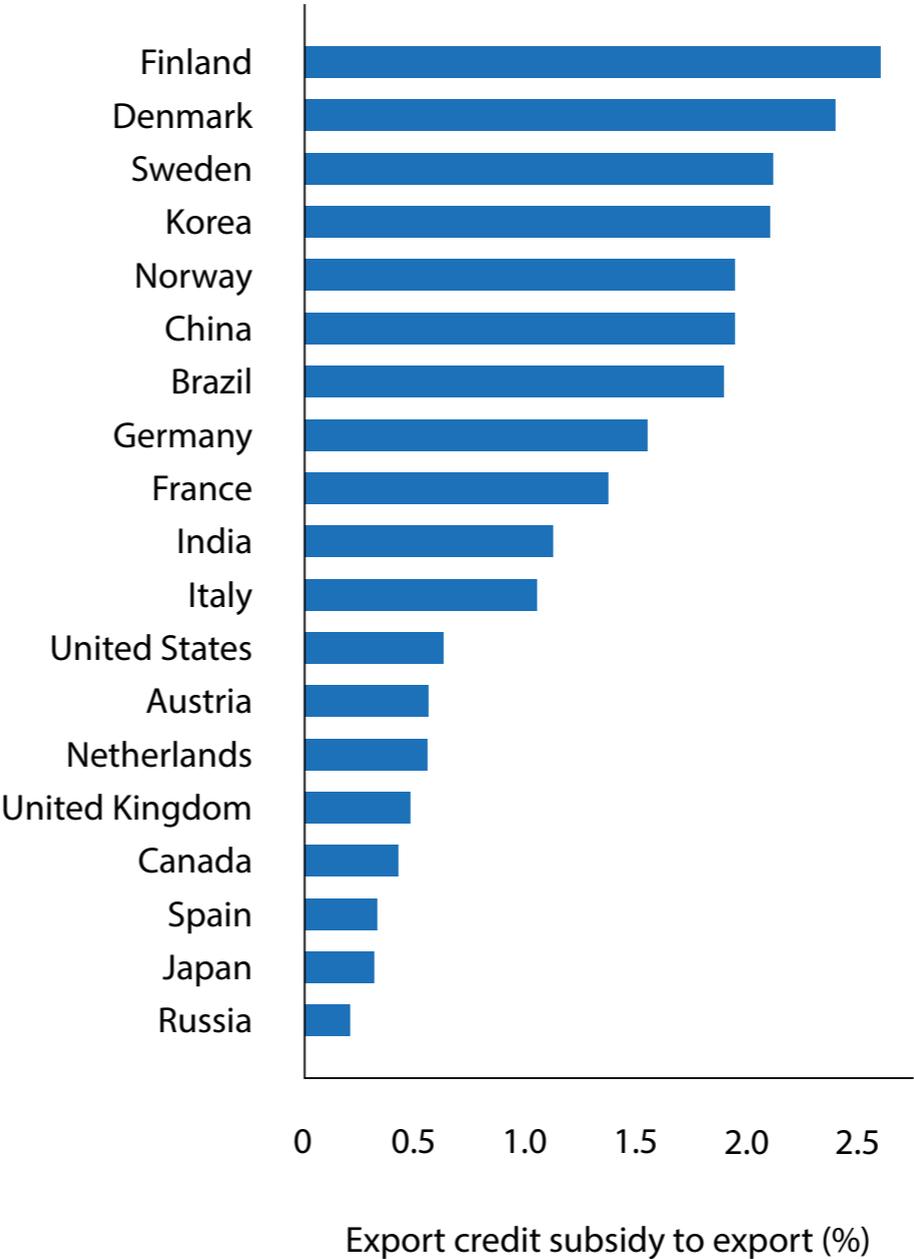
Can governments boost exports by providing targeted trade financing without distorting the allocation of resources? The results in this column, based on the natural experiment of EXIM's lapse of authorisation, suggests that the answer is yes

Figure 1. Export credit subsidies by country

a) Total export credit subsidies



b) Export credit subsidies relative to exports



finance21.net

Source: World Bank 2013.

There is an ongoing debate about whether such institutions should exist. Proponents argue that these agencies boost firm exports by alleviating a private market failure, which in turn can create jobs and promote economic growth.

Critics argue that they provide support to firms that would have been able to finance their exports regardless, and therefore have no effect on the beneficiary firms' performance. In this latter view, export credit agencies primarily provide transfers to well-connected firms at the expense of taxpayers, and simply boost beneficiaries' profits.

In addition to this transfer, agencies might also distort the allocation in the economy by shoring up low-productivity firms. This heightened misallocation would then lower aggregate productivity (eg. Hsieh and Klenow 2009, Bau and Matray 2023).

The US experiment

To better understand the role of export credit agencies, we study the temporary shutdown of the Export-Import Bank of the United States (EXIM) between 2015 and 2019, prompted by a lapse in its charter — a first since the agency's inception in 1945 – and lack of quorum on its board of directors.

The shutdown resulted in an 80% drop in the volume of EXIM-supported transactions in 2016 compared to 2014. The volume of export credit support provided by EXIM only returned to pre-shutdown levels after the resumption of full operations in December 2019.

We focus our analysis on publicly traded firms over the period 2010-2019, which were among the largest in the economy and had received over 80% of EXIM support prior to the shutdown. These firms were also the ones most likely to be able to access alternative sources of credit and to be the least constrained following EXIM's shutdown.

In this respect, it is most likely that we find limited real effects for the average firm and potential distortions in the allocation of capital in this sample of firms.

The large effect of EXIM's shutdown

To estimate the effect of EXIM's shutdown, we obtained detailed loan-level data from EXIM for the period 2010 to 2014 and compare firms that previously benefited from EXIM support with firms that did not. This allows us to tease out the effect of EXIM's shutdown on a host of outcomes using a standard difference-in-differences estimator.

The first conclusion of this analysis is that EXIM-dependent firms experienced a substantial drop in their global sales as we show in Figure 2. This large drop can be explained by a reduction in firm exports, which we are able to measure in several ways, including using proprietary data on the universe of firms' maritime export transactions.

The large drop in global sales resulted in a permanent reduction in capital and labour but did not affect firms' average return on assets. The combination of the large drop in global sales, capital, and labour with the lack of an effect on profitability is inconsistent with a view of inefficient 'capture' in which EXIM support is a pure transfer to beneficiary firms that allows them to earn higher profits without having real effects.

The combination of the large drop in global sales, capital, and labour with the lack of an effect on profitability challenges the prevailing scepticism about the efficacy of industrial policy, particularly the criticism that such interventions are mere transfers to large, well-connected firms without tangible economic benefits.

So why did firms not compensate for the loss of access to EXIM funding? We show that the loss in global sales is concentrated on firms with higher financial frictions, and that the drop in exports is larger for maritime exports than for other form of exports.

This sensitivity is consistent with the importance of financing frictions in explaining the effect of the EXIM shutdown since maritime exports, which tend to have longer shipment times and therefore higher working capital needs (eg. Ahn *et al* 2011, Xu 2022). This underscores the unique role that government-backed agencies like EXIM play in filling gaps left by the private sector, even in advanced financial ecosystems.

Did EXIM foster misallocation of capital and export?

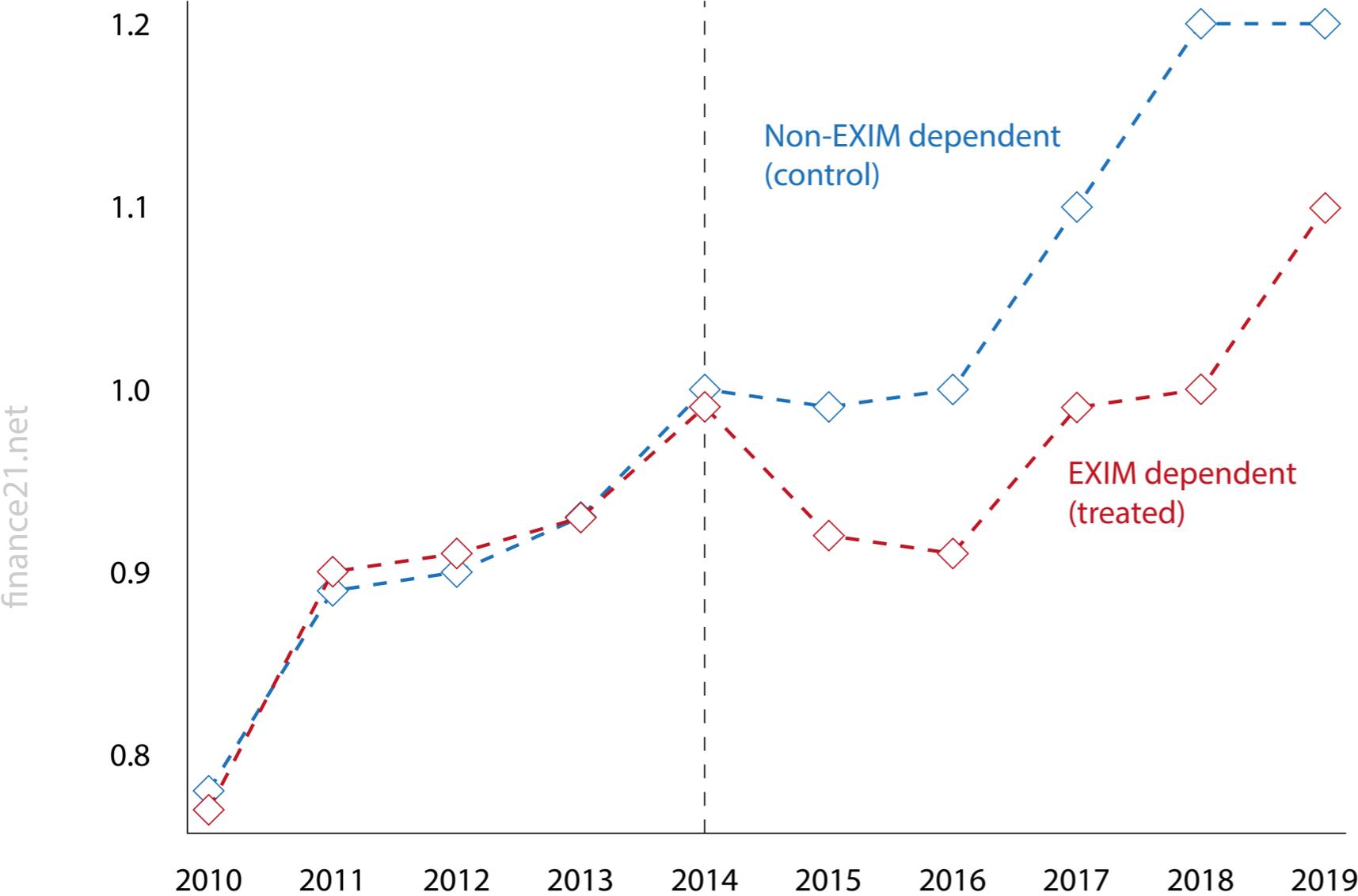
The average negative effects of EXIM's shutdown might be of limited consequence or could even be positive for total output if EXIM initially distorted the competition across US firms in a way that fostered a misallocation of capital.

This would happen if beneficiary firms were simply less productive than other firms, which could make exporting infeasible for these unproductive firms without EXIM credit. If this was widespread, shutting down EXIM could increase overall efficiency. This argument is one of the classic costs attributed to industrial policies, where the policy is wasteful because it only aids the preservation of low-quality firms.

We provide three pieces of evidence inconsistent with this hypothesis. First, we show that the reduction in global sales and capital accumulation induced by EXIM's shutdown is concentrated among firms with high exporting opportunities. In particular, we show that EXIM support is stronger for firms in industries that provide goods experiencing larger export growth in the world market.

Second, we rely on ex-ante differences in firms' marginal revenue products of capital (MRPK) before the shock in order to estimate how misallocation evolves after the reform, in a spirit similar to Bau and Matray (2020, 2023). We find that EXIM's shutdown led to a drop in global sales and capital that is around five times as large for high MRPK firms (firms above their industry's median MRPK) relative to low MRPK firms.

Figure 2. Evolution of global sales



The result that the capital response is larger for high MRPK firms implies that the reallocation of capital across firms worsened due to EXIM's shutdown, which would suggest that a reduction in export credit subsidies increases (not decreases) misallocation.

Third, using aggregate customs data at the product-destination-year level, we show that the EXIM shutdown also impacted total export activity. Industries with a higher reliance on EXIM support saw a reduction in exports relative to others, implying that the firm-level reduction in exports we document aggregate up to industry level.

Therefore, EXIM support creates new exports rather than just reallocating export market share among US firms in favour of firms supported by EXIM.

Conclusion

Can governments boost exports by providing targeted trade financing without distorting the allocation of resources? The results in this column, based on the natural experiment of EXIM's lapse of authorisation, suggests that the answer is yes.

Although there are a few caveats for interpreting our results, they are broadly inconsistent with a pure rent-seeking explanation. While EXIM-supported firms shrank considerably after the agency's shutdown, this effect was more (not less) pronounced for firms that were plausibly more productive before the shock and had more promising export opportunities.

We also find no evidence that the profitability of firms cut off from subsidies decreased over and above the reduction in firm size, which is inconsistent with these firms pocketing artificially high rates of profits through subsidies beforehand.

The results of our column speak to a renewed debate on the circumstances in which industrial policy can be successful in supporting the domestic economy (eg. Juhasz 2015, 2018, Juhasz *et al* 2023a, 2023b). Of course, our study only relies on a single unusual shock—the virtual shutdown of an export credit agency responsible for providing subsidised trade financing to the country’s exporters.

While this setting enables us to credibly estimate the effect of export credit subsidies on domestic firms, it also limits the generalisability of our findings. We hope future work will shed light on the effects of industrial policies in other settings.

Our study speaks to the renewed debate on the circumstances in which industrial policy can be successful in supporting the domestic economy (eg. Juhasz *et al* 2023a, 2023b). While the results from EXIM’s shutdown period do not conclusively settle the debate, they do provide concrete evidence of the positive impact that well-crafted industrial policies, such as export credit subsidies, can have on both firm-level performance and broader economic outcomes.

It suggests that the maturity of financial markets does not diminish the effectiveness of industrial policy. We hope future work will shed light on the effects of industrial policies in other settings. ■

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A framework for geoeconomics

Countries use their economic strength to achieve geopolitical goals. Christopher Clayton, Matteo Maggiori and Jesse Schreger present a novel framework to understand how a hegemon in the international system exerts its power within its economic network

Governments use their countries' economic strength from existing financial and trade relationships to achieve geopolitical and economic goals, a practice often referred to as 'geoeconomics'. Great power competition between the US and China has made geoeconomics part of daily news and an active policy choice in democracies and autocracies alike.

Recent examples include China's Belt and Road Initiative, the US attempting to restrict the use of Huawei's 5G technology in Western countries, and the US using the dollar-based financial system as part of a range of trade and financial sanctions against Russia.

In two landmark contributions, Hirschman (1945, 1958) relates the structure of international trade to international power dynamics and sets up forward and backward linkages in input-output structures as a foundation for structural economic development.

In a new paper (Clayton *et al* 2024), we introduce a framework, inspired by this work, that uses an input-output network model of the world economy to explain how geoeconomic power arises from the ability to consolidate threats across multiple economic relationships (eg. finance and technology jointly) to pressure a target entity.

In our model, a hegemon like the US exerts its power on firms and governments in its economic network by asking them to take costly actions that manipulate the world equilibrium in the hegemon's favour.

Geoeconomic power arises from the ability to jointly exercise threats from separate economic activities, for example, threatening to cut off a deviating entity from both financial services and critical manufacturing inputs.

We characterise the optimal strategy of a hegemon and show that a hegemon asks targeted firms to take costly actions such as imposing or accepting mark-ups on goods or higher rates on lending, but also import restrictions and tariffs.

The network nature of the world economy makes controlling certain strategic sectors more valuable for the hegemon. Strategic sectors increase the hegemon's power over other sectors or its influence over the world economy due to network amplifications.

Collective power over multiple entities gives rise to the hegemon's macro-power – its ability to reshape the world's equilibrium in its favour

We apply our framework to two prominent examples: (1) national security externalities in the setting of US-China competition; and (2) China's Belt and Road Initiative as a sovereign lending programme.

Hegemonic threats to friends and enemies

Hegemons build power by threatening to retaliate against a deviating entity across multiple economic relationships. For example, a target country might be importing both intermediate goods and foreign capital (Figure 1a). If these inputs are controlled separately, there is some value to individual threats.

Generally, however, threats to withdraw both inputs at once (Figure 1b) are more powerful in the sense of inducing greater losses for the target country if exercised.

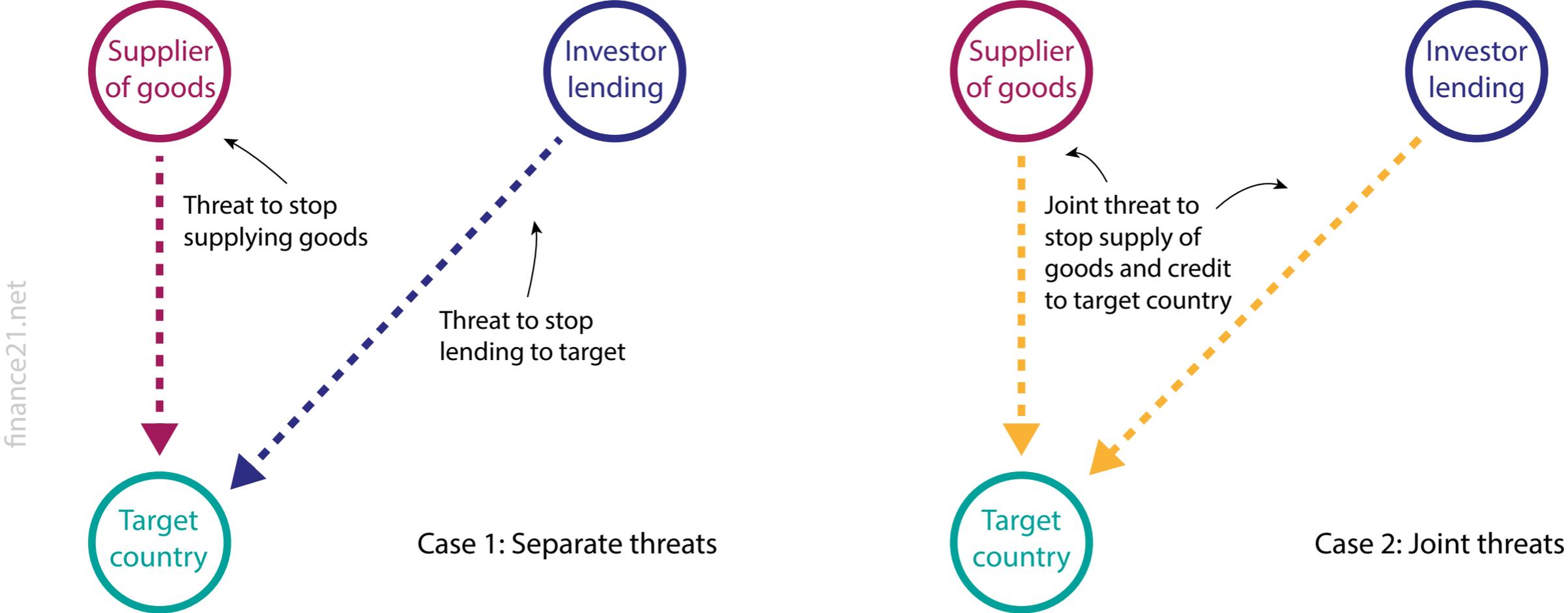
Many threats are either not feasible or not valuable. A threat is not feasible if the hegemon does not control the input. Not valuable means that the target country can easily find a substitute for the input that is withdrawn. For example, Russian threats to withdraw natural gas supplies are less powerful if alternative suppliers can be found.

A hegemon uses these threats to exert power over firms and governments in its network and ask them to take costly actions. These actions can take the form of monetary transfers, mark-ups on trade prices, and surcharges on loans, but also restrictions on import-export (tariffs and caps) and political concessions.

We provide a theory-based notion of friends and enemies of the hegemon (see also Kleinman et al. 2020). Our notion of friendliness is not based solely on nationality or political affinity, but on how an activity impacts the hegemon's welfare either directly or indirectly via its impact on others.

For example, the US might consider a sector producing semiconductor technology in the Netherlands unfriendly in as much as its output is indirectly increasing production of unfriendly technology by China.

Figure 1. Networks and joint threats



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Which sectors are strategic?

The designation of an activity as 'strategic in the national interest' is often abused in economic policy. It can mask protectionist or nationalistic aims of government policy. The abuse is possible due to the lack of a clear definition and policy framework against which to assess a candidate policy.

In our framework there are two notions of power: micro-power and macro-power. Sectors are strategic if they increase these powers. A sector is strategic in the micro-power sense if it increases the hegemon's ability to make valuable threats on other entities.

We refer to this as micro-power since it takes as given all aggregate quantities and prices. Strategic sectors tend to supply inputs to other sectors that are widely used and are not easily substitutable. Some sectors have physical properties of this kind, for example rare earths.

Other sectors exhibit these properties because of increasing returns to scale and natural monopolies. An example is the dollar-based payment and settlement system that the US often uses in geoeconomic threats. The dollar system is so ubiquitous that on the margin countries that are excluded have only poor alternatives.

Collective power over multiple entities gives rise to the hegemon's macro-power – its ability to reshape the world's equilibrium in its favour. Some sectors have high indirect influence on world outcomes by affecting prices or quantities produced by other sectors.

These sectors are strategic because control over these sectors allows a hegemon to influence indirectly a large part of the world economy that it does not directly control. Research and technology, especially at the cutting edge or for military use, are sectors of this kind.

Understanding the US restrictions on Huawei

We consider the US hegemon demanding that countries in Europe stop using a technology input from China that is a national security concern for the US.

As illustrated in Figure 2, the hegemon US can pressure firms and governments in third party countries to curb their imports of Chinese company Huawei's 5G telecommunication infrastructure even though there are benefits to these users from using such technology.

This application highlights the power of endogenous amplification through the production network. We assume that this technology has a strategic complementarity: each user finds the technology more productive the more other users are also using the same technology. These complementarities are typical of information technology but are also present in financial technologies like payment systems.

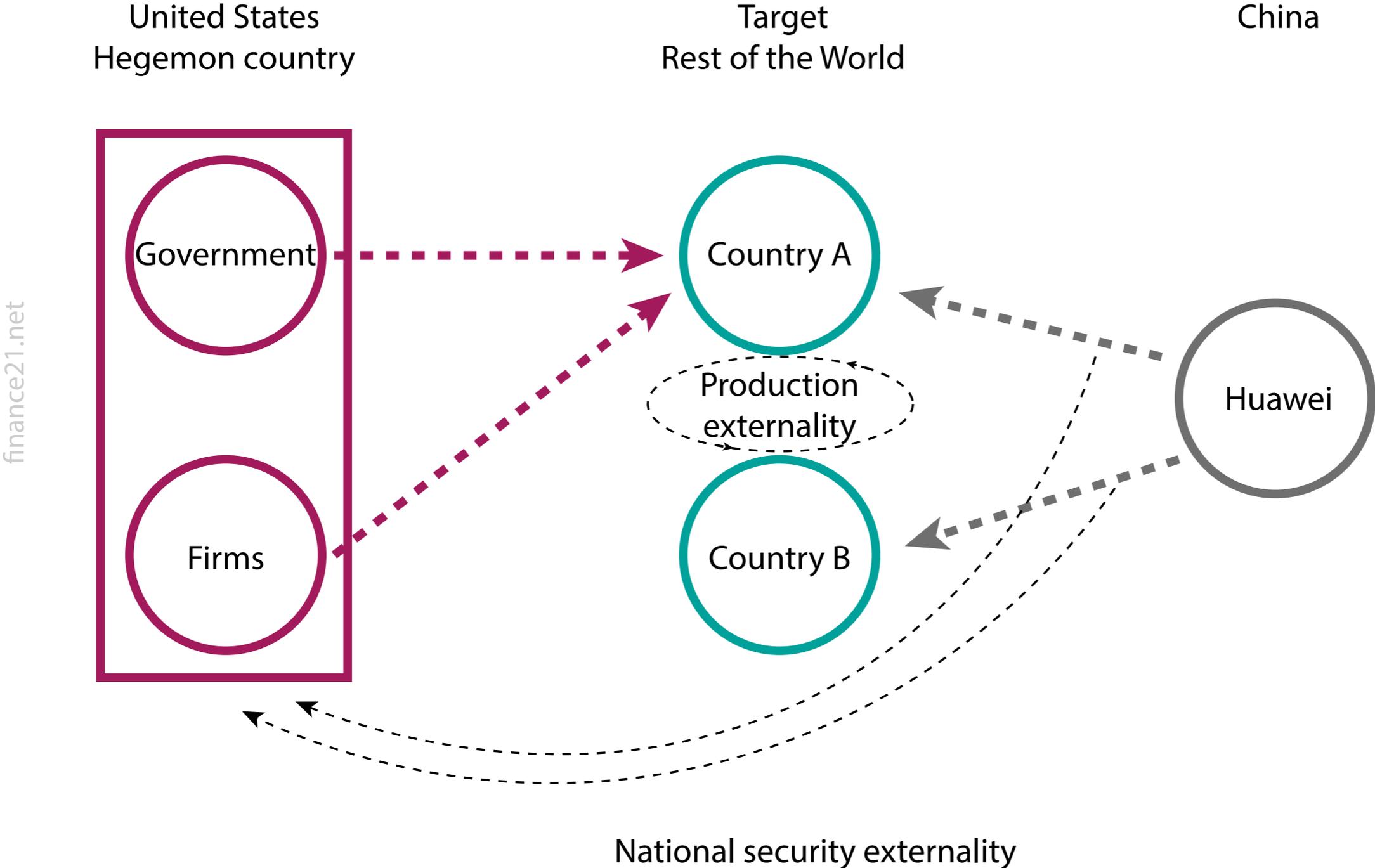
The US wields its macro-power by demanding entities in its network to curb the use of this technology. As targeted sectors use less of China's technology, the technology becomes less attractive also to other sectors that the US cannot directly pressure, increasing the overall impact of US demands.

Understanding the Belt and Road Initiative

China's flagship Belt and Road Initiative provides countries involved package deals of lending, infrastructure projects, and manufacturing inputs. China often extracts political concessions and or better access for its firms to new markets.

We model how China can combine lending and manufacturing exports to extract political concessions (Figure 3). We consider a target country with low legal enforcement, eg. an emerging or frontier market. In the absence of China's geoeconomic power, the country has limited willingness to repay the debt.

Figure 2. US national security and 5G infrastructure from China



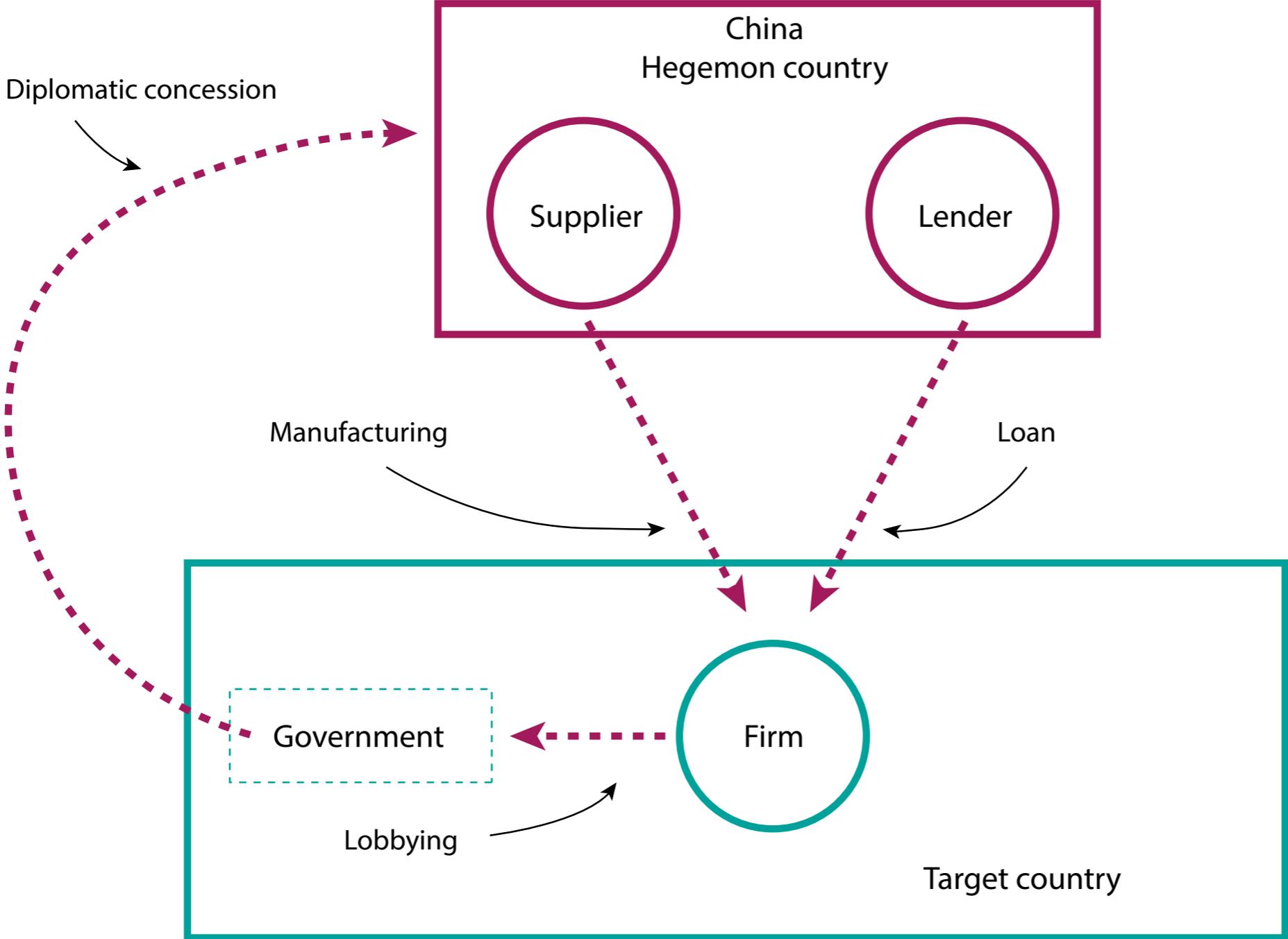
However, China can threaten to jointly stop the financing and reduce the supply of manufacturing goods if the target country does not repay the debt or attempts to expropriate the goods. This joint threat is very powerful, and it expands economic activity that can be carried out in the targeted country.

China extracts some of the value created in these economic relationships in the form of political concessions, for example, closer alignment over the recognition of Taiwan. ■

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Figure 3. China's Belt and Road Initiative

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From the Great Divergence to South-South divergence



The long era of the Great Divergence has come to an end. Ewout Frankema argues that we need to focus on the economic divergence across the Global South

The Great Divergence debate has been the field-defining conversation in economic history for the past 25 years. This debate revolves around the question why the Industrial Revolution originated in Western Europe, and more specifically in Britain, and not in China, India, or Japan. By unifying scholars around this comparative research agenda, the debate has done much to globalise the field of economic history and to stimulate the construction of world-spanning databases on historical GDP, real wages, skill premiums, government revenues, terms-of-trade, human capital, land use, and more.

Such data collection and estimation efforts, in turn, have provoked heated discussion on the methodological and theoretical underpinnings of income and welfare measurements, and on the critical importance of reciprocity in comparative economic historical analyses.

As is the case for all major academic debates, however, at some point of their life cycle decreasing marginal returns are inevitable. Once original questions fade as new adjacent windows of exploration open.

Moreover, the long era of the Great Divergence – which is primarily, but not exclusively, understood as a Eurasian phenomenon – has come to an end with the rapid economic ascendance of Eastern Asia, and China in particular.

As Ken Pomeranz already observed in his seminal book *The Great Divergence* (Pomeranz 2000), the last quarter of the 20th was characterised by impressive rates of convergence, not divergence. In light of both developments, the academic and the historical, in a recent paper (Frankema 2023) I ask: what are the new comparative horizons in global economic history?

Beyond the Great Divergence

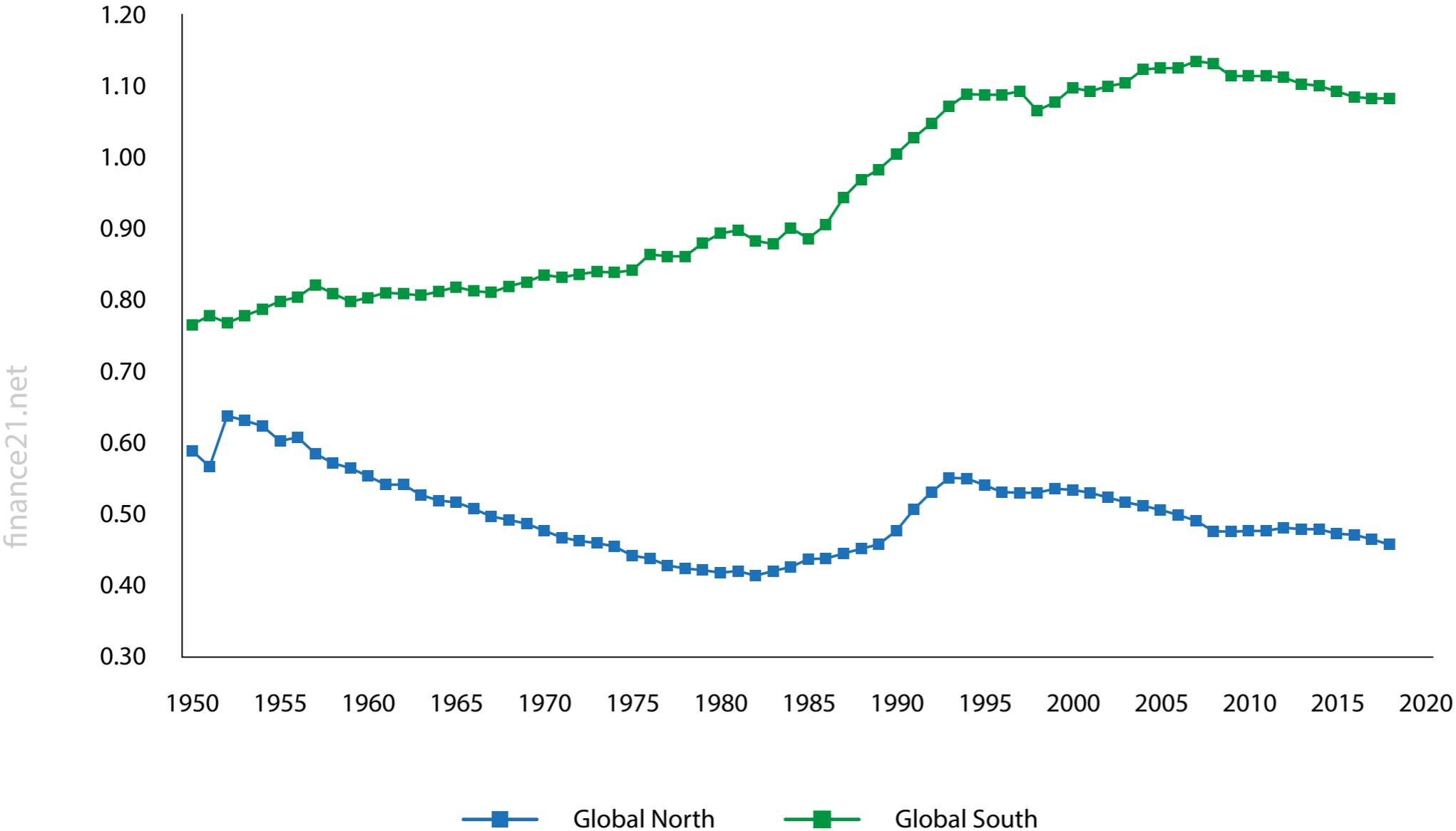
I argue that there is an urgent need to focus on the rapid, and more recent, economic divergence across the Global South. I refer to this new divide as South-South divergence. As the Eurasian gap in economic, industrial, and

technological capacity began to shrink, the South began to experience growing disparities in labour productivity and per capita income.

This process of South-South divergence is illustrated in Figure 1, which shows the coefficient of variation of per capita GDP in the North and the South since 1950. In the South the income disparities widened, while in the North they narrowed, a trend that was only temporarily interrupted by the disintegration of former communist economies during the 1980s and 1990s. This phenomenon of South-South divergence warrants more attention than it has received thus far.

Economic historians have yet to define an agenda to analyse the causes and consequences of divergence in the Global South

Figure 1. Coefficient of variation of per capita GDP in the Global North and Global South, 1950-2018



Note: The coefficients of variation in GDP per capita are taken from a constant sample of 40 Northern and 105 Southern countries listed in Appendix 1. The Global South excludes the oil-rich Gulf Countries; the Global North excludes the former Soviet states that gained independence in the 1990s.
Source: GDP per capita from Maddison Project Database 2020.

To be sure, the attention that has been devoted to the economic history of developing regions has greatly increased over the past two decades. New research networks, conferences and journals have been established.

However, for the most part, these research communities have lacked an explicit trans-regional comparative agenda. They have made great progress on debating topics such as Latin American inequality, African colonial legacies, Middle Eastern culture and religious institutions, or comparative patterns of Asian industrialisation, but seldom do these communities venture out to discuss the nature and drivers of cross-regional divergence. Economic historians have yet to define an agenda to analyse the causes and consequences of divergence in the Global South.

Why care about South-South divergence?

Let me offer four reasons. First, whereas the Global South today already comprises more than 80% of the world population and generates close to 60% of world GDP, its demographic and economic weight is bound to increase further during the 21st century.

By 2100 the North is projected to hold just 12% of the world population, while Asia and Africa together will harbour more than 80% of the world population. The share of world GDP that will accrue to the South is projected to rise from 57% in 2020 to 72% in 2050.

Second, this reconfiguration of global economic gravity is having profound implications for global divisions of labour, capital flows, trade, food demands, investment, and migration patterns.

In fact, one of the most important consequences of South-South divergence has already materialised: the problem of extreme poverty, which had long been a predominantly Asian phenomenon, has shifted decisively towards sub-Saharan Africa.

Table 1. Population and income shares per world region, 1820-2100

	1820	1850	1900	1950	2000	2050	2100
<i>Population</i>							
Asia	0.66	0.62	0.53	0.54	0.60	0.53	0.43
Africa	0.06	0.06	0.06	0.09	0.14	0.26	0.39
Europe	0.22	0.24	0.28	0.23	0.12	0.08	0.06
Americas	0.03	0.05	0.10	0.14	0.14	0.13	0.11
Global South	0.74	0.71	0.64	0.67	0.80	0.86	0.88
Global North	0.26	0.29	0.36	0.33	0.20	0.14	0.12
<i>GDP</i>							
Global South	0.58	0.46	0.28	0.26	0.43	0.72	-
Global North	0.42	0.54	0.72	0.74	0.57	0.29	-

Note: Europe includes all former Soviet republics and Central Asian states; Asia includes New Zealand and Australia.

Source: 1820-1900 from Maddison Project Database 2020; 1950-2100 from UNDP, World Population Prospects, 2022 revision, medium variant.

While back in 1990 more than four out of five of the world's extreme poor were living in Asia, in 2020 two out of three of the world's extreme poor lived in Africa (ca. 65%).

Third, economic history students who have to be trained in recognising, studying, and interpreting the drivers of long-term divergence and convergence will have to be introduced to these global shifts in order to make sense of them. But where is the literature that we prescribe to teach the chapter on South-South divergence?

After all, the Great Divergence did not just end with the era of the Great Convergence (Baldwin 2016), it also shifted the locus of global inequality, a shift that is reconfiguring the 21st century world economy with dazzling speed.

And finally, fourth, in a field that has long been dominated by Western-centred research agendas and North-South perspectives, more systematic engagement with South-South comparisons can lead to new data collection efforts and can help to develop reciprocal comparisons without taking Western economic development as the mirror image.

In this regard, the South-South divergence agenda can take the call for reciprocal comparisons to a next level. Western imperialism may play an important role in understanding the roots of South-South divergence, but it does not have to serve as the ultimate benchmark to measure performance.

Is the South a useful category?

I admit that lumping the world together in two blocks may appear old-fashioned. The idea of juxtaposing the North versus the South goes back to 1980, when the *Brandt Report* published the famous map shown in Figure 2.

How useful is 'the South' as an analytical category given its enormous historical diversity in populations, cultures, states, and institutions? I argue that taking the South as a world on its own is defensible, if one allows for hybrid

cases (eg. Japan, Turkey) and is willing to accept the notion of the 'quadruple challenge'. The quadruple challenge refers to the idea that virtually all Southern states had (or have) to, simultaneously, grapple with the questions of:

1. How to catch-up with technology leaders in the West while being at a considerable distance from the frontier.
2. How to overcome the variegated legacies of externally imposed institutions (colonialism) or extended phases of limited state autonomy as a result of imperialist and neo-colonialist pressures.
3. How to mediate the forces of accelerated globalisation, in particular the volatility of world commodity markets and rising capital flows in the context of their distance to global productivity frontiers.
4. How to deal with increasing constraints on cross-border mobility of labour in the context of heightened environmental pressures (the Anthropocene) including climate change.

If these binding elements suffice as a binding core of similarities, then the diversity in local institutions, geographies and colonial trajectories can provide ample material for analysing how these threads intertwine and have led to strongly divergent post-colonial development paths.

Leading questions

There are numerous big questions that can inspire a South-South divergence research agenda. My paper elaborates three of these. First, what explains the limited spread of the developmental state as it emerged in Eastern Asia, and how can other types of political-economic regimes be qualified?

Figure 2. The Brandt line



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Source: Brandt et al (1980, p. 31-32) and front cover.

This question has been hitherto been mainly of interest to political scientists. Historians can contribute much to these debates by bringing in deeper time scales, diachronic comparative lenses, and more dynamic conceptions of colonial institutional development.

Second, why is development clustered in space and time? Is it nature (geography, agrarian structures, deep-seated cultures) or should we focus on nurture: how regional processes of integration and disintegration have taken shape in Latin America, sub-Saharan Africa, the Middle East or Southeast Asia?

Third, can the whole world be developed? To what extent do the newly industrialising economies of Asia jeopardise the opportunities of African economies to conquer new niches in world markets? How does the rising pressure and rising prices of scarce raw materials draw mining economies deeper into their paths of natural resource exploitation? These three questions are obviously not exhaustive, but they are all relevant for economic policymaking in the Global South.

In sum, my paper offers a plea to integrate the global South in the historiography of global economic development on its own terms, and to rethink, how new comparative horizons can open up to move the agenda away from the old question how the West got rich or weird (Henrich 2020), and to the new question why modern capacities to enhance human welfare have so far spread so unevenly across the globe. ■

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Non-bank risks, financial stability and the role of private credit

Over recent years private credit has become an important source of funding for some corporates. Lee Foulger sets out the FPC's approach to assessing financial stability risks

The Bank of England has a statutory financial stability objective, and the Financial Policy Committee, established following the global financial crisis, is the UK's macroprudential authority charged with the role of identifying, monitoring, and mitigating systemic risks. The FPC seeks to ensure the financial system is resilient enough to be able to serve households and businesses in both good times and also in stress.

Since the financial crisis, non-banks, or the system of market-based finance as we call it, has grown significantly both as part of the UK financial system but also globally, now accounting for around half UK and global financial sector assets.

It also matters more to the real economy, for example, it contributed to nearly all of the c. £425 billion net increase in lending to UK businesses from 2008 to 2023. That means it is important that, alongside banks, the non-bank system can absorb, and not worsen, any shocks that may arise.

But assessing risks in the non-bank sector is challenging given its international nature and the diversity of business models or types of activity. And further by challenges in gathering the data needed to build a picture of the sector and risks.

We set out our framework for doing this last year in a Financial Stability in Focus report¹. Within this framework we consider two types of vulnerabilities. The first of those are 'microfinancial vulnerabilities' – these are risks inherent in the business models of market participants, that they must manage and for which it is generally in their own interests to get right.

These include risks such as maturity and liquidity mismatch, which arise when assets are less liquid or have longer maturities than liabilities, potentially leading to the need to liquidate assets rapidly in a stress. Or leverage, which

can help to increase potential returns or hedge those risks, but which can also amplify losses and exacerbate liquidity issues in difficult market conditions.

The increasing role played by non-bank finance in the provision of credit is a feature of the financial system, not a bug, and a welcome feature if undertaken on a sustainable basis

These business model risks are first and foremost for firms to manage, and in some cases are overseen by market conduct regulators. However even if well managed individually, their collective impact when hit by shocks can inadvertently weaken other firms, spread stress throughout markets, and potentially disrupt the supply of financial services to the real economy. As we have learnt from previous crises, managing your own risks isn't always sufficient to protect against the wider risks to financial stability.

The second type are 'macrofinancial vulnerabilities'. These are risks inherent to the structure of markets, or the collective behaviour of individual firms within them. They include issues such as market concentration, jumps to illiquidity, correlation and interconnectedness.

For example, high market concentration can amplify price moves and increase the risk of disruption, especially where firms' liquidity demands are large compared to the system's ability to supply. For example, liability driven investment (LDI) funds are significant holders of long-dated and index-linked gilts.

In September 2022, when these funds faced a correlated stress, there were few buyers of the gilts they needed to sell, which created the potential for 'doom loop' dynamics².

Jumps to illiquidity can happen when rapid increases in demand for liquidity overwhelm the capacity of markets to absorb it, resulting in amplified price moves and market dysfunction. This can be exacerbated by unwillingness or inability of dealers and other intermediaries to expand their balance sheets to absorb the demand.

This was evidenced by the volatility in US overnight repo rates in September 2019, when the Federal Reserve had to take action to restore market stability.

Correlations can happen when common positions of participants amplify price moves, such as when falling asset prices force those with similar trading strategies to sell assets, leading to further price falls. This can cause direct and indirect losses to other institutions, potentially leading to tighter financial conditions for households and businesses.

Interconnectedness across markets, when combined with opacity, can result in losses being transmitted to counterparties in a sudden or surprising way, driven in part by the lack of certainty on overall positions held in the market. For example, during the financial crisis, the interconnectedness and lack of transparency of derivative markets amplified shocks in the financial system.

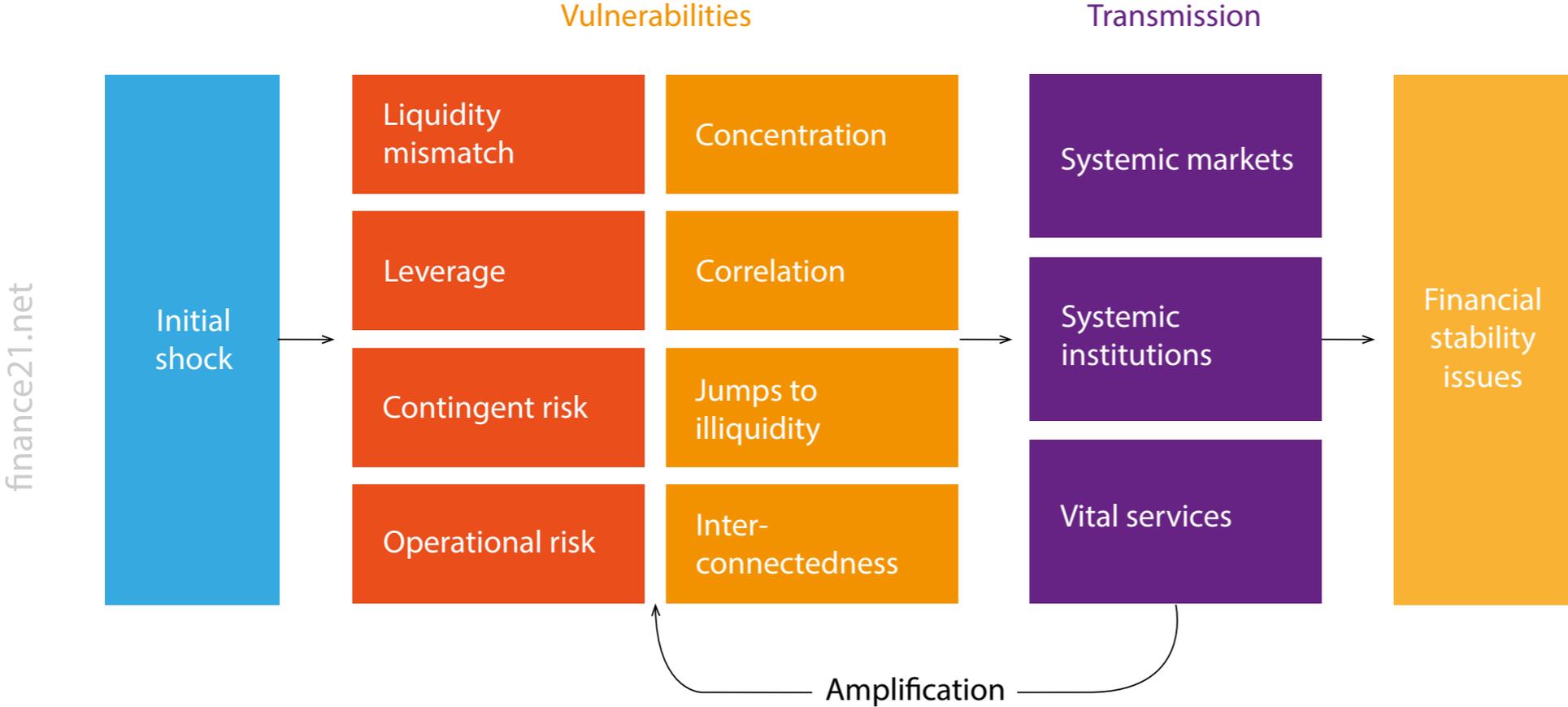
In private markets, these interlinkages could include cross-investing between investors and funds, with some large fund managers exposed to other private credit and private equity funds.

These vulnerabilities can impact UK financial stability through three main channels (Figure 1). Firstly, through systemically important financial markets which are integral to the real economy. Disruptions to these markets would impact the cost or availability of finance for UK households and businesses. The LDI episode highlighted how issues in the non-bank sector can impact government bond markets, impacting the pricing of credit to household and businesses.

Secondly, through systemically important financial institutions such as banks, which could impact the availability or cost of credit. For instance, banks engage in repo and derivative transactions with hedge funds through their broker-dealer operations; a sudden fall in asset values could leave banks' exposures insufficiently collateralised. This scenario could result in losses for banks and cause a spillover to the real economy through reduced credit provision.

Figure 1. How vulnerabilities in market-based finance can affect financial stability

Vulnerabilities and transmission channels to financial stability



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Source: Bank of England

The last channel is through interruptions in vital services, including payment and settlement systems. These can halt critical economic activities undermining the stability of the financial system.

Where do private credit markets fit in?

Over recent years, private credit has become an increasingly important source of funding for some corporates and other asset classes such as real estate, both in the UK and worldwide. This has provided an alternative source of financing for corporates, including those that might have otherwise found it difficult to secure finance through public markets or from banks.

The availability of private credit can be beneficial for economic activity and innovation. By providing finance where traditional means fall short, it can support investment and growth opportunities. And to the extent that private credit substitutes for bank financing, it can contribute to the diversification of financing sources.

In many ways lending via private markets is likely to be lower risk from a financial stability perspective than had the lending been undertaken by the pre-GFC banking system.

Leveraged lending, high yield bond and private credit markets account for around a quarter of all market-based finance globally. And leverage lending and private credit taken together have roughly doubled in size over the past decade.

Within that, we estimate that private credit has grown even faster - four-fold since 2015 to around \$1.8 trillion, though given the limited data available the true market size could be much larger. Much of that growth has been during a sustained period of low interest rates.

However, since the start of 2022 interest rates have increased substantially, and markets are not expecting a return to the levels seen in the recent past for the foreseeable future.

Corporates that borrow through private credit markets, along with leveraged loan and high yield bond markets, are likely to be more challenged in a higher interest rate period. The floating-rate debt structure of private credit agreements makes them vulnerable to challenges around debt servicing and refinancing in a higher rate environment.

To date, private credit market participants have reported low default rates despite the tougher macro environment. But in the past year, highly leveraged borrowers have experienced a significant decline in their interest coverage ratios.

It is therefore important, as it is for all parts of the financial sector and real economy, to understand how the transition to a higher rate environment will affect the private credit markets and in particular whether and how the business model risks in the sector will interact with the macro vulnerabilities I talked about earlier.

The sorts of business model risks we are focused on include the refinancing of existing debt in the context of higher rates, valuations, risk management approaches, liquidity and leverage, and what the impact of these might ultimately be on systemic markets and institutions important for the provision of credit to households and businesses.

For example, some market participants have indicated that refinancing practices aiming to support firms smooth the impact of tighter financing conditions may act to delay or mask the financial vulnerability of the underlying corporates.

'Amend and extend' (A&E) is increasingly common, in which lenders agree to push back a loan's maturity, often in return for a higher yield and tighter financial controls. 'Payment-in-kind' practices are also becoming increasingly common, where borrowers with low liquidity issue new debt in order to meet interest payments.

These measures can help to smooth the impact of tighter financial conditions. While individually rational, they put a premium on robust approaches to risk management and collectively could increase the risk of defaults materialising further down the road.

As interest rates have risen, so has the riskiness of borrowers, which all else equal should impact valuations. The majority of fund portfolios are typically valued quarterly and remain above their public-market peers with some investors left possibly over-allocated to private markets due to this dispersion.

Lagged or opaque valuations could increase the chance of an abrupt re-assessment of risks or to sharp and correlated falls in value, particularly if further shocks materialise.

Risk management of private credit investments may also be made more difficult by the illiquid nature of the asset class. And some private credit funds may have a degree of liquidity mismatch between their investments and the redemption terms of their investors.

The significant interlinkages between private credit markets, leveraged lending, and private equity activity make them vulnerable to correlated stresses. Private credit and leveraged loan markets are interlinked given their floating rate nature and links to private equity activity (Figure 2). Private credit exposures are largely held by a range of institutional investors.

Leveraged loan and private credit markets exhibit some overlap in investor bases. Given the illiquidity of private credit assets, there is a possibility that investors may opt to sell other, comparatively more liquid assets, such as leveraged loans or high-yield bonds to reduce their credit exposures.

If material enough, these risks materialising could trigger a broader reduction in risk appetite that spills over to UK financial stability through financial markets, impacting on financing conditions for UK businesses.

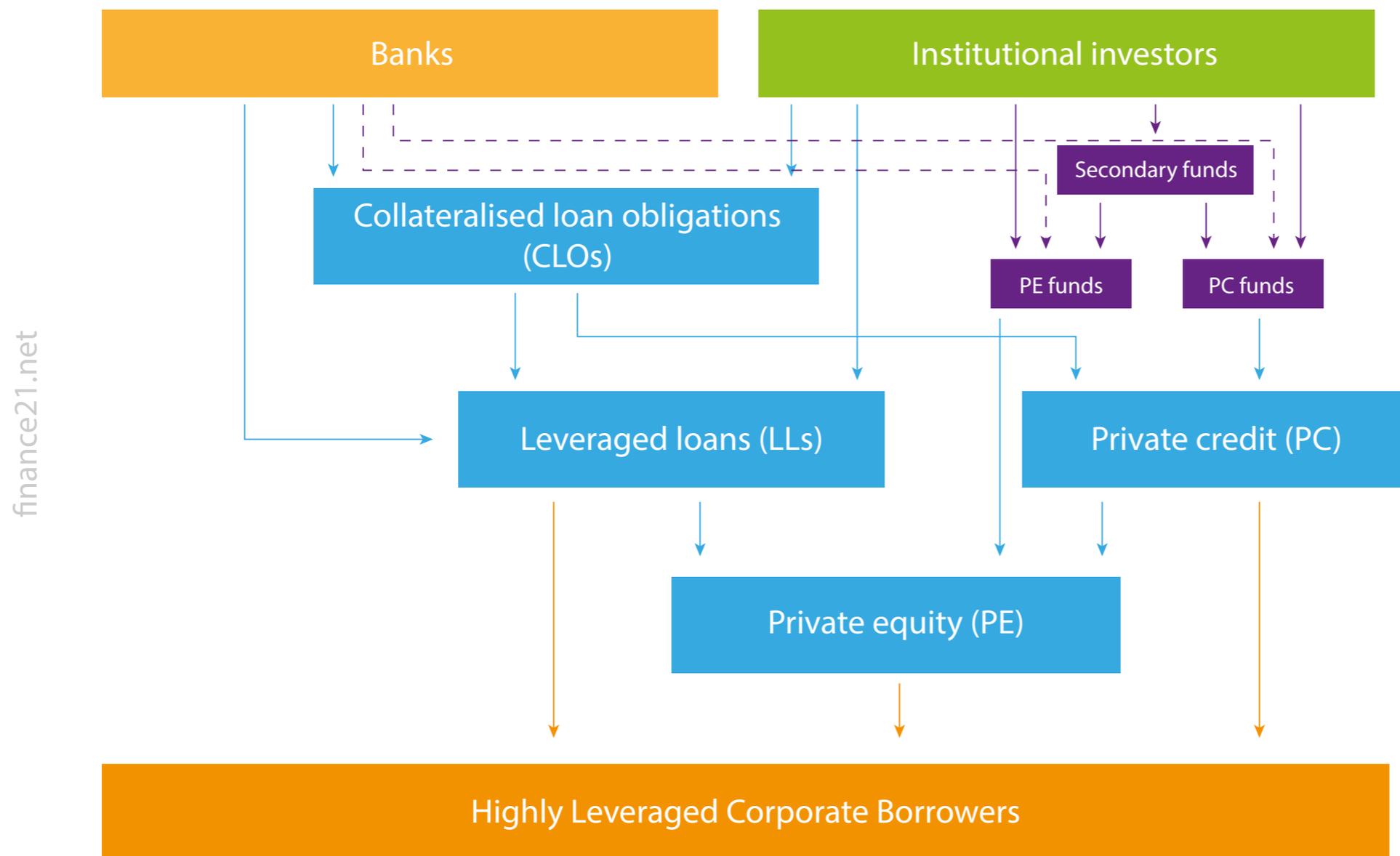
While the leverage deployed appears relatively low, the underlying investments are relatively higher risk, and we lack sufficient data to fully understand their resilience in stress.

In addition to the leverage on the underlying exposures, private credit funds may also use leverage to enhance returns through borrowing from banks and markets, via subscription lines or secured lending against the fund's assets.

The different levels, structures and layers of leverage within the firms, funds and system wide make it challenging to assess aggregate leverage across the market. And it is difficult to identify the extent to which any losses could spill over to banks and investors, and the interconnectedness to systemic institutions.

For institutional investors, losses may dampen their risk appetite for corporate credit more broadly. UK insurers could also be indirectly exposed due to their growing interconnectedness with non-UK reinsurers, which have increasing exposures to highly leveraged corporates³.

Figure 2. Highly leveraged corporates are reliant on a variety of funding sources, including from private credit, private equity and leveraged loans



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Source: Bank of England

Conclusion

The increasing role played by non-bank finance in the provision of credit is a feature of the financial system, not a bug, and a welcome feature if undertaken on a sustainable basis. It has grown particularly strongly following the global financial crisis alongside the tightening of regulations for the banking system, and a period of unusually low interest rates globally.

The shift in the risk environment, including greater geopolitical risks, more subdued economic growth, and tighter financing conditions will pose challenges to the non-bank sector and specific challenges to private credit markets, both in terms of the way risks are managed and because the underlying borrowers and the specific business models are likely to be increasingly challenged in this environment.

Past stresses have demonstrated how in favourable market conditions business model risks can build up and interact with system wide vulnerabilities in a way that can impact credit provision to households and businesses and impact upon systemic institutions and markets when conditions worsen.

Assessing the extent of the risks, or in which scenarios they might crystallise is easier said than done. There are significant challenges with obtaining reliable data to monitor the risks in private credit markets. We have so far used a combination of market intelligence and data analysis to inform our thinking – but welcome further engagement with market participants.

Recently, the Securities and Exchange Commission in the US has adopted new reporting requirements for private funds and separately, the Financial Conduct Authority in the UK has announced its intention to review valuations in these markets, all of which should help to improve our understanding of developments in the sector and any potential financial stability risks.

Going forward, the FPC will continue to closely monitor risks from private credit and interconnected markets, drawing on market intelligence and the data sources available and will publish further assessment of these risks in our Q2 Financial Stability Report in June. ■

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Endnotes

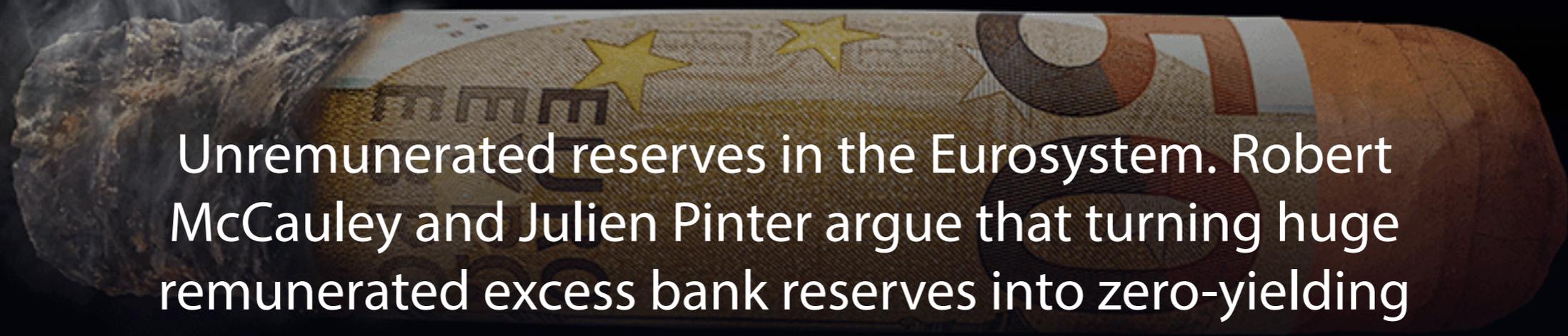
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2. [Risks from leverage: how did a small corner of the pensions industry threaten financial stability?](#) - speech by Sarah Breeden | Bank of England.
3. Letter from Charlotte Gerken '[Feedback on the PRA's preliminary thematic review work on funded reinsurance arrangements](#)' | Bank of England.

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Heads I win, tails you lose

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Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that turning huge remunerated excess bank reserves into zero-yielding required reserves is a tax on banks

Central banks in the euro area are losing money hand over fist. Some economists support a policy that, they contend, would make banks shoulder the losses. In no fewer than four Vox columns last year, De Grauwe and Ji (2023a, 2023b, 2023c, 2023e) propose to turn a large part of the €3.6 trillion in excess reserves¹, currently paid at the ECB's deposit interest rate of 4%, into unremunerated, required reserves.

They assert that reserve remuneration, at a time of large excess liquidity following the ECB's massive bond purchase programmes, amounts to a 'subsidy to banks' and is 'non-sensical'. They further argue that requiring large unremunerated reserves would not prejudice the ECB's mission (De Grauwe and Ji 2023a)².

With a base of reservable deposits of €15 trillion³, each percentage point rise in unremunerated required reserves would seemingly boost the net income of Eurosystem central banks by €6 billion at the current 4% rate. De Grauwe (2023) engaged with Bundesbank President Joachim Nagel as an Invited Speaker at the Bundesbank in September as the ECB (2023) ceased remunerating the 1% required reserve.

In this first column in two-part series, we provide an alternative reading of the proposal to require large unremunerated reserves. We argue that reserve remuneration is not a subsidy to banks. Rather, requiring large unremunerated reserves amounts to a tax on banks, as it is commonly considered (Reinhart and Reinhart 1999, Bindseil 2014).

The policy change ('tails you lose') would not be considered had interest rates stayed low and large-scale bond-buying had produced gains for central banks ('heads I win').

In the second column, we will set out the unintended consequences for the locus of euro bank intermediation of unremunerated reserves.

Reserve remuneration is not a subsidy

De Grauwe and Ji (2023a) charge that remunerating central bank reserves amounts to 'subsidising commercial banks'. We disagree with this characterisation, especially at a time of abundant reserves. We set out our stall in two sections.

First, we recall how the Eurosystem arrived at remunerated required reserves in a world of scarce reserves. Second, we discuss the ramifications of reserve remuneration in a world of abundant reserves after massive Eurosystem bond purchases.

When a central bank unexpectedly halts interest payments on reserves after trading them for long-term bonds, it levies a new tax on banks to boost its profit

Genesis: scarce reserves and remunerated required reserves

In the old, normal times in the euro area, banks demanded reserves from their national central bank to meet reserve requirements, which were by design set above normal clearing and settlement needs.

Formerly, banks obtained these reserves by borrowing at the ECB's refinancing rate against acceptable collateral. Thus, banks paid an interest equivalent to the refinancing rate to secure required reserves.

In the initial negotiations to establish the euro, participating central banks agreed to pay a market-based rate of interest on required reserves, so that banks would not pay much to hold required reserves. The Eurosystem opted for required reserves to establish a deficit in the euro money market, forcing banks to depend on ECB refinancing. And with averaging provisions, required reserves also stabilised short-term rates.

The negotiations rejected the monetarist notion of creating a sharp discontinuity in the returns from holding reserves to tighten the link between reserves and money. Negotiators also rejected requiring unremunerated reserves to boost central bank profits.

This agreement was by no means the only plausible outcome of the euro negotiations in the 1990s. This is the message of an immensely useful 2011 book, *The Concrete Euro*, edited by two clear-headed practitioners who were present at the creation, Paul Mercier and Francesco Papadia.

In negotiations that included the eventual 'outs' as well as the eventual 'ins', seemingly important central banks objected to required reserves and not even a handful of central banks had any experience in remunerating reserves (Galvenius and Mercier 2011, Table 2.2)⁴.

While required reserves were a customary tool of central banks⁵, they contradicted the business model of two European financial centres. Neither the Bank of England, the Riksbank, the Danmarks Nationalbank, nor the Benelux central banks operated with required reserves.

The Bank of England argued that *“a reserve requirement system was inconsistent with market principles”* and the Luxembourg delegation was *“particularly concerned that the application of a reserve requirement system would lead to a relocation of banking business to financial centres outside the euro area”* (Galvenius and Mercier 2011)⁶.

By 1990, when the Fed lowered reserve requirements on non-transaction accounts to zero, this custom was becoming more honoured in the breach than the observance.

The decision to require reserves and to remunerate them at market rates came late, only after it became clear who would be ‘in’ and ‘out’. Still, the weight of the Bank of England and Riksbank in the negotiations arguably tipped the Governing Council to opt to remunerate required reserves as a compromise.

Required reserves were originally set at 2% of specified liabilities, and their remuneration was set originally at the ECB’s refinancing rate, and then at the lower deposit rate in October 2022 (ECB 2023).

Today: abundant reserves and unremunerated required reserves?

Nowadays when abundant reserves more than fully satisfy the needs for clearing balances, the remuneration of reserves is much more consequential. Recall that the Eurosystem loaded commercial banks with excess reserves through its large-scale bond purchase programmes. These are the same excess reserves that De Grauwe and Ji (2023a) would cease remunerating.

When a central bank buys domestic bonds, the seller can be a domestic bank or a domestic or foreign institutional investor. Figure 1 labels the purchase from a domestic bank as A; the purchase from a domestic institutional investor as B (where 'Insurance' is a particular case of an aggregate including pension funds and investment funds); and the purchase from a foreign institutional investor as C. A and C are empirically important cases (ECB 2017), as indicated in the figure with the thickness of the bond arrows in black⁷.

Here we focus on purchases from domestic banks, A, to make the case that remunerating reserves is not subsidising banks. But the reasoning only strengthens when the other two other cases are considered⁸.

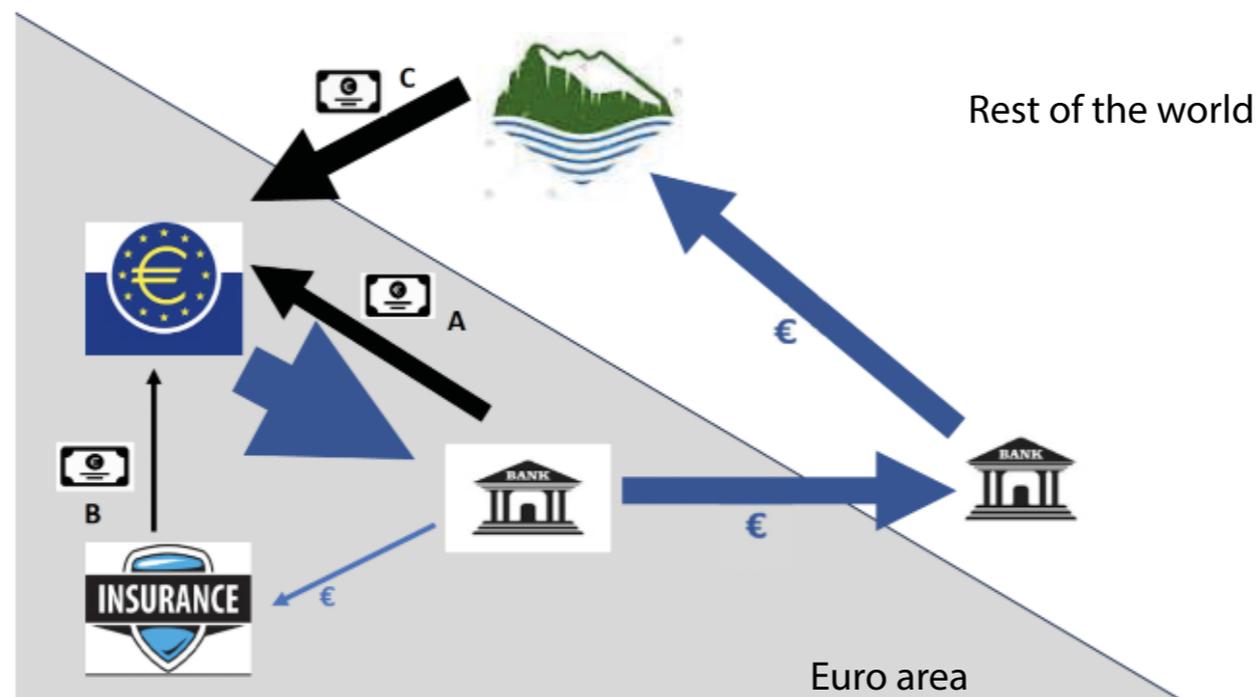
In this case, the central bank exchanged freshly created 'central bank reserves' for a bond held by a commercial bank. Banks only agreed to this exchange if they deemed it beneficial. Consider the case in which a commercial bank intended to hold a bond to maturity and considered selling it and holding the asset obtained in exchange for the same period.

The bank would be willing to sell the bond if the present value of the central bank reserves, including remuneration in the event that short-term interest rates again turned positive, is equal to or exceeds the price of the bond⁹.

This stylised representative (bank) agent case assuming a 'sell and hold' strategy¹⁰, highlights a crucial point: banks factored in reserve remuneration in the states of the world with positive interest rates when selling bonds to the ECB during QE.

Moreover, banks set loan and deposit interest rates based on anticipated reserve remuneration. Recall that the ECB had from its inception remunerated reserves at its policy rate, so only the most imaginative bankers would have factored in the possibility of the ECB's requiring large unremunerated reserves.

Figure 1. ECB bond buying (quantitative easing): flow of funds



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Note: Width of arrows is proportional to the size of the flow in ECB, 2017, not including 'other sectors' residual. Insurance represents insurance companies, pension funds and investment funds.

Source: Avdjiev et al (2019); authors' adaptations.

From the bank's point of view, the imposition of large unremunerated reserves amounts to an unforeseen income loss owing to a central bank's unilateral decision. Unlike a government treasury opting to forgo coupon payments on its bonds, the imposition of large unremunerated reserves is perfectly legal. This unexpected income loss of the bank amounts to an unexpected tax levied by the central bank.

Instead of regarding the act of remunerating central bank reserves as a subsidy, one should thus see the act of ceasing to remunerate central bank reserves as the imposition of an unexpected tax on euro area banks, consistent with Bindseil (2014, Chapter 8).

Let us review the bidding. In the case considered, central banks exchanged their floating rate IOUs for a fixed-rate bond held by the banks. Interest rates subsequently increased much more than anyone expected at the time of the purchases. As a result, commercial banks benefitted from the exchange, holding floating-rate central bank reserves instead of the fixed-rate bonds. The interest rate rise has also led to financial losses for the central bank, making quantitative easing (QE) seem ex-post disadvantageous, from a narrow viewpoint of the central bank finances¹¹. If interest rates had remained very low or even negative, the situation would have differed: central banks might have profited from the exchange over the entire bond holding period while still remunerating reserves.

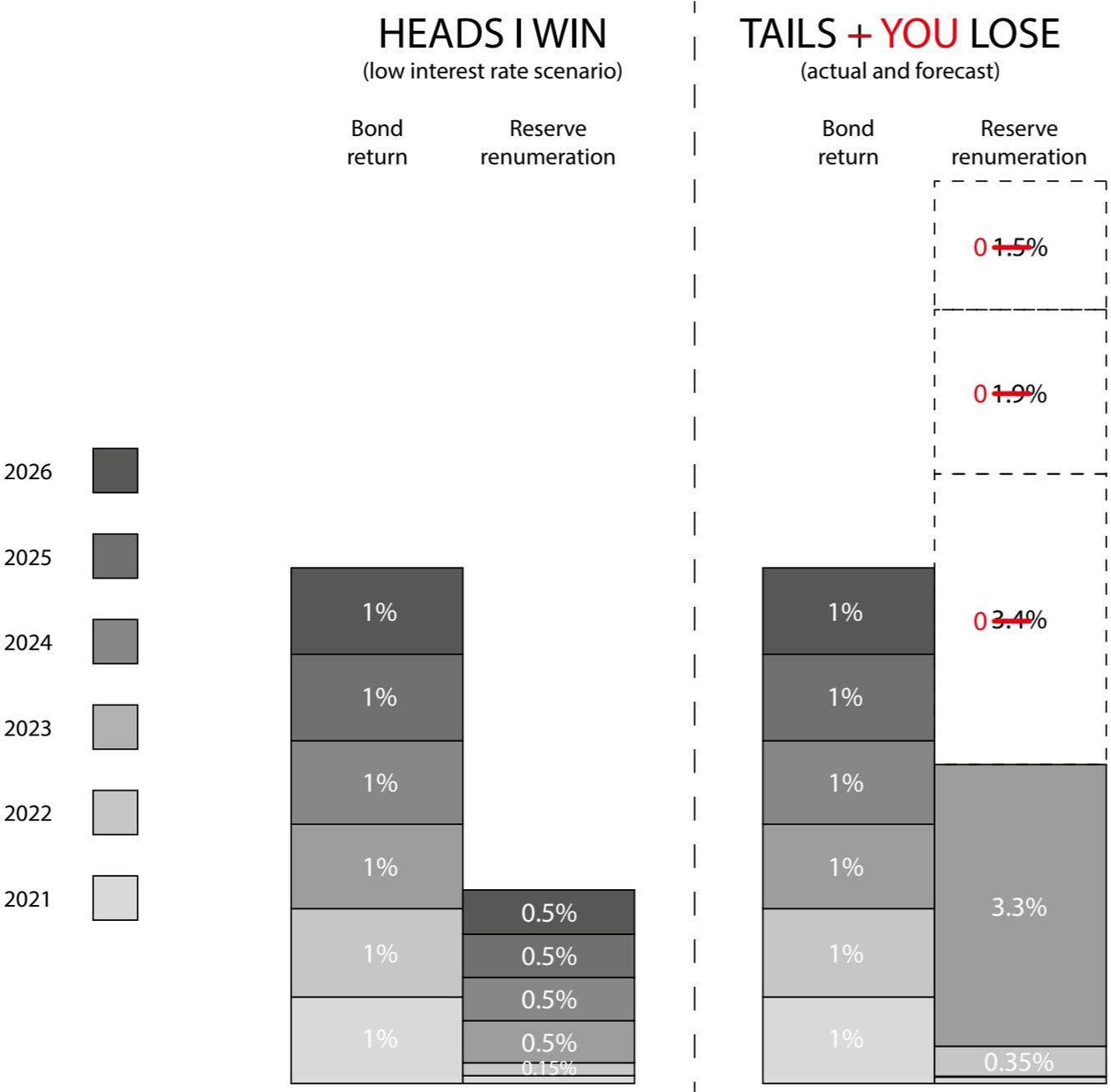
Essentially, De Grauwe and Ji's (2023a) proposal arrives when an unfavourable outcome for central banks' finances has materialised and suggests that central banks change their means of payment from something akin to a floating-rate note into something resembling a banknote that pays no interest. This is all very legal, but perhaps not well advised.

Figure 2 illustrates this 'heads I win, tails you lose' approach with the case of the Eurosystem's buying a six-year bond yielding 1% a year in 2021 from a representative bank. The left panel considers a counterfactual scenario in which the ECB deposit rate remains at low levels.

Figure 2. Heads I win, tails you lose

Returns to the ECB and commercial bank from purchase of a 6-year bond at the start of 2021

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Note: Both panels profile on the left the returns of a 6-year bond yielding 1% per year bought by the central bank at the beginning of 2021, and on the right the remuneration of bank reserves that served as the means of payment. Each rectangle in a column represents the return in a given year, with its height proportional to the return. The left panel profiles the returns in a counterfactual scenario in which the ECB deposit facility rate was 0% in 2021 (as it was for reserves exempted from the negative deposit interest rate), 0.15% in 2022 (as it was on average), and then remained at 0.5% in 2023-2026. Over the entire holding period, the bond return (6%) exceeds reserve remuneration (2.15%): the ECB wins, the bank loses. The right panel profiles the actual returns through 2023 and then forecasts from the ECB’s Survey of Professional Forecasters for 2024-2026, allowing the deposit facility rate gradually to decline to 1.5% in 2026. Over the entire holding period, reserve remuneration (10.45%) exceeds the bond return (6%): the ECB loses, the bank wins. Zeroing reserve remuneration lops off the right bar at 2023: the bank loses, the ECB wins.

The right panel considers the actual ECB deposit rate through 2023 and then plots forecasts for it in 2024 through 2026 from the ECB's Survey of Professional Forecasters (SPF)¹². Red edits in the right panel indicate the effect of a decision to stop remunerating reserves from 2024 on: the policy lops off the return received by the banks at the end of 2023. In both panels the ECB wins, and the banks lose, in the right panel because of the decision to cease remunerating reserves.

Banks would remember such a 'heads I win, tails you lose' approach. Governor Pierre Wunsch of the National Bank of Belgium has warned: *"We need to be very cautious... Next time we need to use QE, I wouldn't like to see banks having to run the probabilities of this leading to losses for central banks and speculating whether they need to boost buffers as we might tax them later"* (Kaminska 2023).

Conclusion

In conclusion, the remuneration of reserves does not suffer from a 'lack of economic foundations', especially when reserve demand is sated, and marginal liquidity services are zero. When a central bank unexpectedly halts interest payments on reserves after trading them for long-term bonds, it levies a new tax on banks to boost its profit. Any prospective usefulness of central bank bond buying ('QE') advises caution in taking such a step. In the second column in this series, we question the frequent assumption that bank owners or bank borrowers would pay the tax imposed by large unremunerated reserves. ■

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Endnotes

1. See Eurosystem consolidated statement | ECB Data Portal (europa.eu).
2. See also DeGrauwe and Ji (2023d, 2023).
3. For the July 2023 datum, see <https://data.ecb.europa.eu/publications/ecbeurosystem-policy-and-exchange-rates/3030611>.
4. Three central banks had experience with remunerating reserves, perhaps because of their inflation history. The Bank of Portugal paid market rates on required reserves, while the Bank of Italy and the Central Bank of Ireland remunerated required reserves partially.
5. Keynes interpreted the minor expense of low required reserves as a fee for banks' participation in a central bank-managed payment system: "The custom of requiring banks to hold larger reserves than they strictly require for till money and for clearing purposes is a means of making them contribute to the expenses which the central bank incurs for the maintenance of the currency" (Bindseil 2014, p. 107).
6. As financial centres, London and Luxembourg had profited from the relocation of dollar and Deutsche mark deposits, respectively.
7. To anticipate the argument of the next column, it is worth noting that the foreign institutional investors accumulated offshore euro deposits as they sold euro-denominated bonds to the Eurosystem (Avdjiev et al 2019).
8. In all cases, the commercial banks in the euro area are the only entities able to hold central bank reserves, the means of payment of the Eurosystem.
9. We neglect here the liquidity service of reserves, since, with abundant reserves (as quickly became the case after quantitative easing was launched), the value of this liquidity service of reserves is zero (Woodford 2012, p 51).
10. Avdjiev et al (2023) outline that the seller has four options to dispose or not of the proceeds received from the buying central bank, of which the 'sell and hold' is one. Our point extends to all other cases beyond the 'sell and hold', to the extent that the ultimate holder of central bank reserves factors in the remuneration of central bank reserves when exchanging another asset for the reserves.

11. This does not take into account the positive financial effects of quantitative easing on the public finances through its lowering of interest rates on bonds that were not bought by the central bank or through its positive impact on the economy and thus on tax receipts.

12. https://www.ecb.europa.eu/stats/ecb_surveys/survey_of_professional_forecasters/html/index.en.html. For the periods for which we do not have Survey of Professional Forecasters (SPF) forecasts (second semester of 2025 and 2026), we assume that the deposit facility rate gradually declines to 1.5% and remains at this level for 2026.

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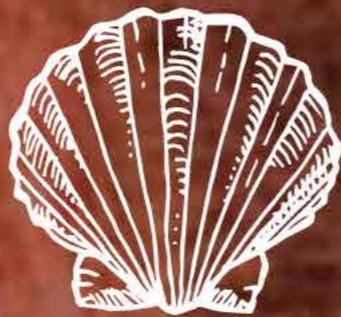
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Unremunerated reserves in the Eurosystem. Robert McCauley and Julien Pinter argue that imposing unremunerated reserves on euro area banks would likely push bank intermediation offshore out of the euro area

In the first of this pair of Vox columns, we argued that the Eurosystem's payment of 4% on €3.6 trillion in excess reserves held by banks in the euro area is not a subsidy. Rather, requiring large unremunerated reserves would amount to a tax on intermediation.

Discussion of this proposal often assumes that bank shareholders would pay the tax (De Grauwe 2023, De Grauwe and Ji 2023a, 2023b, 2023c, 2023d, 2023e, 2023f). That is, banks would repurchase fewer shares, banks would pay smaller dividends, or bank share prices would appreciate less.

This is the obverse of the contention that remunerating excess reserves has transferred profits from central banks to commercial banks, profits that arise from the monopoly of money creation (De Grauwe and Ji 2023c).

Bank analysts at Standard and Poor's, a major rating agency, agree that bank profits would suffer (Charnay and Hollegien 2023). Kwapil (2023), for example, is not sure whether bank shareholders, borrowers, or depositors would pay.

Many participants involved in the debate consider that making bank owners pay is fair. After all, the authorities supported euro area banks in 2008, 2012, and 2020. Banks took then and should now receive less. This would buttress the income of euro area central banks, which are losing money hand over fist holding low yielding bonds. Turnabout is fair play.

This column weighs in on the debate over who would pay: bank shareholders, bank borrowers, or bank depositors. We argue that the evidence of the eurodollar market from the 1970s to 1990 points to the depositor of euros in euro area banks as the likely taxpayer, thanks to bank arbitrage between offshore and onshore deposits.

We further argue that businesses and households could shift trillions of euro deposits to London and other offshore centres. Smaller and less wealthy depositors would pay the tax. Since not all depositors would sit still for the tax, it would raise less revenue than its proponents suggest.

Trillions in euro deposits would relocate to London, leaving smaller, less wealthy depositors to pay the tax. As a result, the projected improvement of euro area central bank income from large unremunerated reserves is likely overstated

We also argue that the imposition of large unremunerated reserves would result in a substantial increase in the share of domestic intermediation by unregulated shadow banks. Ultimately, a further increase in unremunerated reserve requirements must be assessed in terms of its likely impact on the euro area's bank-dominated financial system and its implications for financial stability.

Immobile domestic depositors would likely pay the tax

As De Grauwe and Ji (2023a, 2023d) point out, ceasing to remunerate bank reserves will result in an immediate reduction in bank income. They note that, in the limit, this could imply that *"12% of the balance sheet of these credit institutions would be tied up in non-interest-bearing assets"* (De Grauwe and Ji 2023d).

Lead European bank analysts at Standard and Poor's, a major rating firm, conclude: *"For eurozone banks in aggregate, and all else being equal, we estimate that a one percentage point increase in MRR [(unremunerated) minimum required reserves] could lead to an immediate gross reduction in profit before tax by 3.3%"* (Charnay and Hollegien 2023).

A ten percentage point hike in required reserves would thus presumably cut euro area commercial bank profits by a third. But the story would not end there.

Banks would then seek to restore their overall interest rate spread and retain their profitability relative to capital. To do so, banks might either increase the rate at which they lend or decrease the rate at which they remunerate deposits. De Grauwe and Ji (2023a, 2023d) mention the first possibility, but not the second. On the one hand, the former would align with the ECB's strategy to fight inflation¹.

The latter, on the other hand, would run counter to that strategy. Lower deposit rates would discourage saving and encourage consumption (Kwapil 2023).

The general right answer to the question of whether bank depositors, bank borrowers, or bank shareholders would pay the tax is that it depends on the elasticity of deposit versus loan demand (Reinhart and Reinhart 1999). In this case, however, the experience of the eurodollar market over a generation suggests a clear answer to the question of who would pay the tax.

Aliber (1980: 513), in an article which has aged as well as its author, put it this way:

A major concern is whether the major beneficiaries of the reduced costs of providing banking services in the offshore market [arising inter alia from the absence of unremunerated reserves] are the depositors, the borrowers, or the intermediaries. In general, the additional interest payment to the depositors is equivalent to the interest-equivalent of the cost of the reserve requirements.

The evidence of the eurodollar market from the 1970s until the Fed lowered the reserve requirement on large domestic certificates of deposit to zero in 1990 strongly points to the conclusion that the domestic depositor pays². That is, immobile domestic depositors paid the tax imposed by required reserves, not shareholders or bank borrowers.

Consistent with Aliber (1980), US and foreign banks responded to the Fed's unremunerated reserves on time deposits by arbitraging the London and New York dollar markets to equalise the all-in costs of eurodollar deposits and large domestic certificates of deposit.

As a result, the benchmark three-month dollar Libor typically exceeded domestic US certificate of deposit yields by the cost of the reserve requirement plus the cost of deposit insurance (Kreicher 1982, McCauley and Seth 1992).

Depositors who insisted on depositing in a bank in the US rather than in London or the Caribbean paid for the privilege.

Offshoring euro deposits to London

Would euro area bank depositors sit still for large, unremunerated required reserves? Or would they shift euro deposits to banks outside the euro area? What would prevent ING, Ltd, in London from marketing euro-denominated deposits over the internet to households and firms in the euro area?

Recall that such a deposit is not part of the aggregate of deposits in the euro area that is subject to the now unremunerated required reserve (ECB 2002), and that a very large offshore deposit market in euros already exists and does not need to be created³.

Depositors could command a higher yield without taking any foreign exchange risk and while taking only negligible country risk⁴. At an interest rate of 4% and with a 15% (or 10%) unremunerated reserve, ING could likely offer its internet customers up to 60 (or 40) basis points more on a UK euro deposit than on the same deposit booked in the euro area⁵.

Europeans may not have taken to electronic banking as much as the Californians that staged lightning bank runs last March, but they could learn fast with large enough incentives. In addition to such direct marketing of offshore deposits, what would prevent euro SICAVs in France and euro money market funds in Luxembourg from losing their home bias, as did US 'prime' money market mutual funds a generation or two ago (Baba *et al* 2009)?

Sixty or 40 basis points is not small change. After the post-crisis Dodd-Frank Act widened the base for the Federal Deposit Insurance Corporation charge of just eight to ten basis points, a half a trillion dollars of US deposits moved from offshore to onshore within months in 2011-12 (Kreicher *et al* 2014, McCauley and McGuire 2014).

A similar response to the larger tax wedge from a 15% or 10% unremunerated required reserve in the euro area could induce €3-4 trillion of the €15 trillion in reservable deposits in the euro area to shift to London or other centres.

As a result, the boost to euro area central banks' net income – the tax collected – would fall short of projections that presume that euro area depositors would sit still.

The comprehensiveness and timeliness of euro area money and credit statistics would suffer, but greater damage could be done to financial stability. A 60 or 40 basis point wedge would favour not only offshore euro deposits but also onshore nonbank financial intermediation.

Banks would lose business to shadow bank competitors with inadequate capital, fair-weather liquidity, and no lender of last resort. While large unremunerated required reserves may be intended to stick it to the banks, bank depositors and the public interest in financial stability could prove to be the big losers.

Conclusion

Depositors of euros in euro area banks would likely bear the cost of large unremunerated reserve requirements. Businesses and upper-income households could easily relocate their euro deposits to jurisdictions at the edge of the euro area that do not pose much legal or country risk.

Trillions in euro deposits would relocate to London, leaving smaller, less wealthy depositors to pay the tax. As a result, the projected improvement of euro area central bank income from large unremunerated reserves is likely overstated.

A welfare-optimising level may exist for a positive unremunerated reserve requirement. This level should consider not just the central bank's profit but also the tax's effects on the euro area banking system's structure and competitiveness. De Grauwe and Ji's (2023d) analysis sidesteps these issues. Further study is warranted on the welfare-optimising level of (un)remunerated reserve requirements. ■

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Endnotes

1. Fricke et al (2023) show that banks with larger holdings of excess reserves supply more loans, suggesting that the ECB's tightening has had less effect owing to the large excess reserves. More generally, the effect of monetary tightening is attenuated by either public sector debt at floating interest rates (which rose with QE) or private sector debt at fixed interest rates (BIS, 1995).
2. This section draws on McCauley (2023a) and the next on McCauley (2023b).
3. Putting aside the crossborder deposits within the euro area, London is a larger international banking centre than all the euro area centres combined (Demski et al 2022). Banks in London report €1.7 trillion in euro-denominated liabilities, mostly to non-banks.
4. If ING UK holds the counterpart asset as a deposit in ING Amsterdam bank, the latter's liability would be reservable (ECB 2002). Similarly, in the US case, from 1970 until 1990, net due to positions of US chartered banks to their foreign affiliates were reservable typically at the same rate as large-denomination certificates of deposit (CDs). However, ING could simply rebook loans from Amsterdam to London. If such assets were extraordinarily included in the reserve base, as they were by the Fed, then ING could simply book freshly originated loans in London. In the US case, the eurodollar reserve requirement also included loans made by US-chartered banks' foreign branches to US residents. But this extraterritorial reach of the reserve requirement was not applied to banks without a US charter, giving foreign-headquartered banks a competitive edge in the US corporate loan market (McCauley and Seth 1992).
5. That is, $.04 \times .15 = .006$ or $.04 \times .10 = .004$

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Carbon leakage: an additional argument for international cooperation

Climate change is a collective action problem that requires substantial international cooperation. Christofer Schroeder and Livio Stracca present new evidence that carbon taxes are undermined by 'leakage'

Carbon dioxide (CO₂) emissions are a key driver of climate change and a major threat to lives and livelihoods. As the environment is a global good, emissions reductions benefit the planet as a whole, regardless of where the reductions occur. Governments, therefore, have an incentive to free-ride on the environmental policies of others, foregoing the costs while reaping the benefits in terms of mitigating climate change.

Although this collective dimension is well recognised (eg. Snower 2022), governments around the world have largely introduced unilateral policies aimed at reducing emissions or slowing their growth.

Among the menu of unilateral policy options available, carbon taxes are generally regarded as particularly efficient (Metcalf 2019, Nordhaus 1977) and potentially less regressive (Levinson 2018). Indeed, carbon taxes have been found to exert a significant negative impact on domestic emissions (Andersson 2019, Bustamante and Zucchi 2023, Metcalf 2019), though evidence of their macroeconomic impact is less clear (Känzig and Konradt 2023, Metcalf and Stock 2020).

Carbon leakage

A common concern with carbon taxes is the potential for 'carbon leakage' – shifts in the production of emissions away from regions in which they are taxed. This undermines the effectiveness of such policies, even abstracting from the fact that their introduction suffers from a free-rider problem. Indeed, initiatives such as the EU's Carbon Border Adjustment Mechanism (CBAM), which will come into force in 2026, aim precisely at preventing this problem.

While carbon leakage is an established theoretical channel (see Copeland *et al* 2022 for a detailed discussion), the empirical evidence is mixed. Böning *et al* (2023) find that the EU's Emissions Trading System (ETS) has led to carbon leakage, while Aichele and Felbermayr (2015) provide evidence of carbon leakage from the Kyoto Protocol.

Indeed, aggregate data show that emissions in many advanced economies have been declining since the early 2000s while rising in many developing economies (Plumer 2017). The extent to which these patterns are explained by carbon leakage, however, remains unclear.

In this column, we summarise new empirical evidence of carbon leakage, drawing on our recent research estimating the impact of carbon taxes on emissions, using annual country data from the Global Carbon Project

Nationally determined policies will have a meaningful impact on reducing global emissions only if they are accompanied by mechanisms that eliminate carbon leakage

(Schroeder and Stracca 2023). Our findings suggest that carbon taxes do indeed lead to carbon leakage, particularly for countries that are more open to trade.

Importantly, our study distinguishes between two different measures of emissions at the national level: territorial emissions (or the emissions emitted within a country's borders) and consumption emissions (or the emissions emitted anywhere in the world to satisfy a country's domestic demand)¹.

The difference between the two measures of emissions are net imported emissions. Within this framework, carbon leakage can be observed when a carbon tax leads to a reduction in territorial emissions that is offset by an increase in net imported emissions. Together, these leave consumption emissions less impacted or unchanged.

Our estimates show that carbon taxation has a negative, cumulative impact on territorial emissions over time, which is good, but no impact on consumption emissions, which may imply that their overall effect is limited if implemented in isolation (note that in our paper we do not directly measure the effects of taxes on emissions in other countries).

The results plotted in panel A show that carbon taxes significantly reduce territorial emissions starting around three years after implementation. Consumption emissions, on the other hand, are estimated to fall by less than territorial emissions; these estimates are not statistically significant, as shown in panel B. Together, these results offer evidence of carbon leakage from carbon taxes.

The role of international trade

Carbon leakage across international borders implies that trade acts as a conduit for emissions. That is, countries more open to trade may be more susceptible to carbon leakage than countries less open to trade. Indeed, we find evidence of this outcome.

The results in Figure 2 show that the patterns in Figure 1 are driven by countries that are more open to trade. In particular, carbon taxes significantly reduce territorial emissions over time, regardless of a country's openness to trade, as shown in panel A. The impacts on consumption emissions differ, however, as shown in panel B.

Countries that are more open to trade see no significant impact of carbon taxation on consumption emissions, while countries that are less open to trade see a significant reduction. These results suggest that openness to trade is a key country characteristic enabling carbon leakage.

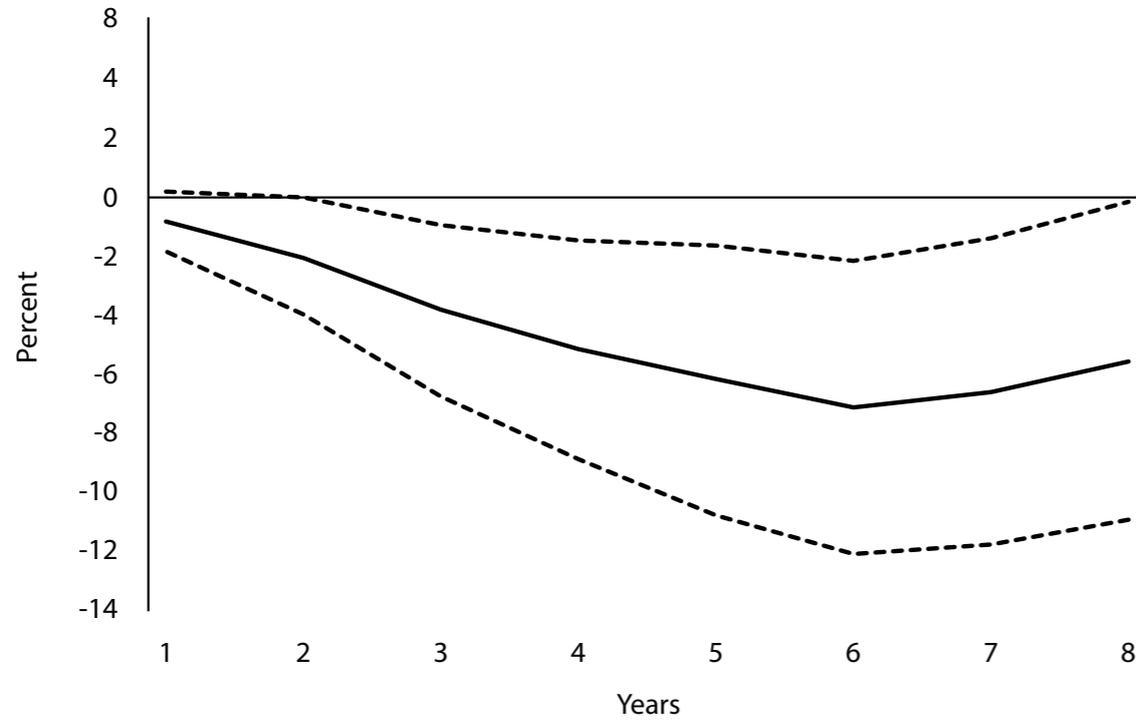
Our findings have important implications for the design of policies aimed at mitigating emissions, which are not limited to carbon taxes but can also involve green subsidies and other instruments. Nationally determined policies will have a meaningful impact on reducing global emissions only if they are accompanied by mechanisms that eliminate carbon leakage.

'Climate clubs' or CBAMs, for instance, can help reduce the incentive to offshore the production of emissions, despite their administrative challenges (Dominioni and Esty 2022). Our findings are in line with a broad literature emphasising the importance of international cooperation and coordination in implementing the policies needed for reducing emissions to meet the goals set out in the Paris Agreement (Ferrari *et al* 2023). ■

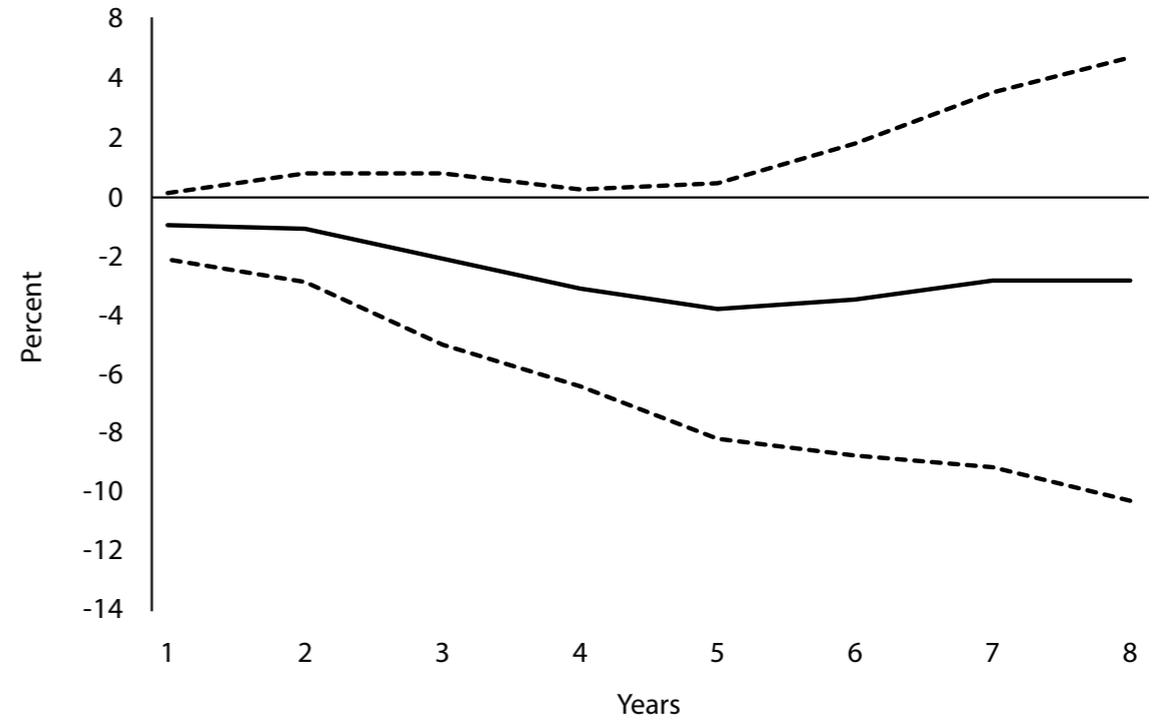
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Figure 1. Dynamic effects of carbon taxation on emissions

a) Territorial emissions



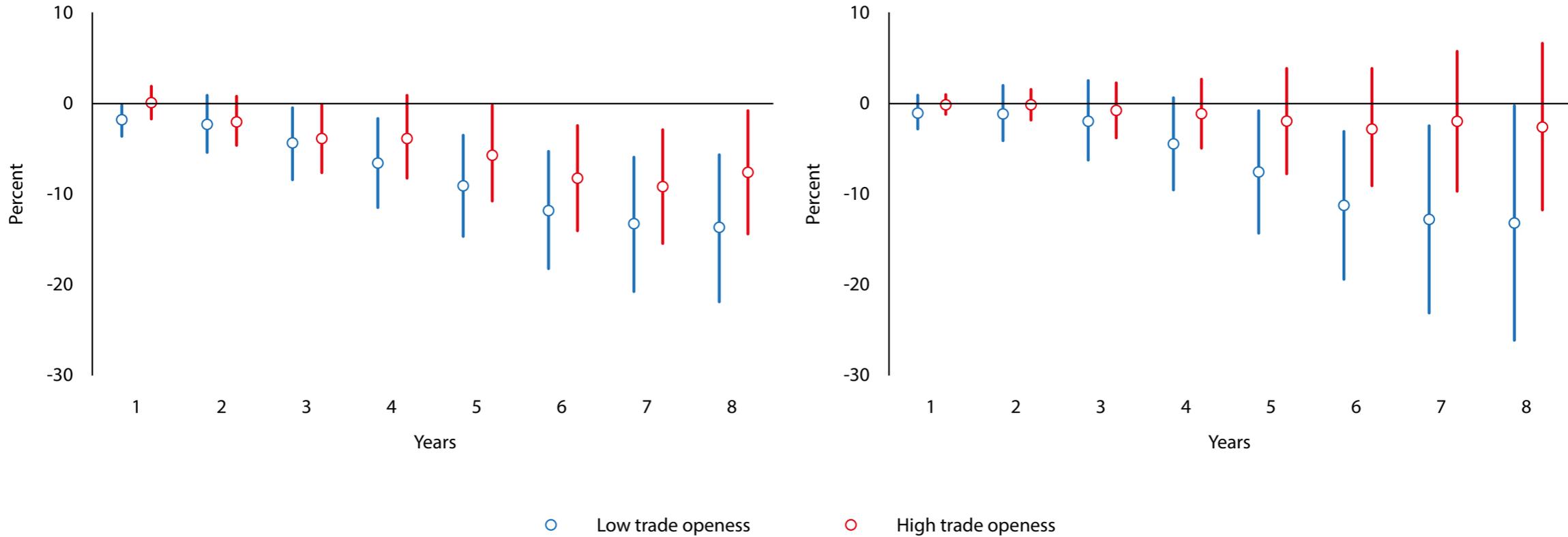
b) Consumption emissions



Notes: This figure plots impulse response functions capturing the dynamic cumulative effects of carbon tax implementation on territorial (panel a) and consumption (panel b) emissions based on local projections of annual data. The dashed lines represent 90% confidence intervals surrounding the point estimates of the dynamic impacts plotted by the solid lines.

Figure 2. Dynamic effects of carbon taxation on emissions by openness to trade

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Notes: This figure plots impulse response functions capturing the dynamic cumulative effects of carbon tax implementation on territorial (panel a) and consumption (panel b) emissions by countries' level of trade openness. The blue circles plot point estimates of the effect for countries with low openness to trade. The red squares plot point estimates of the effect for countries with high openness to trade. High openness to trade countries are defined as those with above median openness to trade in a particular year. Both series of estimates are surrounded by 90% confidence intervals represented by the solid lines of the same colour.

Endnote

1. We draw on data on territorial and consumption emissions from the Global Carbon Project (GCP). See <https://www.globalcarbonproject.org> and Andrew and Peters (2021) for detailed accounts of the data. In practice, the GCP estimates consumption emissions by adjusting territorial emissions with estimates of net emissions transfers via international trade. Net emissions transfers are estimated via environmentally extended input-output analysis (EEIOA).

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A tale of two treatises

In the process towards European economic and monetary union, two reports played crucial roles. Ivo Maes focuses on the *Werner* and *Delors Reports*, capturing the key ideas and debates on the EMU process and the birth of the euro

1 Introduction

Economic and monetary union in the European Union was informed to a great extent, at its beginning a quarter of a century ago, by two documents of great significance: the 1970 *Werner Report* and the 1989 *Delors Report*. These reports very much shaped Europe's debates on economic and monetary union (EMU) and as such have historical significance. But they can also help understand present policy issues and debates.

Economic and monetary union was not one of the objectives of the Rome Treaties of 1957, which established the European Economic Community alongside the European Atomic Energy Community. EMU was put on the European agenda in 1969 at the Hague summit of heads of state and government, where the objective of EMU was adopted officially.

To move it forward, an expert group, chaired by Luxembourg prime minister (and finance minister) Pierre Werner, was established. The group's report, commonly known as the *Werner Report*, specified both a vision of EMU and a path towards it.

Europe started on the path indicated in the *Werner Report*. However, little progress was made in the economically and politically turbulent 1970s and EMU disappeared from the agenda. Only in the second half of the 1980s did the EMU goal resurface. At the 1988 Hanover summit of heads of state and government, the objective of EMU was reaffirmed.

That summit established another expert group, comprising the central bank governors and chaired by Jacques Delors, then-president of the European Commission. The resulting *Delors Report* played a central role in the subsequent EMU debates and shaped very much the 1992 Maastricht Treaty, the basis for Europe's economic and monetary union.

Though the *Werner Report* and the *Delors Report* both presented visions of EMU and a path to get there, their approaches differed significantly. The *Werner Report* argued for an EMU with both a supranational monetary pillar (a European System of Central Banks) and a supranational economic pillar (a centre of decision-making for economic policy), reflecting the dominating Keynesian paradigm with a belief in discretionary fiscal policy.

With the realisation of EMU, it is clear that policymakers succeeded in creating internal momentum, with a positive dynamic between policy initiatives and the working of market forces. Maybe there was also some luck involved, but there was certainly also a strong political will and leadership

The focus of the *Delors Report* meanwhile was on the monetary pillar (an independent European System of Central Banks, with price stability as the objective of monetary policy), while there was scepticism about discretionary fiscal policy.

The Delors approach reflected a new consensus, as policymakers and academics had by then moved away from active demand-management policies and towards a medium-term orientation, with price stability as the fundamental aim of monetary policy.

Moreover, the new consensus emphasised structural, supply-side oriented policies, which had become popular with the Reagan administration in the United States and the Thatcher government in the United Kingdom. Major elements included the deregulation of product and labour markets, and privatisations.

This new paradigm facilitated agreement on EMU. As the perceived room for discretionary economic policies was more limited, it implied a more limited transfer of sovereignty (focused on monetary policy), than envisaged in the *Werner Report*.

In this essay, we pay particular attention to one of the background papers written for the *Delors Report*, *The Werner Report Revisited*, authored by the *Delors Report's* two rapporteurs, Gunter Baer and Tommaso Padoa-Schioppa. Their paper showed how the Delors Committee took on the lessons from the experience of the *Werner Report*.

The analysis in this essay is partly based on original archival research in the Padoa-Schioppa archives at the European University Institute. The Baer and Padoa-Schioppa paper identified four intrinsic weaknesses of the *Werner Report*: absence of internal momentum, institutional ambiguities, insufficient constraints on national policies and an inappropriate (Keynesian) policy conception.

The *Delors Report* was clearly more successful than the *Werner Report* as it was on the basis of the *Delors Report* that EMU was realised. However, Europe's sovereign debt crisis in the twenty-first century showed that this *Delors Report*-based EMU was incomplete and that a strong economic pillar, as envisaged in the *Werner Report*, was missing.

Moreover, the issues of the lack of constraints on national policies and an appropriate policy conception remained very much open questions. In discussing EMU, it is important to keep in mind that decisions about monetary integration have always been taken at the highest level, by heads of state and government, as they involve crucial decisions about sovereignty.

EMU has then been 'high-level politics', with a special role for the Franco-German engine, not least Georges Pompidou and Willy Brandt at the 1969 Hague Summit, François Mitterrand and Helmut Kohl in the Maastricht Treaty process, and Angela Merkel and Nicolas Sarkozy during the euro area debt crisis.

The aim of this essay is not to offer a comprehensive history of the EMU process. With its focus on the *Werner* and *Delors Reports*, the aim is to capture some key ideas and debates. As the *Werner* and *Delors* Committees were composed of senior economic policymakers, it also focuses very much on the main technocrats in the EMU process. We also take the European Union's decision to go ahead with EMU as a starting point and we do not go into the question of whether Europe was an 'optimum currency area'.

The essay follows largely a chronological pattern, providing an overview of Europe's EMU process. After a short overview of the 1960s, we go into the *Werner Report*, the turbulent 1970s and the rise of the new, stability-oriented paradigm.

After that the focus is on the new dynamism in the European Union in the second half of the 1980s and the *Delors Report*. This led to the Maastricht Treaty, which offered a new framework for economic governance in the European Union. In the last sections we go into the functioning of EMU in the twenty-first century.

2 The golden sixties: high days of Keynesian economics and European integration

At the beginning of the 1970s, economic thought among European policymakers was dominated by the experience of the golden sixties: strong economic growth, stable prices and the success of Keynesian demand management.

European economic integration also thrived in the 1960s, especially with the successful completion of the customs union, a key element of the Rome Treaty project (the common agricultural policy, the other main ambition of the Rome Treaty, was a more difficult issue). The launching of the monetary union project at the 1969 Hague Summit – on the basis of which the *Werner Report* was written – reflected this optimistic atmosphere.

The Keynesian economic orthodoxy of the post-war period emphasised very much budgetary policy. One of the foremost historians of Keynesian economics, Alan Coddington (1983), argued that the distinctive trait of Keynesianism is a utilitarian view of the public finances.

A prerequisite for taking such a utilitarian perspective of the public finances is that there must be a systematic, reliable connection between fiscal policy and effective demand in the economy, so typical for hydraulic Keynesianism, which dominated mainstream economic thinking in the postwar period.

Very influential in policy circles was a report, *Fiscal Policy for a Balanced Economy*, produced by the Organisation for Economic Cooperation. It was commonly referred to as the *Heller Report* (after the chair of the committee that produced the report, Walter Heller, a former Chair of John F Kennedy's Council of Economic Advisers).

In line with a utilitarian view of public finance, the *Heller Report* defined the role of fiscal policy as, “not to balance the budget of the public sector, but to balance the economy as a whole” (OECD, 1968, 15). According to the *Heller Report*, fiscal policy was the most important instrument for managing both the level and the composition of global demand in the economy.

Monetary factors were not considered to be of great importance. Leijonhufvud (1969, 13) described this period, especially the mid-1940s and extending into the 1950s and 1960s, as the Keynesian Revolution’s “*Anti Monetary Terror*” (see Maes, 1986).

In the Keynesian view, fiscal policy was the main instrument to steer aggregate demand in the economy. For fiscal policy to influence the level of real activity, a stable and reliable relationship between prices and output is necessary. This was found in the Phillips curve, showing a negative relationship between changes in prices and unemployment (Samuelson and Solow, 1960; Leeson, 1997).

According to the (simplified) Keynesian framework, the main task of policymakers was to determine the preferred trade-off between unemployment and inflation. Demand management, especially budgetary policy, would then be used to reach the preferred trade off. Consequently, every country had then a preferred national inflation rate.

In December 1969, at the European Community summit in the Hague, an ambitious programme to relaunch European integration was established, comprising both a widening of the Community (enlargement to include the United Kingdom, Ireland and Denmark) and a deepening (economic and monetary union).

Several factors contributed to the change in atmosphere that placed economic and monetary union in the spotlight and made it one of the Community’s official objectives. During the 1960s the customs union project, with the abolition of tariffs and quotas, was realised. At the end of the 1960s there was consideration of new projects.

Moreover, unease with the Bretton-Woods system was growing. French President Charles De Gaulle had always criticised the central position of the US dollar in the Bretton Woods system. During the second half of the 1960s, French officials, in order to attain a more balanced international monetary system, developed ideas about a European monetary identity (Haberer, 1981).

A key element was a type of exchange rate mechanism, to tie European currencies more closely together¹. At the end of the 1960s, doubts about the future of the fixed exchange rate system became widespread, especially with the devaluation of the French franc in 1969 and the vulnerable position of the US dollar. The countries of the Community feared that further exchange-rate instability would lead to the disintegration of the customs union and the demise of the common agricultural policy.

Moreover, new political leaders had come to power. In 1969 de Gaulle resigned. His successor, Georges Pompidou, was more open to new European initiatives. In Germany, a new government was formed by the Social Democrats and the Free Democrats with Willy Brandt, a pragmatic but convinced pro-European, as Chancellor.

The Brandt government proposed the EMU project. Foreign policy motives were crucial. Germany wanted to demonstrate its European credentials, also to counterbalance its new Ostpolitik (developing relations with the Soviet Union and the communist countries of central and eastern Europe, with the recognition of the German Democratic Republic as a key element²).

One can observe here a notable similarity with the late 1980s, when the Kohl government favoured both German unification and advances towards European integration with the Maastricht Treaty.

3 The *Werner Report*

After the Hague Summit, a committee, under the chairmanship of the Luxembourg prime minister (and finance minister) Pierre Werner, was set up to elaborate a plan for the creation of an economic and monetary union.

The members of the group were the Chairmen of the main economic policy committees of the European Community: the Monetary Committee (Bernard Clappier, French treasury), the Committee of Governors of Central Banks (Hubert Ansiaux of the National Bank of Belgium), the Short-term Economic Policy Committee (Gerard Brouwers of the Dutch economics ministry), the Medium-term Economic Policy Committee (Johann Baptist Schölnhorn of the German economics ministry, with Hans Tietmeyer as his alternate), the Budget Policy Committee (Gaetano Stammati of the Italian finance ministry) and Ugo Mosca (representing the European Commission).

As one can see, with the chairmen of these policy committees, all the countries of the community were represented, except for Luxembourg. Having a prime minister as its chair reinforced the weight of the Werner Committee (Danescu, 2016).

The Werner Committee submitted its final report in October 1970 (Council Commission of the European Communities, 1970, hereafter referred to as the *Werner Report*). This report formed the basis for further discussions and decisions. It contained a programme for the establishment, by stages, of an economic and monetary union by 1980 (Danescu, 2018).

In the *Werner Report*, attention was first focused on the final objective of economic and monetary union. Thereafter, the realisation by stages was elaborated.

Looming over the *Werner Report* was a basic ambiguity concerning the crumbling Bretton Woods system. Unease with the Bretton Woods system was one of the driving forces for European monetary integration. However, the

European attempt to narrow exchange rate fluctuations took the framework of the fixed exchange rate system of Bretton Woods for granted.

The *Werner Report* first presented a very general picture of economic and monetary union: *“Economic and monetary union will make it possible to realise an area within which goods and services, people and capital will circulate freely and without competitive distortions, without thereby giving rise to structural or regional disequilibrium”* (Werner Report, 9).

The *Report* also offered a definition of a monetary union (which reflected very much a Bretton Woods perspective): *“A monetary union implies inside its boundaries the total and irreversible convertibility of currencies, the elimination of margins of fluctuation in exchange rates, the irrevocable fixing of parity rates and the complete liberation of movements of capital. It may be accompanied by the maintenance of national monetary symbols or the establishment of a sole Community currency”*³.

However, the *Report* favoured a single currency: *“From the technical point of view the choice between these two solutions may seem immaterial, but considerations of psychological and political nature militate in favour of the adoption of a sole currency which would confirm the irreversibility of the venture”* (Werner Report, 10)⁴.

To ensure the cohesion of economic and monetary union two elements were necessary: transfers of responsibility from the national to the Community level and a harmonisation of the instruments of economic policy in various sectors.

On the institutional plane, this implied the establishment of two new, supranational Community institutions: a centre of decision-making for economic policy and a Community system for central banks (very much like the Federal Reserve System in the United States)⁵.

The *Werner Report* took then a symmetric vision of EMU, with both a strong monetary and a strong economic pillar. The centre of decision-making for economic policy would exercise *“a decisive influence over the general economic policies of the Community”* (Werner Report, 12).

A key responsibility would be budgetary policy. While the *Werner Report* admitted that the role of the Community budget would remain limited, it emphasised that the centre of decision-making for economic policy should have a significant role in steering national budgetary policies: *“the essential features of the whole of public budgets, and in particular variations in their volume, the size of the balances and the methods of financing or utilizing them, will be decided at the Community level”* (Werner Report, 12).

Given these substantial transfers of sovereignty to the Community level, the *Werner Report* argued that there should also be a corresponding transfer of parliamentary responsibility from the national to the Community level. The centre of decision-making for economic policy would be responsible to the European Parliament.

This implied a fundamental reform of the European Parliament, *“not only from the point of view of the extent of its powers, but also having regard to the method of election of its members”* (Werner Report, 13).

However, the *Report* did not enlarge very much on these new institutional structures (it did *“not consider that it will have to formulate detailed institutional proposals as to the institutional form to be given to the different Community organs”*; Werner Report, 12).

The *Werner Report* underlined the fundamental political significance of transfers of responsibility to the Community level and came out in favour of a political union: *“Economic and monetary union thus appears as a leaven for the development of political union, which in the long run it cannot do without”* (Werner Report, 12).

The *Werner Report* also paid attention to structural and regional policies. It expressed an awareness that differences in the economic structures of countries might cause problems for the functioning of EMU. Structural and regional policies were then important, also at Community level: *“In an economic and monetary union, structural and regional policies will not be exclusively a matter for national budgets”* (*Werner Report*, 11).

In this context, it raised the issue of environmental problems, which should be *“treated at Community level under their various technical, financial and social aspects”* (*Werner Report*, 11).

Concerning financial issues, the *Werner Report* argued for a true European capital market. This implied the free movement of capital and financial services. The *Report* further noted that: *“The financial policy of the member states must be sufficiently unified to ensure the balanced operation of this market”* (*Werner Report*, 11). It did not further discuss this, nor did it discuss financial stability issues (banking and financial crises were not really an issue during these years).

To reach economic and monetary union, the *Werner Report* proposed a three-stage plan. This gradualist approach towards economic and monetary union was laid down by the heads of state and government at the Hague Summit and was typical for the process of European integration.

The *Werner Report* did not lay down a precise timetable for the whole of the plan. Rather it wanted to maintain a measure of flexibility, while concentrating on the first phase. It proposed that the first stage would start on 1 January 1971 and would take three years.

The main elements were: (a) a reinforcement of procedures for consultation and policy coordination; (b) a further liberalisation of intra Community capital movements and steps towards an integrated European capital market;

(c) a narrowing of exchange-rate fluctuations between Community currencies (compared to the Bretton Woods framework).

On the second stage, the *Werner Report* was vague. The main element was “the promotion on a number of fronts and on ever more restrictive lines of the action undertaken during the first stage” (*Werner Report*, 28). The Report also proposed establishment of a European Fund for Monetary Cooperation. However, it was left open whether this would be in the first or second stage. The third stage would then be the establishment of economic and monetary union.

Of fundamental importance in the *Werner Report* was the concept of ‘parallel progress’. This notion formed a compromise between the so-called ‘monetarists’ (emphasising greater exchange rate stability and European exchange rate support mechanisms, with France as an important advocate) and the ‘economists’ (emphasising the coordination of economic policies and economic convergence, led by Germany). This notion enabled the Werner Group to present a unanimous report (Tsoukalis, 1977, 101).

4 Economic debates and growing divergencies in the early 1970s

The *Werner Report* triggered intense discussions among policymakers and in academic circles. A major issue was the feasibility of economic and monetary union. Many eminent economists expressed their scepticism with respect to the feasibility of the proposals contained in the *Werner Report*.

Macroeconomic discussions in the early 1970s typically took place in a ‘Phillips curve world’ (De Grauwe, 1975), which assumed a stable relationship between inflation and unemployment. Differences in inflation between countries could then be traced to three main factors: (a) the position of the Phillips curves (trade union aggressiveness, structural factors affecting unemployment, etc.); (b) the rates of productivity growth; (c)

the preferences of governments in relation to unemployment and inflation. Every country has then a *“national propension to inflation”* (Magnifico, 1972, 13).

The economic policy choice of the government is of crucial importance. In this type of world, inflation rates between two countries will only be equal by accident.

Naturally, differences in inflation rates would lead to balance-of-payments imbalances, which were incompatible with fixed exchange rates. As observed by Fleming (1971, 467): *“The principal danger involved in participating in a fixed rate area arises from the certainty, in the absence of perfect competition in product and factor markets, that developments would occur from time to time that pushed the relative cost levels of the participating countries out of line.”*

Monetary union would then force a country to accept a trade-off between unemployment and inflation that it considered suboptimal. The country would be forced to sacrifice its internal balance for exchange-rate unification.

Europe’s monetary union project quickly ran into significant difficulties. The proposal for supranational European institutions was not well received in France. Immediately after its publication, Pompidou got angry at reading the *Werner Report*, while Maurice Schumann remarked: *“Il ne faut pas compromettre l’union économique et monétaire des Six par un fatras institutionnel prématuré”* (*“The economic and monetary union of the Six must not be compromised by a premature institutional mix-up”*; Werner, 1991, 132).

However, the removal of these institutions in subsequent Commission proposals was not well received in Germany. Moreover, the new European exchange rate system quickly turned into a de-facto German mark zone. The European Commission asked a group of experts, chaired by former Vice-president Robert Marjolin, to make an assessment of the situation.

The 1975 *Marjolin Report* was very hard and described the situation as a 'failure'. It summarised the overall development between 1969 and 1975 as: *"if there has been any movement it has been backward"* (CEC, 1975, 1).

An important factor behind these difficulties was that the international environment had become very hostile with the collapse of the Bretton Woods system and the first oil shock. The breakdown of the Bretton-Woods fixed exchange rate system implied that economic policies, especially monetary policy, no longer had to be geared in function of the exchange rate against the dollar. This implied that policymakers had to find a new nominal anchor for their policies.

Moreover, it contributed to a growing indebtedness in the world economy, as there were fewer constraints on economic policies (de Larosière 2018). The first oil price shock of October 1973 challenged Western dominance in the world economy – it can be regarded as a first manifestation of the so-called 'Global South.'

The severe turmoil in the world economy contributed to a serious worsening of Europe's economic performance in the 1970s. Inflation and inflation divergence between countries rose, and economic growth slowed significantly. Europe's stagflation crisis had started. With growing inflation divergence, the European exchange rate system quickly ran into problems and several countries had to leave the system.

An important factor was that Europe's governments reacted very differently to the crisis, especially the increase in oil prices. For German policymakers, the oil shock was essentially an inflationary shock, to be contained with restrictive policies. The French considered, in the first instance, that this might lead to a recession (as the French economy became poorer due to the deterioration of the terms of trade, it might lead to a reduction in demand) and pursued more expansionary policies.

So, divergence in inflation rates soared, making fixed exchange rates unsustainable. The European exchange rate system had then a turbulent existence: there were several realignments of parities and many currencies dropped out. From January 1974, after the French departure, it was generally considered as a de-facto German mark zone (notwithstanding a return of the French franc from July 1975 to March 1976).

5 The stagflation of the 1970s and the rise of a new economic paradigm

While Keynesian economics was still dominant in the 1960s, a new economic paradigm had been gaining in importance. In the academic world, the so-called 'Monetarist Counter Revolution' had already questioned the Keynesian framework. One might distinguish three stages in these academic controversies.

In the first stage, discussions centred around the determination of nominal demand, with monetarists, such as Milton Friedman (1973), emphasising the money supply and not budgetary policy as the main determinant of effective demand.

In a second stage, attention shifted towards the functioning of the labour market with monetarists attacking the Phillips curve, arguing that the curve shifted when workers adjusted their inflation expectations (Friedman, 1968). The Phillips curve did not provide then a stable relationship between prices and unemployment.

In the third phase, the formation of expectations became the focal point, with the rational-expectations hypothesis, implying that a change in policy could alter the behaviour of economic agents (Lucas, 1976).

Gradually then, a new policy conception emerged, in which monetary policy was geared principally against inflation and inflationary expectations. While, after the breakdown of the Bretton Woods system, smaller countries continued with exchange-rate pegs, bigger countries started using the money supply as an intermediate target of monetary policy, in line with monetarist ideas.

In Europe, the Konstanz Seminars played an important role in the spread of monetarism, also in the transmission of monetarist ideas to policymakers. The first seminar was organised in June 1970 at the University of Konstanz by Karl Brunner, one of the most eminent monetarists (even if he is less well known than Milton Friedman).

Among the participants was Helmut Schlesinger, a future president of the Bundesbank (Neumann, 1972, 30). The Bundesbank, where Schlesinger became president, set its first money-supply target in December 1974, for the year 1975.

Among policymakers, especially in France, the oil shock of 1973 and the ensuing stagflation were of fundamental importance, leading to changes in their conceptions of economic policy. The crisis showed very clearly the openness of the economy and its vulnerability to external developments.

The oil shock was a, more or less fatal, blow to the French planning experience. French policymakers became more and more aware that there were limits to activist policies, and that France had to take into account the external constraint.

During the second half of the 1970s, under the prime ministership of Raymond Barre, French economic policies became more stability oriented. The exchange rate was a crucial element in the strategy to instil discipline in the French economy. Barre also pushed through measures to liberalise prices.

This reorientation of French economic policy was an important reason why German policymakers consented to the creation of the European Monetary System (EMS) in 1979. The EMS can then be considered as a case of 'parallel progress', towards exchange-rate stability and stability-oriented policies, as requested in the *Werner Report*.

The stagflation of the 1970s gave rise to substantive discussions among economic policymakers, also at the world annual economic summits, which were initiated in 1975, and at the European level. At the Group of Seven (G7) summit in Bonn in May 1978, a coordinated macro-economic strategy at global level, pushed by US president Jimmy Carter, was drawn up.

It led to the so-called 'concerted action', through which Germany agreed to boost its economy with a budgetary package of 1 percent of GDP. It showed that the golden sixties, with its strong economic growth performance associated with Keynesian demand management policies, remained an important reference framework against which many policymakers still approached the economic problems of the 1970s.

However, the more expansionary budgetary policy in 1979 and 1980 coincided with an economic recovery, working pro-cyclically. This created a severe trauma, especially in Germany (which was confronted with a balance-of-payments deficit), and in international institutions including the Organisation for Economic Co-operation and Development and the European Commission, which were important advocates of policy coordination.

The failure of the budgetary stimulus raised the issue of the efficiency of economic policy and made economists much more sceptical about possibilities for fine tuning policy. The failure of macroeconomic policy coordination at the end of the 1970s then became an important element leading to a reformulation of the strategy of economic policy in the early 1980s.

An example of the reflections and discussions among policymakers after the failure of the concerted action can be found in the 1980 *Annual Economic Report of the European Commission*, which marked a break compared to earlier studies (Maes, 1998). At the centre of the report was the shift in economic policy orientation, away from active demand management policies and towards a more medium-term orientation, emphasising structural, supply side oriented policies.

The new policy orientation was clearly set out in the report's introduction: *"While in the past economic policy was often perceived as a problem of demand management, in a world based on the assumption of unlimited supply of energy and raw materials, the importance and critical value of supply constraints and structural adjustment problems are now evident"* (CEC, 1980, 9).

The break with the past, and the medium term orientation of economic policy, was further illustrated and elaborated: *"The concerted response to the present general economic situation should be based on the right strategic mix of demand and supply policies and notably the right balance in their application to short- and medium term problems. Short-term adjustments should be more moderate than at times in the last decade, and a heavier weight has to be given to reducing medium term inflationary expectations and improving supply conditions in the economy"* (CEC, 1980, 13, original emphasis).

This implied a shift away from discretionary demand management in favour of a medium-term orientation with an important role for monetary aggregates, as well as a focus on improving the growth potential of the economy, with attention paid to the structure of public expenditure, taxation and regulation.

The report further offered a thorough analysis of the limits of demand-management policy. Several elements were analysed, starting with the external constraint and time lags. Moreover, behind the new policy orientation was a new view of the functioning of the economy, moving away from the mechanical Keynesian paradigm. Policymakers were influenced by debates in the academic world. A first element concerned the Lucas critique (that a change in policy could alter the behaviour of economic agents) and rational expectations.

This implied that economic agents were not responding in a mechanical or 'Pavlovian' way to changes in economic policy. Policymakers had to be aware that markets would anticipate policy measures. This further undermined the belief in the possibility of fine tuning the economy and led to a greater emphasis on medium term policies.

Moreover, monetary policy was, in the long run, not independent of budgetary policy, via the financing of public deficits. This was very much the experience of the 1970s, when stagflation contributed to increasing budget deficits, which, to a great extent, were financed by money creation (an experience that would haunt the Delors Committee).

The changes in economic policy conceptions were further supported by new advances in economic theory. Building on monetarist and rational expectations theories, the literature on time-inconsistency pointed further to the inflationary bias of a discretionary monetary policy (Barro and Gordon, 1983).

To retain flexibility, while dealing with the inflationary bias of a discretionary policy, central-bank independence quickly topped the research agenda (Fischer, 1994). Moreover, empirical studies indicated that central-bank independence went together with better inflation performance (Grilli *et al* 1991). Central-bank independence became a key theme not only in German ordoliberalism, but also an important element of mainstream economics.

The Phillips curve disappeared from the debates. The way then to improve the trade-off between inflation and growth was to take measures on the supply side of the economy. A major element of these supply-side policies was privatisation, which started in Europe with the Thatcher government in the United Kingdom in 1979.

In France, when Mitterrand came to power, he implemented a large-scale nationalisation programme. Privatisations began in France during the first 'cohabitation' (a socialist president sharing power with a Gaullist government), with Balladur as finance minister in 1986.

Multilateral forums, including the European Union, the OECD, the Bank for International Settlements and the International Monetary Fund, contributed greatly to the dissemination of these new ideas on stability-oriented policies. Senior French and German officials met regularly, not only bilaterally, but also in these international settings.

This contributed to the growth of a kind of epistemic community. Policymakers met often, sometimes also with academics, and their debates would be prepared by their research departments, so that academic ideas were also taken up by policymakers. This contributed to a growing consensus on 'sound money' policies.

The emergence of this consensus on stability-oriented policies also took the heat out of the old debate about the sequencing of the monetary integration process: whether priority should be given to exchange-rate stability or policy coordination.

Parallel progress, as requested in the *Werner Report*, became natural. Policymakers in both Germany and France followed stability oriented policies. For French policymakers the exchange rate, the 'franc fort', became an important anchor for their economic policies.

So, at the end of the 1970s a shift occurred in Europe from a more activist policy towards a strategy based on medium term stability, market-oriented policies and emphasis on measures enforcing the supply side of the economy. The shift was apparent in all major European countries.

The clearest break was in the United Kingdom, with the election victory of Margaret Thatcher in 1979. In Germany, a more conservative government was formed in 1982 under Helmut Kohl. However, a major change in fiscal policy had occurred already in 1981 under his socialist predecessor, Helmut Schmidt.

In France the change occurred somewhat later, given the election victory of Mitterrand in 1981. After 18 months of a rather disastrous experiment in policy activism, the socialists reoriented their economic policy in a much less interventionist way.

6 The European Community in the 1980s: from eurosclerosis to a new dynamism

The early 1980s was a time of morosity in the European Union: the economy was in the doldrums and the integration progress was stalling. Europe's economic performance in the early 1980s was disappointing: economic growth was low and unemployment was increasing strongly, while inflation was high and declined only stubbornly.

An important factor was certainly the second oil shock in the autumn of 1979, which acted as a stagflationary shock to Europe's economy. But the European performance contrasted also markedly with the situation in the United States, where the recovery, from 1983 onwards, was very strong and unemployment started declining, something that observers associated with President Reagan's supply-side economics. 'Eurosclerosis' was the term used to characterise the economic situation in the Community (Giersch, 1987).

The European integration process was also in the doldrums. The dominant issue in the European debate in the first half of the 1980s was the British contribution to the European budget, crystallised in Mrs Thatcher's famous phrase, *"I want my money back."* A solution was only reached at the Fontainebleau summit in June 1984, clearing the way for the European Community to concentrate on projects that would further integration.

The appearance of morosity in the European Community was further reinforced by the rather lacklustre performance of the Thorn Commission (1981-1984), which did not take noticeable initiatives to further the European integration process.

The main impetus to the integration process came from the European Monetary System (EMS), which was founded in March 1979 (Ludlow, 1982). In the mid-1970s, European monetary integration languished after the unravelling of the exchange rate system, while discussions about the place of the United Kingdom dominated the European scene.

Roy Jenkins, then president of the European Commission, tried to revive the monetary union project, especially in a famous speech in Florence (Jenkins, 1977). The following year, the French president Valéry Giscard d'Estaing and the German chancellor Helmut Schmidt played a crucial role in the relaunch of the monetary integration process with the creation of the European Monetary System.

The European Monetary System was agreed by the heads of state at the Brussels summit in December 1978. Formally, the EMS started in March 1979. However, the European Monetary System was an intergovernmental agreement (Delors, 2006).

It was also a more modest project, when compared to the ambitions of the Werner plan (it is noteworthy that the free movement of capital was absent from the EMS). Moreover, the first years of the EMS were very difficult: there was a lack of convergence of economic policies and performances, especially inflation, and there were several realignments (Mourlon-Druol, 2012).

The development of the EMS was one of the main preoccupations of economic policymakers at the European Commission. Tensions in the EMS were exacerbated from May 1981, when Mitterrand, the new French President, followed an isolated Keynesian policy strategy.

This led to a loss of competitiveness of the French economy, capital outflows and speculative pressures against the French franc, leading to several realignments. After the March 1983 realignment and the change towards more orthodox economic policies in France, the EMS came into calmer waters.

Things would change in January 1985 with the Delors Commission, which developed several projects to reinvigorate the European economy and the integration process. Of special importance was the internal market

project. Before Jacques Delors became president of the European Commission, he toured the member states, discussing ideas to relaunch European integration.

A renewed campaign for a European internal market emerged as the most favoured option, as it fitted in with the general tendency towards deregulation. A single European financial market was a key element of this (Maes, 2007). It comprised the free movement of capital, which had always been a crucial German condition for progress in the area of monetary integration.

The Community adopted the single market programme. It became a Treaty obligation with the adoption of the Single European Act, the first major revision of the Community's founding Treaties. The Act extended greatly the scope of the Community and simplified the decision-making process (with qualified majority voting instead of unanimity for most of the internal-market measures). The Act constituted an early and crucial triumph for the single market project, and further contributed to the renewed momentum of the Community.

The internal market programme was also part of the Commission's more general economic policy strategy, which aimed at strengthening the foundations of the economy (Mortensen, 1990, 31). Other important elements of this strategy were wage moderation, budgetary consolidation and increasing the flexibility of markets.

During these years, a new view on industrial policy also took shape (Maes, 2002). Industrial policy figured prominently on the policy agenda of the Community in the 1970s, focused on supporting sectors confronted with problems, such as the steel industry.

In the 1980s and 1990s, the emphasis shifted towards a more horizontal industrial policy, with the creation of a favourable environment for firms, and towards competition policy. This also contributed to the reinforcement of the internal market.

Delors requested a report by a study group, chaired by Tommaso Padoa Schioppa, on the implications of the internal market for the future of the Community, which was published with the title *Efficiency, Stability, Equity* (Padoa Schioppa, 1987).

Padoa Schioppa had been a director general of DG II (the economic service of the Commission) at the end of the 1970s and the early 1980s (Maes, 2013). During that period, he got to know Delors, who was then chairman of the European Parliament's economic and monetary committee. After his stay in Brussels, Padoa Schioppa returned to the Banca d'Italia, but remained in close contact with Delors.

The title of the report, *Efficiency, Stability, Equity*, referred to the classic work of Richard and Peggy Musgrave (1973) on public finance, which distinguished between the three main tasks of fiscal policy: improving the allocation of resources, contributing to greater (macroeconomic) stability, and improving the income (and wealth) distribution.

The Padoa-Schioppa report contained a warning that the single market (with not only the free movement of goods, but also the liberation of capital movements), was inconsistent with the prevalent combination of exchange-rate stability and national autonomy of monetary policy (a thesis Padoa Schioppa called "*the inconsistent quartet*"; Masini, 2016).

The European Community continued with the internal market momentum. At a summit in Hanover in June 1988, economic and monetary union was brought back on the agenda. The heads of state and government decided to set up a committee with the task of studying and proposing concrete steps leading towards economic and monetary union.

This committee, mainly composed of central-bank governors and chaired by Jacques Delors, produced its report in April 1989 (*Report on Economic and Monetary Union in the European Community*, Committee for the Study of Economic and Monetary Union (1989), hereafter referred to as *Delors Report*).

As observed by Alexandre Lamfalussy, a member of the Delors Committee and later the first President of the European Monetary Institute, the central-bank governors were not in favour of a monetary union: “*There never would have been a single currency if the decisions had been left to the central banks. Never. [...] The motivation was political, and one man who played a very important role in persuading people was Jacques Delors*” (Lamfalussy et al 2013, 134).

Delors convinced the heads of state and government not only to establish the committee with the central bankers on it, but also to limit the mandate of the committee to the means of achieving EMU. As Lamfalussy further observed, Delors had got the European Council to “*task a group dominated by central banks with preparing the way for the bankers’ own suicide. It was absolutely inspired*” (Lamfalussy et al 2013, 135). One of the first studies for the *Delors Report* was a paper on the *Werner Report* titled *The Werner Report Revisited*.

As observed by James (2012, 242), it was part of a “*carefully planned strategy*” by Delors.

7 The Werner Report Revisited

Besides its members, four persons played important roles in the work of the Delors Committee: the two rapporteurs – Gunter Baer and Tommaso Padoa-Schioppa – and two close collaborators of Delors, Joly Dixon and Jean-Paul Mingasson. As mentioned, Padoa-Schioppa was an old friend of Delors and he later became a founding member of the European Central Bank Executive Board and Italian finance minister.

Gunter Baer was a German who worked with Lamfalussy at the Bank of International Settlements. Joly Dixon, a British citizen, was a member of Delors's private office, where he was responsible for the EMU dossier. Mingasson, a French citizen, was a Deputy Director General at DG II, where he was responsible for the monetary directorate (which reported directly to Delors)⁶.

In the Padoa-Schioppa archives there is a copy of the Werner Report with the annotations by Padoa-Schioppa (hereafter TPS, with the archive referred to as TPSA). These notes show very well some of TPS's main ideas about EMU and the process for getting there. TPS considered as critical that the growing interpenetration between the economies would limit the autonomy of national business-cycle policies (TPSA-184, WR, 8).

For the quantitative orientations (or policy guidelines) which were foreseen for budgetary policy in the *Werner Report*, he noted "*nessun vero vincolo*" (no real constraint) (TPSA-184, WR, 8). Concerning the technical harmonisations for policy coordination with respect to the financial markets, he wrote "*vago! vago!*" (vague) (TPSA-184, WR, 22).

Concerning the narrowing of exchange rate fluctuations, he noted "*non si sa quando*" (one does not know when) (TPSA-184, WR, 24). The remarks already show some of the main lines of *The Werner Report Revisited*.

The preparatory work for the Delors Committee started quickly after the Hanover summit. Dixon produced a first note on the *Werner Report* on 14 July, followed by a note by Mingasson on 18 July and a new note by Dixon on 22 July.

This last note identified four 'intrinsic weaknesses' of the *Werner Report*: a lack of institutional ambition; an excessively mechanical conception of policymaking; an over-emphasis on the importance of the harmonisation of

policy instruments; and a lack of clarity over the independence of the conduct of monetary policy (TPSA-184, fax from Dixon to TPS, 26 July 1998). On 28 July, Dixon produced a new note (of seven pages) with the title *The Werner Report Revisited*.

On 2 August, TPS sent a four-page note with comments. He emphasised that the main message of the paper should be that stages one and two of the *Werner Report* had been implemented but that “if the results had not been as good as hoped”, three elements were important: lack of institutional change; lack of a dynamic element; and an unfavourable economic environment.

A key argument of TPS was that: “*The Werner approach is essentially ‘coordination and recommendation’ rather than ‘institution and decision’*” (TPSA-184, fax from TPS to Dixon, 2 August 1998). The paper went through some further drafting sessions and was discussed at the first meeting of the Delors Committee in September 1988.

The *Werner Report Revisited* is divided in four sections: ‘Main features of the Report’, ‘Follow-up to the Report’, ‘An assessment’ and ‘The post-Werner period’. Already in the first section the tone was set with two key messages: the *Werner Report* did not pay attention to the process of achieving EMU and did not consider much the institutional structure of EMU (Baer and Padoa Schioppa, 1988, 53).

In the assessment section, the paper highlighted, besides the difficult international environment, four significant weaknesses of the *Werner Report*:

- (a) “*Insufficient constraints on national policies.*” The *Werner Report* was too much based on voluntary agreements and guidelines: “*insufficient constraints on national policies*” was one of the *Werner Report’s* main flaws: “*These guidelines had the character of recommendations and there was no provision to ensure their*

observance. Such an approach could work only as long as there was a sufficiently strong policy consensus and willingness to cooperate. However, once that consensus began to weaken, more binding constraints on national policy would have become necessary" (Baer and Padoa-Schioppa, 1989, 57);

(b) *"Institutional ambiguities."* It was not always clear who was responsible for which decision;

(c) *"Inappropriate policy conception."* The *Werner Report* was based on a very high degree of confidence in the ability of policy instruments to affect policy goals in a known and predictable way. *"This over-optimistic view of the efficacy of economic management gave rise to a rather mechanistic and relatively rigid approach to policy coordination (especially in the budgetary field)."* This was typical for the, then dominant, hydraulic Keynesian paradigm;

(d) *"A lack of internal momentum."* The *Werner Report* did not envisage an interactive process in which the implementation of certain steps would trigger market reactions that in turn would necessitate further steps towards economic and monetary union.

The paper further emphasised that significant progress had been achieved in the European integration process and that a new policy consensus had been established. It observed that, while at the end of the 1960s there was an agreement on *"medium-term planning and fine-tuning"*, the stagflation of the 1970s had led to a paradigm change: *"a new consensus had developed in which attention has shifted towards medium-term financial stability, the supply side of the economy and structural policies"* (Baer and Padoa Schioppa, 1988, 58).

In the conclusion, the paper further emphasised that *"the full potential of the single market will only be realized with satisfactory monetary arrangements"* (Baer and Padoa Schioppa, 1988, 60).

8 The Delors Report

The *Delors Report* played a crucial role as a reference and anchor point in further discussions, just as the *Werner Report* had nearly two decades earlier. It was an important milestone on the road to the Maastricht Treaty, which provided the constitutional framework for Europe's economic and monetary union (Dyson and Featherstone, 2000).

Like the *Werner Report*, the *Delors Report* revolved around two issues: first, which economic arrangements are necessary for a monetary union to be successful; and, second, what gradual path should be designed to reach economic and monetary union.

Initially, the relationship between Delors and Karl-Otto Pöhl, the President of the Bundesbank, was rather tense. However, Delors's main aim was to finalise a unanimous report (Maes and Péters, 2020). So he took a low profile and focused on seeking consensus in the committee.

As observed by Dixon, Delors *"took it very gentle. We started with history; we went back to the Werner Report; we went very very gentle"* (JDI, 11). Delors also asked Pöhl to sketch out his vision for a future EMU, something Pöhl could not refuse. As observed by Lamfalussy, with that manoeuvre, Delors rendered Pöhl and the Bundesbank *"captive"* (Lamfalussy *et al* 2013, 136).

In his contribution, Pöhl took a 'fundamentalist' position and emphasised the new monetary order that had to be created: *"Above all agreement must exist that stability of the value of money is the indispensable prerequisite for the achievement of other goals. Particular importance will therefore attach to the principles on which a European monetary order should be based"* (Pöhl, 1988, 132).

He argued for price stability as the prime objective of monetary policy, which had to be conducted by an independent central bank. Pöhl further emphasised the *"indivisibility of monetary policy"*, that decisions should be

taken either at the national level or by a common central bank. In defining the necessary conditions for a monetary union, the *Delors Report* referred to the *Werner Report*. On the institutional level, the *Delors Report* proposed the creation of a 'European System of Central Banks'.

Pöhl's fundamentalist approach was deeply influential in the *Delors Report* and inspired a number of principles that also figured prominently in the Maastricht Treaty (Padoa-Schioppa, 1994, 9). The Delors Committee took great care to work out first its view on the final stage of EMU, especially the monetary pillar. This was a major contrast to the Werner Committee.

The *Delors Report's* European System of Central Banks was to be responsible for the single monetary policy, with price stability as the ultimate aim. In the discussions on the independence of the central bank, Pöhl received valuable support from Jacques de Larosière, for whom the Delors Committee presented an opportunity to increase the independence of the Banque de France (Maes and Péters, 2021).

During the second meeting, Lamfalussy raised the crucial issue of whether the necessary fiscal discipline could be left to market forces. He questioned strongly whether one could rely on the financial markets to 'iron out' the differences in fiscal behaviour between member countries.

With his experience as a commercial banker and having lived through the Latin American debt crisis, he questioned whether the interest premium to be paid by a high-deficit country would be very large. Moreover, even if there was a premium, he doubted that it would be large enough to reduce significantly the deficit country's propensity to borrow (James, 2012, 249).

In a paper on the coordination of fiscal policies, which he prepared for the committee, Lamfalussy (1989) not only went into the economic theory, but also provided an overview of the experiences of federal states. He concluded that fiscal policy coordination was a *“vital component for a European EMU”* (Lamfalussy, 1989: 93).

The two aims of coordination should be a European fiscal policy stance that was appropriate for the European and international environment, and avoiding tensions from excessive differences between national fiscal policies. Lamfalussy observed that ‘misalignments’ between national fiscal policies could, in principle, be remedied in two ways: via the community budget or by limiting the scope of national discretion in budgetary policies.

In a footnote, Lamfalussy (1989: 95) referred to the classic work of Musgrave and Musgrave (1973) on public finance. He noted that, given the difficulties in coordinating economic policies, the academic literature typically argued for giving the stabilisation function to the federal level.

During the discussions in the committee, Lamfalussy argued for a *“Centre for Economic Policy Coordination.”* This idea was, however, not taken up in the *Delors Report*. The report argued for *“both binding rules and procedures”* in the area of budgetary policy (Delors Report, 28). The economic pillar of EMU remained a difficult issue⁷.

It is further interesting to note that, during the discussions in the Delors Committee, Lamfalussy (and Wim Duisenberg, the President of the Dutch central bank) also argued in favour of giving the European Central Bank a role in the area of banking supervision (Minutes of the fourth meeting of the Delors Committee on 13 December 1988, DCA).

However, they did not really pursue this issue and the *Delors Report* only mentioned that the new system *“would participate in the coordination of banking supervision policies”* (Delors Report, 26).

To attain economic and monetary union the Delors Committee proposed three stages. In contrast to the emphasis by the *Werner Report* on the first stage, all three stages were worked out in the *Delors Report* in considerable detail.

These stages implied, from an institutional and legal point of view: the preparation of a new Treaty (first stage), the creation of a new monetary institution (European System of Central Banks, second stage), and the transfer of responsibilities to this new institution (third stage). From an economic and monetary point of view, these stages implied increased convergence and closer coordination of economic policy.

However, the committee underlined the indivisibility of the whole process: “*the decision to enter upon the first stage should be a decision to embark on the entire process*” (*Delors Report*, 31).

In a note for Belgian finance minister Philippe Maystadt, Edgard Van de Pontseele, the Director of the Belgian Treasury, went into the significance of the *Delors Report*.

In his view, this was not in the intellectual contribution of the report nor in its proposal for the path towards EMU. For him the main novelty was the unanimity with which the central-bank governors had accepted the report (*Verslag over de economische en monetaire eenheid in de Europese Gemeenschap*, sd, BSA). He emphasised two elements: it would be the governors who would lose their powers with the establishment of a European Central Bank; and the argument that the project was technically not sound had become invalidated.

The European Community followed the path indicated in the *Delors Report*. The first stage started in July 1990 and the intergovernmental conference on economic and monetary union, along with another on political union, opened in Rome in December 1990.

Meanwhile, the broader European scene was changing dramatically with the breakdown of the iron curtain and German unification, contributing to the speeding up of the process of European monetary integration. The German government's policy line could almost be summarised in Thomas Mann's dictum: *"Wir wollen ein europäisches Deutschland und kein deutsches Europa"* ("We want a European Germany and not a German Europe"; Schönfelder and Thiel, 1996, 12).

9 The Maastricht Treaty: a new economic governance framework

The intergovernmental conferences reached their climax at the Maastricht Summit in December 1991. The Maastricht Treaty marked a step forward for the European Community in the same way that the Treaty of Rome had done. It created a so-called European Union, based on three pillars (Maes, 2007).

The first pillar had at its core the old Community but carrying greatly extended responsibilities with it. The main new element was economic and monetary union. The second pillar was for foreign and security policy. The third concerned cooperation on topics such as immigration, asylum and policing. The new Treaty also extended the powers of the European Parliament.

Economic and monetary union had a kind of asymmetrical structure. Monetary policy was centralised. It was the responsibility of the European System of Central Banks (ESCB), composed of the European Central Bank and the national central banks, which are all independent. The primary objective of monetary policy is price stability. Without prejudice to the objective of price stability, the ESCB must support the general economic policies in the Community.

This part of the Treaty went quite smoothly through the intergovernmental conference. The preparations in the Delors Committee and the Committee of Central Bank Governors certainly contributed to this. The prominence of the German institutional model was also evident.

Several factors contributed to this: the sheer size of Germany and the Deutsche mark; strong theoretical support, based on a blend of German ordoliberal and mainstream economics ideas; the successful history of German monetary policy; the strong bargaining position of the German authorities and the unique federal structure of the Bundesbank.

However, with the anchoring of price stability and central bank independence in a treaty, the Maastricht Treaty went further than the German situation, giving these principles a constitutional status – “*a pre-eminence unparalleled in legal history*” (Herdegen, 1998, 14).

The responsibility for other instruments of economic policy, including budgetary policy and incomes policy, remained basically decentralised, resting with the national authorities. However, member states had to regard their economic policies as a matter of common concern and coordinate them accordingly⁸. However, as history would show, there was a repeat of “*insufficient constraints on national policies*” as *The Werner Report Revisited* had warned.

During the Maastricht Treaty negotiations there were hard negotiations on a European economic government. However, the topic was divisive and the transfer of sovereignty for economic policy was not acceptable for the member states. The consequence was an EMU with a well-developed monetary pillar but a weak economic pillar (Maes, 2004).

The different characteristics of monetary union and economic union reflected the limits of the willingness of the member states to give up national sovereignty. As Bordo and Jonung (2000, 35) observed, EMU is quite unique in history, being a monetary union while countries retain political independence.

The budgetary policy coordination process and the responsibility for exchange-rate policy were the topics of some of the tensest discussions during the intergovernmental conference. France proposed a '*gouvernement économique*', whereby the European Council would provide for broad guidelines for economic policy, including monetary policy.

This provoked a strong clash with Germany, for which the independence of the European Central Bank was not negotiable. However, the Germans were also convinced of the necessity of coordination of other economic policies, especially budgetary policy, as they determine the environment in which monetary policy must function⁹.

Agreement was only reached after intense negotiations, including secret bilateral discussions between the French and the Germans (Dyson and Featherstone, 1999).

An important topic in the later EMU negotiations was the Stability and Growth Pact (SGP). Discussions were launched with the proposal by Theo Waigel, the German finance minister, in November 1995, that a 'Stability Pact for Europe' should be concluded¹⁰. This would tighten the rules on budgetary behaviour for the EMU participants and should include potential sanctions.

After long and extended negotiations, a political agreement was reached at the Dublin Summit in December 1996. The SGP introduced two complementary pieces of secondary EU legislation: a 'preventive arm', which aimed at ensuring prudent fiscal policies with, as an objective, a government budget close to balance or in surplus; and a 'corrective arm', aiming to correct gross policy errors (with the possibility of sanctions).

The first decade of the euro was, with hindsight, relatively quiet. There was however a crisis around the SGP, with the European Commission taking Germany and France to the EU Court of Justice. It led to the first reform of the SGP in 2005, making the rules more flexible and giving the Council a greater degree of discretion.

The euro's second decade was much more tumultuous, with the Great Financial Crisis (starting in 2007 with problems in the US subprime mortgage market) and the euro area debt crisis. These went together with vivid economic debates (see Brunnermeier *et al* 2016, and Buti, 2021).

To counteract the deflationary consequences of the Great Financial Crisis, policymakers adopted expansionary budgetary and monetary policies, which marked a return to Keynesian economics. The sovereign debt crisis became a watershed in the process of European integration. The crisis showed the limits of Europe's incomplete EMU, with a well-elaborated monetary pillar, but a weak economic pillar.

European economic policymakers responded with a range of measures, not just emergency assistance, fiscal consolidation programmes and non-conventional monetary policy, but also substantial reforms to European economic governance, taking steps towards a more 'symmetric' EMU, as advocated in the *Werner Report*.

In the first instance, especially given the major budgetary derailments in Greece, the focus was on a strengthening of fiscal sustainability. Three legislative packages were particularly important: the 'six pack', 'two pack' and the new 'fiscal compact'.

A primary aim was to tighten fiscal discipline by reinforcing the SGP, both the preventive and corrective arms. A further objective was to increase national ownership and transparency in the area of budgetary policy, especially with the creation of independent national fiscal councils.

Moreover, major competitiveness imbalances and asset boom-bust cycles were major factors behind the crisis. This was clearly shown in Ireland and Spain, where the lower interest rates that came with EMU led to a booming economy, especially in the real-estate sector.

This also led to significant wage increases, which hampered the competitiveness of these economies. When interest rates rose, the boom in the real-estate sector collapsed, leading to banking crises in these countries. This showed that asymmetric shocks could not only originate in the public sector (the focus in the Delors Committee), but also in the private sector.

Consequently, a new Macroeconomic Imbalances Procedure was set up. The aim was to create a system of ex-ante surveillance of macroeconomic risks and competitiveness positions. The European Union also set up new financial stabilisation mechanisms to provide for financial solidarity, especially the European Stability Mechanism.

Significant steps were also taken to establish a banking union. Setting up the Single Supervisory Mechanism (SSM) was a significant step in the European integration process, probably the most important since the introduction of the euro (Véron, 2015).

That the SSM was entrusted to the European Central Bank was a sign of confidence in the ECB and its institutional set-up. But the completion of the banking union remains to be done.

The COVID-19 pandemic, which swept through Europe in 2020, also had significant economic consequences. The European Central Bank set up a Pandemic Emergency Programme, a major asset buying programme, aimed at preserving access to affordable funding for persons and firms. But there was also a strong consensus that a Keynesian type of budgetary impulse was necessary to avoid a depression. The SGP was suspended in 2020.

Moreover, new funding initiatives at the EU level were launched, especially SURE (Support to mitigate Unemployment Risks in an Emergency) and the post-pandemic recovery plan, NextGenerationEU (with, at its centre, the Recovery and Resilience Facility, a vehicle for EU borrowing and the provision to member states of grants and loans).

The aim was not only to boost aggregate demand but also to support the most hard-hit countries (a form of ex-post insurance for countries that were impacted most by the pandemic) and to strengthen the economic growth potential of the EU (with a focus on the green and digital transitions).

However, the 'whatever it takes' fiscal policy contributed to significant government deficits and increases in government debt in several countries, raising the issue of fiscal dominance. In summer 2021, inflation started to rise again.

It led to a debate among policymakers and academics about whether this rise would be temporary or not. The inflation turned out to be higher and more persistent than the forecasts of about all institutions.

With the end of COVID-19 as a pandemic, the issue of a normalisation of policies also came to the forefront. The shortcomings of the SGP led to significant debates (see, eg. Arnold *et al* 2022), and the European Commission launched proposals for a new reform of the Pact.

Also, the former president of the European Central Bank, Mario Draghi (2023), raised the issue of fiscal union. A well-designed 'central fiscal capacity' would relieve pressure on national fiscal policies, making it easier for national fiscal policies to follow a rules-based path.

It could further provide for the provision of European public goods (for instance related to a common defence policy). Such reforms would bring Europe's EMU closer to the type of EMU that was advocated in the *Werner Report*, with both a strong monetary and economic pillar.

10 Conclusion

During the second half of the twentieth century, there was a major shift in economic paradigms, both in the academic community and among policymakers. While in the 1960s Keynesian economics dominated, with a belief in discretionary economic policy, in the second half of the 1980s, there was a broad consensus on medium-term stability-oriented policies.

This shift towards a more stability-oriented stance of economic policy was clearly reflected in the EMU debates in Europe. In both the *Delors Report* and the Maastricht Treaty, price stability was emphasised as the overriding goal of monetary policy, which had to be carried out by an independent central bank.

These ideas were not really mentioned in the *Werner Report* when monetary policy was discussed. The *Werner Report* also proposed the creation of a supranational centre of decision-making for economic policy, which would exercise “a decisive influence over the general economic policy of the Community” (*Werner Report*, 12), while the *Delors Report* emphasised binding rules for budgetary policy.

The emphasis on budgetary discipline went together with proposals for a limited budget for the European Community. In a 1993 report for the European Commission, an EU budget of 2 percent of Community GDP was considered capable of sustaining economic and monetary union (CEC, 1993, 6).

This contrasted with the earlier *MacDougall Report*, which considered that an EU budget of 5 percent to 7 percent of GDP was necessary for a monetary union (CEC, 1977, 20). The lower figure reflected a different economic paradigm, with a more limited role for the government in economic life. A smaller Community budget was also a more realistic option, given the attachment of national states to their sovereignty.

Of crucial importance for the development of the European Union was the way that a further push towards integration fitted into this new (neo-liberal) conceptual framework. The completion of the internal market, with its elimination of the remaining barriers to a free flow of goods, services, persons and capital, was compatible with the deregulation strategy being pursued in the various European countries.

Macroeconomic policy in the countries of the European Community became more stability oriented, as policymakers became convinced of the illusory nature of the trade-off between inflation and unemployment. This orientation fitted in with a policy of stable exchange rates and a move towards EMU.

But it would become an EMU with a strong monetary pillar and a weak economic pillar. This proved to be a weakness when the euro area was confronted with severe challenges in the twenty-first century.

On 1 January 1999, EMU effectively started with eleven countries. One might ask why this attempt at EMU was successful, in contrast to the fate of the Werner plan in the 1970s. Two types of factors can be distinguished: first, long-term structural developments which created a favourable background (a greater degree of economic and financial integration, a greater consensus on policy objectives and an increasing underlying political will to achieve European integration, as exemplified in the Kohl-Mitterrand tandem) and, second, the dynamics of the process of European integration in the 1980s and 1990s.

This was the period when history accelerated, with the fall of the Iron Curtain and German unification, creating a window of opportunity, which has been skilfully exploited with the help of appropriate policy decisions and meticulous preparations. However, on numerous occasions the project could have derailed, especially during the 1992-1993 crisis of the European Monetary System. It could therefore be argued that the achievement of EMU should not be taken for granted.

The transfer of sovereignty over monetary policy to the European level was certainly not an easy decision from a German perspective. German economic policymakers, and the Bundesbank, were comfortable with how the European Monetary System functioned.

This transfer of monetary sovereignty was part of a political project. For Kohl it was a step towards a United States of Europe, a recurring theme in his speeches. He knew that France would only accept this if monetary union was part of it. But the transfer of monetary sovereignty was the limit of what could be accepted.

Giving up monetary sovereignty was also easier as countries had de facto lost their monetary autonomy in the EMS and it were the central-bank governors who would lose power, not the politicians.

However, countries did not accept further significant transfers of economic policymaking. It made for an EMU with a strong monetary pillar, but a weak economic pillar, a stark contrast with the vision of the *Werner Report*.

We have paid considerable attention to a background study for the *Delors Report, The Werner Report Revisited*. This study highlighted four 'intrinsic weaknesses' of the *Werner Report*: absence of internal momentum, inappropriate policy conception, institutional ambiguities and insufficient constraints on national policies. An interesting question is how these issues have played out in the Maastricht Treaty framework.

With the realisation of EMU, it is clear that policymakers succeeded in creating internal momentum, with a positive dynamic between policy initiatives and the working of market forces. Maybe there was also some luck involved¹¹, but there was certainly also a strong political will and leadership. However, the momentum to go towards a 'complete' EMU is clearly lacking.

As regards an inappropriate policy conception, one can only observe that, during the last few decades, the world has gone through several paradigm changes. With the Great Financial Crisis and the COVID-19 pandemic, there has been a return to Keynesian economics and discretionary budgetary policies, followed by a return of inflation. It shows a certain relativity of economic theory.

It is then important for policymakers to take an instrumental approach to economic theory and to identify the most appropriate economic theories, given the policy challenges. A broad and pluralist approach towards economics can help in this. It is important to select theories that highlight the relevant features of reality.

The great Austrian economist, Joseph Schumpeter (1954: 15), approvingly referred to Henri Poincaré's observation, *"tailors can cut suits as they please; but of course, they try to cut them to fit their customers."*

An historical perspective can offer insights into the relative strengths and weaknesses of economic theories. Moreover, for policymakers, the policy regime is of crucial importance. Sometimes, one tends to take the policy regime as given, rather ignoring that a change in regime will affect economic events and policy outcomes.

At other moments, on the contrary, there are heated discussions about the policy framework. A broad historical approach, which can offer distance and a wider variety of experiences, can be helpful. Regarding institutional ambiguities, the picture is mixed.

For the monetary side of EMU, a strong institutional pole has been created with the European Central Bank and the Eurosystem. A testament to this is that the tasks of the ECB have been extended, with important responsibilities for banking supervision.

However, EMU has remained incomplete, with economic policy competences still mostly at national level. Given the absence of a significant central fiscal capacity at the EU level, rules for budgetary policy have to take into account the different roles that national budgetary policies have to play (not only sustainability but also stabilisation of the national economy).

As more discretionary fiscal policies had to be adopted during the twenty-first century crises, the absence of a strong economic pillar of EMU, as advocated in the *Werner Report*, turned out to be a serious shortcoming of Europe's EMU.

The Werner Report Revisited highlighted very much the “insufficient constraints on national policies” in the *Werner Report*. However, regarding the Maastricht Treaty framework and the Stability and Growth Pact, the situation is not much better.

One could argue that the phrase, “*the Werner approach is essentially ‘coordination and recommendation’ rather than ‘institution and decision’*” also applies to the economic pillar of the Maastricht Treaty framework. Why this weakness has not (yet) been corrected raises some fundamental political-economy questions about the conception and implementation of a sound economic governance framework.

These are not only issues of concern for national sovereignty but are also related to the multidimensional aims of fiscal policy (with the Musgravian triad of allocation, stabilisation and redistribution) and the need to keep the public finances sustainable. ■

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Endnotes

1. This contrasted with German analyses of the Bretton Woods system, which focused on the threat that intervention obligations in the foreign exchange markets posed for price stability (Emminger, 1977, 53).
2. Given the reluctance of German economic policymakers (the Bundesbank and the economy and finance ministries did not want to prepare a proposal on the lines Brandt wished), Brandt turned to Jean Monnet, who asked Robert Triffin to elaborate a memorandum for Brandt (Maes with Pasotti, 2021).
3. While the free movement of capital was an indispensable element of a monetary union, the Werner Report also underlined that it was an essential element of a common market (with the four freedoms: free movement of goods, services, labour and capital).
4. The report further argued that only the balance of payments with the external world would be of relevance for the monetary union, "Equilibrium within the Community would be realized at this stage in the same way as within a nation's frontiers, thanks to the mobility of the factors of production and financial transfers by the public and private sectors" (Werner Report, 10). It is a somewhat strange statement. It reflects very much optimum currency area theory (like the Mundell criterion on factor mobility as well as the importance of transfers). The euro area's debt crisis showed the importance of the balance of payments also inside an (imperfect) monetary union.
5. The Werner Report did not mention the notion of central-bank independence. Discussing the relations between the different institutions, it mentioned "safeguarding the responsibilities proper to each" (Werner Report, 13). According to Tietmeyer (interview, 18 December 2001), this implied the independence of the central bank.
6. It shows Delors's interest in the EMU dossier from the moment he became president of the Commission. He would attend the meetings of the Committee of Central Bank Governors (Maes, 2006). It is also noteworthy that Delors started his career at the Banque de France.
7. In a later report, the European Commission (CEC, 1990) emphasised three aspects of (national) budgetary policies in EMU: autonomy (to respond to country-specific problems), discipline (to avoid excessive deficits) and coordination (to assure an appropriate policy-mix in the Community).

8. *Important elements in this coordination process were the Broad Economic Policy Guidelines, the multilateral surveillance process and the excessive deficit procedure (with two reference values: 3 percent of GDP government deficit and 60 percent of GDP for government debt). There was also the no-bail-out clause – that countries remained solely responsible for their debts.*

9. *Senior German policymakers admitted that there was a kind of contradiction in the German negotiation position, with Germany being against a 'gouvernement économique' but in favour of restraints on national budgetary policies. Waigel's political problems in Bavaria were mentioned as an explanatory factor.*

10. *For German economic policymakers, the Italian debt situation was one of their main preoccupations in the EMU negotiations. The Waigel initiative came around the same time that Italian policymakers showed their interest in being among the first group of countries to adopt the euro. Was it a quid pro quo?*

11. *It is said that Napoleon asked of his generals that they were lucky.*

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TPSA – Tommaso Padoa-Schioppa, Historical Archives of the European Union, European University Institute, Florence.

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The first 25 years of the euro: a bird's-eye view

At 25 the euro area has shown extraordinary resilience. Marco Buti and Giancarlo Corsetti articulate a set of reforms to complete the euro area architecture

The 25th anniversary of the euro is a good time to take stock of “*the greatest monetary experiment of the modern era.*” At its inception, economists’ views were polarised. Many, especially in the Anglo-Saxon world, expressed doubts, even going so far as to argue that the single currency would lead to a war between member states (Feldstein 1997).

At the other extreme, the official narrative at times envisaged a rosy future of macroeconomic stability, ensured by a fiercely independent central bank and a stability-oriented fiscal framework. It counted also on the desirable structural reforms eventually adopted by member states.

In reality, none of the extreme scenarios (war versus Nirvana) materialised. Rather, the euro has shown extraordinary resilience through several critical moments, proving prophecies of doom wrong. While it delivered on some of its promises – primarily, price stability over most of the period, in line with other regions in the world – it has disappointed those who held expectations of an increase in economic integration and potential growth, combined with a leap forward towards political union in Europe.

In large part, the mixed record of the euro area is due to the fact that its architecture was incomplete at birth and, in spite of substantial progress, remains incomplete today, with the fiscal and economic arms vastly underdeveloped compared to the monetary one.

At the outset, the case for a balanced architecture was dismissed with the argument that trying to address all issues before the launch of the single currency would risk derailing the project altogether. Today, the case is much stronger.

The euro's four phases

To see what an incomplete architecture has meant for the euro area, in a new *CEPR Policy Insight* (Buti and Corsetti 2024) we review the past 25 years distinguishing four phases: the first decade of (over-)optimism and resource misallocation (1999 to 2008); the decade of home-bred crises and fragmentation (2008 to 2019); the progressive response to the pandemic (2020 to 2021); and the return of policy trade-offs in the battle against inflation (from 2022 to the present day). The main economic indicators and the institutional developments characterising these four phases are summarised in Tables 1 and 2.

It should now be crystal clear that leaving the euro area architecture incomplete, hoping for a 'political leap forward' in the next crisis, is both very costly and very risky

Table 1. Main macroeconomic indicators

	GDP	Inflation	Current account	Government balance
1999-2008	2.25% (0.5/3.8)	2.2% (1.2/3.3)	0.1% (-0.7/1.0)	-2.1% (-3.1/-0.7)
2009-2019	0.8% (-4.6/2.6)	1.3% (0.2/2.7)	2.4% (0.5/3.6)	-2.9% (-6.3/-0.4)
2020-2021	-0.1% (-6.3/6.0)	1.4% (0.3/2.6)	3.0% (2.3/3.6)	-6.2% (-7.1/-5.2)
2022-2023	2.0% (0.7/3.4)	7.0% (5.6/8.4)	1.8% (1.0/2.5)	-3.4% (-3.6/-3.2)

Note: Columns refer to the year-on-year growth of real Gross Domestic Product, yearly HICP, current account balance (as % of Euro Area GDP) and government balance (as % of Euro Area GDP). Numbers in parenthesis refer to the minimum and maximum registered value for the period.

Source: European Commission.

The first phase is the '2% decade': growth, inflation, and budget deficits are on average close to 2%. It was the period of 'Great Moderation' and excess optimism, associated with a systematic underestimation of macro and micro risks, in the European economy as in the world economy.

It was in these years that, in a context of perceived stability, the imbalances that will haunt the euro area in the years to come accumulated. The bonus of interest rate convergence across member states, with minimal spreads,

Table 2. EU and euro area institutional reforms

	1999-2008	2009-2019	2020-2021	2022-2023
Supranational	SGP reform	Six and Two Pack BU: Single Supervisory Mechanism (SSM) European Financial Stabilisation Mechanism (EFSM) Launch CMU	Triggering of the SGP General Escape Clause State Aid Temporary Framework NGEU Support to mitigate Unemployment Risks in an Emergency (SURE)	Economic governance reform (ongoing) State Aid Temporary Framework + RePower EU
Intergovernmental		ESM (successor of the temporary European Financial Stability Facility, EFSF) Fiscal compact	ESM Pandemic Facility ESM Treaty reform (backstop Single Resolution Mechanism, SRM)	ESM Treaty ratification (ongoing)
Euro area accession (11 members in 1999)	EL (2001) SI (2007) CY, MT (2008)	SK (2009) EE (2011) LV (2014) LT (2015)		HR (2023)

Source: Authors' elaboration based on European Commission sources.

embellished public accounts and led to a reduction in overall deficits in vulnerable countries; accommodating fiscal and monetary conditions favoured growth, reducing the pressure to adopt structural reforms and removing the urgency to strengthen the banking system.

Nominal convergence, however, concealed structural divergence: capital within the euro area flew in the right direction, from the richest towards the less wealthy countries, but ended up in the wrong sectors (real estate and non-tradable services) through the wrong instrument (short-term bank loans).

While the current account was in balance for the euro area as a whole, large imbalances opened inside the area, reflecting the increasing specialisation of the 'periphery' in non-tradeables and dependency of its banking system on the core countries' banks, in turn heavily exposed overseas. These structural divergences translated also into a divarication of social preferences between euro area members.

The Great Financial Crisis brought these imbalances to light. Relative to the magnitude of financial problems in the European banking system, the Greek fiscal crisis that ignited the crisis was actually a relatively contained issue.

But because the crisis originated from it, with discovery that the official Greek accounts were far from the truth, trust among member countries quickly evaporated, preventing a prompt and effective response to the crisis in all its fiscal and financial dimensions.

The political narrative became one of fiscal laxity and moral hazard, implicitly seeing the costs of the crisis as necessary to discipline profligate governments. The overarching principle was 'putting your own house in order'.

Therefore, the EU intervened only as 'ultima ratio', after all means at national level had been exhausted. In this context, a euro area-level response, with the creation of the European Stability Mechanism, the launch of the Banking Union project, the introduction of the Outright Monetary Transactions, and the scaling up of the ECB balance sheet programmes, came substantially late.

The focus on fiscal policy delayed the measures needed to put the banking system on a sounder footing. It was only after Mario Draghi's "*whatever it takes*" speech in July 2012 that the risks of a euro area breakup receded and the area could return to a path of growth, but with large disparities between countries. With monetary policy long being the 'only game in town' (much more in the euro area than in other regions), the economic and financial space of the euro area remained fragmented, and the macro stance insufficiently weak.

Reflecting the strong fiscal correction and recession in the crisis countries, the external balance of the euro area moved into a persistent surplus of 2% of GDP or more. Remarkably, in spite of the perceived sense of existential crisis, the euro area continued to expand – an indication of the huge amount of political capital invested in the euro that markets tended to belittle.

Remarkably, the response to the pandemic crisis of early 2020 was totally different. The lessons from the mismanagement of the sovereign debt crisis were at least in part learned, but more importantly, the ambitious policy response benefitted from a 'benign coincidence' of circumstances: the exogenous nature of the crisis and the absence of electoral appointments on the horizon allowed EU leaders to act with fewer internal constraints and embrace a narrative of solidarity free of moral hazard concerns.

The result was the suspension of the Stability and Growth Pact, the SURE programme to support the labour markets, NextGenerationEU to foster the double transition, both with common borrowing, and the ECB's Pandemic

Emergency Purchase Programme. Policies moved in the same direction, ensuring a congruent mix across policies (fiscal and monetary) and space (EU and member countries). Evidence of strong collective leadership reassured markets, the risks of fragmentation receded, and the economy rebounded strongly.

This virtuous scenario, however, did not last. The surge in inflation, ignited worldwide by strong macroeconomic stimulus and the imbalances due to the disruption of value chains during the lockdown, was exacerbated in Europe by the energy crisis following Russia's war of aggression.

Europeans manage to coordinate policies to reduce the region dependence on Russian gas but failed to deliver a common and forward-looking response in the spirit of NextGenerationEU. Monetary and fiscal policy moved in opposite directions.

With rising debt and deficits, the strongest monetary tightening since the 1980s marked the return of policy trade-offs. This new phase – still ongoing – did not remove the deadlocks in the debate on EMU reforms. The huge political capital spent to maintain unity on the sanctions against Russia and the overriding domestic political concerns probably hindered other common endeavours.

Back to the future: from the 'inconsistent quartet' to the 'euro trilemma'

Based on the assessment above, how should the reform of EMU's architecture be approached? In light of the experience of the first 25 years in the life of the euro, it seems appropriate to go back to the initial inspiration for the project of a single currency as a keystone of the Single Market project.

Indeed, Tommaso Padoa-Schioppa proposed the 'inconsistent quartet', a European version of the open economy 'trilemma', adding free trade (essentially, the Single Market) among EU members as the fourth corner: a single

currency would prevent the competitive devaluations that were incompatible with preserving a level playing field and that created political acrimony in the 1980s (Padoa-Schioppa 1987).

The quartet clarifies that a deficit in macroeconomic stabilisation at EA/EU level would create strong political and economic incentives for national governments to respond to shocks (domestic and external) resorting to national industrial policy, tax and regulatory initiatives and stealth subsidies, de jure or de facto incompatible with the Single Market.

The experience during the energy crisis and the response to the American Inflation Reduction Act (IRA) is telling. A resilient euro area, with enough stabilisation tools in place, is essential to prevent member states from going down a route that would lead to 'real' fragmentation, up to creating risks for the integrity, let alone the performance, of the Single Market.

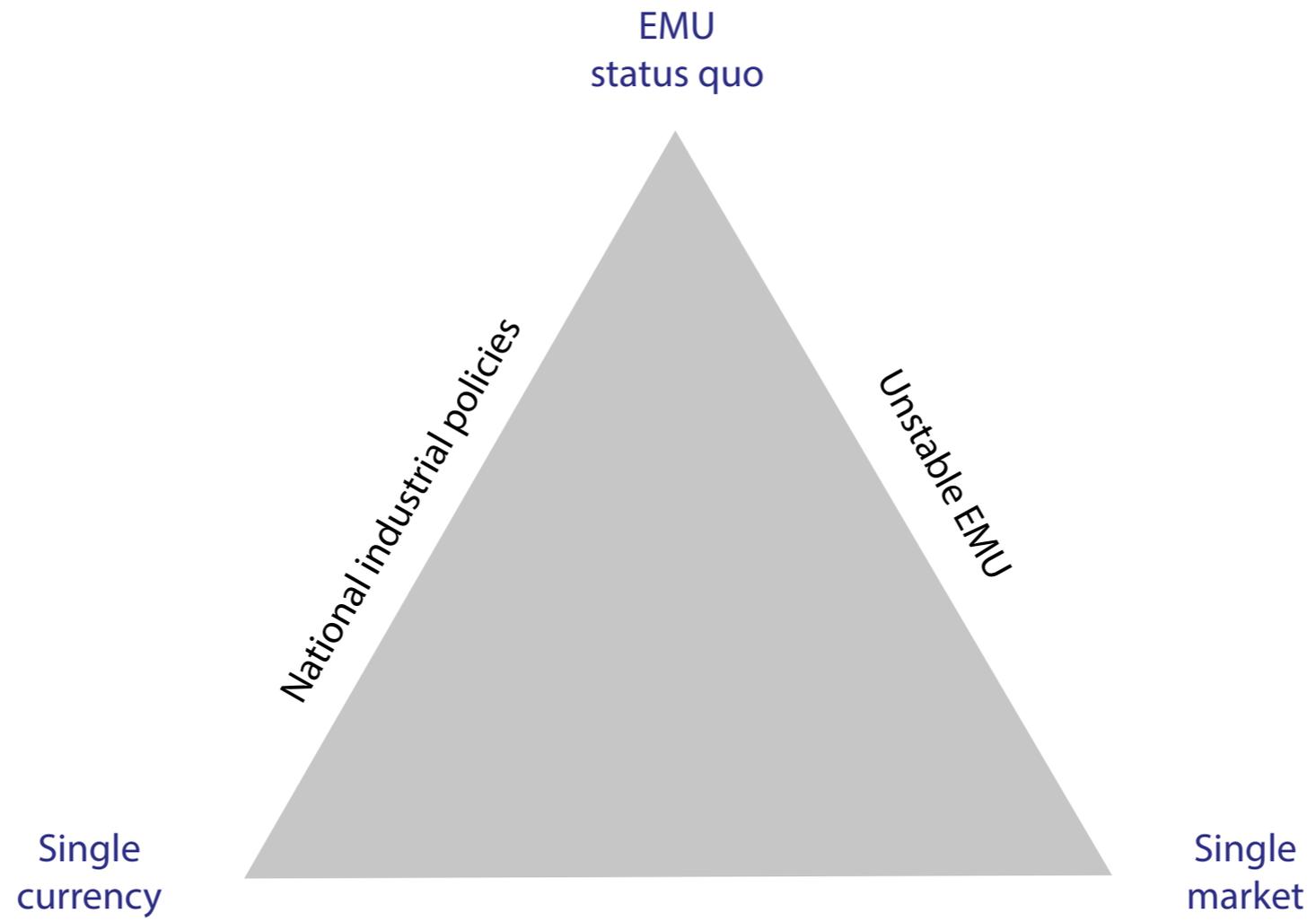
These considerations can be synthesised via a modern reformulation of the inconsistent quartet, in terms of a euro trilemma (see Figure 1). Currently, the incomplete-union status quo (the upper corner of the triangle) is not simultaneously compatible with the Single Market (right lower corner) and a stable single currency (left corner).

The need to maintain macro and financial stability conditional on the current architecture (along the left side of the triangle) creates strong incentives to resort to inward-looking national industrial policies and other measures undermining the foundations of the Single Market.

Enforcing the Single Market rules without an adequate EMU architecture empowered with tools and competences to complement the Single Market (the right-hand side of the triangle) creates permanent risks of macro and financial instability, which we synthesise with the idea of an 'unstable EMU'.

Figure 1. The euro area trilemma

finance21.net



Source: Authors' elaboration

The single market in an area of macro and financial stability (the bottom side of the triangle) is the constitutional goal of the reform of the euro area architecture.

The policy agenda looking forward: back to Delors' inspiration

In the light of the history of the first 25 years, how should we approach the reform of the euro area's economic constitution to overcome the current status quo?

We stress two main points. First, it should now be crystal clear that leaving the euro area architecture incomplete, hoping for a 'political leap forward' in the next crisis, is both very costly and very risky. The response to the pandemic was possible because of favourable circumstances, but there is no guarantee that in the next crisis the EU will find comparable cohesion and deliver an effective common response (the suboptimal agreement on the reform of fiscal rules is there to demonstrate this).

We do not need to wait for another crisis to complete the Banking Union with a credible resolution fund (here, the failure to ratify the new treaty of the European Stability Mechanism by Italy is serious) and a common deposit insurance. These are key reforms to enhance the stability, integration, and development of the European financial system overnight.

The opposition of risk sharing to risk reduction can be overcome (reconciling the two strategies) if one considers the major benefits (economic and geopolitical) from integrated and stable financial markets – which in turn reinforces the case for removing the stalemate on the Capital Markets Union, given the challenge of financing the digital and green transitions.

Second, and most crucially, completing the euro area architecture is necessary to safeguard – and further develop – the most precious asset of European economic integration: the Single Market. Coupling the Single Market with a single currency, within an overall project addressing Europe’s growth bottlenecks and equity concerns, was the most prescient intuition and the enduring legacy of Jacques Delors as President of the European Commission in the 1980s and early 1990s.

In the past 25 years, the contribution of ‘one money’ to ‘one market’ has not been stellar. In the first decade, in the context of a half-baked architecture, the euro favoured the misallocation of resources and undesirable specialisation patterns; in the second decade, the deficiencies of the macro and financial governance in the area magnified instability and created fragmentation of the economic and political space.

Thanks to a series of fortuitous circumstances, it did not prevent effective coordination in the response to the COVID-19 pandemic, minimising the risk of an economic meltdown, but this response has not raised the appetite for institutional development.

As of today, Europe appears to be facing the risk of an inefficient multiplication of national industrial policies financed via state aid, undermining the very core of the Single Market project. This state of affairs has to be overcome.

The most straightforward and economically sensible way is to step up transnational investment in European public goods in the double green and digital transition, in human capital and in the availability of critical materials – as the core of an industrial policy at European level that can truly relaunch the competitiveness of the EU economy.

This will require, again, crossing difficult political red lines. Kohl, Mitterand and Delors were able to do so after the fall of the Berlin Wall, and Macron, Merkel, and von der Leyen during the pandemic. Due to different circumstances, they all had a low 'political discount rate'. A similar display of leadership will be required to make the euro future-proof. ■

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Beyond money: the euro's role in Europe's strategic future

To ensure the euro's role in Europe's future Fabio Panetta argues that we need effective macroeconomic stability, a fully-fledged banking and capital market union, and a dynamic payments and market infrastructure

The euro itself was launched 25 years ago, in January 1999, and at the end of that year Latvia, Lithuania, Romania, Slovakia, Bulgaria and Malta were invited to start negotiations to join the European Union (EU)¹. These events are all part of a single, coherent historical process, driven by the integration project that Europe undertook in the post-war period.

The Economic and Monetary Union (EMU) is one of the most ambitious elements of this project, and the euro is both a key achievement and a powerful symbol of success. Given my role and background, you might expect me to talk about the euro from a purely monetary perspective.

However, I will not do that. Finance is a means to serve society, and the euro is no exception: the single currency has objectives and implications that go far beyond the monetary sphere. Its fate shapes Europe's role in the global economic and financial landscape.

Its function as an international reserve currency affects Europe's strategic autonomy and geopolitical position. From the perspective of 2024, the relevance of these issues can hardly be overstated. My remarks are structured around three broad themes.

First, why we care about the international role of the euro (IRE), second, how this role has evolved over time, and third, what we can do to strengthen it.

1. Why do we care about the international role of the euro?

Before February 2022, most people would have answered this question in purely economic terms. Issuing a currency that is widely used internationally for commercial and financial transactions brings both benefits and risks to an economy.

It is crucial for a central bank to consider these factors in order to achieve its price stability objective and preserve financial stability. Let me summarize them. Before the global financial crisis, the benefits were traditionally considered to be threefold.

First, high seigniorage for the central bank, and ultimately for the taxpayers of the issuing country². Second, a reduction in transaction and hedging costs for users of the currency. Third, the 'exorbitant privilege'³: as long as there is strong global demand for safe assets, an economy issuing a reserve currency enjoys lower funding costs than its peers and hence it earns a positive return on its net foreign asset position⁴.

A scarce supply of safe euro-denominated assets is perhaps the single most important constraint on the CMU, and hence on the global reach of the euro

The main risks were associated with higher volatility in monetary aggregates and capital flows due to exogenous shifts in demand and risk appetite. The global financial crisis prompted a re-examination of these issues.

On the one hand, we realized that the 'exorbitant privilege' could become an 'exorbitant duty' at times of international stress, when the dominant economy unwillingly becomes a global bank and experiences a sharp exchange rate appreciation⁵.

On the other hand, we learned that an international reserve currency reduces the pass-through of exchange rate shocks to domestic inflation, making foreign exchange volatility less of a concern, and that, in a financially integrated world, it can make monetary policy more powerful by generating positive spillovers and spillbacks⁶.

All in all, the macroeconomic benefits of issuing a reserve currency should largely outweigh the risks⁷. The estimates obtained from US data are instructive in this respect. Research shows that the US Treasury historically issued long-term bonds at a discount of 30 to 70 basis points relative to private securities with comparable characteristics, generating seigniorage revenues of the same magnitude as those obtained by the Federal Reserve from the monetary base.

For the euro area, assuming a hypothetical 50 basis points discount, seigniorage could in principle generate a revenue of ½ percentage point of GDP per year⁸. These numbers are purely indicative, but they may give us an idea of the magnitude of the potential gains⁹.

More importantly, Russia's aggression against Ukraine was a stark reminder that these monetary benefits only tell (at best) half the story: the other half has more to do with politics than monetary economics. In a politically volatile world, a country that issues an international currency is less exposed to financial pressures from other (possibly hostile) nations.

The reason for this is that its financial and payment flows do not require the use of other currencies. In and of itself, an international currency is a pillar of the issuer's 'strategic autonomy'. It acts as an insurance policy – a function that may seem worthless in normal times but becomes very valuable in bad times.

Europeans are fully appreciating its value today. The issuer of a global currency can use its financial power to influence international developments. This power must be used wisely, however, because international relations are part of a 'repeated game': weaponizing a currency inevitably reduces its attractiveness and encourages the emergence of alternatives.

The case of the renminbi is instructive in this respect. The Chinese authorities are explicitly promoting its role on the global stage and encouraging its use in other countries, including those sanctioned by the international community following the invasion of Ukraine.

Most of Russia's imports from China, as well as some of its oil shipments to China, are now invoiced in renminbi¹⁰, and the share of Chinese trade settled in renminbi has doubled over the past three years¹¹. As a result, at the end of 2023, the renminbi overtook the euro as the second most used currency for trade finance¹² and the yen as the fourth most used currency for global payments¹³.

There is little evidence so far that political fragmentation is *systematically* translating into currency fragmentation¹⁴, but we should be alert to the possibility that politics will have a greater impact on international currencies in the coming years. And, of course, vice versa.

2. The performance of the euro since its launch

How has the euro performed over its 25-year journey? Between 1999 and 2022, the euro's share in global portfolios fluctuated between 17 and 25 per cent (Figure 1)¹⁵. The dominance of the US dollar has remained unchallenged. In

terms of foreign exchange reserves, for example, the euro accounts for 20 per cent of the total, while the share of the US dollar is three times as high and has only recently fallen below 60 per cent.

Given the size of the underlying economies, one might think that the euro is 'punching below its weight'¹⁶. After all, the US and European economies are about the same size (Figure 2). A closer look at the data sheds light on why the euro failed to gain more ground in global markets.

The share of the euro declined significantly during the financial and sovereign debt crisis, between 2009 and 2015, when the euro area was hit by asymmetric shocks that were met with inadequate policy responses. During this phase, fiscal policies supported the economy for a short time but then turned into procyclical fiscal consolidation. Interventions were uncoordinated and inconsistent with the appropriate fiscal stance at European level.

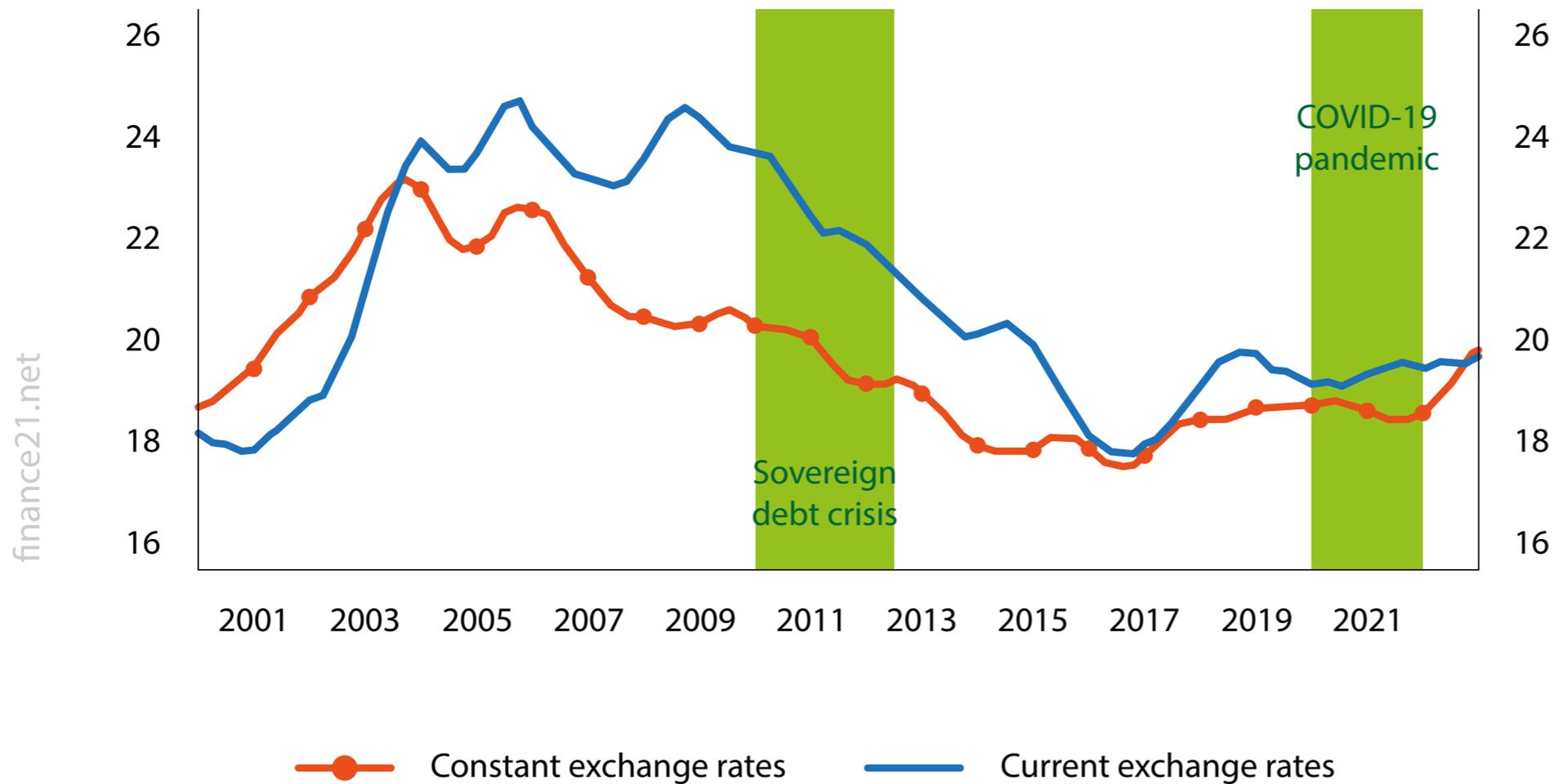
As a result, a fault line emerged between a 'core' and a 'periphery', leading to deep economic, social and political divisions. Investors believed that the euro area could break up under pressure.

Unsurprisingly, procyclical policies and conflicting messages from policymakers did little to reassure them. It was President Draghi's 'whatever it takes' statement that turned the tide in financial markets, making it clear to everyone that the euro would weather the storm¹⁷.

Now let's fast-forward to more recent times. Between 2020 and 2022, Europe was hit by a series of large and persistent supply shocks. The pandemic and the invasion of Ukraine depressed economic activity and caused a rise in uncertainty that was in many ways more significant than that experienced a decade earlier.

Figure 1. ECB Composite Index of the international role of the euro (1)

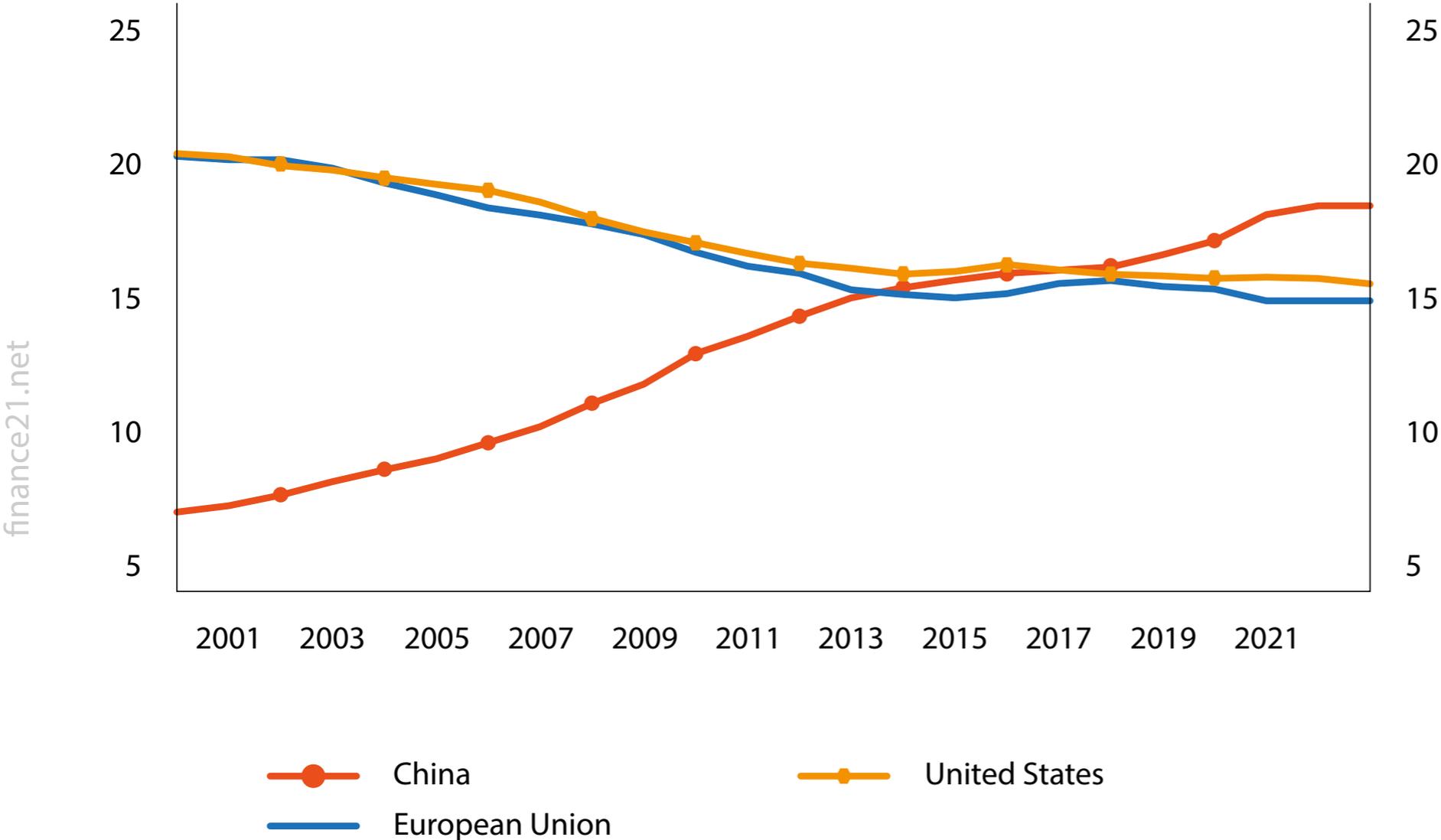
(quarterly data; percentage points)



(1) Four-quarter moving average, at current and constant Q4 2022 exchange rates. Arithmetic average of the shares of the euro in stocks of international bonds, loans by banks outside the euro area to borrowers outside the euro area, deposits with banks outside the euro area from creditors outside the euro area, global foreign exchange settlements, global foreign exchange reserves and global exchange rate regimes. See ECB (2023).
Source: ECB.

Figure 2. GDP based on purchasing power parity (1)

(annual data; percentage points)



(1) Share of world GDP.
Source: IMF, World Economic Outlook, October 2023.

These shocks also clogged production lines, and dramatically disrupted trade flows. However, this time round they hit an institutional system that was better equipped to deal with them.

Moreover, they were countered by a mix of strong and coherent policy responses at both European and national level. As a result, they had no impact on the IRE: the euro held its ground, and by some measures even strengthened during this period.

It is risky to draw general conclusions from a few observations. However, it seems clear to me that both the nature of the shocks and the policy responses were crucial in these episodes. The euro area is vulnerable to shocks that fragment its economy and financial markets along national lines; the problems are exacerbated when coordination problems hamper or even impede an effective policy response.

Yet Europe can easily withstand large shocks, as long as it sticks together and responds quickly and decisively with appropriate policies. While it may still be true that Europe 'will be forged in crises', as Jean Monnet famously declared¹⁸, it is also true that not all crises are equal and not all responses are the same.

3. Enhancing the international role of the euro

So, how can we promote the IRE? The creation of a global currency is a complex phenomenon that requires many ingredients. Economic size is certainly essential, but not sufficient. Three other factors come to mind.

3.1 The policy mix

The first and most obvious ingredient is macroeconomic stability. When foreign investors buy euro-denominated assets, they are effectively buying a stake in our economy. The dividend they expect is economic growth and low and stable inflation, and the only way to guarantee this dividend is to implement credible, effective and countercyclical macroeconomic policies.

Even a structurally sound country would struggle to maintain its global role if it lurched from one recession to the next, or experienced frequent bouts of inflation or deflation. This means that getting the 'policy mix' right is of paramount importance.

The Great Moderation is now a fading memory, and there is a good chance that Europe will again face situations that require a joint European monetary and fiscal response. The pandemic provides a template for how these situations should be managed; the sovereign debt crisis arguably provides a template for how they should not be managed.

3.2 Capital markets

The second key ingredient is a better meeting place for savers and borrowers. To retain domestic investment and attract resources from abroad, Europe needs liquid and integrated capital markets.

This was the idea behind the Capital Markets Union (CMU) initiative launched by the European Commission in 2015, as well as the Commission's Action Plan of 2020. The CMU could play a key role in diversifying the financing of EU companies, in strengthening private risk sharing and in providing better investment opportunities for domestic and foreign savers.

However, capital markets in Europe are still underdeveloped compared with those in other major advanced economies. Despite efforts to harmonize rules and integrate national markets through the implementation of European legislation, progress towards a single European market has been limited.

Over the past 25 years, financial integration has followed roughly the same path as the IRE (Figure 3). After rising steadily in the early 2000s, it fell to a minimum in the sovereign debt crisis. The positive trend resumed in 2012, following the announcements of the establishment of the Banking Union and the ECB's Outright Monetary

Transactions and, apart from a temporary dip in 2020, integration maintained its momentum throughout the COVID pandemic.

This is no coincidence: it indicates that the global relevance of the euro goes hand in hand with the degree of financial integration within the EMU. The data also show that, after these ups and downs, European markets are about as integrated today as they were in 2003-2004. I dare say that this result falls short of the European Commission's initial aspirations¹⁹.

How can we do better? I will not bore you with a detailed review of the CMU, but I would like to mention two issues that I consider critical from the perspective of a 'global euro'. The first problem is the lack of a European safe asset. The availability of a common risk-free benchmark is necessary for critical financial activities.

It would facilitate the pricing of risky financial products such as corporate bonds or derivatives, thereby stimulating their development. It would provide a common form of collateral for use in centralized clearing activities and crossborder collateralized trading in interbank markets.

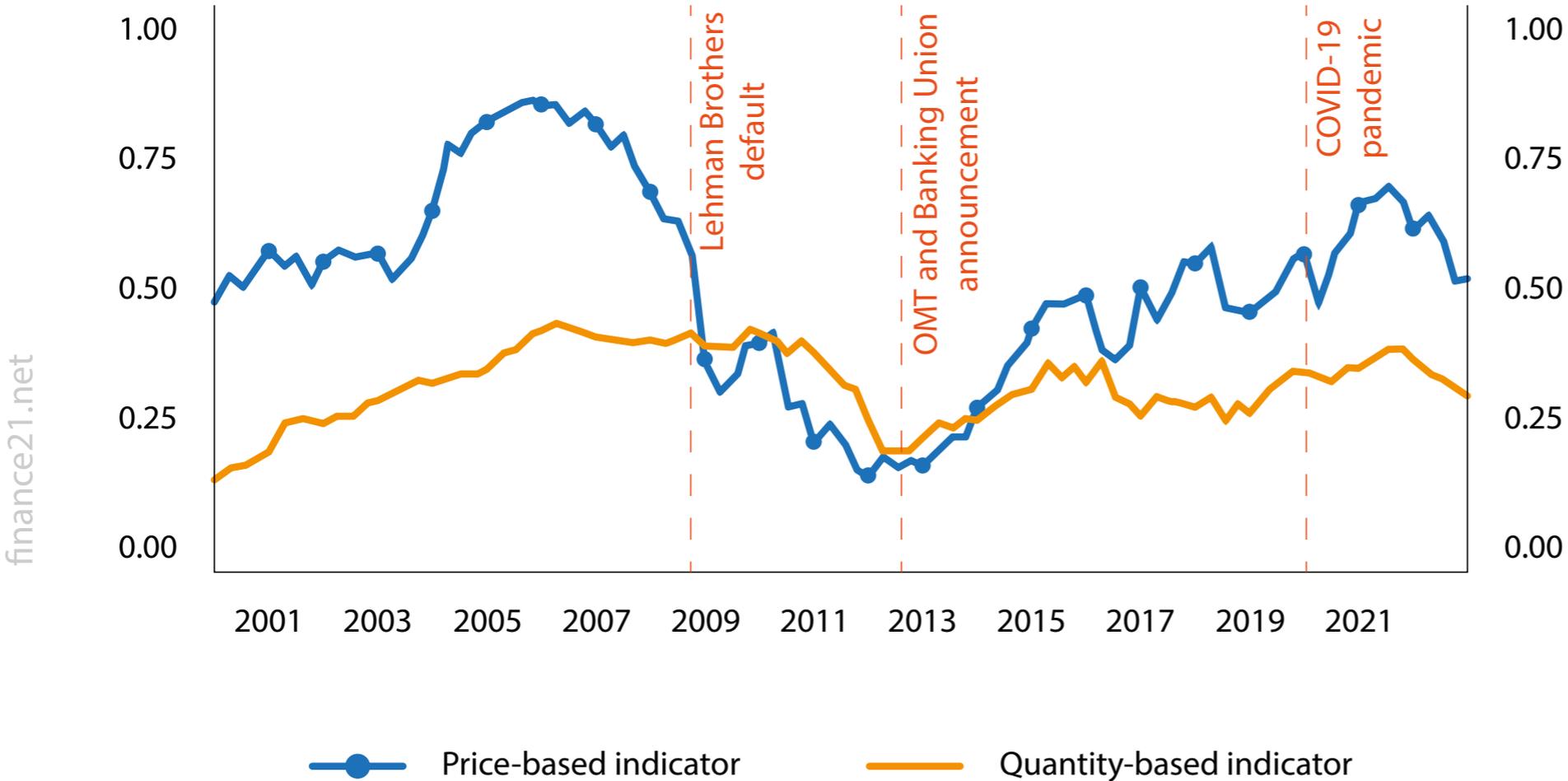
It would help diversify the exposures of both banks and non-banks. It would form the basis of the euro-denominated reserves held by foreign central banks. And the list goes on.

A scarce supply of safe euro-denominated assets is perhaps the single most important constraint on the CMU, and hence on the global reach of the euro²⁰.

The issuance of the Next Generation EU bonds is a first and welcome step in this direction, but a one-off programme is not a game changer: to stimulate the development of the CMU and strengthen the IRE, we would need a steady, predictable supply of 'safe assets'.

Figure 3. Financial integration composite indicators (1)

(quarterly data)



(1) The price-based composite indicator aggregates ten indicators for money, bond, equity and retail banking markets; the quantity-based composite indicator aggregates five indicators for the same market segments except retail banking. Both indicators measure integration on a scale from zero (no integration) to one (perfect integration). See *Financial Integration and Structure in the Euro Area*, ECB Committee on Financial Integration, April 2022.

Source: ECB.

The second problem is that we do not have a fully-fledged banking union (yet). The creation of a Single Supervisory Mechanism and a Single Resolution Mechanism after the financial crisis was a quantum leap in this respect, but it was not sufficient to create a single banking market.

The European banking sector remains largely segmented along national lines: in 2021, banks held domestic assets worth more than four times the value of their non-domestic euro-area assets²¹. This poses a problem for the creation of a genuine CMU, as banks play a central role in all the major financial centres.

They operate – and often lead – in key segments such as asset management, bond underwriting and initial public offerings, they provide financial advice and they trade actively in securities markets, often providing critical market-making services. It is therefore difficult to imagine a genuine CMU without banks that are able to operate smoothly throughout the euro area. Improving in these dimensions is as important as ever.

In the coming years, Europe may have to navigate a more challenging global political environment than in the past. It will also have to deliver on its ambitions in areas such as defence and the green and digital transitions. As I have argued elsewhere, a fully functioning CMU would greatly enhance its chances of success²².

3.3 Payment systems and market infrastructure

The third component is payment and market infrastructures fit for the 21st century. These are an essential part of the ‘plumbing’ of the financial system.

Digitalization is clearly the defining challenge of our time: it is a profoundly transformative process that is already having a vast and complex impact on society. Payments are no exception to this trend: demand for digital payment services has grown markedly around the world, especially in the aftermath of the COVID pandemic²³.

In this landscape, a central bank digital currency (CBDC) can play an important role²⁴. The good news is that Europe is in many ways at the forefront of the progress in this area. Many will be familiar with the digital euro, the retail CBDC that is being considered by the Eurosystem.

In addition to making life easier for European citizens, a digital euro would offer great opportunities at international level if it could be made available outside the euro area or used for cross-currency payments²⁵.

The same applies to a wholesale CBDC. Unlike the retail version, this is already a reality: the TARGET infrastructure operated by the Eurosystem, which allows banks to settle euro-denominated digital transactions in central bank money via a central ledger, has been operating successfully for decades²⁶.

Building on this experience, the Eurosystem is now exploring new solutions based on distributed ledger technology (DLT), and how these could interact with the existing TARGET infrastructure²⁷. Digital central bank money is not the only game in town: many other initiatives have been launched to modernize and enhance the EU's infrastructures.

These include, for instance: (i) promoting the linking of TIPS (the euro area's Target Instant Payment Settlement mechanism) with fast payment systems in other countries²⁸; (ii) developing the Eurosystem Collateral Management System²⁹; (iii) adopting the new EU Regulation on Markets in Crypto Assets (MiCA) to regulate the cryptoasset ecosystem³⁰; (iv) adopting the Eurosystem's Cyber-resilience strategy for Financial Market Infrastructures³¹; and (v) revising the European Market Infrastructure Regulation (EMIR) to support the growth and resilience of European clearing services and reduce reliance on third-country central counterparties³².

As well as supporting the IRE, these developments will give a much-needed boost to global crossborder payments, which are currently expensive, sluggish and not very inclusive³³.

4. Conclusions

Before I conclude, let me step back from the technicalities and take a look at the big picture. The rise and fall of global currencies is often seen as a structural process that unfolds slowly and smoothly over time.

History tells us otherwise: in the last century, the dollar overtook sterling as the main invoicing currency in the immediate aftermath of the First World War and equalled its share of global bond issuance around 1929.

However, its rise reversed sharply with the Great Depression, and the two currencies coexisted at the apex of a bipolar monetary system until the 1950s. In short, the making – or unmaking – of an international currency is not only complex, but also volatile, non-linear and less predictable than most people think.

This means that the IRE is not set in stone. Over the next decades, the euro could maintain its role, be relegated to the periphery of the global monetary system, or gain a stronger position at its centre. A combination of factors is needed to strengthen its role.

We need effective macroeconomic policies that deliver macroeconomic stability; a fully-fledged banking and capital market union; and dynamic, future-proof payments and market infrastructures.

The common thread behind these initiatives is that they all reinforce the integration process; they would allow us to build on our past achievements and take the EMU a step closer to a truly integrated monetary, fiscal and political union.

The recipe may seem difficult to implement, but it is what Europe's citizens expect of their governing institutions: the IRE is just another good reason not to let them down. The stakes are high, because the euro is the keystone of

the EMU, and the EMU is much more than just an economic arrangement: it reflects the dedication of its members to European unification.

In times of geopolitical tensions, it also functions as a collective defence clause: any attack against a member affects the single currency, a crucial aspect of our shared sovereignty, and is consequently an attack against the entire Union³⁴.

The EMU is the vehicle that generations of Europeans have built to pursue peace, freedom and prosperity together. It embodies their desire to walk and work together on the world stage. As such, it deserves our unwavering support. ■

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Endnotes

1. At the Helsinki summit in December 1999, the European Council decided to convene bilateral conferences to begin negotiations with Latvia, Lithuania, Romania, Slovakia, Bulgaria and Malta.
2. Seigniorage is the profit made by a central bank (and hence by a government) by issuing currency. This profit can be very significant when a currency is widely used internationally.
3. The expression 'exorbitant privilege' was created by Valéry Giscard d'Estaing in the 1960s with reference to the advantages that the United States has due to the US dollar's role as the global reserve currency.
4. ECB, 2019, *The international role of the euro*; Gourinchas, Rey and Sauzet, 2019, *The international monetary and financial system*, *Annual Review of Economics* 11, 859-893.
5. Rey, 2019, *International monetary systems and global financial cycles*, Bank of Italy Baffi Lecture on Money and Finance.
6. ECB, 2019, cited.
7. See eg. Cova P, Pagano P and Pisani M (2016), 'Foreign exchange reserve diversification and the "exorbitant privilege": global macroeconomic effects', *Journal of International Money and Finance*, 67, 82-101.
8. The estimate for the US is taken from Krishnamurthy A, and Annette Vissing-Jorgensen, A (2012), 'The aggregate demand for Treasury debt', *Journal of Political Economy*, 120 (2), 233-267. The paper shows that the discount depends on the debt-to-GDP ratio and is lower when debt is high (implying an ample supply of government bonds). Based on an average debt-to-GDP ratio of about 44 per cent in the pre-2008 data, the authors estimate an average discount of 53 basis points and a seigniorage revenue of 0.23 per cent of GDP. The euro area calculation reported in the text assumes similar debt demand curves for the US and a hypothetical euro area debt issuer, which is clearly a simplification. We apply the discount to the euro area debt-to-GDP ratio observed at the end of 2022, which was 91 per cent.
9. Financial markets provide another perspective on this issue. Bond purchases by central banks, finance ministries and sovereign wealth funds have a large impact on yields: a \$100 billion purchase can reduce the 10-year Treasury yield by 50 basis points over a one-year horizon (see Ahmed, R, and Rebucci, A, 2022, 'Dollar reserves and US yields: Identifying the

price impact of official flows', National Bureau of Economic Research Working Paper no. 30476). At the end of 2022, global foreign exchange reserves amounted to €11.4 trillion, of which 80 per cent (around 9.1 trillion) were in currencies other than the euro. Based on the above estimate, and assuming euro- and dollar-denominated bond markets to behave in the same way, a shift of 1% of these reserves (0.9 trillion euros) into euro-denominated bonds could reduce European yields by 45 basis points.

10. *Wall Street Journal, 'How China manages its currency, and why that matters', 2 January 2024. The share increased from 13 per cent to about 25 per cent between 2020 and 2023.*

11. *Wall Street Journal, 'China's Yuan is quietly gaining ground', 27 December 2023.*

12. *After the dollar. See Financial Times, 'China's renminbi pips Japanese yen to rank fourth in global payments', 21 December 2023. The ranking is based on the currencies' shares in the payments settled through the Swift platform.*

13. *After the dollar, euro and sterling.*

14. *See eg. ECB, 2023, The international role of the euro.*

15. *The figures are based on the composite indicator employed in the ECB (2023). The indicator is the arithmetic average of the shares of the euro in stocks of international bonds, loans by banks outside the euro area to borrowers outside the euro area, deposits with banks outside the euro area from creditors outside the euro area, global foreign exchange settlements, global foreign exchange reserves and global exchange rate regimes.*

16. *Ilzetki, E, Reinhart, CM and Rogoff, KS (2020), 'Why is the euro punching below its weight?', Economic Policy, 35(103), 405-460.*

17. *Panetta F, 'Europe's shared destiny, economics and the law', Lectio Magistralis on the occasion of the conferral of an honorary degree in Law by the University of Cassino and Southern Lazio, 6 April 2022.*

18. *Monnet, J (1978), Memoirs, Collins, London.*

19. *Medium-term trends show that access to market-based finance for companies has deteriorated, the amount of loans transformed into market instruments such as securitization has fallen significantly, intra-EU integration has deteriorated slightly, while the amount of household wealth in the form of securities has shown little progress, AFME, 'Capital Markets Union. Key Performance Indicators – Sixth Edition', November 2023.*

20. Ilzetzki et al (2020), cited.
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22. See Panetta F (2023), 'Europe needs to think bigger to build its capital markets union', Politico, 30 August 2023, and Panetta F (2023), 'United we stand: European integration as a response to global fragmentation', speech delivered at a Bruegel meeting on 'Integration, multilateralism and sovereignty', Brussels.
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25. The ECB and the euro area National Central Banks are exploring options for using CBDCs to make cross-currency payments faster, cheaper, more transparent and more inclusive. See CPMI, BISIH, IMF, WB (2022), Options for access to and interoperability of CBDCs for crossborder payments.
26. Panetta, F (2022), 'Demystifying wholesale central bank digital currency', speech at the Symposium on 'Payments and Securities Settlement in Europe – today and tomorrow', hosted by the Deutsche Bundesbank, 26 September 2022.
27. The exploration involves trials and experiments to create a 'technological bridge' between the central bank's currency settlement system and the external private DLT platforms that manage tokenized digital assets. The tests have been conducted independently so far by Banca d'Italia, Banque de France and the Bundesbank. See H Neuhaus and M Plooi, 'Central bank money settlement of wholesale transactions in the face of technological innovation', published as part of the ECB Economic Bulletin, Issue 8/2023.
28. Tests have been successfully carried out on the connection of the instant payment systems of the Eurosystem, Malaysia, and Singapore, using the Bank for International Settlements Project Nexus model. A Proof of Concept was successfully executed between TIPS and Buna, the crossborder and multi-currency payment platform for the Arab region.
29. The Eurosystem Collateral Management System (ECMS) is a unified system for managing assets used as collateral in Eurosystem credit operations. Together with the other TARGET Services offered by the Eurosystem, the ECMS will ensure that cash, securities and collateral flow freely across Europe.

30. MiCA aims to regulate the issuance, offer to the public, admission to trading and provision of services relating to digital representations of rights and value based on DLTs, defined as cryptoassets.

31. The strategy is based on three pillars: (i) fostering the readiness of financial entities by providing a range of tools to assess euro-area payment systems and financial infrastructures; (ii) strengthening the resilience of the financial sector as a whole, by implementing market-wide business continuity exercises; and (iii) enhancing cooperation and information sharing on cyber threats among the major financial entities through the establishment of the Euro Cyber Resilience Board for Pan-European Financial Infrastructures.

32. One of the main measures proposed by the European Commission is that all the relevant market participants would be required to hold active accounts with European CCPs. Other proposed measures are meant to strengthen the existing supervisory framework for EU CCPs. See EUR-Lex - 52022PC0697 - EN - EUR-Lex (europa.eu).

33. Panetta F (2023), 'The world needs a better crossborder payments network', *Financial Times*, 31 October 2023.

34. Article 42(7) of the Treaty on European Union states that 'If a member state is the victim of armed aggression on its territory, the other member states shall have towards it an obligation of aid and assistance by all the means in their power, in accordance with Article 51 of the United Nations Charter'. This principle was recalled by the EU Heads of State and Government in the Versailles Declaration of 10 and 11 March 2022.

This article is based on an [address](#) delivered at the Conference Ten years with the euro, Riga, 26 January 2024.

Demystifying fears about bank disintermediation

The ECB's Governing Council has decided to proceed with the 'preparation phase'. Ulrich Bindseil, Piero Cipollone and Jürgen Schaaf focus on the debate around the impact of a digital euro on bank funding

Central banks explained early on and in great detail the reasons why they are working on central bank digital currencies (eg. ECB 2020). Despite strong support by consumer organisations (BEUC 2023) and merchants (EuroCommerce 2023), and an overall positive reception by academic economists (eg. Brunnermeier and Landau 2022), there are still critical voices.

Some doubt the usefulness of CBDCs (eg. Waller 2021, Bofinger 2022, *Financial Times* 2023; *The Economist* 2023), while others worry about their potential negative side effects and risks (eg. bank disintermediation). Central bankers have taken these concerns seriously¹ and have not only explained further the rationale for CBDCs but also addressed them through CBDC design choices (ECB 2023c).

In this column, we focus on the debate around the impact of a digital euro on bank funding since the ECB announced the likely design features and the European Commission published its draft regulation on a digital euro. We argue that earlier concerns should be reassessed now that they have been effectively addressed by design choices which need to be incorporated into the analysis.

Key design features of a digital euro as of October 2023

On 18 October 2023, following the conclusion of the investigation phase of the digital euro project, the ECB's Governing Council announced a specification of the functional scope and key features of a digital euro (see ECB 2023c, which aggregates and completes the findings from ECB 2022a, 2022b, 2023a and 2023b).

The Governing Council also decided to proceed with the 'preparation phase' of the project. The preparation phase focuses on additional experiments, selecting service providers, prototyping, and aligning with the ongoing efforts of relevant European co-legislators preparing the legal framework for a digital euro (Cipollone 2023).

The actual decision on whether to issue a digital euro will be taken at a later stage, but not before the legal framework is in place and all functional features have been specified.

Based on ECB (2023c) and European Commission (2023), one can expect the digital euro's features to include pan-European reach, legal tender status, and a high level of privacy. A digital euro would combine all the features of a modern digital payment solution, offering convenience and safety to its users. Just like cash in the physical world, a digital euro would allow citizens to pay with central bank money in the digital world.

It is now widely accepted that a pan-European digital retail payment instrument is needed to secure Europe's strategic autonomy and to lead the monetary union into the digital age in an integrated manner

It would fill the gap left by the absence of a European electronic payment solution that is available and accepted free of charge throughout Europe, thereby strengthening the monetary sovereignty and resilience of the currency union (Schaaf and Bindseil 2023).

To avoid an increase in the footprint of the central bank and preserve the economic function of commercial banks, individual digital euro holdings would be limited². Merchants would be able to receive and process digital euro, but not hold them. Moreover, digital euro holdings would not accrue interest.

Last but not least, users would be able to seamlessly link their digital euro account to a payment account with their bank, enabling a 'reverse waterfall' mechanism. This eliminates the need to pre-fund the digital euro account for online payments, as any shortfall would be covered instantly from the linked commercial bank account, provided it has sufficient funds available³.

Earlier concerns have been addressed by the design blueprint

In the debate about CBDCs, questions concerning their necessity and the risk to bank funding were at the centre of the discussion from the outset. It is now widely accepted that a pan-European digital retail payment instrument is needed to secure Europe's strategic autonomy and to lead the monetary union into the digital age in an integrated manner.

The continued availability of both central bank money and commercial bank money to citizens anchors the monetary system (as private money is in essence defined by a promise of convertibility into central bank money) and preserves the established competition between the two forms of money for the benefit of citizens⁴.

The debate about the risk of bank disintermediation has evolved differently. In theory, CBDCs could affect financial institutions, as depositors might choose to move money from commercial bank deposits into CBDCs. This could in turn reduce the ability of the traditional banking system to provide credit.

However, central banks (Sveriges Riksbank 2017, ECB 2020, Bank of England 2020) and other public institutions (BIS 2020, CPMI 2018, Mancini-Griffoli *et al* 2018) have analysed the issue in an objective way to prepare for and find ways to tackle such risks, including through modelling and granular empirical research (Adalid *et al* 2022, Meller and Soons 2023). The possible implications for monetary policy implementation and central bank liquidity provision have also been studied in detail (Bindseil 2020, Caccia *et al* 2024).

Banking associations, bank-sponsored think tanks, roundtables (Thomadakis *et al* 2023), and scholars (Bofinger and Haas 2023) have published multiple studies and analyses emphasising the risks of bank disintermediation in the context of the potential issuance of CBDCs in general and of a digital euro in particular. But these analyses – including the most recent bank-sponsored studies (Næss-Schmidt *et al* 2023, Tenner *et al* 2023) – disregard the predictable effects of the intended design of a digital euro.

The combination of the reverse waterfall, a holding limit, and no remuneration will strongly reduce incentives to keep money in a digital euro wallet. Users would rely on digital euro as means of payments rather than of investment – particularly in view of the tendency of money holders to consolidate their liquidity pool. Moreover, banks could always offer higher remuneration to retain deposits (Cipollone 2024).

The digital euro is designed to act as the next level in the development of cash as a means of payment – stepping in to compensate for the declining role of paper money. Moreover, the decision to exclude merchants (and any

other firms) from storing digital euro and to require them to transfer any digital euro position instantly to their bank account will help protect the corporate deposit base of the banking system.

Revisiting the main concerns

Critics continue to argue that demand for a digital euro would be so high that there would be a large flow of deposits from banks to the ECB. Such an outflow could be problematic in three ways.

First, it is argued that, if a *single* bank is in trouble, it would be very easy to withdraw funds deposited with that bank and move them to the deposit facility offered by the central bank (Kumhof and Noone 2018). However, it is already the case today that retail customers can transfer deposits to another private bank with a single click or tap, sometimes even in real time, or they can invest in a money market fund or government bond. Moreover, there is no limit on such transfers, while holdings of digital euro would be subject to limits.

Second, critics say that, in an acute *economy-wide banking crisis*, a digital euro could lead to accelerated bank runs, which could exacerbate the crisis (EBF 2021, Angeloni 2023a). This is, however, not very plausible, for the following reasons:

- If a limit is applied to digital euro holdings, the ability of customers to withdraw *unlimited* amounts of cash, would be much more relevant from the perspective of banks. Indeed, the disadvantage of cash as a short-term store of value because of safety concerns would be relatively unimportant at such an order of magnitude.
- Even in severe banking crises, many banks are still considered safe (particularly as central banks act as a system-wide lender of last resort). For example, in 2008, during the great financial crisis, but also in the recent

US regional banks crisis, such banks benefited from inflows.

- In recent decades, bank runs have generally not been triggered by large numbers of retail customers withdrawing small deposits, but by incidents in the wholesale market⁵ or the withdrawal of very large individual amounts above the thresholds covered by deposit guarantee schemes⁶.

Third, the attractiveness of safe central bank money could lead to *banks losing deposits as a source of refinancing in the long term*. This could put a strain on lending to companies and private households. According to the Association of German Banks, substantial quantities of central bank money could be withdrawn from the banking system, which would restrict the ability of commercial banks to refinance against customer deposits (Tenner *et al* 2023).

However, the combination of a holding limit, zero remuneration, the reverse waterfall, and the absence of corporate holdings of digital euro would imply rather low overall levels of digital euro holdings.

Analysis must include banknotes

What matters is the total amount of central bank money in circulation (Cipollone 2024). Focusing on digital euro alone ignores banknotes in circulation, which would be misleading as both are identical in how they affect the financial accounts of the economy.

Banks experienced elevated demand for euro banknotes during the period of financial stress and low interest rates, but they never raised this as an issue. Between 2007 and 2021, euro banknotes in circulation increased from €628 billion to €1,572 billion, an increase of almost one trillion euros, which is far more than can be expected to be issued in the form of digital euro, given the current blueprint.

The declining use of banknotes for daily transactions will eventually also reduce the structural demand for banknotes. By definition, the purpose of a 'store of value' is that it should eventually be spent.

Therefore, the store of value function also relies on the ease at which money can ultimately be spent, so the decline in the use of banknotes also risks reducing their attractiveness as a store of value in the long term.

Indeed, in 2023 the value of euro banknotes in circulation declined for the first time in nominal terms since 2002, by around €5 billion. Even though only 20% of the demand for banknotes can be attributed to domestic payment functions⁷ and this trend reversal is probably mainly a reflection of higher interest rates, the digitalisation of payments is also a factor.

Digitalisation in general, even when factoring in the issuance of a digital euro as outlined in ECB (2023c), may well lead to lower real growth in central bank money in circulation than in the past, or even to a decline.

From this perspective, the persistent complaints regarding future volumes of digital euro in studies sponsored by the banking system are not looking at the right variable (which is central bank money in circulation) and outdated (by ignoring the digital euro blueprint).

Conclusion

As the ECB progresses in developing a digital euro, it will continue to refine design choices, address potential risks, and optimise benefits. The investigation phase of the project has yielded innovative design features that would contain the circulation of digital euro while offering benefits to users.

The concerns regarding bank funding have thus been taken seriously. Moreover, the eventual holding limits will be calibrated on the basis of a comprehensive analysis considering all relevant factors (Cipollone 2024).

What really matters for banks in this context is the total volume of central bank money in circulation. Amid the declining use of banknotes, it is likely that nominal growth in banknotes in circulation will diminish or even turn negative.

This suggests a possible scenario of a decline of central bank money in circulation relative to GDP. It is often overlooked that the introduction of CBDCs by central banks is a reaction to the declining role of paper money in payments.

Moreover, new players, like stablecoins, e-money institutions and other narrow bank constructs, some sponsored by Big Tech companies with huge customer bases, do not care about banks and their role in the economy and pose a greater risk to bank funding than CBDCs. Non-banks have no obvious incentive to limit the use of their stablecoins or the services they offer (Panetta 2023), and the use of stablecoins could become significant.

This would hold particularly true if it was accepted that central bank money does not follow digitalisation but stays exclusively in paper form. It seems important that such firms should not be allowed to hold significant customer funds on the balance sheet of the central bank (Bindseil and Senner 2024).

It would be absurd for central banks to limit holdings of CBDCs while allowing unlimited deposits with the central bank from non-bank payment service providers issuing what might be called a 'synthetic CBDC' (ie. a stablecoin backed by central bank deposits).

Banks are barking up the wrong tree when they rely on studies that overlook the outlined design features of the digital euro: in doing so, they ignore the many other challenges they need to address to ensure stable funding through deposits.

Banks have to offer attractive products and services to incentivise customers to hold their deposits at banks rather than migrate to new and powerful private competitors.

And the digital euro is also a unique opportunity for banks, as it will allow them to launch new and innovative products, address new use cases, and extend their scope beyond domestic markets. ■

Ulrich Bindseil is Director General of Market Infrastructures and Payments, Piero Cipollone is a Member of the Executive Board, and Jürgen Schaaf is and Advisor to the Senior Management of Market Infrastructure and Payments, all at the European Central Bank

Endnotes

- 1. Some more radical economists have indeed advocated CBDCs to disintermediate the banking system and have suggested combining the introduction of CBDCs with a prohibition on banks issuing sight deposits. These economists argue that this would improve financial stability, as it would prevent bank runs and, by implication, banking crises. At the same time, it would save taxpayers' money, as banks would no longer need to be rescued and more seigniorage income would be earned by the central banks and passed on to government (Huber 2017, Dyson et al 2016). Central banks and legislators (at least in the EU) have not endorsed these views but instead defended the role of banks and have designed CBDCs accordingly.*
- 2. While the limit will be set based on further in-depth analysis before a possible issuance of a digital euro, an order of magnitude of €3,000 per resident has been mentioned (Bindseil et al 2021).*
- 3. The envisaged offline function of the digital euro would require sufficient prefunding. Moreover, a holding limit and zero remuneration would still apply.*
- 4. As the European Banking Federation (EBF) states: "The banking industry supports a long-term vision of European strategic autonomy in payments and sees that new forms of digital currencies and payment methods will be needed to support the multi-faceted digitalisation of the economy. We envision a future digital economy where Europe has a strong, resilient, innovative and competitive payments and digital asset ecosystem, with enhanced European strategic autonomy" (EBF 2023).*
- 5. Deutsche Bank cut a €67 million trading line to a mid-sized bank, IKB Deutsche Industriebank, on 27 July 2007, during the subprime crisis. IKB's then CEO, Stefan Ortseifen, told a court that Deutsche Bank's decision to cut credit lines had caused immeasurable reputational damage to IKB, crimping its ability to function normally in turbulent markets. Deutsche Bank denied the allegations. IKB became a high-profile casualty of the credit crisis and required several bailouts.*
- 6. For example, the run on Silicon Valley Bank (SVB) in March 2023 started amid rumours about its solvency. According to the Californian supervisory authority, on 9 March alone customers tried to withdraw \$42 billion – a quarter of the bank's total deposits. Individual deposits in the US are guaranteed up to \$250,000. However, more than 90% of SVB's customers had deposits that were significantly higher.*

7. Cash used as a means of payment in the euro area accounts for around 20% of the value of euro banknotes in circulation, while the majority of cash holdings relate to its store-of-value function and its use abroad (Zamora-Pérez 2021).

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From laggard to leader?

Isabel Schnabel emphasises the euro area's strengths in social protection and environmental initiatives, and advocates measure to close the euro area's technology gap

More than 30 years after its inception, Economic and Monetary Union is widely seen as a success. It has steadily gained support among Europeans. Nearly 80% of euro area citizens support the single currency¹. This is a strong vote of confidence, which shows that the euro is more than a currency. Our monetary union has become a global leader in social protection, a pioneer in fighting climate change and a guardian of free trade and democracy.

But these values and achievements are being increasingly questioned and challenged in a world that is becoming less open, less stable and less reliable². To assert its role, the euro area needs to remain competitive; it must be capable of creating the sustainable growth that our social and economic fabric depends on.

However, this capability is increasingly under threat. At the turn of the millennium, Europe was operating at the global technological frontier, but today many euro area firms are laggards. Compared with many of their global peers, they invest less in both physical capital and research and development, and they are less productive.

I will explain the factors behind the euro area's competitiveness crisis and propose remedies to address its deeper root causes. I will argue that our most potent weapon for enabling European firms to catch up to the technological frontier is to eliminate the remaining barriers to the free movement of goods, services and capital in the European Union. European firms would then be able to compete and thrive in an environment of disruptive technological change where the 'winner takes most'.

Europe's lost IT revolution

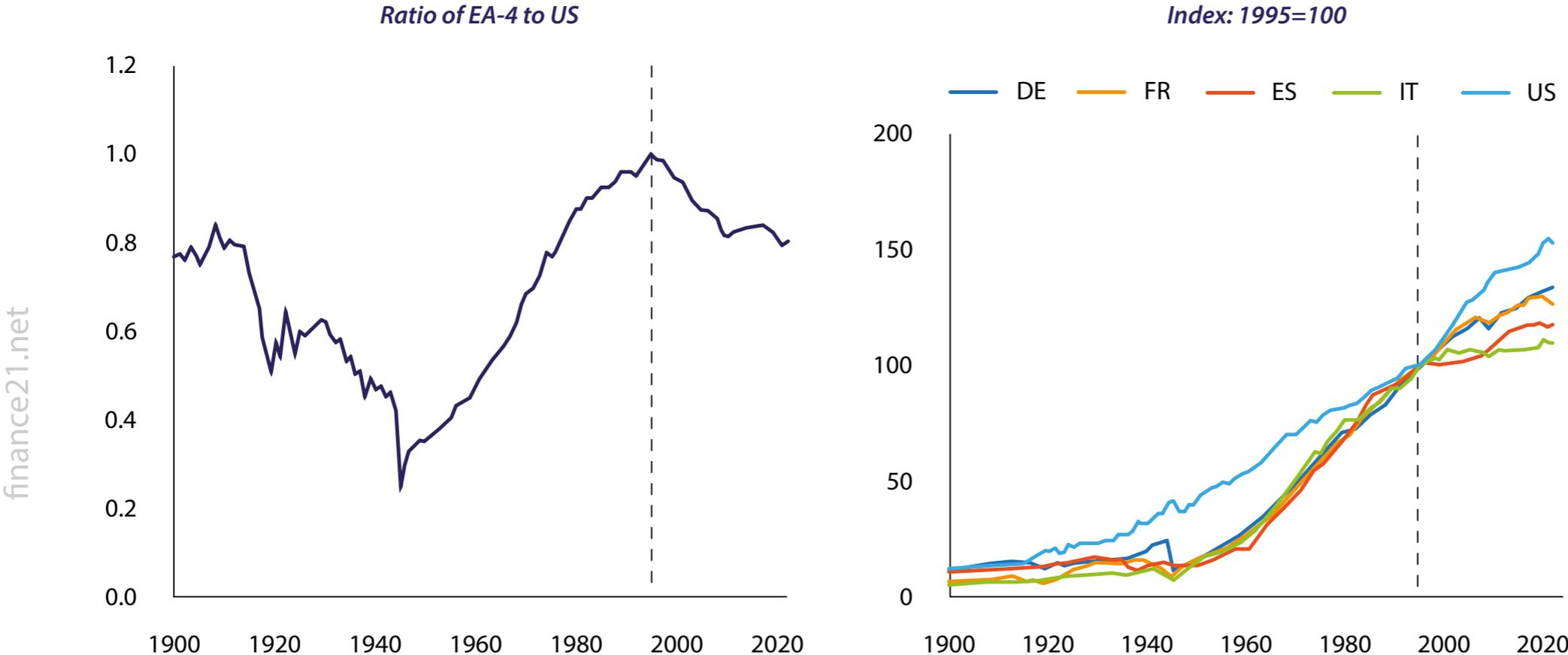
Europe looks back on a long history of innovation and fundamental transformation. In the 16th and 17th centuries, the discoveries of Nicolaus Copernicus and Isaac Newton marked watershed moments for social and scientific progress. In the 18th and 19th centuries, the rise of industrial Europe laid the foundations for modern society and the ensuing significant improvements in the standard of living.

After World War II, Europe once again became the world's engine of productivity growth. In the four largest economies in the euro area, the ratio of labour productivity compared with that of the United States increased rapidly, soaring from 25% in 1945 to 100% in 1995 and thereby closing the productivity gap with the United States (Slide 1, left-hand side)³.

Growing economic nationalism, threats to our territorial security and a rising technology gap between ours and other advanced economies make the case for boosting the euro area's competitiveness ever more urgent

Slide 1. Euro area started to lose competitiveness at the turn of the millennium

Long-term developments in productivity per hour worked



Notes: EA-4 is a weighted average of productivity developments in Germany, France, Italy and Spain.
Source: Long-Term Productivity Database and ECB calculations.

These gains were widely shared across euro area economies, reflecting the fast integration in trade and finance in the run-up to the establishment of the EU's Single Market, with new technologies spreading rapidly across borders (Slide 1, right-hand side)⁴.

So, going into the 21st century, Europe was operating at the global productivity frontier⁵. Productivity growth was slowing over time, but that was to be expected as the distance to the frontier narrowed. But in the following years, the euro area took a different course and fell behind other economies like the United States.

Between 1995 and 2007, annual growth in GDP per hour surged measurably in the United States, whereas it slowed and diverged in the euro area. By the time of the global financial crisis in 2008, euro area economies had accumulated productivity losses of some 20% relative to the United States, with the productivity ratio falling back to 0.8.

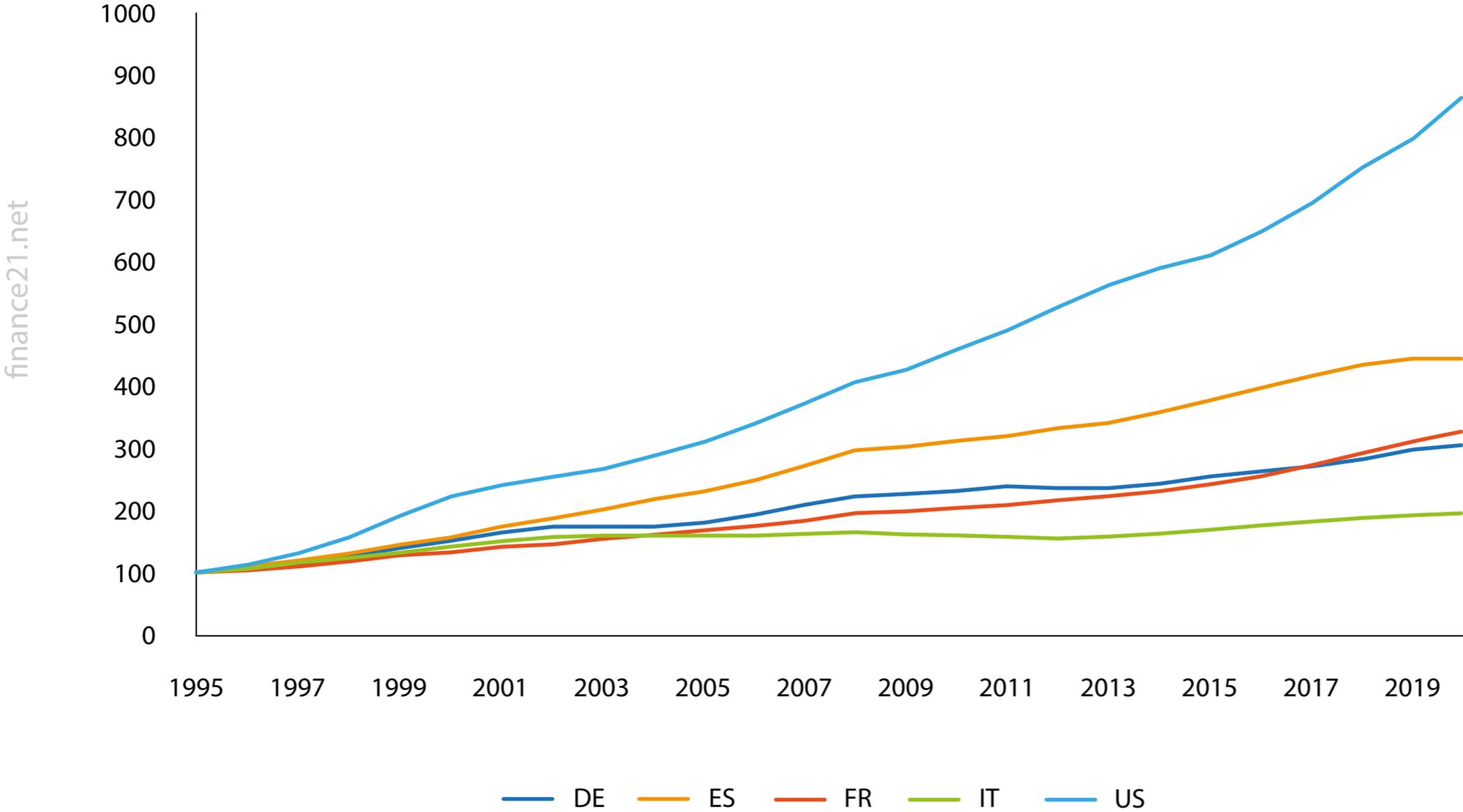
The euro area has not been able to recover from this loss of competitiveness. Productivity growth has remained subdued, a development reinforced more recently by the repercussions of the pandemic and the Russian war in Ukraine.

The dismal trajectory of Europe's productivity has been subject to much analysis. Most economists agree that European firms' failure to reap the efficiency gains brought about by information and communication technologies – or ICT for short – is one of the root causes⁶. This shows up in both the capital stock and total factor productivity.

Over the past three decades, a striking gap in the real IT-related capital stock has emerged between the euro area and the United States (Slide 2)⁷. Broad-based investments in ICT fundamentally transformed the US economy, especially the services sector, as ICT became a general purpose technology which radically changed the way many firms operated and served their customers⁸.

Slide 2. Rising gap in IT-related capital stock between euro area and United States

Real IT-related capital stock
(index: 1995=100)



Note: IT-related capital stock is the sum of computing equipment and computer software & databases for all NACE industries. See Schivardi, F and Schmitz, T (2020), "The IT Revolution and Southern Europe's Two Lost Decades", Journal of the European Economic Association, Vol. 18(5), pp. 2441-2486

Source: EUKLEMS.

As a result, annual productivity growth in the services sector in the United States increased by 3.2% on average between 1995 and 2005, compared with just 0.9% in Europe⁹.

But even in the United States, the productivity boost driven by the ICT boom proved temporary. Since the global financial crisis, productivity growth has been subdued across advanced economies, despite continued rapid technological change, including the rise of generative artificial intelligence (Slide 3).

The potential causes of this slowdown have been discussed intensively and controversially. Some argue that the most recent technological innovations are simply less revolutionary than earlier inventions, such as the railway, electricity or the telephone¹⁰.

Others claim that we have yet to see the full benefits of AI and other cutting-edge technologies, as history shows that technology adoption rates can be slow¹¹. In 1987 Robert Solow famously remarked that computers were everywhere except in productivity statistics¹².

Empirical evidence supports this second hypothesis. It finds that although technologies developed at the global frontier are spreading across countries ever faster, they are spreading to all firms within an economy ever more slowly¹³. Slow technology diffusion is also at the core of why firms in the euro area have failed to benefit from the ICT revolution. Two explanations have been identified in the literature.

The role of competition and capital markets

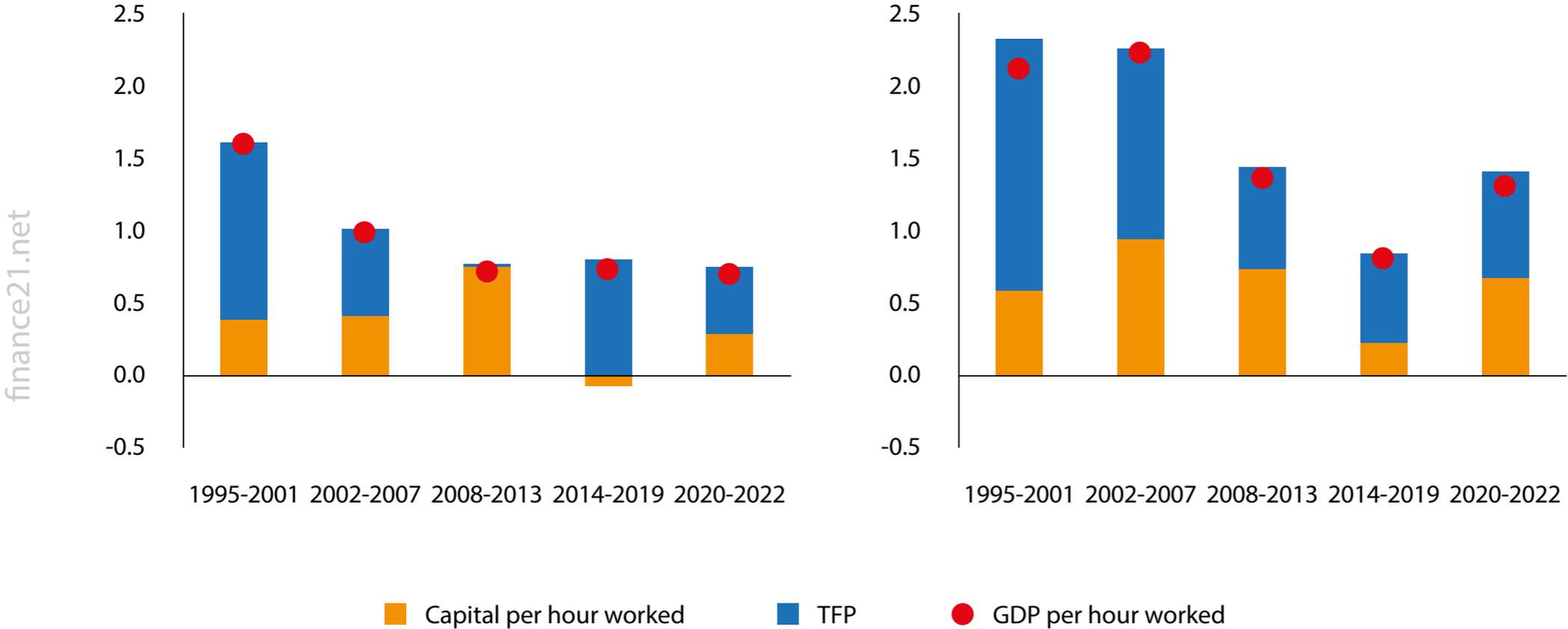
One is that the business environment in the United States made it easier, or more pressing, for firms to invest in ICT. Despite important progress on reforms in the wake of the sovereign debt crisis, product and labour markets in the euro area often remain heavily regulated¹⁴. For example, many euro area countries set higher administrative requirements for start-ups than other advanced economies¹⁵.

Slide 3. Global productivity growth has been subdued since the global financial crisis

Contributions to growth in GDP per hour worked

Euro area

United States



Note: Refers to Euro Area 19.
Source: AMECO data and ECB calculations.

High barriers to entry protect the rents of incumbents, reduce technology diffusion and constrain the entry of younger firms, which are more likely to innovate¹⁶. In the euro area, younger firms that survive are on average almost three times as productive as their older peers (Slide 4, left-hand side)¹⁷.

Most of this gap can be explained by young 'superstar' firms, which increase their productivity on average by around 100% per year. These firms invest more than their competitors, particularly in intangible assets, such as software and databases, and they use fewer and more specialised workers (Slide 4, right-hand side).

The link between firm demography, technology diffusion and productivity growth can be seen in the manufacturing sector in particular. The marked decline in productivity growth of high-tech frontier firms in this sector during the past decade coincided with a measurable slowdown in business dynamism (Slide 5, left-hand side)¹⁸.

Today, the average age of a high-tech frontier firm in the manufacturing sector is about 50% higher than it was before the global financial crisis, and about twice as high as that of their peers in the services sector (Slide 5, right-hand side). This lack of 'creative destruction' is often associated with a lower level of innovation activity¹⁹.

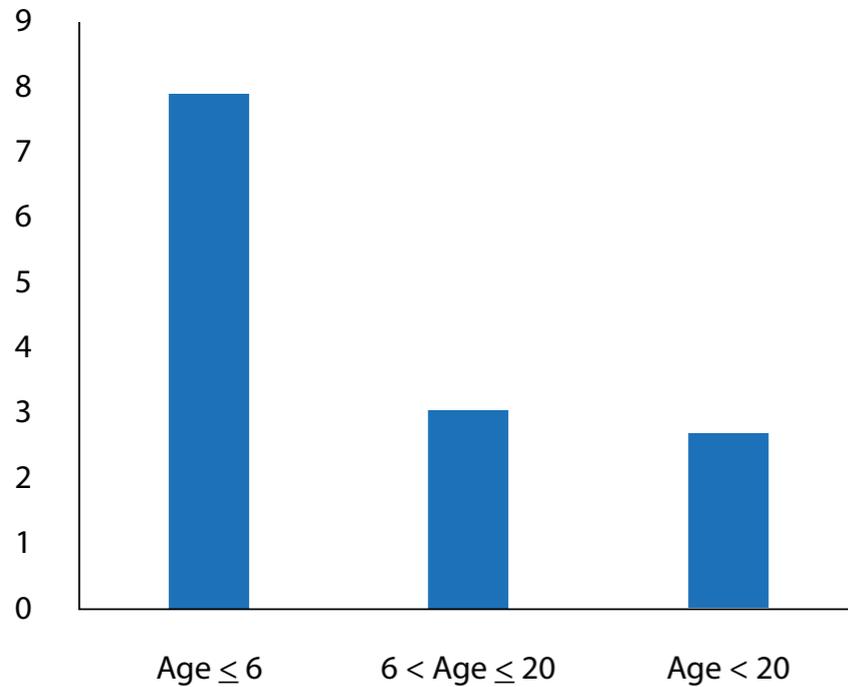
Empirical evidence also shows that firm size is an important factor driving investments in ICT, as the fixed costs related to process reorganisation weigh particularly on small and medium-sized enterprises²⁰.

However, higher administrative requirements may prevent younger firms from expanding. In France, for example, several labour laws only become binding when a firm exceeds the 50-employee threshold²¹. Such requirements have made it harder for euro area firms to grow to a sufficient size. In the United States, firms with more than 250 employees account for almost 60% of total employment (Slide 6). In the euro area, the share is between 12 and 37%.

Slide 4. Lower barriers to entry and higher competition support rise of young superstar firms

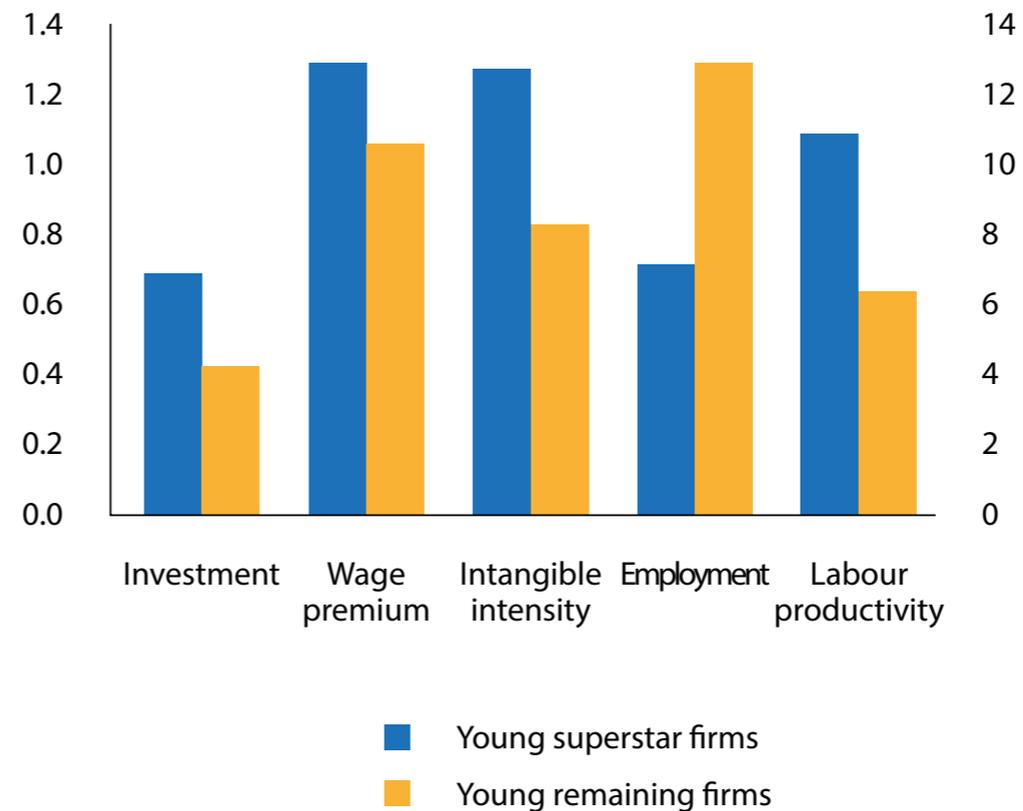
Annual labour productivity growth of surviving firms by age group

(mean, in %)



Average characteristics of young superstar firms and other young firms

(lhs: ratio; rhs: number of employees, intangible intensity in € thousands, labour productivity in € ten-thousands)



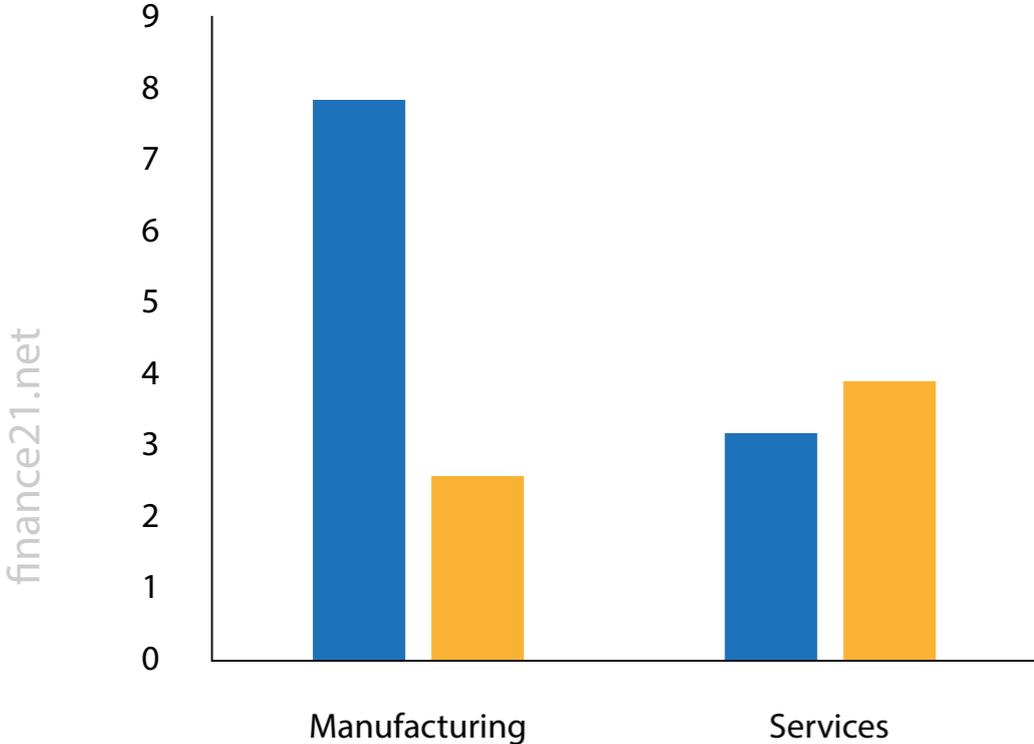
finance21.net

Notes: Each bar represents the coefficient from a regression of each variable listed in the x-axis on a dummy for the firm being a young superstar firm and a set of fixed effects controlling for the different countries, sectors and years. Productivity is computed as real value added per employee at the firm level. Intangible intensity is computed as the ratio of intangible capital to number of employees. Investment is computed as the change in real fixed tangible capital over the previous period's real fixed tangible capital. The period considered begins after the great financial crisis to avoid potential slumps.

Source: ECB Economic Bulletin Issue 1(2022). Data from Bureau van Dijk Orbis, the Bank for the Accounts of Companies Harmonized (BACH) database and ECB staff calculations.

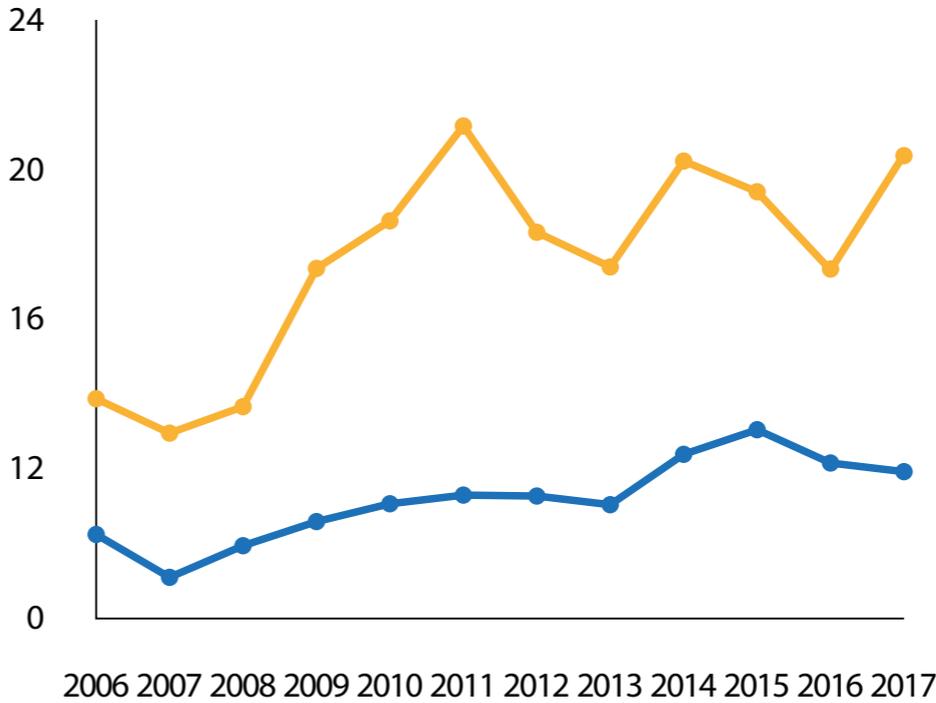
Slide 5. Decline in productivity growth in manufacturing coincided with lower business dynamics

TFP growth of high-tech frontier firms



Age of high-tech frontier firms

(years of activity)



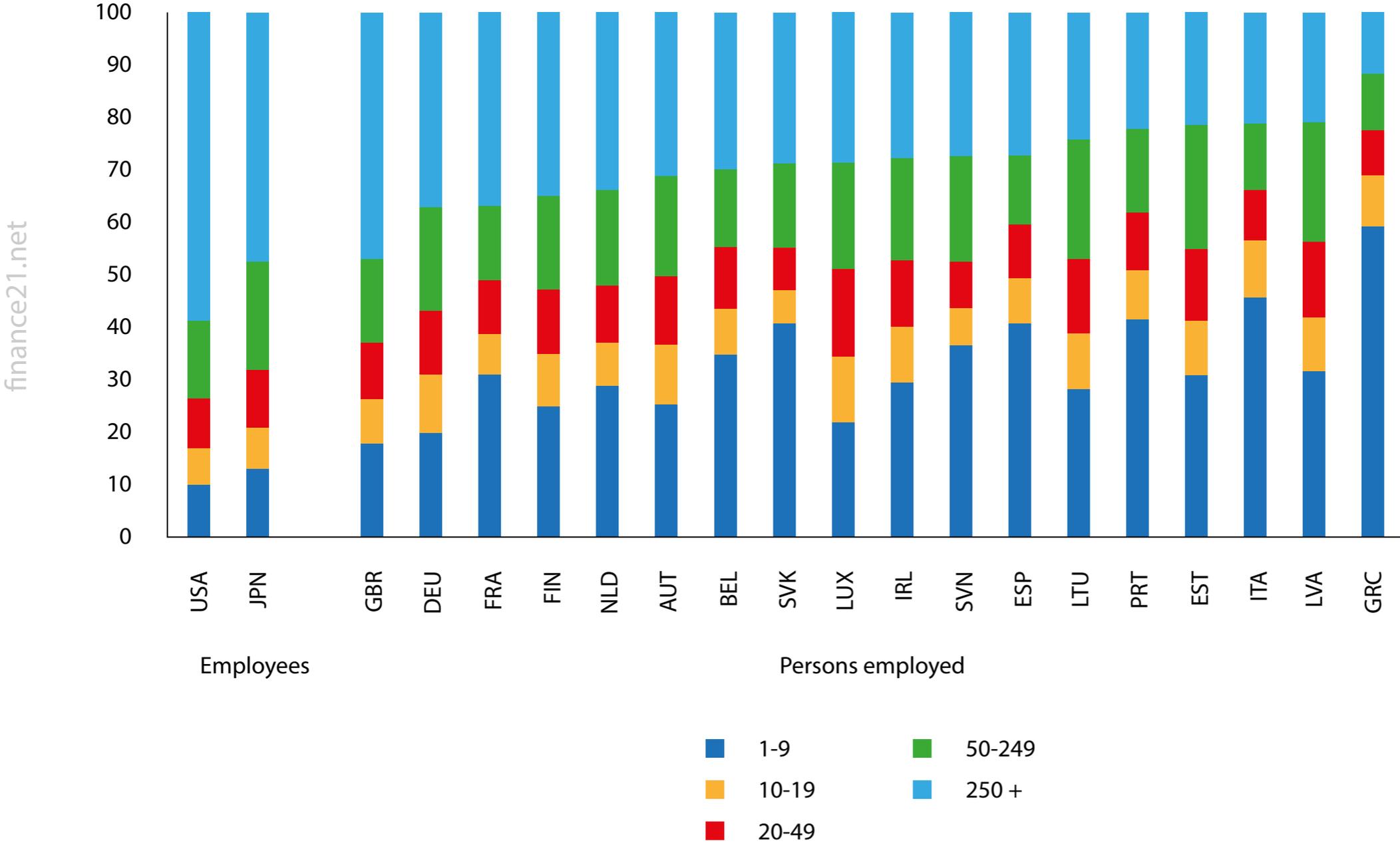
■ 2005-2007
■ 2013-2017

—●— Manufacturing
—●— Services

Notes: Weighted average annual TFP growth rates of the top 5% most productive firms in a given year in a 4-digit industry. Manufacturing industries are classified according to their R&D intensity (R&D by value added of the industry) into high-technology and medium high-technology on the one hand, and medium low-technology and low-technology on the other hand following the Eurostat classification. Service industries are classified into knowledge-intensive services and less knowledge-intensive services based on the share of tertiary educated persons at NACE 2-digit level, also following Eurostat standards.
Sources: Occasional Paper Series No. 268 (ECB). Own calculations using ECB iBACH-Orbis Database.

Slide 6. Large firms invest more in ICT, but most firms in the euro area are small

Employment by enterprise size, business economy
(percentage of total employment)



Notes: Legend refers to number of employees/persons employed at firm level.
Source: OECD.

Similarly, the lack of external capital often makes it difficult for firms to scale up. In the euro area, venture capital investments are much lower than in the United States, so that many innovative companies hit funding constraints once they have entered the growth phase²². This may lead them to relocate to places where funding is more readily available and capital markets are deeper.

Having young firms that are highly productive, while displaying low productivity at country level means that a large part of our available resources is stuck in corners of our economies that are comparatively less productive.

The US management hypothesis

A large body of empirical evidence suggests, however, that broader business conditions have not been the only impediment to ICT-related productivity growth in the euro area.

A look at US multinationals doing business in Europe illustrates this well²³. These firms have significantly higher productivity gains from IT than their European peers, despite facing the same regulatory environment. This seems to be because US firms consistently score higher in people management practices.

The 'US management hypothesis' rests on the observation that IT adoption requires complementary changes in a firm's organisation to reap the productivity gains of digital technologies²⁴.

That is, as the price of IT equipment falls and computational capacity rises, improvements in productivity mainly depend on skilled people using data, software and new procedures that leverage these technologies.

The experience of police departments in the United States is a good example²⁵. Higher IT investment alone had no statistically significant effect on reductions in crime rates or increases in clearance. However, when IT adoption

was complemented by the introduction of CompStat – a management system created by the New York City Police Department – crime rates fell and clearance rates rose.

The evidence from the euro area confirms these patterns. Research by ECB staff shows that only about 30% of firms, those closest to the technology frontier, manage to use digital technologies in ways that raise productivity over time (Slide 7, left-hand side)²⁶. For most firms, investment in ICT has no significant impact on their efficiency.

In other words, digital technologies require a large stock of human and managerial capital. In many euro area countries, however, a significant share of adults – in some cases more than a third – have not completed upper secondary school (Slide 7, right-hand side). Such gaps in the education system can help explain why many firms have not been able to reap the benefits of the ICT revolution so far.

Why Europe urgently needs to tackle its competitiveness crisis

Closing the euro area's technology gap has become more urgent than ever. Russia's war of aggression against Ukraine is weighing heavily on the price competitiveness of euro area firms. Today, electricity prices in the industrial sector in the EU are almost three times as high as in the United States and more than twice as high as in China (Slide 8, left-hand side).

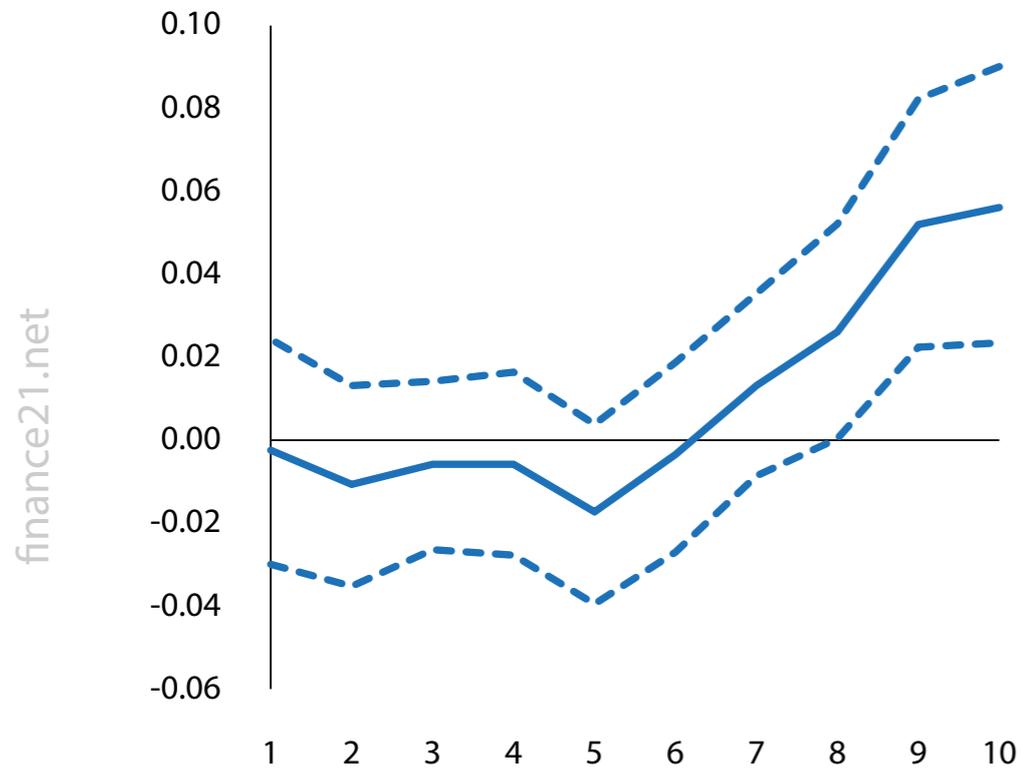
As a result, the production of high energy-intensive goods is declining at a concerning pace, undermining the euro area's stronghold in traditional industries (Slide 8, right-hand side).

Energy from fossil fuels is bound to become even more expensive over time as carbon prices rise. This implies that the only way to sustainably regain competitiveness is to reduce our dependency on fossil fuels by accelerating the green transition.

Slide 7. Few firms reap benefits from digitalisation, also reflecting shortages of skilled workers

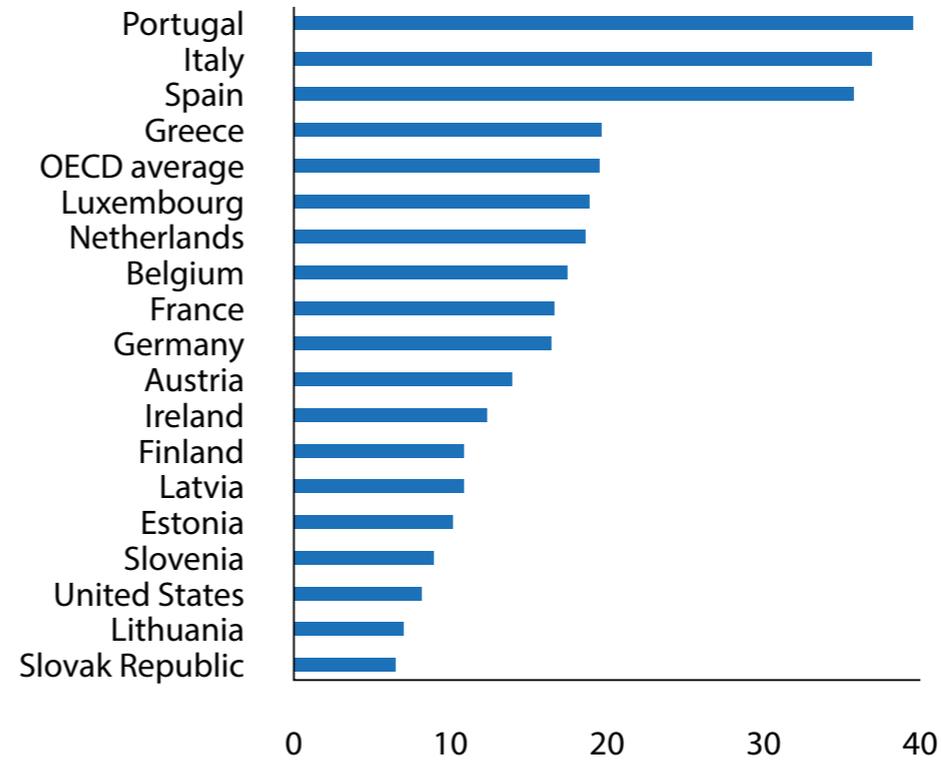
Estimated impact of digitalisation on TFP growth of firms with different initial TFP levels

(digital investment intensity)



Share of adults without upper secondary education

(% of 25-61 year olds)



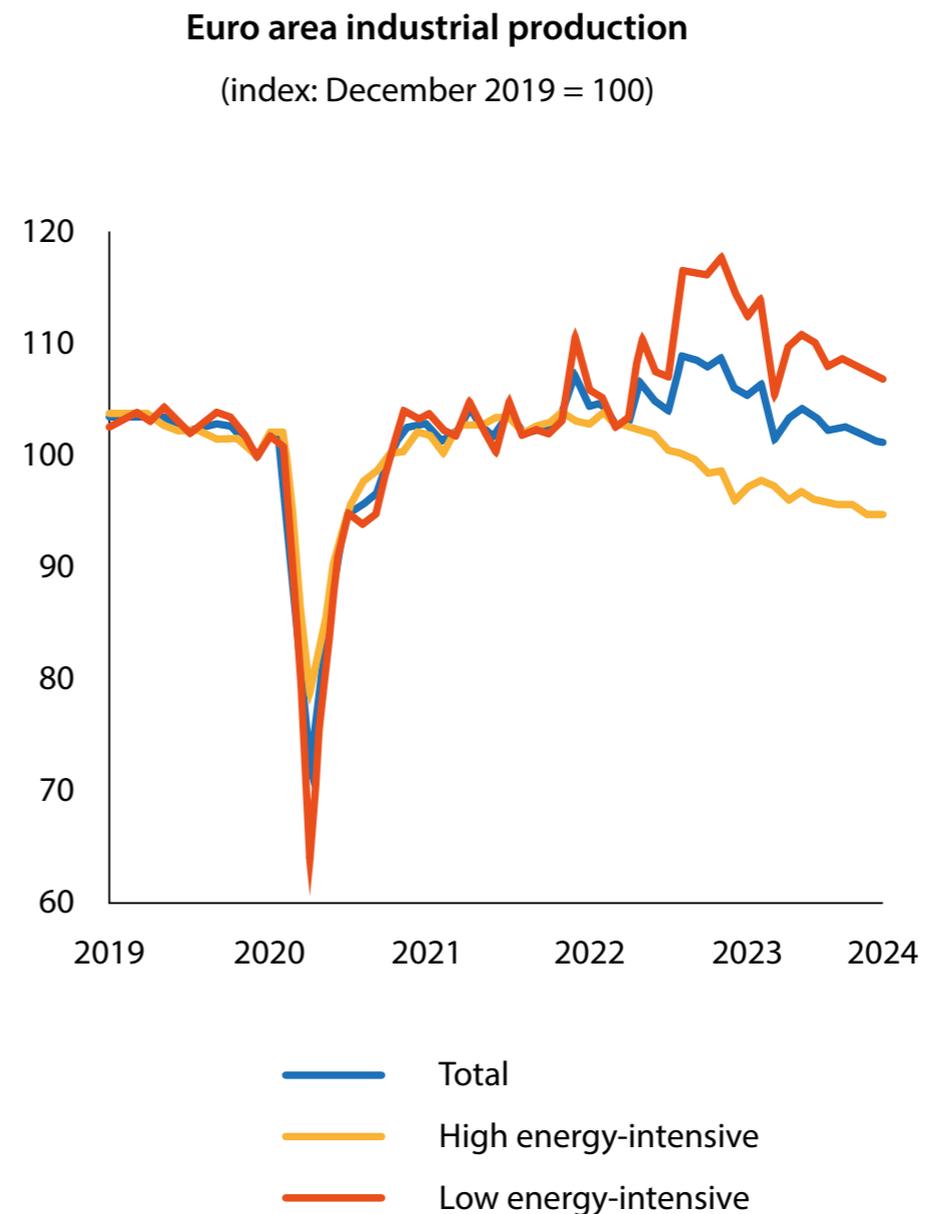
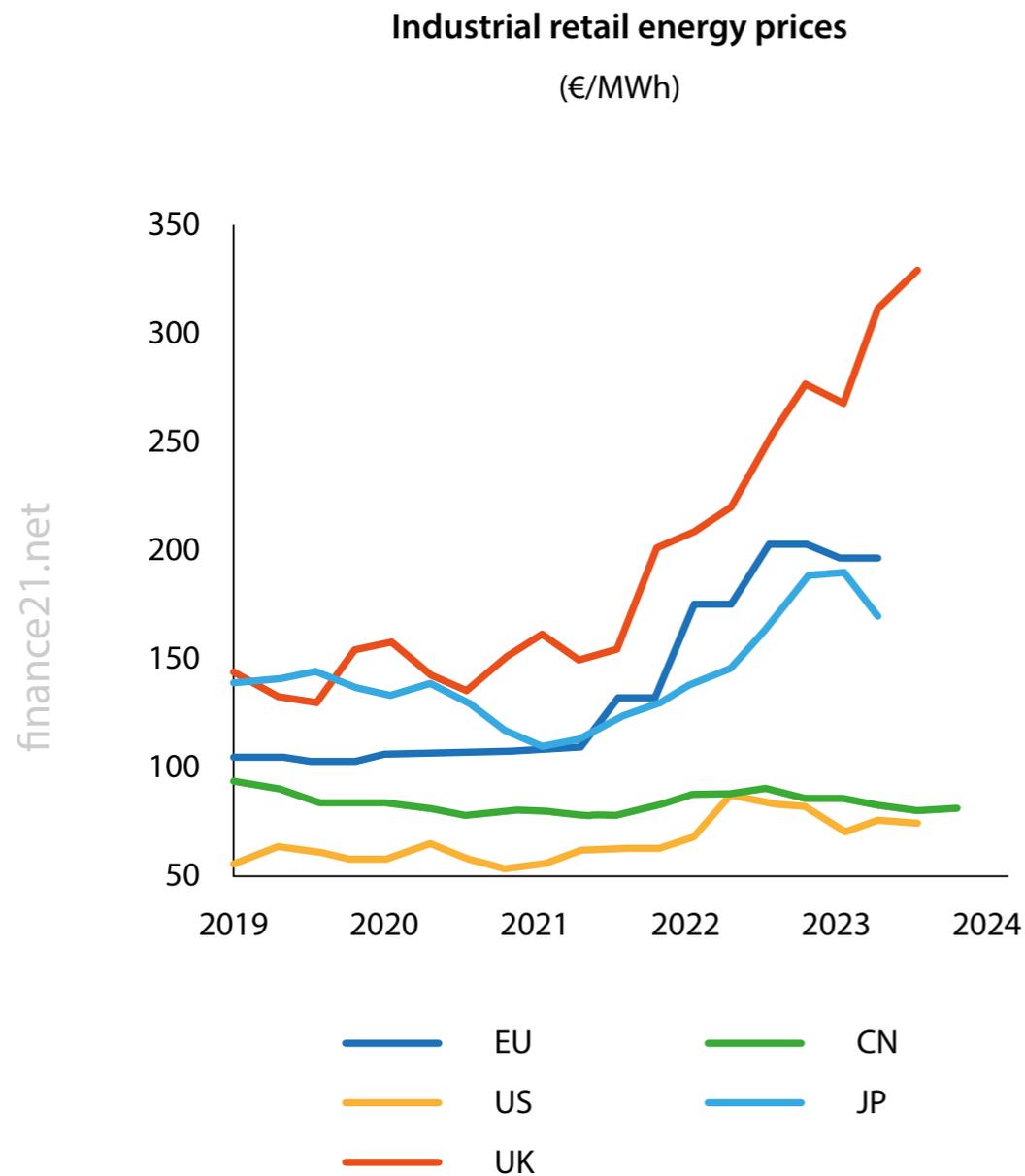
lhs Note: x-axis: proximity to frontier (decile, lowest-highest). Dashed lines refer to confidence intervals.

Source: Anderton, R, Botelho, V and Reimers, P, "Digitalisation and productivity: gamechanger or sideshow?", Working Paper Series, No 2794, ECB, March 2023.

rhs Notes: Data refer to 2022 or latest available.

Source: OECD.

Slide 8. Higher electricity prices undermine price competitiveness and industrial production



lhs Latest observation: Q2 2023 for EU and JP, Q3 2023 for US and UK and Q4 2023 for KR and CN.

Sources: Eurostat, EIA, DESNZ, CEIC, METI and ECB staff calculations.

rhs Notes: Data are seasonally-adjusted. Industrial production indices for individual sectors are aggregated with value-added weights. Low (high) energy-intensity sectors are defined as those with an energy intensity lower (higher) than that of the median sector. For more details, see Chiacchio, De Santis, Gunnella and Lebastard (2023).

Latest observation: November 2023.

Sources: Eurostat, Trade Data Monitor and ECB staff calculations.

However, since high carbon-intensive sectors, such as mining, refineries and air transport, have so far been on average more productive than greener ones, the reallocation of production factors across sectors during the green transition will mechanically reduce aggregate productivity over the short run²⁷.

Boosting technology adoption in less carbon-intensive sectors could help offset some of these effects. And by raising wages and reducing inflation, this could also secure public support for the green transition.

Domestic headwinds are further aggravating the euro area's productivity malaise. Three of them are particularly relevant.

Demographic headwinds require higher productivity growth

First, the euro area is facing demographic change of unprecedented magnitude. Based on the latest population projections by Eurostat, the old-age dependency ratio - that is the number of people aged 65 or above relative to those of working age (20 to 64) - is expected to increase on average from 37% in 2022 to 60% in 2070 (Slide 9, left-hand side).

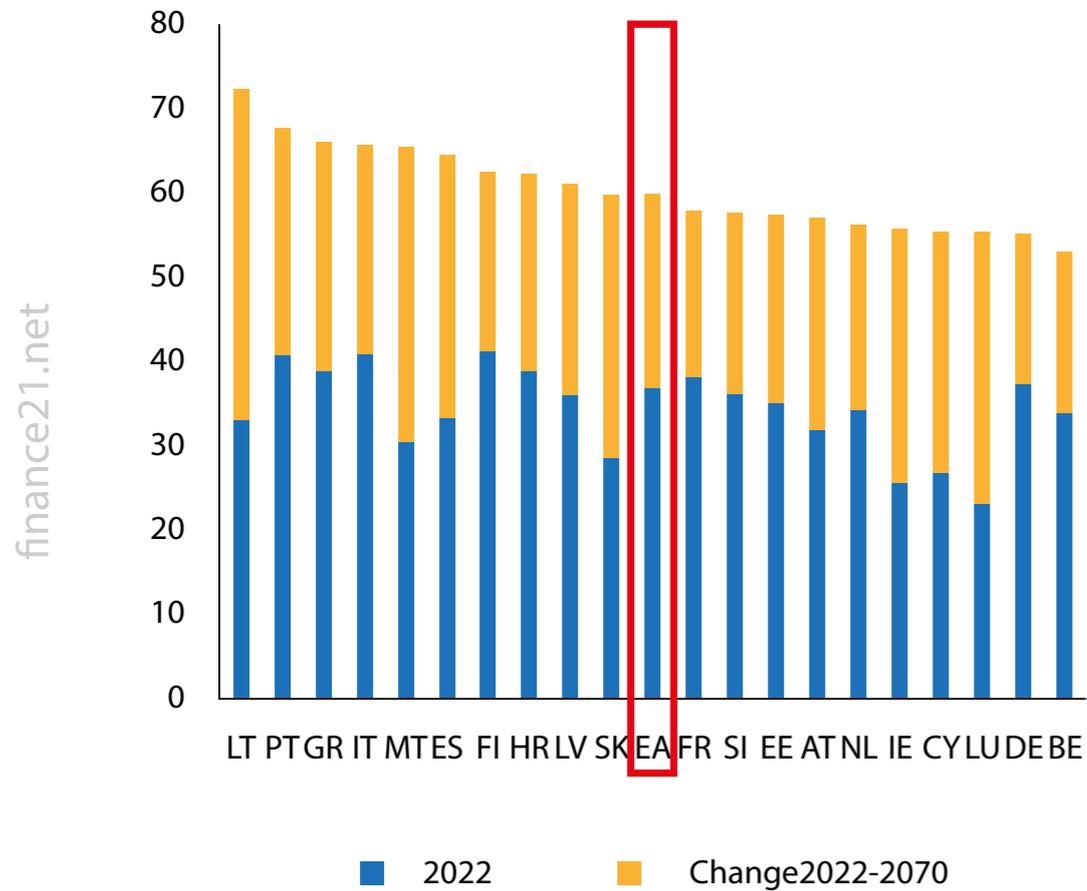
The rapid ageing of our society coincides with a shift in preferences, as more and more people prefer to work fewer hours. Average hours worked per employee have been on a secular downward trend since the 1970s, mostly reflecting a decline in the number of hours employees desire to work (Slide 9, right-hand side). With fewer working-age adults working fewer hours per each elderly person, output per hour worked needs to increase for our social system to remain sustainable.

Slow technology diffusion risks raising market concentration

Second, as productivity gains from digitalisation remain confined to a few highly innovative and productive firms, we are seeing a concerning trend in market concentration.

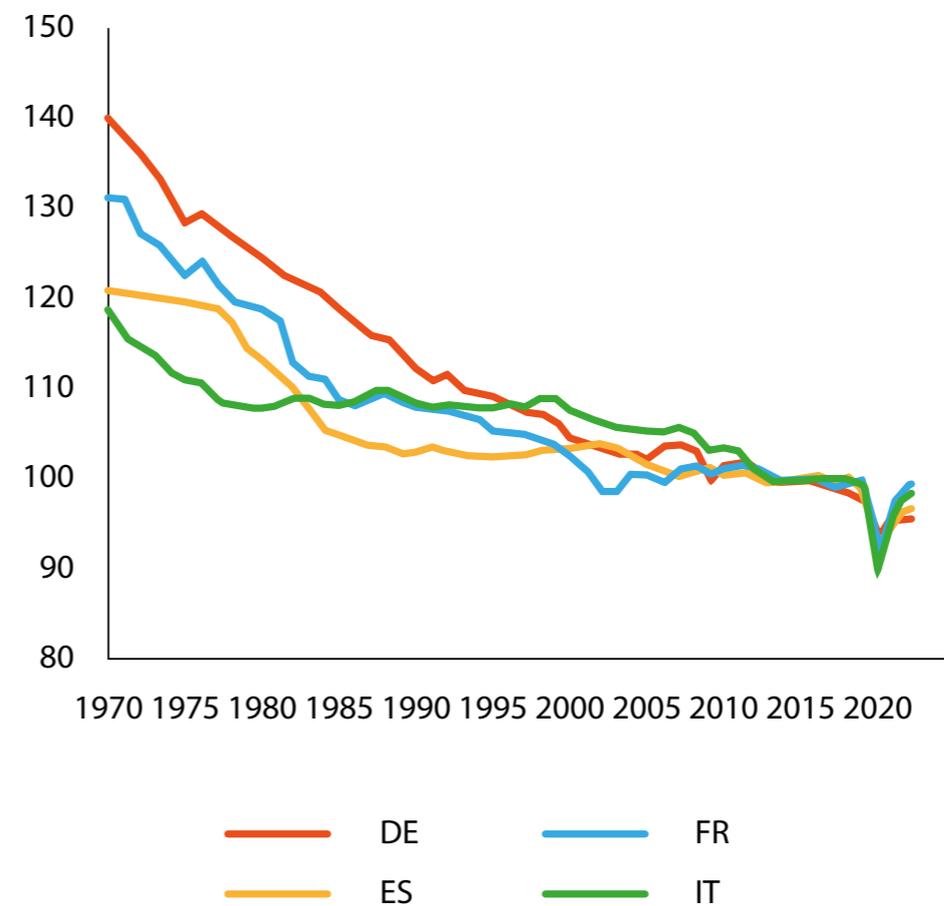
Slide 9. Ageing and preference shifts require higher productivity growth to sustain social system

Old-age dependency ratio in 2022 and increase until 2070



Average hours worked per person employed

(index: 2015 = 100)



lhs Note: The old-age dependency ratio is the population aged 65 and over as a % of the population aged 20-64. Data are shown as the proportion of dependents per 100 persons of working-age.

Source: European Commission EuroPop 2023 population projections.

rhs Source: OECD data.

Recent estimates by ECB staff suggest that while the median price mark-up of firms has remained broadly unchanged over the past two decades, the upper tail of the mark-up distribution has increased considerably (Slide 10, left-hand side)²⁹.

Such 'winner-takes-most' dynamics are mainly observed in the services sector, where the productivity gap between frontier and non-frontier firms has been widening rapidly, also because many laggards have failed to exploit the efficiency gains from ICT (Slide 10, right-hand side).

The experience of the United States suggests that the rise of 'superstar' firms, such as Apple, Amazon and Alphabet, can have lasting macroeconomic consequences and can help explain several secular trends, including the fall in the labour share of income and the rise in income inequality in the United States³⁰.

Moreover, to the extent that some monopoly rents are increasingly earned outside the euro area, such 'winner-takes-most' dynamics increase the dependency of domestic firms on third countries for the supply of technology, constraining strategic autonomy.

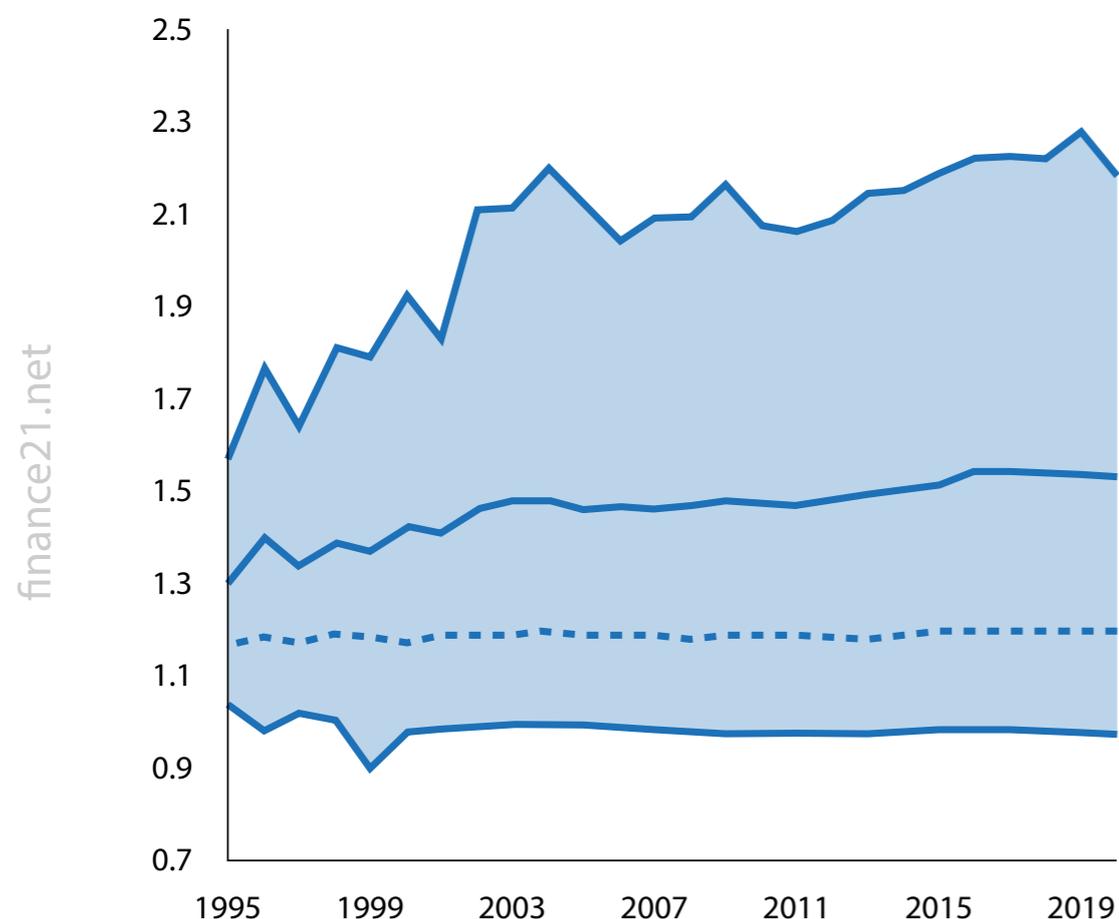
Productivity growth supports monetary policy

Third, productivity growth is a key determinant of medium-term inflation and real interest rates, which means it directly affects the conduct of monetary policy.

Over the past year, we have made considerable progress in restoring price stability after the largest inflationary shock in decades (Slide 11, left-hand side). Raising our key interest rates was instrumental in curbing high loan growth that risked entrenching the adverse cost-push shocks that the euro area economy had faced since 2020³¹.

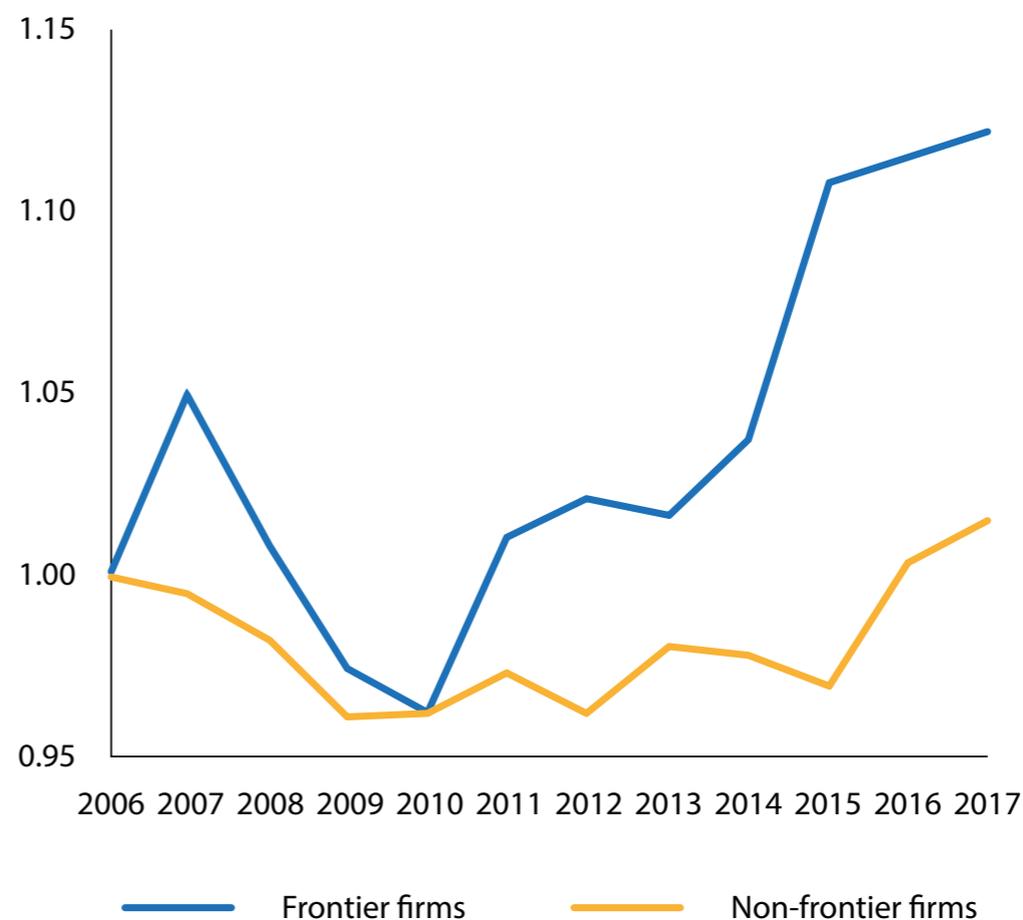
Slide 10. Slow diffusion of technologies can give rise to 'winner-takes-most' dynamics

Euro area markup distribution



TFP levels of frontier and non-frontier firms in the services sector

(2006 = 1)



lhs Notes: The dotted line shows the weighted median, the continuous line the weighted average, and the range is between the weighted 10th and 90th percentiles. See the paper for the calculation of markups using firm-level data.

Sources: Kouvavas et al (2021), "Markups and inflation cyclicality in the euro area", ECB Working Paper No. 2671.

rhs Notes: Frontier firms are defined as those at the top 5% of the TFP distribution in a given year in a 4-digit industry. Non-frontier firms are defined as the median firm in a given year in a 4-digit industry.

Sources: Occasional Paper Series No. 268 (ECB). Own calculations using ECB iBACH-Orbis Database.

But persistently low, and recently even negative, productivity growth exacerbates the effects that the current strong growth in nominal wages has on unit labour costs for firms (Slide 11, right-hand side). This increases the risk that firms may pass higher wage costs on to consumers, which could delay inflation returning to our 2% target.

In this environment, monetary policy needs to remain restrictive until we can be confident that inflation will sustainably return to our medium-term target. The recent long period of high inflation suggests that, to avoid being forced into adopting a stop-and-go policy akin to that of the 1970s, we must be cautious not to adjust our policy stance prematurely.

Measures that help firms boost productivity growth directly support monetary policy in achieving its objective of securing price stability over the medium term³².

Such measures would also expand the future policy space for central banks if faced with new disinflationary shocks. This is because higher productivity growth pushes up the marginal product of capital and hence the neutral real interest rate r^* , which is the interest rate at which monetary policy is neither expansionary nor restrictive³³.

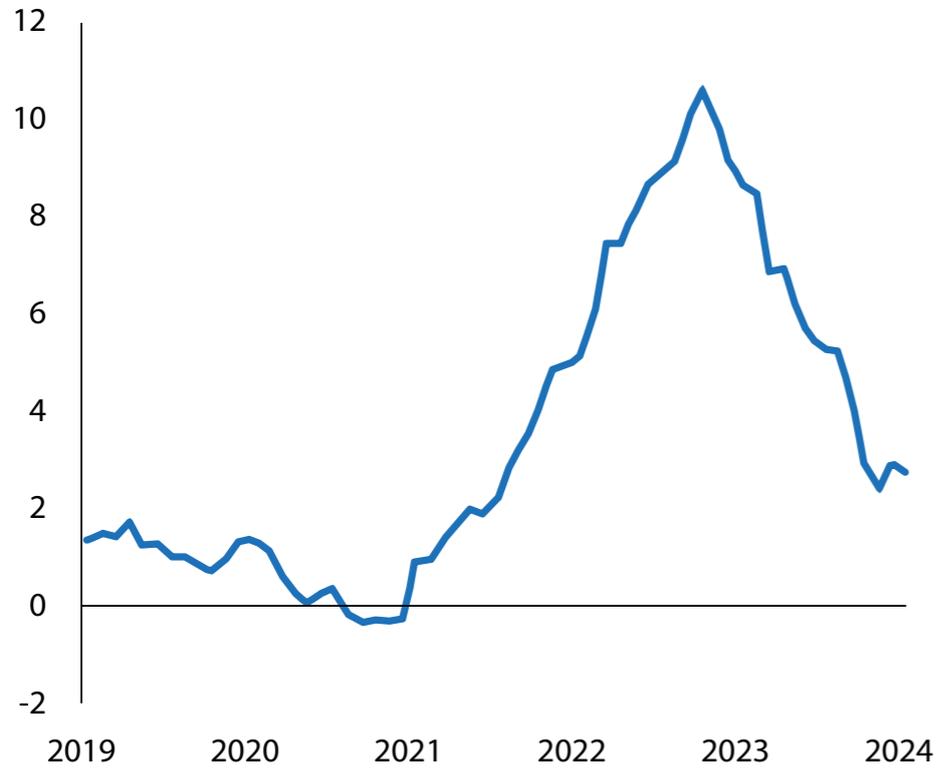
New estimates show that an increase in trend productivity growth by one percentage point can increase r^* by 0.6 percentage points³⁴. A higher r^* would reduce the need to embark on unconventional policy measures that often come with larger side effects³⁵.

How to boost productivity?

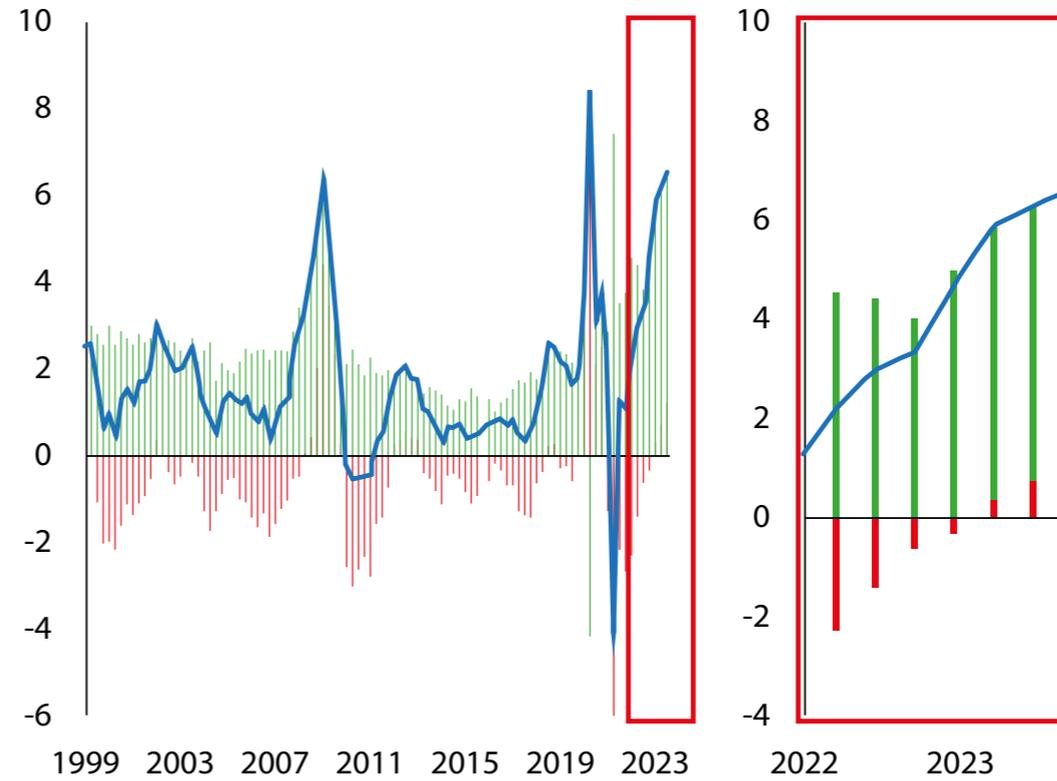
How, then, can we solve the euro area's competitiveness crisis? My diagnosis of the problem suggests that aggregate productivity growth depends both on how technologies are used and advanced at the firm level – the management hypothesis – and on how resources are allocated across firms – in other words the broad business environment³⁶.

Slide 11. Restrictive monetary policy needed to contain pass-through of rising unit labour costs

Headline inflation in the euro area (HICP)
(annual percentage changes)



Unit labour costs
(annual percentage changes)



- Productivity
- Wages
- Unit labour costs

*lhs Last observation: January 2024 (flash).
Source: Eurostat.*

*rhs Note: A positive contribution of productivity to unit labour costs implies negative productivity growth.
Last observation 2023 Q3
Source: Eurostat and ECB calculations.*

There are important interactions between these two factors. A slower technology diffusion across firms, as suggested by the divergence of productivity between frontier and laggard firms, boosts the gains that arise from reducing an inefficient allocation of resources³⁷.

These gains are estimated to be significant in the euro area³⁸. In Italy, for example, it is estimated that aggregate productivity in the manufacturing sector would be around 15% higher if national frontier firms were as large as the global frontier benchmark (Slide 12)³⁹.

If these firms were empowered to scale up, aggregate productivity growth could rise significantly. This is what happened in the United States in the 1970s and 1980s. Research shows that a substantial part of productivity growth in manufacturing during this period can be explained by output shifting from less productive to more productive firms⁴⁰.

The European Commission recently presented concrete action points for improving competitiveness in the euro area, and it is working towards a regulatory framework for enhancing growth⁴¹. In addition, Mario Draghi is expected to deliver a comprehensive report on the EU's competitiveness later this year.

From a euro area perspective, I see three mutually reinforcing factors as critical for reducing resource misallocation and for promoting and easing the diffusion of digital technologies in the euro area.

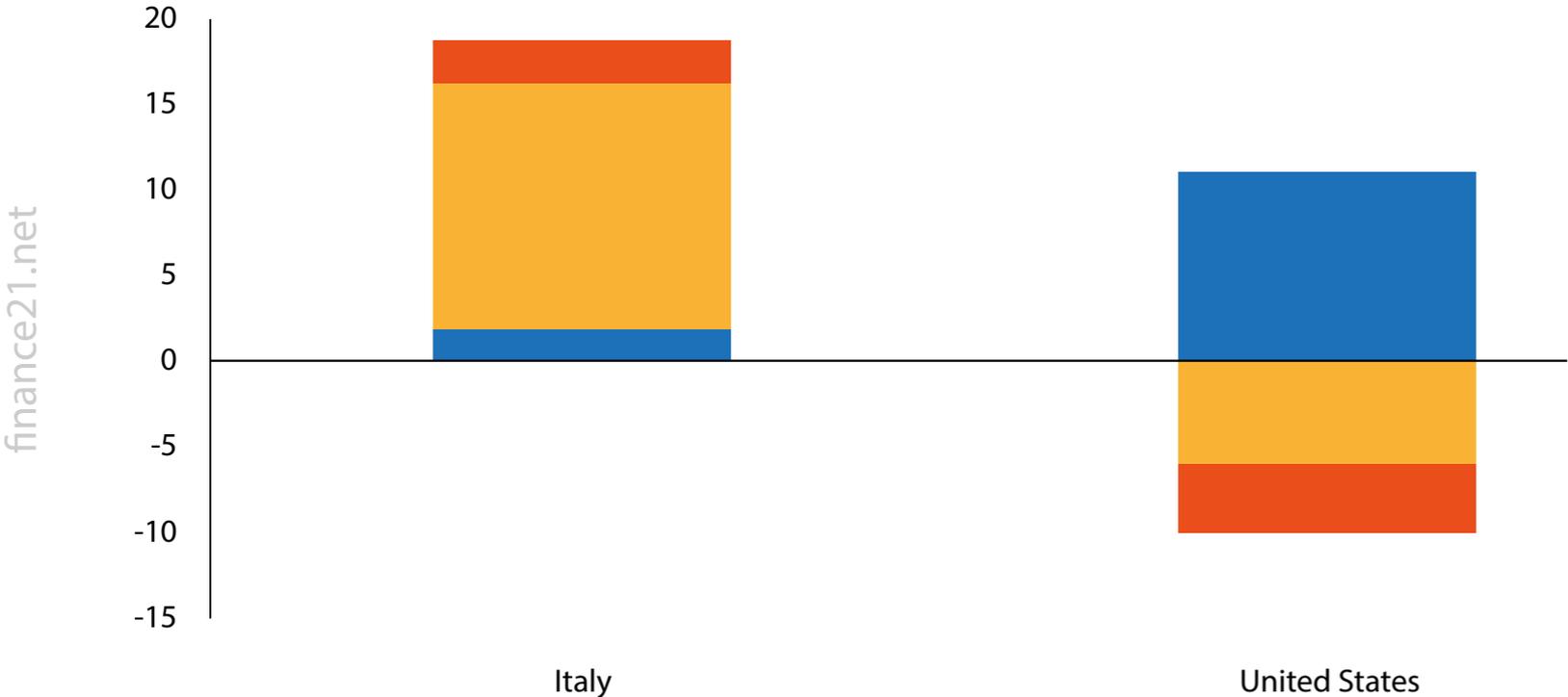
Increased competition raises diffusion of skills

First, we need a regulatory framework that more strongly embraces and encourages competition. There is broad evidence showing that strict product market regulations, rigid labour markets and excessive red tape have significantly inhibited the adoption of digital technologies in the past⁴².

Slide 12. Reducing resource misallocation can measurably increase productivity growth

How much would overall manufacturing sector productivity rise if firms at the national fi
wage were as productive and large as firms at the global frontier?

(percentages)



Note: The productivity (size) gap shows how much higher manufacturing productivity would be relative to baseline if the national frontier firms (NF) were as productive (large) as the global frontier (GF) benchmark. The cross term shows the impact on aggregate productivity of simultaneously closing the productivity and size gaps. The estimates are constructed by taking the difference between counterfactual labour productivity and actual labour productivity. The counterfactual gaps are estimated by replacing the labour productivity (employment) of the top 10 NF firms with the labour productivity (employment) of the 10th most globally productive firm in each two-digit sector. The industry estimates are aggregated using US employment weights.

Source: Andrews, D, Criscuolo, C and Gal, P (2015), "Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries," OECD Productivity Working Papers.

Since the euro area sovereign debt crisis, many governments have made measurable progress in making their economies more flexible and less rigid⁴³. However, the momentum of reform slowed notably after 2012.

In an environment of rapid technological change, this slowdown has made existing regulation more costly, as the impact of regulations on economic activity is highly state-dependent.

For example, competition policies are typically less important in countries that are far away from the global technological frontier. During the 1960s and 1970s Europe was able to catch up with the United States despite lower business dynamics⁴⁴.

In today's digital world, however, competition matters significantly more than it did in the 20th century. Research shows that stronger competition is associated with significant improvements in managerial ability, which we have seen is a key ingredient in reaping the benefits of digitalisation⁴⁵.

To kickstart this virtuous circle, the cost of firm entry and expansion as well as the cost of closing a failing business need to be reduced. For example, in the euro area it takes, on average, more than twice as long as in the United States – two years instead of one – for creditors to recover what they are owed after a company defaults.

Bolstering the Schumpeterian process of creative destruction has become even more important after the pandemic, as government support schemes have led to fewer firms exiting the market than during previous crises, although this process has started to reverse.

Strengthening the Single Market and fostering integration

Second, we need to foster integration in the euro area. Firms operating in larger markets can more easily build economies of scale and tend to be more innovative⁴⁶. The single market is our strongest weapon for combining our

economic weight and allowing European firms to compete and thrive in an environment where the 'winner takes most'⁴⁷.

However, the level of European integration, especially in the area of market services, which account for around 70% of the EU's GDP, remains disappointing. Intra-EU trade in services accounts for only about 15% of GDP compared with more than 50% for goods (Slide 13, left-hand side).

Similarly, only 25% of large firms offer crossborder online sales in the EU. For small and medium-sized enterprises, the share is below 10%. To a significant extent, this reflects remaining regulatory and administrative barriers restricting crossborder trade in services, with little if any progress having been made in addressing this in recent years.

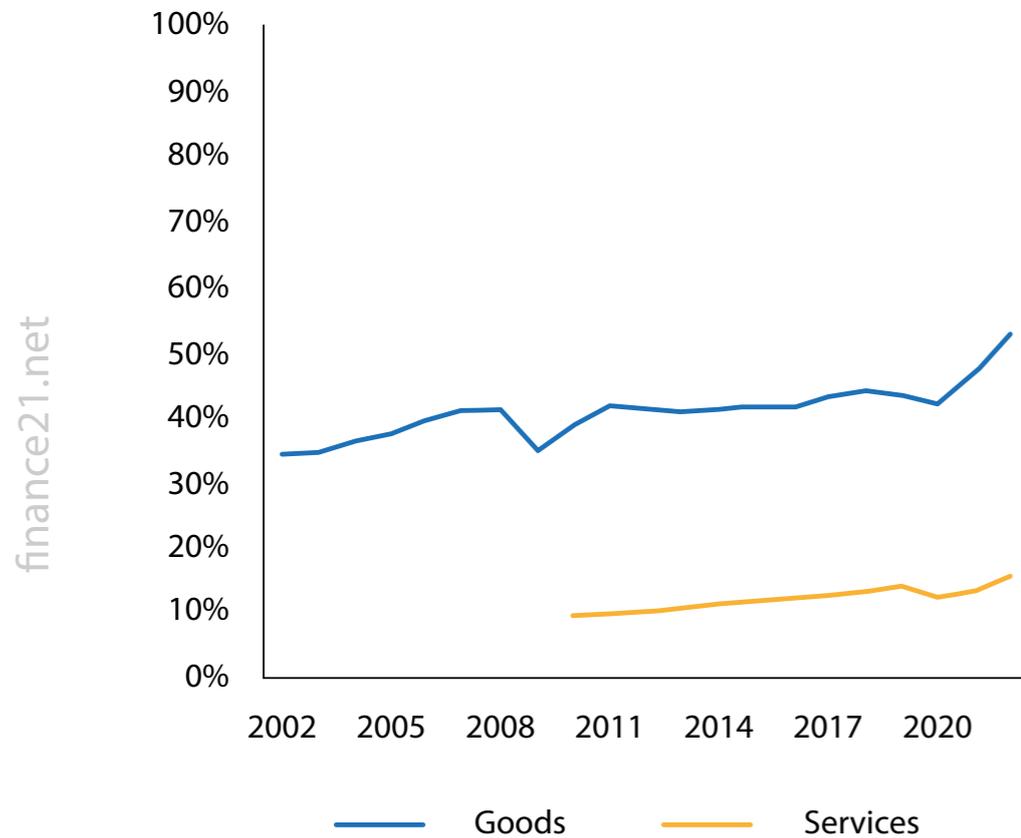
Our financial markets also remain segmented along national borders. Financial integration in the euro area has not increased from where it stood in the early years of monetary union. This contributes to capital misallocation and reduces the potential for crossborder risk sharing (Slide 13, right-hand side).

Research shows that deeper and more integrated capital markets could measurably boost diffusion of technology: increasing access to capital can reduce the distance from the technological frontier by 5 to 7 %⁴⁸.

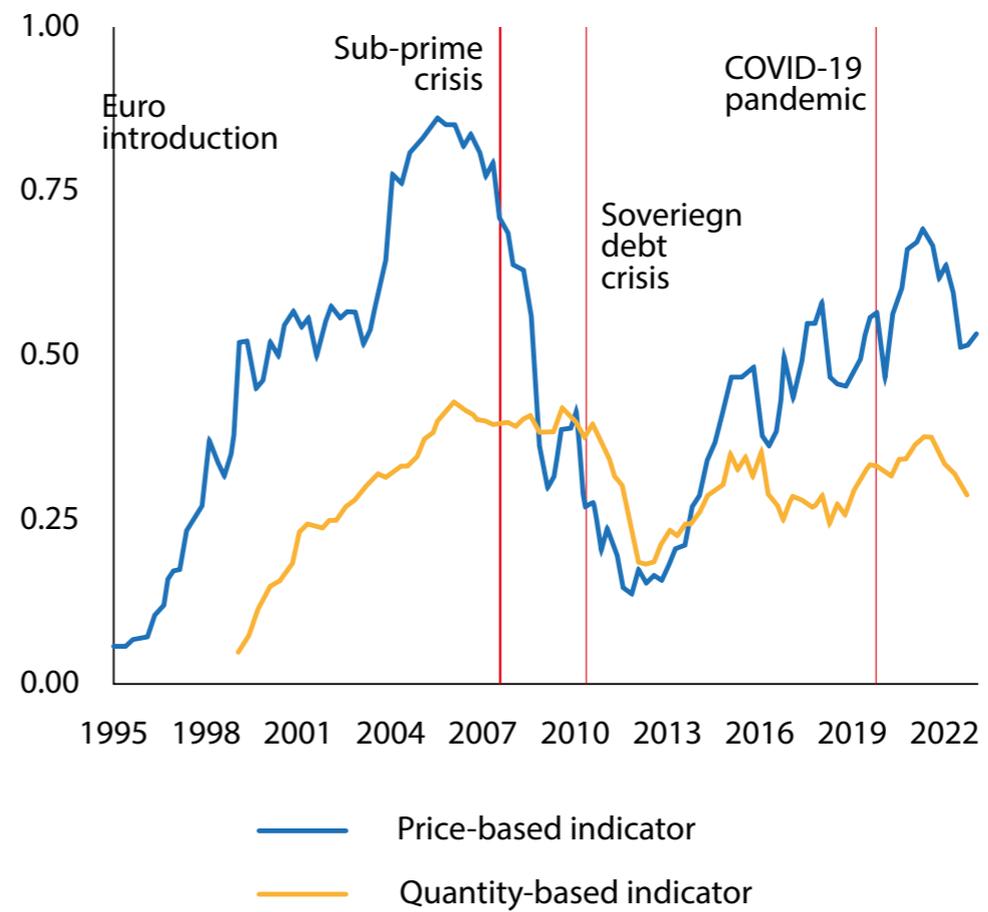
ECB President Christine Lagarde recently laid out how important timely progress towards a true capital markets union is for succeeding in the ongoing green and digital transitions⁴⁹. Consolidating rules and market infrastructures and reviving the securitisation market would go a long way towards reducing segmentation and improving access to external finance⁵⁰.

Slide 13. Limited progress in crossborder trade in services and in financial market integration

Intra-EU trade in goods and services
(annual, in percentage of GDP)



Price-based and quantity-based composite indicators of financial integration



lhs Notes: Intra-EU trade is obtained by summing intra-exports and imports as a ratio of GDP, measured in euros.

Latest observation: 2022.

Source: Eurostat and ECB staff calculations.

rhs Source: ECB staff calculations.

Completing banking union is equally important. Banks remain the backbone of our economy. Yet, since the establishment of ECB Banking Supervision in 2014, we have made little progress in creating the conditions for banks to operate freely across borders. Total EU crossborder assets held by banks, especially via subsidiaries, remain far below the level seen before the sovereign debt crisis (Slide 14).

Deepening our banking union requires two additional steps. One is reducing regulatory impediments that continue to hinder crossborder consolidation and competition. These impediments include fragmented tax and insolvency regimes and limited crossborder fungibility of capital and liquidity within a single banking group as a result of ring-fencing measures by national competent authorities.

As it takes time for such obstacles to be removed, a faster means of achieving this goal would be for banks to rely more extensively on branches instead of providing services through subsidiaries. In this regard, ECB Banking Supervision has already brought forward important suggestions for facilitating the use of branches⁵¹.

Further steps are completing the ratification of the amendment of the Treaty establishing the European Stability Mechanism and creating a European deposit insurance scheme (EDIS). Regrettably, national sovereign safety nets remain the ultimate backstop for banks. This cements the sovereign-bank nexus that led the euro area into a deep crisis more than ten years ago.

Progress on risk sharing through EDIS needs to be accompanied by stronger market discipline to mitigate adverse incentives and make risk sharing more politically palatable⁵². Therefore, risk sharing and market discipline should be advanced in parallel.

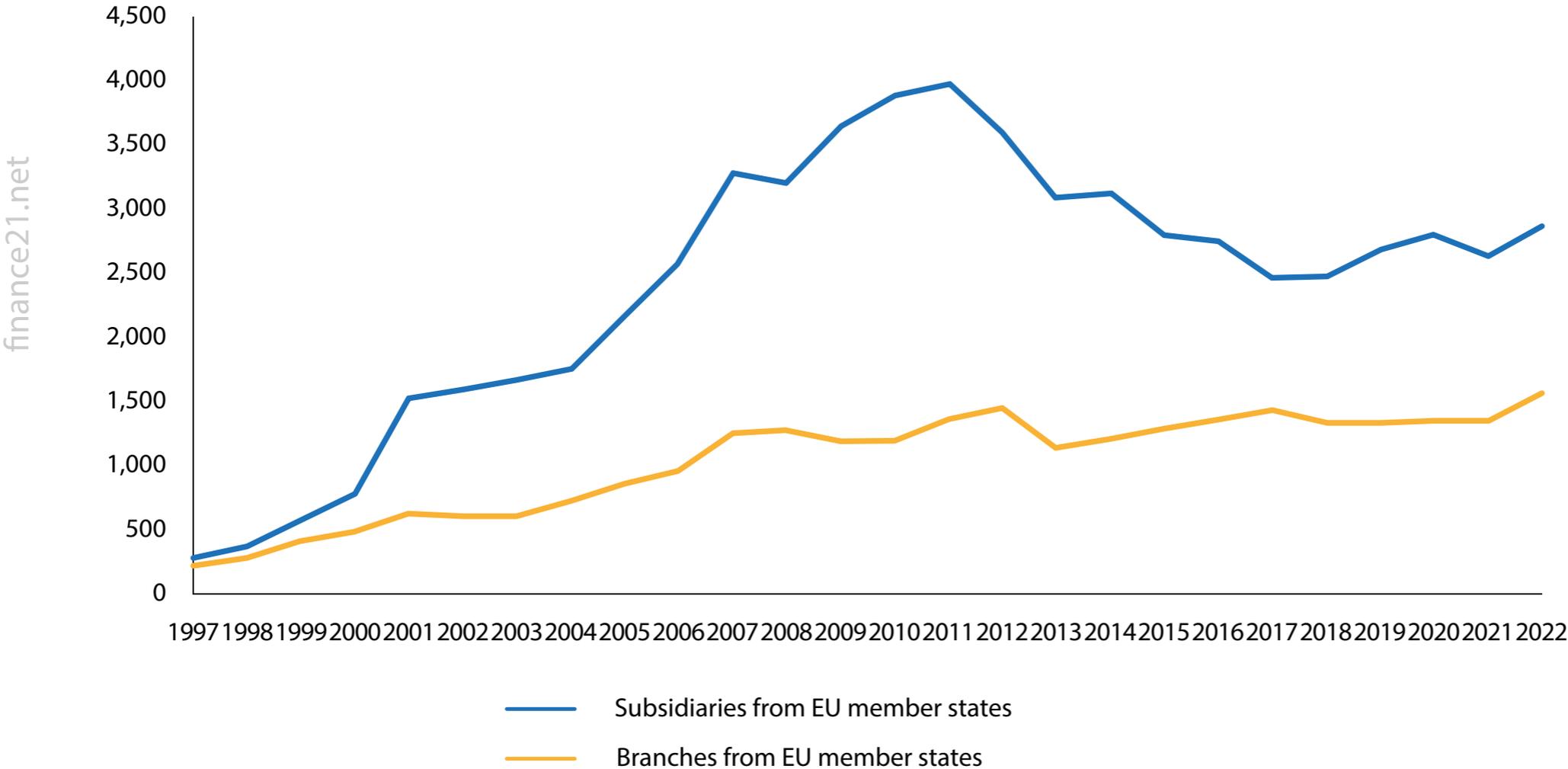
Raising public investment

Third, we need to raise public investment, both at national and European levels, in order to deal with pressing

Slide 14. European banking sector remains segmented along national borders

Total EU crossborder assets in the euro area

(Total assets, € billions)



Source: ECB Structural Financial Indicators.

structural challenges: the green transition, territorial security, digitalisation and a growing shortage of skilled workers.

Complementarities between public and private investments mean that capital deepening by firms alone will not be sufficient to overcome the euro area's competitiveness crisis⁵³.

Public investment has been weak in the euro area for a long time. After the sovereign debt crisis, a visible gap in public investment opened between the euro area and the United States (Slide 15, left-hand side)⁵⁴.

Against this background, the ECB welcomes the recent agreement in the European Parliament and the Council on a new economic governance framework that attempts to balance the need to ensure debt sustainability against incentives for investments and structural reforms. The latter are essential for raising productivity and economic growth, and therefore also vital in supporting debt sustainability.

Now governments must take full ownership of the new rules. Besides consolidation efforts, this means meeting the reform and investment commitments made in their national Recovery and Resilience Plans, which are at the heart of the Next Generation EU (NGEU) programme⁵⁵.

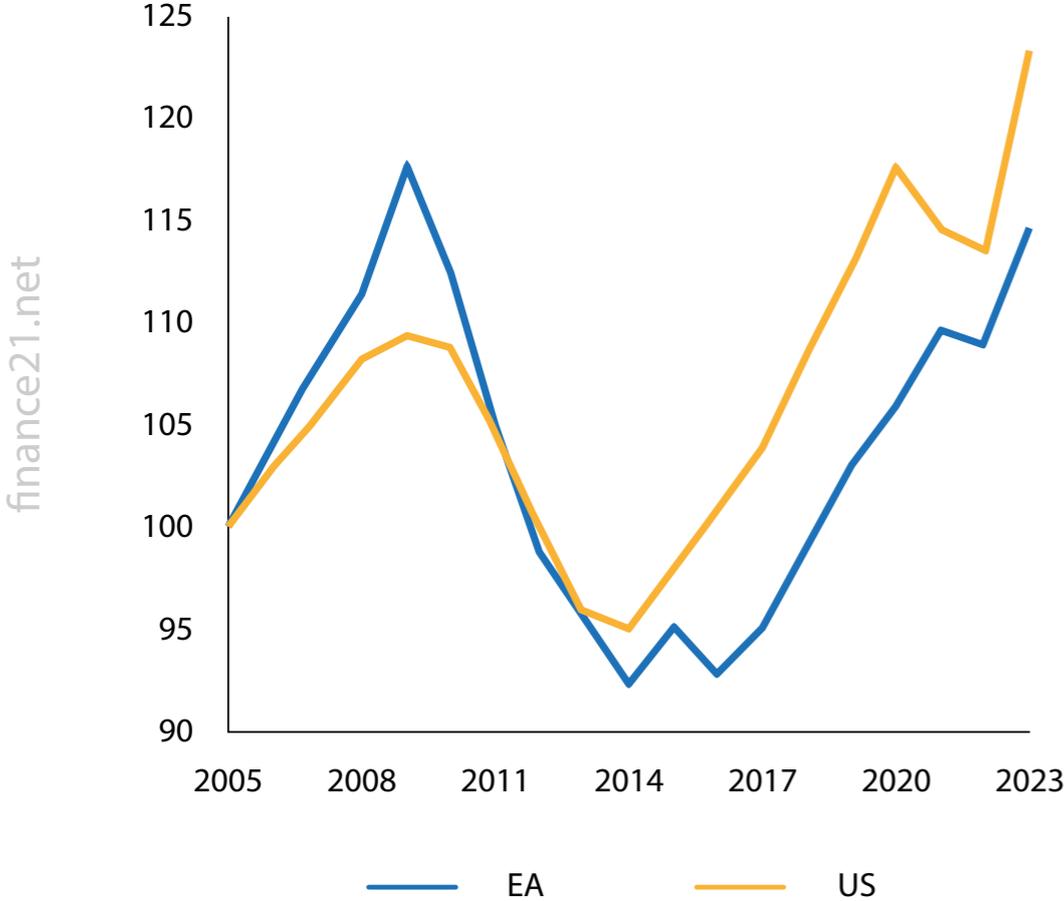
NGEU can play a significant role in overcoming the euro area's competitiveness crisis, as it allocates most of its funding to public investment, including in education and training⁵⁶. For the euro area, financial support offered by national Recovery and Resilience Plans amounts to €513 billion, or almost 4.1% of euro area GDP⁵⁷.

Estimates by ECB staff suggest that NGEU has the potential to measurably boost productivity growth over the coming years (Slide 15, right-hand side). However, this requires full implementation of previous commitments.

Slide 15. Public investment can boost productivity growth and potential output

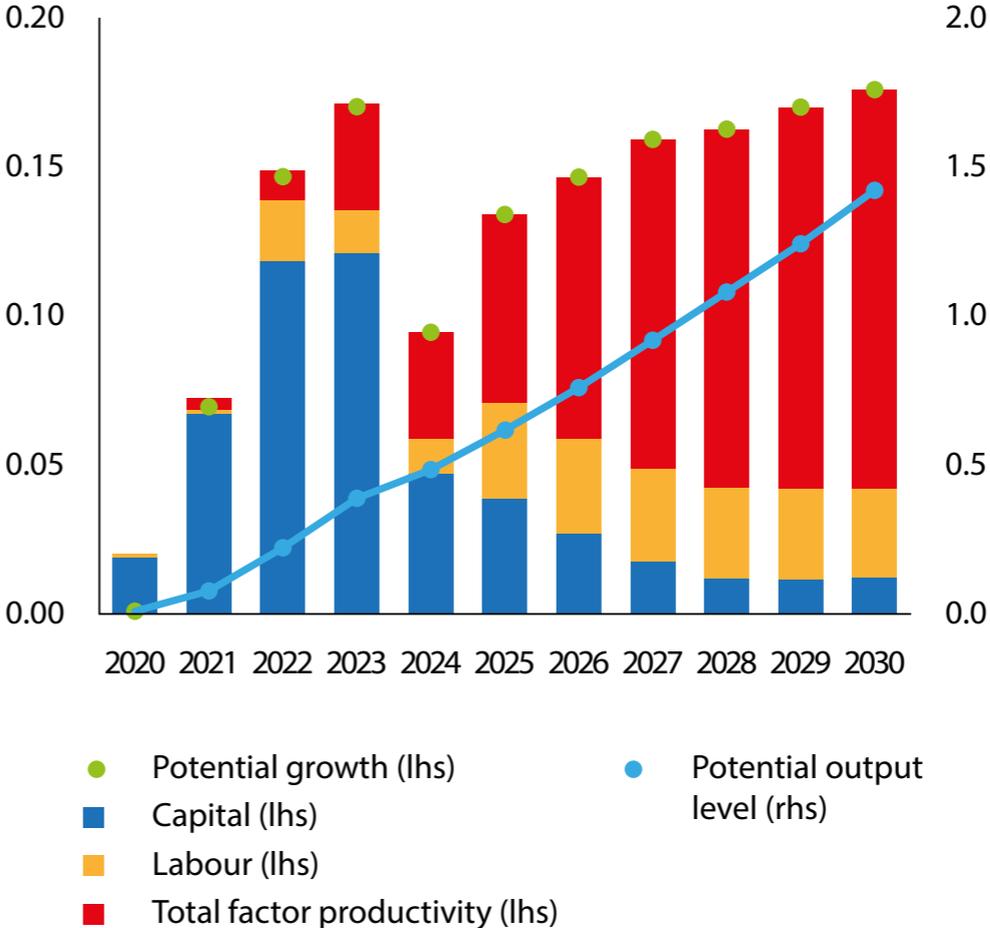
Headline inflation in the euro area (HICP)

(annual percentage changes)



Impact of NGEU on potential output and growth of seven euro area countries

(impact on level in percentages, on growth and contributions in percentage points)



lhs Notes: The 2023 figure for the Euro area is based on AMECO projections.
 Latest observations: 2023.
 Sources: European Commission (AMECO), Bureau of Economic Analysis and ECB staff calculations.

rhs Note: Countries included: DE, ES, FR, GR, IT, MT and PT.
 Source: ESCB staff calculations (Bańkowski et al 2022).

Reforms and investments are being actively pursued across the EU. By the third quarter of 2023, around 500 reform-related milestones and targets had been assessed as satisfactorily fulfilled (Slide 16)⁵⁸.

At the same time, despite a significant catch-up in December last year, the latest evidence points to some backloading in the implementation of investment plans. For the euro area aggregate, the latest estimates by ECB staff indicate a cumulative shortfall over the period 2021-2023 of around 4% in relation to the total funding that was initially available⁵⁹.

The European Commission has published an independent evaluation report on the progress made on implementing investment plans so far. The delays highlight two potential areas for reflection on the way the Recovery and Resilience Facility (RRF) is designed.

One is the administrative burden. The RRF regulation requires member states to set up an effective control and audit system. Such a system is important for protecting the EU's financial interests, but anecdotal evidence suggests that this system poses a considerable challenge for national administrations which has led to delays in payment requests. It is a trade-off that requires reassessment.

The other area for reflection relates to NGEU's ambitious horizon: all funds need to be tapped by 2026 the latest. While we have no time to lose when it comes to stimulating productivity and fighting climate change, rushing the implementation of investment projects could translate into supply bottlenecks, unwarranted demand-driven inflationary pressures and the risk of selecting 'easy-to-fulfil' projects that favour government consumption over investment.

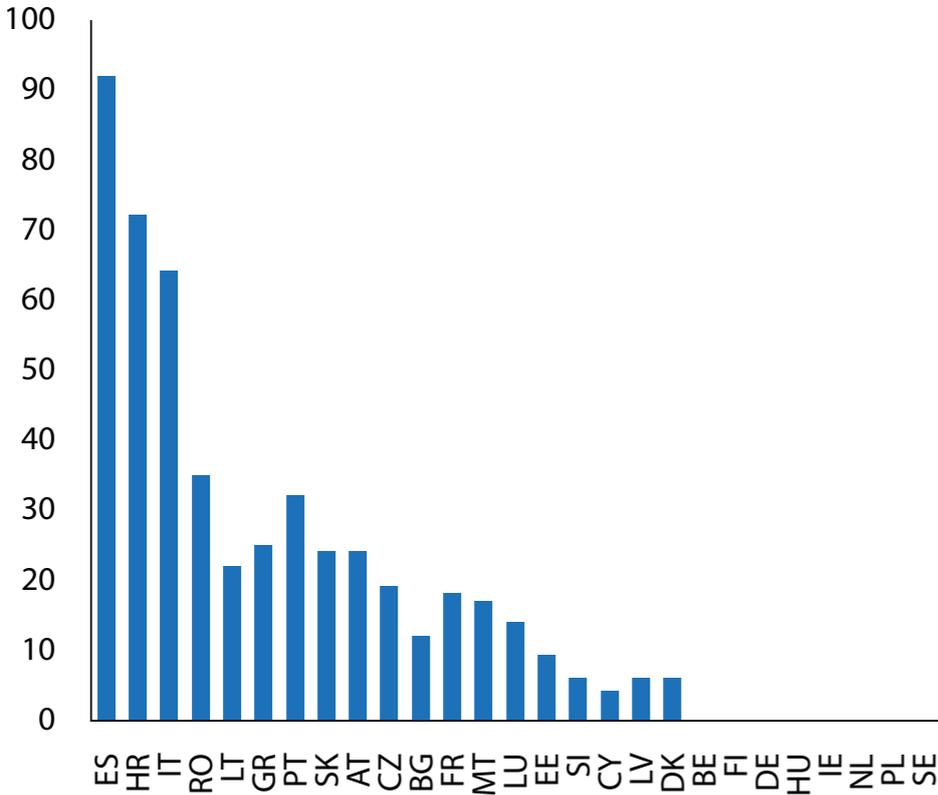
These issues demand attentive contemplation, as we cannot allow NGEU to fail. The stakes are simply too high, also for the ECB.

Slide 16. Significant number of reform-related RRF milestones and targets already fulfilled

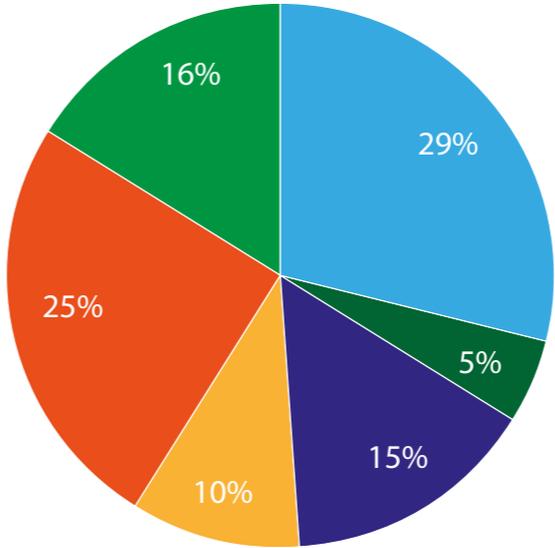
RRF milestones and targets: breakdown by country
(total number)

RRF milestones and targets: breakdown by policy pillar
(percent)

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- Green transition
- Digital transformation
- Smart, sustainable and inclusive growth
- Social & territorial cohesion
- Health, economic, social and institutional resilience
- Policies for the next generation



lhs Note: Database accessed on 6 December 2023. A Milestone or Target is counted as fulfilled if the Commission has assessed it as being satisfactorily fulfilled. All EU countries included.

Source: ECB illustration based on European Commission data.

rhs Note: Database accessed on 6 December 2023. A Milestone or Target is counted as fulfilled if the Commission has assessed it as being satisfactorily fulfilled. All EU countries included.

Source: ECB illustration based on European Commission data.

With NGEU, the euro area temporarily addressed three important gaps in its institutional architecture: (i) it set up a central fiscal tool to provide stabilisation through common resources, which supports monetary policy; (ii) it led to closer integration in economic policymaking by coordinating strategic investment decisions at the European level; and (iii) it increased the liquidity of EU bonds and it deepened euro area capital markets, thus making progress towards the creation of a truly European safe asset⁶⁰.

How effectively governments use the NGEU funds to make our economies fit for the challenges we face will therefore critically define the future path of European integration.

Successful implementation of NGEU presents a unique opportunity to boost productivity, lay the groundwork for completing the euro area's institutional architecture and make monetary policy more effective.

Conclusions

Nobel laureate Paul Krugman once noted *"Productivity isn't everything, but, in the long run, it is almost everything."*⁶¹. European leaders recognised this already more than 20 years ago when they signed the Lisbon strategy. But progress has so far been disappointing.

Growing economic nationalism, threats to our territorial security and a rising technology gap between ours and other advanced economies make the case for boosting the euro area's competitiveness ever more urgent. The responses to the pandemic and the war in Ukraine demonstrate that Europe is able to pull together when faced with adversity.

Turning from laggard to leader requires initiating a virtuous circle between public and private investment on the one hand and productivity growth on the other. This starts with full implementation of previous commitments

under the Recovery and Resilience Facility. Priority must be given to measures that strengthen competition, reduce bureaucracy and stimulate further integration in product, labour and financial markets.

These measures will help channel capital and labour towards their most productive uses, challenging incumbents and removing barriers that are holding back young productive firms from growing to their full potential.

And, importantly, Europe leading the way on productivity also helps the ECB maintain price stability. ■

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Endnotes

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Can AI change economic logic and bring abundance for all?

Daniel Daianu asks if AI can address imbalances between needs and resources sustainably by bringing about abundance for all?

Debates on artificial intelligence (AI) have intensified greatly in recent years. The British government organized a high-level conference on this topic recently. Top officials from the EU and the USA consider AI among their priority policy orientations. Prominent Silicon Valley voices, major companies, are actively engaged in this debate.

In Asia, AI is at the forefront of attention. At last year's annual meeting of the *Academia Europaea*, Professor Helga Nowotny's inaugural address and other lectures focused on AI. While the benefits of AI are widely acknowledged, deep concerns about its potentially harmful effects and the possibility of it spiralling out of control are also raised.

Can AI be regulated without stifling innovation? Could AI address imbalances between needs and resources sustainably by bringing about abundance for all? This debate is particularly relevant given the significant disruptions of recent years, that have perturbed people's lives and have led to a 'cost of living' crisis with political ramifications.

Is it justified to speak about an abundance of goods and services in society? This question is to be judged given that, in the traditional sense, economics examines the dynamics of needs (both individual and collective) in relation to available resources.

Markets regulate the relationship between demand and supply of goods and services through 'equilibrium prices' – which are influenced by imbalances that depend on business cycles, shocks that disrupt supply chains, and policies that foster unsustainable consumption.

However, 'equilibrium prices' can conceal significant disparities in incomes, purchasing power, and assets of individuals, in the distribution of economic/financial power in markets. These asymmetries can heavily impact (through more or less obvious interest groups) political life – which can also imply the capture of public decisions.

States of apparent equilibrium can be precarious, highly fragile. Hence, public policies have over time emerged, that seek to ensure, in societies that value moral and equity related criteria, equal opportunities and that attempt to avoid/alleviate large-scale economic and social distress.

Antitrust legislation originates from this concern, as does the system of separation of powers (in democracies), regulations aimed at preventing blatant power abuses in economic and political life, including the over-financialization of economies.

AI cannot eliminate competitiveness gaps between economies on its own. It is hard to accept that AI would spread globally in a way that eliminates development disparities

It is not coincidental that there is an ongoing conversation about the need to make the economy work for the benefit of as many citizens as possible (see also Robert Reich, *Saving Capitalism for the Many, Not the Very Few*, 2016; Martin Wolf, *The Crisis of Democratic Capitalism*, 2023).

There are also imbalances between economies, which are illustrated by different trade balances that express competitiveness gaps.

Economics has long been dubbed the dismal science, a term dating back to the 19th century in the controversial writings of Thomas Carlyle and the thoughts of Thomas Malthus on available resources in relation to population dynamics – a theme revived by the Club of Rome about half a century ago and by the Stern Review in 2007.

Nicholas Georgescu-Roegen, a prominent economist originally from Romania, also delved into the issues surrounding the relationship between economic dynamics and resources. Climate change has heightened concerns regarding the connection between resources and human needs.

Reservations about this terminology may stem from the perception that it is overly pessimistic, that it is inappropriate to compare current scientific and technological progress, the development of artificial intelligence, with the 19th century industrial revolution, and that that century is vastly different from the contemporary world, which has lifted hundreds of millions of people outside of Europe and North America from abject poverty.

I refer particularly to Asia here. Moreover, the range of goods and services in today's world is different from, let's say, that of over 100 years ago (not to mention differences in quality).

On the other hand, feelings and aspirations, joys and concerns have their roots in the real lives of people, in their social, economic, and cultural connections, in how public authorities respond to basic public needs – these, in turn,

stemming from concrete life situations. At the same time, individuals and groups use collective benchmarks and personal preferences to articulate specific desires and requests.

It must be noted that new technologies do not improve people's living standards automatically and equally. For example, smartphones can provide access to information for numerous citizens but do not ensure access to civilization and equal opportunities for everyone.

In Africa, for instance, over three-quarters of the continent's population use mobile phones, yet economic progress is generally very limited, and poverty is endemic. Moreover, the COVID-19 pandemic and climate change, the latter seen as an existential threat, bring attention to the possibility of dystopian worlds.

Martin Weitzman, with his *Dismal Theorem* (2011), outlines a scenario in which we might not have the resources (technological capacity) to avoid extreme changes in the environment (because we would need to allocate more and more of our present resources to save future generations – a very difficult trade-off for most people to accept).

Referring to the historian Karl Wittfogel, I have spoken about the spectre of 'hydraulic societies' if the adverse effects of climate change are not effectively addressed (Hotnews, March 18, 2021). The issue of intergenerational resource distribution is very hard to deal with and climate change exacerbates it. Be it so however, it should not lead to the conclusion that nothing can be done, that every person should think about him/her only. In public policies, decisions are made even under extreme uncertainties, duress, based on cost-benefit assessments that may be highly approximate.

Artificial intelligence, beyond its undeniable benefits, is viewed by not a few specialists as an existential threat in the sense that it could surpass the cognitive and inventive abilities of humans. Consequently, AI could potentially dominate humans and pose a threat to their existence.

AI is also seen as a means to amplify military capabilities (see Steven Feldstein, [AI in war: can advanced military technologies be tamed before it is too late?](#) Bulletin of the Atomic Scientists, January 11, 2024). An analogy can be drawn here with nuclear energy and the proliferation of atomic weapons.

Therefore, there are increasing calls for the regulation of AI usage. Whether this can be achieved in an increasingly fragmented, multipolar world, with intense geopolitical rivalries is a more than legitimate question. Nevertheless, it must be attempted. Just as it is necessary to do in combating pandemics.

The health crisis, along with partial lockdowns during the pandemic, has highlighted the ability of many companies and public entities to function with a significant reduction in the number of employees. Recently, the IMF pointed out that over 40% of occupations (60% in economically advanced countries) will be affected by AI in the future, leading to massive job losses.

Remote work, digitization, new technologies in general, and the increasing use of AI imply significant changes in the operations of many firms, leaving their mark on the future structure of the labour market.

This impact should be viewed in the context of a large number of losers due to unrestricted globalization in recent decades. Not coincidentally, there is a rethinking of globalization, a regionalization of cross-border economic relations, and an increase in protectionist measures – strengthened by geopolitical and military security considerations, by the need to enhance resilience.

Numerous layoffs will exacerbate social problems and structural unemployment. This is why the introduction of a guaranteed minimum wage is considered by some analysts as a means to prevent social tensions from reaching extremes.

Financing a guaranteed minimum income could be achieved through a tax on robots (as advocated), leading to a redistribution of income from those using robotics (and replacing humans) to those who lose their jobs; the more automated and profitable a business is, the more it would be taxed in absolute terms.

Such ideas are understandable if we strive to avoid the situation where many people become desperate, leading to severe social anomalies. The issue of moral hazard loses significance in such a reasoning. However, the question of 'honourable' work as a characteristic of human dignity (it is said honourable because enslaving work dishonours and humiliates) remains unresolved.

This is so since work undergirds an ethos of education, self-respect, and contributes to societal cohesion. These may be lofty words, but they are not without merit. Would artificial intelligence (AI) alter the logic of economic life towards a presumed abundance of goods and services?

This question recalls the vision of John Maynard Keynes about a century ago when he foresaw an era of abundance 'for our grandchildren' (*Economic possibilities for our grandchildren*, in *Essays in Persuasion*, London, 1930), based on continuous technological progress. However, this vision has been questioned by many economists.

It is worth noting that behavioural economics has brought nuanced insights into how people make decisions, with variables such as affection, satisfaction, self-fulfilment, simple rules, emotions, empathy, loyalty, altruism, individual and group identities being relevant factors.

However, the acquisitive nature of human beings (which defines the Homo Economicus, not in contradiction with the Homo Faber) is essentially unaltered by such behavioural nuances. In similar conditions, most people choose

to possess more rather than less, often manifesting selfishness; they are not like Franciscan monks, even though ethical and moral values operate in society.

This is why it is so hard to alter the logic, the rationality of economic activity (maximizing net income/profit under given conditions). Markets struggle to internalize externalities that people do not easily perceive or are obliged in some way to consider (such as Pigovian taxes designed to discourage harmful activities).

The sometimes negligible cost of 'informational goods' (Paul Mason, *Post-capitalism: A guide to our future*, 2015) does not change the nature of competition and the effects of economic inequality. Moreover, and not least, people need to eat and have access to clean water.

The acquisitive nature of humans reveals specific traits when identity issues, group dynamics, and the desire for power come into play. Conflicts between people (groups of people, states), including military conflicts, can be interpreted through the lens of the desire to have/control resources that ensure individual and group security and power.

The rule of law must operate within societies and in the international arena. International law is meant to regulate relations between states and, in this regard, to safeguard peace. However, we see so many misfortunes and tragedies miseries occurring in the world we live in. Though, it could be remarked that human history is littered with misfortunes, both large and small. Such an observation, however, cannot provide solace and is even cynical.

It is not simple to redefine wellbeing in statistical and accounting terms; markets are accustomed to aggregates of economic activity that tend to grow, even if macroeconomic adjustments are required due to excessive deficits debt stocks. All of this leads to the inference that markets, performance evaluation algorithms, do not (yet?) accept

lower production and consumption trends, even though such a reversal could entail saving the human species and creating a friendly habitat.

There is a market myopia here when judged broadly (that is supported by evaluations from rating agencies and financial institutions, as well as from many firms and governments).

AI cannot eliminate competitiveness gaps between economies on its own. It is hard to accept that AI would spread globally in a way that eliminates development disparities. On the contrary, AI could potentially widen such gaps and accentuate inequalities within societies.

The strength of inventiveness and innovation varies significantly between countries and depends on the level of education, technological capabilities, expenditures on research and development (R&D), the existence of companies excelling in cutting-edge fields, and more.

AI also cannot reduce public and private deficits, excessive public and private debts, like a wizard; macroeconomic corrections are needed to work toward these goals.

Therefore, it is difficult to see AI as a way out of economic logic, of economic rationality (in the sense we know), as heralding an era of abundance for all human beings; issues of competition, distribution, and inequalities (with social and political effects stemming from them), power seen on multiple levels, will continue to define human interactions and relations between states. Development disparities between economies will persist.

Various scenarios speak of increasing uncertainties, fragmentation, the erosion of social fabric, and deep divisions in societies, the proliferation of military conflicts, an increasingly militarized and dangerous world; such scenarios amplify the ratio of pessimism regarding the future.

A world that allocates more resources to weapons and leans more towards military confrontation while facing enormous challenges related to climate, public health, education, the cost of living, is heading in the wrong direction; it is a path conducive to authoritarian regimes, autocracy.

Looking at the overall context from an economic and political perspective, one could say by using a French aphorism that *“plus ça change, plus c’est la même chose”* (the more things seem to change, the more they stay the same). This last inference does not mean that we should stop thinking that the world can be better, that we should not try to make it better, or at least try to stop negative developments from progressing further. ■

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PS. Although I reacted hot-tempered to Costica Bradatan's opinion Democracy is only for the Gods (New York Times, July 5, 2019), in Democracy is not only for the gods (Hotnews and Contributors, February 8, 2020), what is happening in the world seems to largely support his thesis.

ETF approval for Bitcoin – the naked emperor's new clothes

Bitcoin has failed on the promise to be a global decentralised digital currency. Ulrich Bindseil and Jürgen Schaaf argue that the latest approval of an ETF doesn't change the fact that Bitcoin is not suitable as means of payment or as an investment

On 10 January, the US Securities and Exchange Commission (SEC) approved spot exchange-traded funds (ETFs) for Bitcoin. For disciples, the formal approval confirms that Bitcoin investments are safe and the preceding rally is proof of an unstoppable triumph. We disagree with both claims and reiterate that the fair value of Bitcoin is still zero.

For society, a renewed boom-bust cycle of Bitcoin is a dire perspective. And the collateral damage will be massive, including the environmental damage and the ultimate redistribution of wealth at the expense of the less sophisticated.

A post on [The ECB Blog](#) in November 2022 debunked the false promises of Bitcoin and warned of the social dangers if not effectively addressed.

We argued that Bitcoin has failed to fulfil its original promise to become a global decentralised digital currency. We also showed that Bitcoin's second promise to be a financial asset, the value of which would inevitably continue to rise, was equally wrong.

We warned about the risks to society and the environment if the Bitcoin lobby managed to re-launch a bubble with the unintended help of legislators, who could give a perceived blessing where a ban would be required (Bindseil, Schaaf and Papsdorf, 2022).

Alas, all these risks have materialised.

- Today, Bitcoin transactions are still inconvenient, slow, and costly. Outside the darknet, the hidden part of the internet used for criminal activities, it is hardly used for payments at all. The regulatory initiatives to combat the large-scale use of the Bitcoin network by criminals have not been successful yet.

Even the full sponsoring by the government in El Salvador which granted it legal tender status and tried hard to kick off network effects through an initial Bitcoin gift of \$30 in free bitcoin to citizens could not establish it as successful means of payment.

The history of Bitcoin has been characterised by price manipulation and other types of fraud. This may not be very surprising for an asset that has no fair value

- Likewise, Bitcoin is still not suitable as an investment. It does not generate any cash flow (unlike real estate) or dividends (stocks), cannot be used productively (commodities), and offers no social benefit (gold jewellery) or subjective appreciation based on outstanding abilities (works of art). Less financially knowledgeable retail investors are attracted by the fear of missing out, leading them to potentially lose their money.
- And the mining of Bitcoin using the proof of work mechanism continues to pollute the environment on the same scale as entire countries, with higher Bitcoin prices implying higher energy consumption as higher costs can be covered by miners.

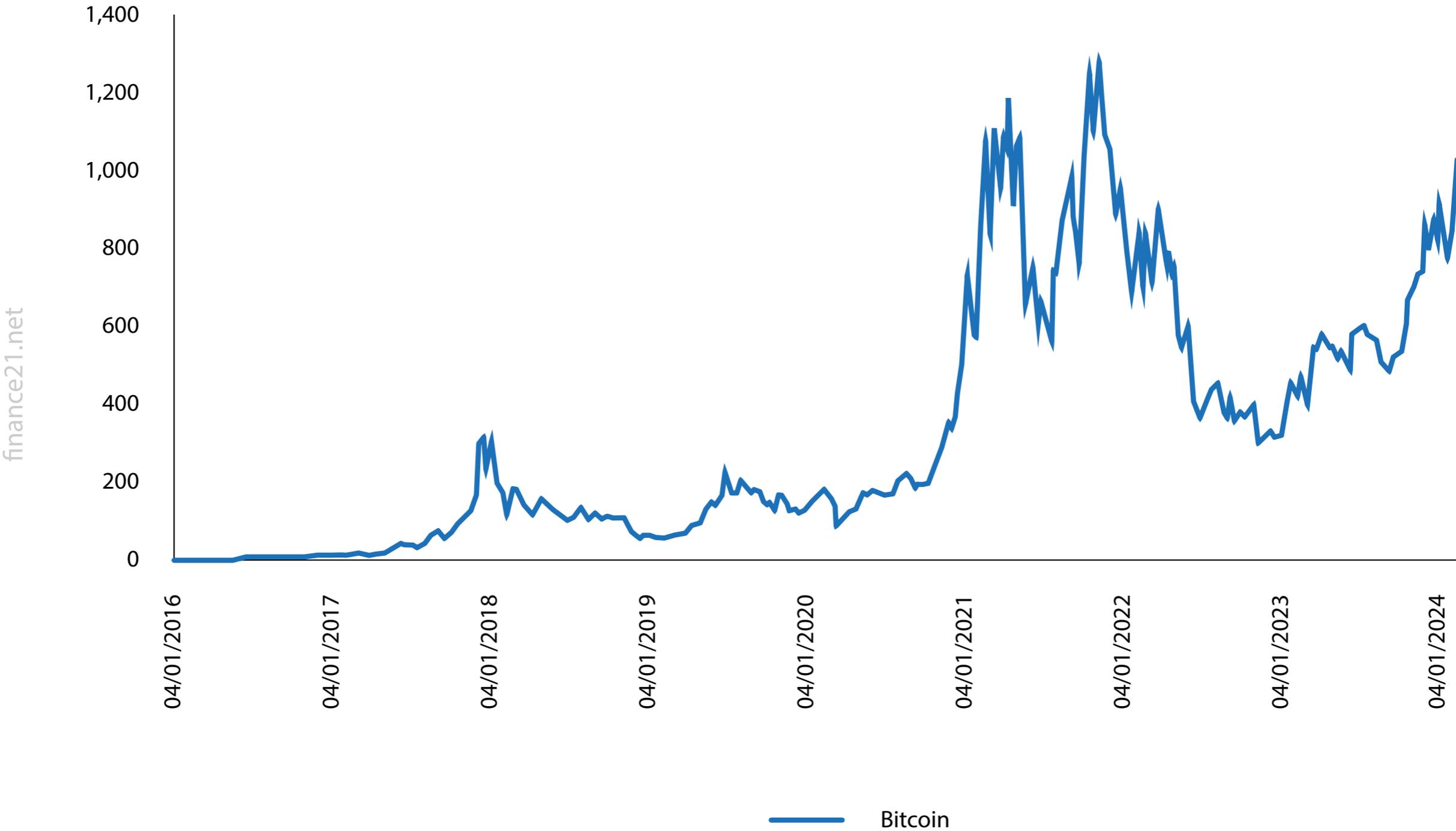
But although this was all known, and the reputation of the entire crypto scene has been harmed by a long and growing list of further scandals¹, Bitcoin has recovered big time since late December 2022 from just under \$17,000 to more than \$52,000. Small investors are easing back into crypto, although not yet rushing in headfirst as they did three years ago (Bloomberg, 2024).

So why is this dead cat bouncing so high? For many, the rally in the autumn of 2023 was initiated by the prospect of an imminent turnaround in the US Federal Reserve's interest rate policy, the halving of the BTC mining rewards in spring and later the approval of the Bitcoin spot ETF by the SEC.

Lower interest rates would have increased the risk appetite of investors² and the spot ETF approval would have opened the floodgates to Wall Street for Bitcoin. Both promised large inflows of funds – the only effective fuel in a speculative bubble.

Still, this could turn out to be a flash in the pan. While in the short run the inflowing money can have a large impact on prices irrespective of fundamentals, prices will eventually return to their fundamental values in the long run

Chart 1. Market capitalisation of Bitcoin, billion USD



Source: IntoTheBlock

(Gabaix and Koijen, 2022). And without any cash flow or other returns, the fair value of an asset is zero. Detached from economic fundamentals every price is equally (im)plausible – a fantastic condition for snake oil salesmen.

Likewise, the use of ETFs as financing vehicles does not change the fair value of the underlying assets. An ETF with only one asset turns its actual financial logic on its head (although there are others in the United States). ETFs normally aim to diversify risk by holding many individual securities in a market.

Why would anybody pay fees to an asset manager for the custody service of only one asset – instead of using the custodian directly, which is in most cases one huge crypto exchange, or even holding the coins for free without any intermediary?

Moreover, there were already other easy ways to gain listed exposure to Bitcoin or to buy Bitcoins without any intermediation. The problem has never been a lack of possibilities to speculate using Bitcoin – but rather that it is only about speculation (Cohan, 2024).

Finally, it is incredibly ironic that the crypto unit that had set out to overcome the demonised established financial system should need conventional intermediaries to spread to a broader group of investors.

The halving of the BTC mining rewards will take place in mid-April. After the bitcoin network mines 210,000 blocks, roughly every four years, the block reward given to Bitcoin miners for processing transactions is cut in half. The current limit of 900 BTC per day will then be cut to 450.

Halving reduces the bitcoin rewards for mining, even though it remains costly. In the past such halvings were followed by rising prices. But if this was a reliable pattern, the rise would already be fully priced in (some say that this was the case).

While the current rally is fuelled by temporary factors, there are three structural reasons that may explain its seeming resilience: the ongoing manipulation of the 'price' in an unregulated market without oversight and without fair value, the growing demand for the 'currency of crime', and shortcomings in the authorities' judgments and measures.

Price manipulation since the start of Bitcoin

The history of Bitcoin has been characterised by price manipulation and other types of fraud. This may not be very surprising for an asset that has no fair value. Crypto exchanges were shut down and operators were prosecuted because of scams during the very first cycles³.

And pricing has remained dubious in last year's upswing. One analysis (Forbes, 2022) of 157 crypto exchanges found that 51% of the daily bitcoin trading volume being reported is likely bogus⁴.

Manipulation may have become more effective as the trading volumes diminished significantly during the recent marked downturn called 'crypto winter' as market interference has more of an impact when liquidity is low. According to one estimate the average trading volume of Bitcoin between 2019 and 2021 was about 2 million Bitcoins, compared to a meagre 500,000 in 2023 (Athanasakos and Seeman, 2024).

The currency of crime: financing evil

As critiques often point out: a key utility offered by crypto is the financing of terrorism and crimes like money laundering and ransomware. The demand for this infamous benefit is large – and growing.

Despite the market downturn, the volume of illicit transactions has continued to rise. The range of possible applications is broad.

- Bitcoin remains the top choice for money laundering in the digital world, with illicit addresses transferring \$23.8 billion in crypto in 2022, marking a 68.0% increase from the previous year. Approximately half of these funds were funnelled through mainstream exchanges, which, despite having compliance measures, serve as conduits for converting illicit crypto into cash. (Chainanalysis, 2024)⁵.
- Furthermore, crypto continues to be the preferred means for ransomware payments, with attacks on hospitals, schools, and government offices yielding \$1.1 billion in 2023, compared to \$567 million in 2022 (Reuters, 2024b).

Misjudgment by authorities?

The international community initially acknowledged Bitcoin's lack of positive social benefits. Legislators hesitated to concretise regulations due to the abstract nature of guidelines and concerns over Bitcoin's divergence from traditional financial assets. However, pressure from well-funded lobbyists and social media campaigns prompted compromises, having been understood as a partial approval of Bitcoin investments (*The Economist*, 2021).

In Europe, the Markets in Crypto Assets Regulation (MiCA) of June 2023 aimed to curb fraudulent issuers and traders of crypto units with - despite the initial intentions towards genuine cryptoassets - an eventual focus on stablecoins and service providers, although without regulating and constraining Bitcoin per se. At the same time, less informed outsiders might have the false impression that with MiCA in place, Bitcoin would be also regulated and safe.

In the USA, the SEC's approach to Bitcoin ETFs initially involved compromises, favouring futures ETFs due to their perceived lower volatility and lower risk of price manipulation. However, a court ruling in August 2023 compelled the SEC to authorise spot ETFs, leading to a significant market rally⁶.

Neither the United States nor the EU have so far taken any effective steps to address Bitcoin's energy consumption, despite evidence of its huge negative environmental impact.

The decentralised nature of Bitcoin presents challenges for authorities, sometimes leading to unnecessary regulatory fatalism. But Bitcoin transactions offer pseudonymity rather than complete anonymity, as each transaction is linked to a unique address on the public blockchain. Therefore, Bitcoin has been a cursed tool for anonymity, facilitating illicit activities and leading to legal action against offenders by the tracing of transactions (Greenberg, 2024).

Moreover, it seems wrong that Bitcoin should not be subject to strong regulatory intervention, up to practically forbidding it. The belief that one is protected from the effective access of law enforcement authorities can be quite deceptive, even for decentralised autonomous organisation (DAO).

DAOs are member-owned digital communities, without central leadership, that are based on blockchain technology. A recent case involved BarnBridge DAO, which was fined more than \$1.7 million by the SEC for failing to register the offer and sale of crypto securities.

Despite claiming autonomy, the DAO settled following SEC pressure on its founders. When administrators of decentralised infrastructures are identified, authorities can effectively prosecute them, highlighting the limitations of claimed autonomy.

This principle also applies to Bitcoin. The Bitcoin network has a governance structure in which roles are assigned to identified individuals. Authorities could decide that these should be prosecuted in view of the large scale of illegal payments using Bitcoin. Decentralised finance can be regulated as forcefully as the legislator considers necessary.

Recent developments, such as increased fines for lax controls (Noonan and Smith, 2024). and the EU's agreement to strengthen anti-money laundering rules for cryptoassets⁷, suggest a growing recognition of the need for tighter regulation in the crypto unit space.

Conclusion

Bitcoin's price level is not an indicator of its sustainability. There are no economic fundamental data, there is no fair value from which serious forecasts can be derived. There is no 'proof of price' in a speculative bubble. Instead, a reflation of the speculative bubble shows the effectiveness of the Bitcoin lobby.

The 'market' capitalisation quantifies the overall social damage that will occur when the house of cards collapses. It is important for authorities to be vigilant and protect society from money laundering, cyber and other crimes, financial losses for the financially less educated, and extensive environmental damage. This job has not been done yet. ■

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Endnotes

1. Recent prominent examples are the collapse of crypto exchange FTX and the criminal conviction of its founder Sam Bankman-Fried, Binance's \$4.3 billion fine for money laundering and breaching sanctions, the Luna/TerraUSD crash, the shutdown of Three Arrows Capital, or the liquidation of Voyager Digital.

2. The contradictions within the original narrative are obvious: like gold, Bitcoin was supposed to be a hedge against volatile financial markets and act as a safe haven in bear markets – and not positively correlate with the riskiest speculative investments. And it is difficult to see why ETFs would be “stepping stones to tokenization” as BlackRock chief Larry Fink framed the approval of the ETF, though it is a recourse to conventional financial products from the pre-crypto era (Rosen 2014).

3. Dunn (2021) attributes the first Bitcoin bubble in 2013 to the Mt Gox exchange. Its bankruptcy resulted in a loss of 650,000 Bitcoins, as it hosted 70 percent of Bitcoin trading. Gandal et al (2021) suggest the initial boom, soaring from \$100 to \$1,000 in two months, was also manipulated via trading software. Griffin (2020) connects the second and third booms to Tether's launch and rise. Tether, a stablecoin, aims to maintain a stable value, backed by fiat currency. Griffin's findings on the 2017 boom indicate that 50 percent of the price increase resulted from Tether manipulation.

4. In the crypto sphere many manipulation techniques can be seen: 1) Wash trading entails repeated buying and selling of crypto units by the same owners, inflating trading volumes and deceiving investors about supply and demand, thereby impacting price discovery. One study based on a sample of almost 30 big crypto exchanges, including Bitcoin, found that wash trading accounts for 77.5% of the total trading volume on unregulated exchanges (Cong 2023). 2) Pump-and-dump schemes involve manipulators using false information, often via social media augmented by algorithms, to artificially increase the price and attract buyers, allowing them to sell at a profit. On 9 January the US SEC's official account on X (formerly Twitter) was comprised. Hackers posted false news about the anticipated SEC approval of a spot ETF containing bitcoin. Bitcoin's price spiked – and dropped sharply when the SEC deleted the post about 30 minutes later (Reuters 2024). 3) “Whale manipulation” occurs when large holders influence a crypto's price to strategically buy or sell significant amounts.

5. More recently Tether, a huge cryptocurrency platform, has emerged as one of the leading payment methods for money launderers in south-east Asia (UNODC 2024). But just because Tether is being increasingly used for money laundering does not mean that Bitcoin is being used less.
6. It should be noted that SEC Chair Gary Gensler said the agency's approvals were not an endorsement of Bitcoin, and he called it "primarily a speculative, volatile asset that's also used for illicit activity including ransomware, money laundering, sanction evasion and terrorist financing." Moreover, Caroline Crenshaw, a Democratic commissioner who voted to deny approval, ran through a list of investor safety concerns in her dissent, ranging from inadequate oversight of the markets to wash trading (New York Times 2024).
7. Cryptoasset service providers must make checks on customers who carry out transactions worth €1,000 or more and report suspicious activity. Crossborder cryptoasset firms must make additional checks (Reuters 2024a).

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The views expressed in each blog entry are those of the author(s) and do not necessarily represent the views of the European Central Bank and the Eurosystem. This article is based on [The ECB Blog](#), 22 February 2024.



Modernising finance: the role of central bank money

The payments system is being transformed. Piero Cipollone argues that central banks need to be at the vanguard of digital transformation to ensure financial stability

Since their inception, central banks have continuously adapted to the changing requirements of the payment sector. They have also taken a keen interest in ensuring it functions smoothly, to protect financial stability and the implementation of monetary policy. Central banks provide the financial system with a safe asset at its core: central bank money. Convertibility into central bank money is what keeps the value of private money stable. And the pivotal role played by central bank money is what connects all the different parts of the payments system. In short, central bank money ensures the singleness of money and the integration of the payments system.

This is particularly valuable in a monetary union like the euro area: central bank money – cash or reserves – can be used to settle transactions from and to all parts of the euro area. This ensures that one euro in Lisbon is the same as one euro in Riga.

But for central bank money to retain its stabilising and unifying role, it must stay at the forefront of technology to ensure it remains an attractive means of settling payment transactions. There is no reason why central banks should be the only stakeholders not keeping pace with the digital transformation.

In fact, they should be at the vanguard of this transformation, acting as an anchor of stability for financial innovation and providing a safe path for modernising finance. The Eurosystem is working to maintain this role.

This is true for retail payments. That is why we are working on a digital euro, so that everyone can use central bank money not just in its current physical form – cash – but also in digital form¹.

Today, however, I will focus on new technologies for settling transactions between financial institutions in central bank money, often referred to as wholesale CBDC to distinguish it from retail CBDC, which is used by the general public.

Historically, central banks have played a key role in simplifying the settlement of these transactions, supporting and often leading the transition from physical forms of money to book-entry formats, and to the electronic clearing and settlement of payments, making it possible to update accounts almost instantaneously².

We now find ourselves on the brink of another significant shift: the advent of tokenisation. According to market participants³, digitally representing claims using distributed ledger technology (DLT)⁴ has great potential. However, this transformation could redefine current financial intermediation and wholesale settlement structures.

We must be cautious that innovations do not undermine the stabilising role of central bank money in settling transactions among financial institutions

To enable central bank money to continue performing its stabilising role, even as the financial system undergoes this transformation, we need to find technological solutions that will allow it to also be used to settle transactions recorded on new DLT platforms.

Let me now explain the role central bank money currently plays as an anchor of stability for wholesale payments. I will then discuss the promises and risks of new technologies for wholesale payments before telling you a little more about how we are exploring new technologies for central bank money settlement of wholesale transactions.

Central bank money as an anchor of stability for wholesale payments

While 'wholesale CBDC' is generally presented as something new, made possible by the emergence of DLT, central bank money has in fact been available in digital form for wholesale transactions between banks for decades⁵.

In 2022 the Eurosystem's large-value payment system, TARGET2 (T2), processed 92% of the total value settled by large-value payment systems in euro and remained one of the largest payment systems worldwide, processing 102.6 million transactions amounting to €570.5 trillion⁶. In other words, every six business days T2 settles transactions equivalent to the euro area's annual GDP.

Financial institutions use central bank money mainly for two reasons. First, central banks issue the safest and most liquid settlement asset, avoiding the credit and liquidity risks associated with private money systems. Being able to convert into central bank money the money that commercial banks issue strengthens public confidence in private means of payment. This in turn reassures market participants that the value of a euro is the same, regardless of its issuer.

Second, settling in central bank money limits the risk associated with wholesale financial markets of payment activities becoming concentrated in individual players.

The widespread use of central bank money to settle wholesale payments therefore minimises the risks for the financial system as a whole and provides an anchor of stability for payments. International standards recognise how crucial this is⁷.

That's why the Eurosystem has continued to modernise its market infrastructure services to make them future-proof and ensure they can meet the needs and expectations of market participants.

In March 2023 a new T2 platform was launched, providing modernised services, enhanced cyber protection and optimised liquidity management across all TARGET services. The platform aligns with ISO 20022, facilitating the exchange at global level of more granular data in a more structured manner.

Moreover, in November we will launch the European Collateral Management System, a unified system for managing assets used as collateral in Eurosystem credit operations that will ensure collateral flows freely across the euro area, contributing to financial integration.

In the context of securities settlement systems, the EU is also considering a shift from T+2 settlement to T+1 or even T+0, potentially decreasing counterparty credit risk and collateral needs⁸.

Successfully implementing this change requires careful analysis of costs and strong coordination between all market players. At the same time, we must take into account that other jurisdictions, such as the United States, are making the transition to shorter settlement cycles⁹.

While experience suggests that the coexistence of different settlement cycles in the EU and other non-EU jurisdictions is feasible at the technical level¹⁰, we must prevent this mismatch in settlement times from weighing on the attractiveness of European capital markets.

We must therefore carefully consider whether, and how, to harness the benefits of aligning standard settlement cycles across major jurisdictions, provided this does not impair the smooth functioning of EU financial markets and financial market infrastructures.

Alongside these challenges of a more traditional nature, we also face challenges relating to the rapid digitalisation of the economy. While the market is calling for standard transactions to be settled more efficiently, it is also calling for solutions to accommodate new use cases. As central bankers, we have to monitor these developments closely and be prepared to respond to them.

New technologies for wholesale payments: promises and risks

The advent of blockchain technology has spurred experimentation among a broad range of market players, including banks and financial market infrastructures.

The application of distributed ledger technology to wholesale financial transactions is still at the exploratory stage, despite the financial industry's strong interest in DLT. Currently only around 22% of European banks use DLT, while another 22% are testing or experimenting with it¹¹.

But a majority of market stakeholders surveyed by the Eurosystem expect a significant uptake of DLT for wholesale payments and securities settlement in the next five to ten years¹².

The benefits of DLT for trading financial assets are twofold. First, it can enhance efficiency by allowing market participants to perform the three key phases of a transaction – trading, settlement and custody – on the same distributed ledger. Of the many advantages this offers, participants mention lower credit risk, fewer failed transactions and less need for extensive reconciliation.

DLT can operate on a 24/7 basis, which would tackle the issue of international market fragmentation caused by different time zones. Lastly, the use of smart contracts¹³ can help streamline the process of verifying and executing transactions.

Second, DLT opens avenues for new applications, such as providing new ways to raise capital and trade financial instruments. A shared platform could make the trading of financial instruments more efficient and resilient, particularly those not currently serviced by financial market infrastructures like over-the-counter traded securities or credit claims.

Thanks to lower costs and reduced complexity, DLT platforms could be more easily accessed by small and medium-sized enterprises (SMEs). This would underpin the EU's capital markets union objective to improve SMEs' access to capital¹⁴.

Moreover, experiments with tokenised bank deposits are underway to assess innovative ways of transferring funds – using blockchain technology, for example – between clients of the same bank or group of banks.

DLT is also being explored as a possible means to improve crossborder payments. However, it is worth noting that these solutions are not always radically innovative, as the benefits associated with them can also be achieved in other ways.

For instance, the Eurosystem's TARGET Instant Payment Settlement (TIPS) service offers immediate payment settlement in central bank money 24/7, facilitates automated and conditional payments through application programming interfaces and is establishing itself as a useful platform for crossborder payments.

Potential DLT-based innovations are still at an early experimental stage. Nevertheless, central banks cannot afford to sit on the sidelines, as any widespread adoption of such innovations could jeopardise the anchoring role of central bank money in guaranteeing the efficiency and stability of our payment system.

Many explored DLT use cases involve transactions, notably in securities, currently settled between banks using central bank money. These include delivery-versus-payment settlement in both primary and secondary markets, along with recurring payments during the life cycle of securities, such as coupon payments.

Insofar as these applications lead to a proliferation of decentralised private money-based settlement systems, including stablecoins and tokenised deposits, they could lead to the refragmentation of wholesale payments. This in turn could impair central banks' ability to provide liquidity in periods of financial stress, elevating financial stability risks.

Eurosystem surveys show that this is not the desired outcome for market participants. They would generally prefer to continue settling in central bank money, or even to expand the range of central bank money settlement services available.

In fact, the absence of solutions enabling settlement in central bank money could impede innovation due to the credit risk associated with private settlement assets. Market players might shun promising new technologies if central bank money is unavailable as a settlement asset.

The availability of solutions for settling DLT-based wholesale financial transactions in central bank money could have the added benefit of facilitating the interoperability and integration of decentralised systems. It could also create opportunities to use central bank money to settle transactions currently settled in commercial bank money, such as over-the-counter derivatives, thereby reducing credit risk in the system.

The ECB's exploration of new technologies for wholesale central bank money settlement

The Eurosystem envisages two options for DLT-based infrastructures for settlement in central bank money. The first involves unified ledger solutions¹⁵.

In these solutions, euro central bank money and other assets, such as securities or foreign currency, would be recorded and settled on the same DLT platform. This could potentially be operated by the Eurosystem or jointly with other parties, subject to compliance with Eurosystem rules.

Although it may be easier to realise the envisaged benefits of new technologies if all assets and cash involved in transactions are on the same platform, reaching consensus on how to regulate and manage this is not without considerable challenges¹⁶.

This could take years given the difficult technical, legal, governance and business considerations, especially when multiple types of assets and jurisdictions are involved¹⁷. Moreover the implications of using DLT for the conduct of monetary policy need to be fully understood and possible risks duly assessed and mitigated.

Moreover, the move from existing systems to DLT platforms is likely to be gradual, as the market is still in the early stages of development and market players still need to make major technological decisions. This means there would be coexistence with legacy systems, whether operated by central banks or private stakeholders.

This situation calls for solutions that can adapt to rapid market innovation while still serving traditional use cases and enabling seamless interaction between old and new systems. By achieving sufficient harmonisation and interoperability, there is a good chance that the desired automation can be attained, even across different platforms.

The second option for DLT-based infrastructures for settlement in central bank money is thus based on interoperability-type solutions. Such solutions are likely to be faster to develop and less costly, and they do not prevent us from continuing to assess unified ledger solutions. The Eurosystem has for some time been looking at interoperable solutions and conducting exploratory work in cooperation with interested market participants.

These solutions could respond to immediate market demand and involve creating a link between market DLT platforms and central bank payment infrastructures. This link would, for example, enable securities or foreign currency transfer on a DLT platform to trigger settlement in euro central bank money, which may alternatively be provided in the form of DLT tokens, registered on a platform operated by the Eurosystem, or in central bank accounts in infrastructures based on existing technology.

Several interoperability-type solutions have been developed by national central banks within the Eurosystem, including the Deutsche Bundesbank's Trigger Solution, the TIPS Hash-Link solution developed by the Banca d'Italia and the Banque de France's Full DLT Interoperability solution.

The Eurosystem's exploratory work consists of experiments involving mock transactions and trials in a test environment in which a limited number of actual transactions will be settled. In December we published a call for expression of interest to participate in these experiments which will be conducted this year. The results will form the basis for the Eurosystem's future considerations about wholesale payment infrastructure.

The Eurosystem is not alone in exploring new technologies for wholesale financial transactions. Currently, up to 86 central banks around the world are exploring various ways to interact with DLT platforms¹⁸.

Crossborder projects coordinated by the Bank for International Settlements (BIS) and its innovation hubs are exploring how new technologies could potentially improve crossborder transactions.

Achieving a truly integrated market for wholesale transactions, whether DLT-based or not, requires collaborative efforts between public authorities, central banks and the market. In this respect, the European Union is at the forefront.

By adopting a pilot regime¹⁹ for DLT-based market infrastructures, European legislators have made it possible to experiment using real transactions. And by developing a solution for central bank money settlement of wholesale financial transactions recorded on DLT platforms, the Eurosystem is backing regulation with innovation. This has the potential to give Europe a competitive advantage in developing its industry base for DLT trading and in supporting the international role of the euro²⁰.

Stakeholders considering a move to DLT should ensure they do not trigger the recurrence of market fragmentation. This involves enabling interoperability between platforms, harmonising protocols or adopting a common data taxonomy. Agreeing on industry standards and implementing them across the ecosystem is crucial, not only for DLT-based transactions but also for settlements using existing technologies.

Conclusion

The rapid growth of digital technologies has sparked widespread market interest and experimentation. DLT-based technology is seen as promising, with the potential to increase efficiency for some existing transactions and to facilitate new use cases.

But we must be cautious that such innovations do not undermine the stabilising role of central bank money in settling transactions among financial institutions. Instead, central banks must be ready for the possible broad adoption of new technologies and keep pace with them as they have done in the past. This will help to combine innovation with financial stability, facilitating the modernisation of finance.

Achieving this requires public-private partnership to shape the future ecosystem for wholesale central bank money settlement. This collaboration should harness the benefits of new technologies while ensuring that settlement remains secure and efficient.

As we push the technology frontier, we must recognise that there are still many aspects that need to be understood in greater depth. The Eurosystem is playing its part by making central bank money solutions available for exploratory work. It is also conducting further analysis to develop its vision for the future wholesale financial transactions ecosystem.

However, it is ultimately the market's responsibility to demonstrate the added value of DLT for wholesale business cases, and to establish and implement the necessary standards. ■

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Endnotes

1. See Cipollone, P (2023), [“The digital euro: a digital form of cash”](#), ECB, 17 November; and Panetta, F. (2023), [“Shaping Europe’s digital future: the path towards a digital euro”](#), introductory statement at the Committee on Economic and Monetary Affairs of the European Parliament. See also ECB (2023), [“Digital euro: The next step in the advancement of our currency”](#), 18 October; and ECB (2023), [“A stocktake on the digital euro - Summary report on the investigation phase and outlook on the next phase”](#), 18 October.
2. Norman, B, Shaw, R and Speight, G (2011), [“The history of interbank settlement arrangements: exploring central banks’ role in the payment system”](#), Working Paper, No 412, Bank of England, June.
3. According to [this article](#), 97% of institutional investors believe it will revolutionise asset management.
4. Distributed ledger technology (DLT) refers to a family of technologies that allow users to modify records in a shared database (the ledger) without relying on a central validation system.
5. In other words, wholesale CBDC already exists. What is new is the exploration of solutions for central bank money settlement of wholesale financial transactions recorded on distributed ledger technology (DLT) platforms. See Panetta, F (2022), [“Demystifying wholesale central bank digital currency”](#), speech at the Symposium on “Payments and Securities Settlement in Europe – today and tomorrow” hosted by the Deutsche Bundesbank, Frankfurt am Main, 26 September.
6. See ECB (2023), [TARGET Annual Report 2022](#), June.
7. See Bank for International Settlements, (2012), [“Principle 9: Money Settlements”](#), [Principles for financial market infrastructures](#), April. This principle foresees that “[a financial market infrastructure (FMI)] should conduct its money settlements in central bank money where practical and available.”
8. See European Securities and Markets Authority (2023), [Call for evidence – On shortening the settlement cycle](#), 5 October.
9. China has transitioned to T+0 for interbank market government bonds. India has already moved to T+1 for shares traded on exchange while the United States and Canada are planning to move to T+1 for a broader set of financial instruments by the end of May 2024. The United Kingdom is assessing a possible move to T+1 or T+0.

10. Both the US government and government agency debt markets as well as the UK government bond markets have been settling on a T+1 basis for a few years now.
11. See European Banking Authority (2023), [“Box 10: Digitalisation trends at banks”](#), Risk Assessment Report of the European Banking Authority, December.
12. See ECB (2024) [“Central bank money settlement of wholesale transactions in the face of technological innovation”](#), Economic Bulletin, Issue 8/2023.
13. smart contracts can be used to automatically check if a contract’s terms and conditions have been met before executing the resulting action, eg. a transaction or a flow of information.
14. See Lagarde, C (2023), [“A Kantian shift for the capital markets union”](#), speech at the European Banking Congress, Frankfurt am Main, 17 November; and Panetta, F (2023), [“Europe needs to think bigger to build its capital markets union”](#), The ECB Blog, 30 August.
15. This would not imply one global ledger for all assets and use cases. There could be a multiplicity of individual unified ledgers, potentially connected to each other and to existing systems.
16. See Bank for International Settlements (2023), [“Blueprint for the future monetary system: improving the old, enabling the new”](#), BIS Annual Economic Report, 20 June.
17. Consolidation on a common platform – or perhaps more realistically on a limited number of platforms – could be a long-term objective. However, this requires carefully assessing the implications of making central bank money available on a platform that may be jointly operated with others or may involve participants that do not currently have access to central bank infrastructures, new categories of market participants or participants in other jurisdictions. Before moving towards any common platform, assurance is needed that it can be implemented in such a way that central banks can continue to meet their objectives, not least as regards the conduct of monetary policy. For the Eurosystem, a key requirement would be the ability to control the central bank money we issue: any risk of external parties creating or destroying euro central bank money, or euro central bank money falling into the hands of anyone ineligible to hold it, must be avoided.

18. See Kosse, A and Mattei, I (2023), *“Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto”*, BIS Papers, No 136, Bank for International Settlements, July.

19. See Regulation (EU) 2022/858.

20. See also Panetta, F (2024), *“Beyond money: the euro’s role in Europe’s strategic future”*, address at the “Ten years with the euro” conference, Riga, 26 January.

I would like to thank Mirjam Plooij, Cyril Max Neumann and Jean-Francois Jamet for their help in preparing this speech. This article is based on a [speech](#) delivered at the 30th Annual Congress of Financial Market Professionals organised by Assiom Forex, Genoa, 9 February 2024.

Shaping the future financial system in the public interest

CBDC

Technological change has been fast and foundational.
Cecilia Skingsley discusses innovation and the future of
central bank digital currencies

hope to contribute to the discussions about CBDCs along two dimensions. First, a longer-term view of why I believe the public sector must focus on innovation. Second, what central bank digital currencies can and cannot do, and the task of developing international standards for them.

Being a great fan of history, I know that we can really only call a moment 'historic' in hindsight. Still, I will risk saying that we are going through an inflection point in history, one of those moments when the way we think about a certain topic might be changing in a fundamental way.

Technological progress increases humankind's appetite for better goods and services. In the area of money and payments, this means transactions should be available 24/7, settle instantly and be generally more efficient domestically as well as across borders.

Technological change has also been so fast and foundational that it might be altering some core concepts of the financial system. Here I am thinking about the notion of money as a social and institutional construct. We accept money today because we expect that other people will accept it tomorrow as well. That trust originates from institutional arrangements that have evolved over generations and have central banks at their core.

Sometimes you may hear claims that the tech industry can replace this framework of trust and functionality with algorithms and encryption. The practical results have been mostly unconvincing so far – in the sense that most of us still use fiat money to pay for our shopping and bills.

But we can already draw two conclusions: one, that there are many technological ideas out there with a lot of potential; and two, if left unchecked, these technologies may develop into services and structures in a way that does not have the public interest as first priority.

Money is a public good, and a very fundamental one. It should be neutral, and it should be easy to use, safe and accessible for everyone. It is a clever solution to our need to make economic value portable. And who should be responsible for it?

I would say central banks. Central banks are by legislation entrusted with offering money that meets criteria such as being a stable store of value and an efficient medium of exchange. They also provide a critical role as lenders of last resort in times of stress.

Technology is raising new questions about the roles of the state and the private sector. The accelerating digitalisation of our societies is bringing new possibilities. Some are exciting, but some present reasons for concern

Central banks are monopolists in the provision of money as a public good. I strongly believe it should be so. But central banks should not be complacent.

This topic is causing a lot of heated debate. Technology is raising new questions about the roles of the state and the private sector. The accelerating digitalisation of our societies is bringing new possibilities. Some are exciting, but some present reasons for concern.

To paraphrase what the French politician George Clemenceau said about war and generals, money is too important a matter to be left only to central bankers¹.

What do I mean? In designing the future financial system, we will have to grapple with many difficult questions on privacy, choice, inclusion, stability, innovation and geopolitics, to name a few. All of these involve complex public policy choices and more players in the official sector having to work together.

I will not pretend to know the answers. But I am sure that we need to have this debate to reach some deliberate answers. As the ultimate trustees of the monetary system, central banks and other public authorities have the obligation to investigate and explore what the money of the future will look like.

I am also convinced that the current infrastructures in the financial system need to be upgraded to handle new kinds of demand. Public policy objectives such as protecting the singleness of money, financial inclusion, efficiency, stability and resilience need to be met.

That said, I acknowledge the fact that different countries approach this very differently. The starting point and pace of transition vary, and ambitions vary. Some countries trust the private sector to deliver greatly, while others have different approaches.

Before I get to the CBDCs, let me say a few words about cash. The role that cash plays in our societies is also being disrupted by technology, both from incumbents and new players.

I believe cash should continue to exist and people should have the option to use it if they want. But coming from Sweden, one of the most cashless societies in the world, I see the writing on the wall: cash usage is going down, and the network effects go against it.

The scenario of a cashless society is claimed by some to be a conspiracy led by banks and credit card companies. I think the reality is more boring: we are seeing a behavioural shift towards digitalisation and dematerialisation, which we also see in the wider financial system.

Of course, it's not the same in every country. And there are many social, economic and development dynamics around it. But when it comes to cash usage, many countries observe the same trend².

So, policymakers need to think carefully about what they want to do about it. Because this is one of those situations in which a lot of work is required to reach a structure that reflects societal preferences. Ensuring access to and protecting cash usage is a policy decision and requires specific actions. In our rapid evolution into a more digital society, this just doesn't happen by itself.

And this brings me to CBDCs. CBDC refers to money issued in digital form by the central bank for use amongst either financial institutions only (wholesale) or by the public for households and businesses, what we call a retail CBDC.

Let's first look into retail CBDCs in a domestic context. Then I will broaden the focus to discuss concepts of wholesale CBDCs and what that can imply in an international perspective. There is a lot of hype and heat around this, both positive and negative. So, allow me to take a minute to discuss some common statements.

Solution looking for a problem

One thing we hear a lot is that 'retail CBDC is a solution looking for a problem'. Why bother in the first place? Things are just fine. I hear that some in the financial industry are making just that argument.

Imagine for a second if a pharmaceutical company were to say, 'That's it, no more research. We don't need new drugs, the ones we have are enough. And if we haven't found the cure to certain diseases yet, we'll probably have to live with that.' Or imagine car manufacturers saying, 'That's it, no more safety improvements!'

First, things are not generally well. Payment services are often opaque, slow and expensive.

Second, innovation usually takes us to new places and opens up possibilities that were not there until a new technological breakthrough has happened.

Let me again resort to history and provide an example. In 1989, engineers at Swedish phone company Ericsson were trying to develop wireless headsets. They invented Bluetooth.

They were not trying to stream wirelessly from a tablet to a TV and have fancy wireless speakers around the house; they were not thinking about wearables, power meters for bikes or the internet of things. All these things became possible after the basic technology was developed. Someone at the time might have thought, 'What's the problem with wires?', and Bluetooth would never have been invented.

Similarly, if we dismiss CBDCs as a structure and a service because they don't address immediate problems, we might be forgoing opportunities to improve that precious public good, money. We would miss opportunities to provide better, safer and cheaper services to people.

Protecting privacy

A second accusation often hurled at CBDCs is that they will be a threat to privacy and an instrument for social control.

Technology can be used for good or misused. This is nothing new. Many people are rightly worried about how much privacy we are losing today because of technology, and how much of our lives is already monitored through our phones. That sense of vulnerability certainly influences the debate about privacy and financial innovation.

But let's take a step back and remind ourselves that the privacy we have has not come about by chance.

Our banks know absolutely everything we spend, where and how. This information is protected by robust legal frameworks in most countries. So, these mechanisms can and should be preserved if and when countries decide to launch a retail CBDC.

The BIS Innovation Hub, which I lead, is working on several aspects of how CBDCs can protect privacy. One ongoing experimentation, named Polaris, looks into the best design options for offline use. We have published the conclusions of another project, called Tourbillon, which proposes new privacy solutions for retail CBDCs.

Let me also point out that the monetary system offers alternatives. And having choices enhances welfare. A retail CBDC should not be something that is forced on individuals. Those who wish to stick to cash or those who are happy with their cards should have these choices.

Let me also state for the record, once again, that central banks have no commercial interest in personal data – unlike the private sector. Privacy is a social and legal construct, which correlates with the level of development and the strength of democratic institutions in each country.

As BIS General Manager Agustín Carstens reminded us in a recent speech, the laws in most countries establish strong privacy protections but also limits to that privacy. A practical example are the existing safeguards for using cash in the formal economy. If I tried to buy a house with cash, I should expect significant scrutiny.

Financial stability

A third statement I wish to discuss is the supposed risk that retail CBDCs could represent to financial stability: how they could facilitate bank runs and disintermediate the financial system.

In terms of bank runs, the train has left the station. We are already living in a world where digital runs can happen. Could a CBDC make the problem even worse? Well, not necessarily: with the right provisions in place, CBDCs can be neutral in that regard³.

And in terms of the financial system, what we call the two-tier system has worked well: central banks provide money as a public good and neutral platform. The private sector manages customers, innovates and creates new services, while playing their part in allocating credit to the economy.

Money and payments on the global stage

So, now that I have discussed some statements and hopefully dispelled some misperceptions, let me leave the topic of retail CBDC and take us to money and payments on the global stage.

Let's look at the problems. As I already mentioned, crossborder payments have a lot of room for improvement. They can be faster, cheaper and more transparent. But how?

While I believe there is a role for retail CBDC in crossborder payments, it is not an immediate use case. We are still far away from a future where domestically issued retail CBDCs are used in a crossborder context.

But we have other alternatives. Joseph Schumpeter defined innovation as both creating new things and improving the existing ones.

Connecting fast payment systems is one of these areas of improvement. The Innovation Hub is currently working on Project Nexus, which has the potential to realise a platform for interconnecting national fast payment systems. There are 64 of those around the world. Trying to interconnect them individually would generate a maze of over 1,700 bilateral connections.

Project Nexus proposes a single hub for any country to plug their system into, by adopting certain technical and governance requirements – similar to how internet protocols work. Five countries in Asia – Indonesia, Malaysia, the Philippines, Singapore and Thailand – are developing the Nexus platform to integrate their systems.

If they succeed, a market of over 500 million people will be able to send payments as easily as they send a text message. Just think how convenient that would be for sending remittances.

Wholesale CBDCs

Coming back to new things: as opposed to retail, which would be used by consumers similarly to cash, wholesale CBDCs are more advanced in paving the way for crossborder payments⁴. Wholesale CBDCs can be described as central bank money offered as a settlement vehicle for financial institutions, but not available to individuals.

They would serve a similar role to reserves in the current system, but with added functionalities that can alleviate many frictions we see today.

Central banks around the world are actively working on solutions that would include the use of wholesale CBDCs⁵.

Can wholesale CBDCs be a game-changer for crossborder payments? Reviewing the BIS Innovation Hub project portfolio – Jura, Dunbar and mBridge – my answer is yes. Based on our findings, benefits from issuing a wholesale CBDC could include operational transparency, faster settlement, less risk. In other words: faster, cheaper, simpler crossborder payments.

The opportunities of wholesale CBDCs do not stop there. Together with tokenised deposits and securities, they can facilitate a future ecosystem with less frictions and more efficiency⁶.

If in the future financial institutions and market infrastructures move towards more tokenised securities and that becomes systemic, then we will need a system built on the trust of central bank money in the form of wholesale CBDC. This can be used as a vehicle for settlement.

Our latest [Annual Economic Report](#) laid out a vision for a new kind of financial market infrastructure that would build on tokenised assets—which we have termed a ‘unified ledger’. It would be a common platform bringing together central bank money as the settlement asset, tokenised deposits and tokenised assets.

It would allow these various components to work together seamlessly, while remaining grounded in the foundation of trust provided by the central bank and its capacity to knit together key elements of the financial system.

That is the vision. A great deal of work is going into turning it into reality. The BIS Innovation Hub is currently exploring a project that will experiment further with this concept.

Tokenisation also opens up the possibility of encoding policy and regulatory requirements into a common protocol for crossborder use cases, for example related to anti-money laundering and know-your-customer procedures – which we are now exploring with Project Mandala.

For those of you who think this all sounds like science fiction, blue-sky stuff, let me say that things are happening now.

We will continue to test the usefulness of tokenisation in a new project: we will work together with the World Bank and the Swiss National Bank to simplify the process for making development money available for emerging and developing economies through international financial institutions and we are collaborating with additional institutions, such as the IMF, to explore other potential use cases.

So much progress has been made in the wholesale CBDC space. But there is still much that we need to learn. Technology needs to be developed. Even more important, legal and governance structures need to be put in place.

The future of CBDC

For those of us who believe that the fiat money system is the best version of money for our societies, we need to explore the subject further. Different countries will make sovereign choices, and their views can also vary over time.

However, while issuing a CBDC is definitely a matter for each country to decide, crossborder integration needs to be in the picture. How then can central banks reconcile the domestic and international perspectives?

The answer depends on the appetite for common standards. Various existing standards are relevant for CBDCs. Let me present three broad categories.

- First, legal and regulatory standards already exist. These are the Principles for Financial Market Infrastructures, and the multiple recommendations on financial integrity developed by groups such as the Basel Committee on Banking Supervision and the Financial Action Task Force.
- A second category relates to payments-specific technology and operational standards such as message formats and communication protocols. For the non-CBDC systems we see today, technical interoperability is promoted through various sets of common standards.
- Finally, there are cross-cutting technology standards with general application beyond just digital currencies. Take, for example, technical specifications related to security or identity⁷. These can help enable the development of accessible CBDC platforms.

Together these standards can play a critical role in supporting the security and interoperability of CBDCs. They can facilitate trust and the protection of the public interest above all.

However, questions remain. Do these standards need to be implemented early on or else they would be difficult to change later? To what extent do they need to be adapted to ensure they can operate with non-CBDC systems? These questions are already being addressed at different levels by the global community.

Conclusion

Given their historical roles and current mandates, central banks will need to make sure money continues to work and meets society's broad needs.

While the purpose is clear, the plan is flexible. There is no one solution to rule them all. Different countries have different homework to do. But many issues rhyme, and collaboration is useful. This is one of the core missions of the BIS Innovation Hub: foster collaboration across central banks and between those and other players, like commercial banks and technology companies.

I said in the beginning that I like history. Schumpeter also defined history somewhat negatively as *“a record of ‘effects’ the vast majority of which nobody intended to produce.”*

Technology will not slow down for anyone, and digitalisation affects everyone. We should not end up in a position of just having to live with the effects. It is our collective job to make sure technology serves economically meaningful activities. ■

Cecilia Skingsley is the Head of the BIS Innovation Hub

Endnotes

1. "War is too important a matter to be left to the military."
2. See [Digital payments make gains but cash remains \(bis.org\)](#).
3. Read more about in [Central bank digital currencies: financial stability implications](#).
4. [BIS-IMF-World Bank central bank conference: Paving the way for cross-border CBDC payments](#).
5. The most recent examples were the announcements last month by the Bank of Korea, to which the BIS is providing advice, and by the Swiss National Bank, building on Project Helvetia, developed in partnership with the BIS Innovation Hub.
6. Read more about trade finance use cases in the BIS's 2023 Annual Economic Report: [Blueprint for the future monetary system: improving the old, enabling the new](#).
7. For example, the NIST cyber security framework, or the Digital Identification for Financial Services standards developed by the International Telecommunications Union.

This article is based on a keynote [speech](#) by at the 'Exploring central bank digital currency: Evaluating challenges & developing international standards' conference, 28 November 2023, Washington DC.



Advancing crossborder payments and financial inclusion

Payments are a vital part of the global and interconnected financial ecosystem. Michelle Bowman considers the evolving payments landscape

Introduction

We are all participants in a global and interconnected financial ecosystem, and payments are a vital component of this system. The payments landscape continues to evolve, through infrastructure upgrades, innovation, changing consumer preferences, and advancements in both the public and private sectors.

Faster, cheaper, more transparent, and more inclusive crossborder payment services offer widespread benefits for citizens and economies around the world, with the potential to support economic growth, international trade, global development, and financial inclusion.

This global ecosystem is comprised of individual jurisdictions, each with its own history, public policy objectives, payment infrastructures, and regulatory environments. Within these independent economies exist a wide range of businesses and consumers, all with vastly different needs and requirements.

As policymakers, we must consider not only how to foster safe, efficient, and accessible payment and settlement infrastructures to support the broader financial system but also how those same systems and infrastructures can support the needs of consumers, businesses, and financial service providers.

This includes support for responsible innovation and enabling providers, such as banks and other nonbank financial service providers, to meet the evolving needs of their customers.

In many cases, the policy tradeoffs we face domestically are amplified in the crossborder context. To foster safety and efficiency in the payment system, it is imperative to seek improvements that support an accessible and inclusive system that works for the broad spectrum of different participants, while still maintaining rigorous risk, fraud prevention, and compliance standards that are critical for protecting participants and the overall system.

It is also important to note that these issues are complex and will not be resolved through advances in technology alone. Rather, changes in technology must align with the evolution in individual behaviour and market conventions, and when this does occur, it does so only over time.

The payments landscape is complex, and it continues to evolve in response to consumer and business needs. Policymakers must continue to consider opportunities to improve domestic and crossborder payment and settlement infrastructures and seek to further broader access to the financial system

I will share my views on the evolving crossborder payments landscape, discuss how financial inclusion is framed within this broader context, highlight the roles that both the public and private sectors play, and identify actions that the Federal Reserve is taking to improve payment system infrastructures and support responsible innovation. Throughout, I will highlight the key challenges and public policy tradeoffs that we, as policymakers, should consider.

Complexity and challenges of the crossborder payments landscape

Crossborder payments face a number of challenges, including high costs, low speed, barriers to access, and limited transparency¹. Today crossorder payments are carried out through a diverse, multilayered set of networks and are inherently more complex than domestic payments as they involve multiple participants, infrastructures, currencies, time zones, jurisdictions, and legal and regulatory frameworks.

These challenges add complexity and create frictions in the crossborder payments process, leading to higher transaction costs and slower processing times for consumers and businesses. To help address these frictions, the G20 countries agreed in 2020 to a multiyear roadmap to identify and develop improvements to crossborder payments².

The *G20 Roadmap for Enhancing Cross-Border Payments* is an instructive example of collaboration across jurisdictions, engaging in international dialogs and working with the private sector to identify how best to ease unnecessary frictions.

As one who values efficiency, I am generally supportive of opportunities to address unnecessary frictions. However, when considering frictions related to crossborder payments, some are necessary while others may not be necessary.

Any discussion of these frictions must be nuanced and properly contextualized since there are public policy tradeoffs and operational realities that must be considered.

Some frictions may be the result of intentional policy choices and safeguards implemented to protect the parties involved in a transaction while also protecting the financial system as a whole. Other frictions may result from consumer or business preferences. As policymakers, we must consider all of these frictions within this broader context.

Let's take compliance requirements as an example. Banks play a critical role in implementing compliance and reporting requirements that support public policy objectives, including the deterrence of financial crimes and countering terrorism finance.

In the United States and other jurisdictions, banks balance this need for transparency to deter crime with the need to protect the privacy of consumer financial data³. While regulatory compliance requirements add complexity, particularly in crossborder payments, it is a complexity that results from the discretion to apply various compliance frameworks in different jurisdictions.

With this in mind, we can consider ways to encourage more consistent implementation of rigorous international standards and continue to support the development of new technologies and solutions that help automate processes, reduce costs, and promote effective safeguards across jurisdictions.

As I have discussed in previous remarks, while conversations on payments innovation often focus on technological capabilities as the solution to realizing certain benefits, technology on its own is not always the driver of realizing these benefits since many of these issues are grounded in policy choices and operational realities⁴.

However, it is still important to assess potential opportunities for technological innovation and the benefits technology could provide within the broader context of a robust, well-functioning global banking and payments system. I have long supported responsible innovation that solves specific problems and enables financial service providers to meet the needs of consumers and businesses in a safe and sound manner.

Despite the difficulty and complexity of overcoming crossborder frictions and challenges, we can work together, through the G20 and in other collaborative settings, to identify ways to make incremental and tangible progress.

There are many tools to consider—such as infrastructure improvements, sharing best practices across jurisdictions, improving data flows, and recognizing innovative technologies and business models. This work will likely require a combination of these tools to reduce unnecessary frictions while still achieving significant policy goals.

Payments and financial inclusion

I will turn now to discuss financial inclusion, which is an important lens through which policymakers should consider these challenges⁵. Many features of the payment system—such as access, cost, and speed—have profound implications for financial inclusion.

In my view, the payment system and the broader economy are most efficient and effective when there is broad participation, when unnecessary frictions are minimized, and when banks, especially smaller financial institutions, can provide services to meet consumer demand in a safe and sound manner. An inclusive financial system offers accessible choices that meet consumers' needs and enhance their financial wellbeing.

From a consumer's perspective, this means the opportunity to make payments, to build wealth and gain access to credit and other needed financial services to participate in an increasingly digital and interconnected economy.

Access to the payments system enables consumers to meet financial obligations by receiving and transferring money safely and in a timely manner. Reliable, cost-efficient payment services promote financial inclusion by providing consumers with options that meet their various needs. This is critical because financial inclusion is not a one-size-fits-all solution.

In the US, for example, consumers come from a wide range of economic circumstances; have varied perceptions of and experiences with the banking system; and, most importantly, have different needs when it comes to financial products and services.

It is also essential to note that gaps in financial inclusion differ across jurisdictions. In some cases, these gaps stem from the limited availability of and individual ability to access the various types of payment and financial services provided in different countries.

This varied access to services may be due in part to unique regulatory environments and consumer and business preferences. Thus, policymakers and service providers within each jurisdiction are best suited to tailor solutions within their own domestic context.

Although each jurisdiction is unique, we as policymakers should be willing to collaborate and assess opportunities for systemic improvements that could provide widespread benefits, including the work of the G20 in support of crossborder payments.

Minimizing unnecessary frictions is a worthy goal whether the intended beneficiary is an international financial institution, a small business or nonprofit managing cashflow with international customers, or a consumer simply

seeking to send and receive payments, needing to do so safely without excessive fees or experiencing extended delays in receiving funds.

In the context of crossborder payments, global remittances can also play a significant role in expanding financial inclusion. In some countries, these remittances are an economic driver by serving as a key source of funding for some households, which can provide a path to a more inclusive economy.

As a result, it is critical that consumers can send and receive these types of payments safely, efficiently, and affordably. Research has shown that the ability to receive remittances increases the probability of having a bank account and contributes to economic engagement⁶.

Yet, high fee structures for remittance services can have a significant impact on households sending money abroad. Recent data show the average cost for sending a \$200 remittance from the United States was approximately 5.8 percent of the transaction amount, or about \$12⁷.

The G20 countries have reaffirmed the United Nations Sustainable Development target for reducing average remittance fees to below 3 percent by 2030⁸. Encouraging more cost-effective remittance services could result in a greater proportion of funds reaching the intended recipients, which could further bolster their economic capabilities.

Roles to be played by both private and public sectors

But how might we achieve some of these more efficient and cost-effective payment systems? Both public- and private-sector participants have critical and complementary roles in advancing financial inclusion within a given jurisdiction and improving the efficiencies of crossborder payments and remittances.

The payments industry has long relied upon innovation to meet the evolving needs and expectations of consumers and businesses. In an increasingly digital economy, these innovations offer valuable options for consumers and business to send and receive payments in more convenient and cost-effective ways.

Today, the private sector offers opportunities to expand access to digital payments and other financial services. For example, in the U.S., the Bank On program promotes a national standard for customer bank accounts that are both low cost and low risk⁹.

Other jurisdictions have incorporated improvements in financial access through mobile money transaction accounts. Some payment service providers have established partnerships to expand upon the options available to consumers and businesses for sending and receiving funds.

Other private sector initiatives are exploring technology enhancements to offer more convenient digital options for consumers and businesses to send remittances or make payments across borders. These private sector developments complement ongoing public sector crossborder initiatives, including the G20 work.

Continued collaboration like these efforts across the public and private sectors must support responsible innovation, including a well-defined regulatory perimeter that protects consumers and the broader financial system.

I'd like to take a moment to highlight two instances in which the Federal Reserve has provided clarity to support financial inclusion within a framework of responsible innovation. First, the Fed issued an interagency statement in support of banks engaging in small-dollar lending¹⁰.

This guidance underscores the importance of financial institutions offering small-dollar loan products to consumers and small businesses that support successful repayment outcomes and that avoid continuous cycles of debt due to rollover and reborrowing.

Additionally, the statement recognizes that these products can help borrowers transition into other types of credit-based financial products. Second, the Fed also issued an interagency statement on the use of alternative data in credit underwriting¹¹.

This guidance clarifies that with a customer's consent, a bank can use alternative data, like checking account balance activity, to help evaluate the creditworthiness of a potential borrower who might not otherwise qualify for a loan.

In both cases, timely guidance has sought to support responsible innovation and leverage the cashflow information on deposit accounts to meet their customers' needs.

While I have highlighted a few examples that illustrate the connection between payments and financial inclusion, the Fed supports and participates in several initiatives to broadly enhance these efforts. These efforts will continue to work toward fostering a US economy that works for everyone¹².

Payment system improvement and international collaboration

Finally, I would like to highlight some recent Federal Reserve activities that support domestic and international payment systems improvement and responsible innovation. The US financial and payment systems currently support the effective transmission of funds, and our work will continue to evaluate opportunities to improve upon an already safe and efficient system.

The recent introduction of the FedNow® Service, our new interbank system for instant payments, and our commitment to adopt the ISO 20022 messaging standard for the Federal Reserve's wholesale payment service by March of next year demonstrate this ongoing effort¹³.

Over the longer term, the Federal Reserve will continue to conduct research and assess innovative technologies and business models to better understand their potential role in the future payments and financial ecosystem. This analysis must include a consideration of potential opportunities, risks, and tradeoffs primarily for crossborder payments and secondarily for financial inclusion.

The Federal Reserve also works closely with our international counterparts on payments innovation and related topics. This includes work with multilateral institutions including the Bank for International Settlements, the G7, and the Financial Stability Board, as well as bilateral engagements with other central banks.

As I've discussed, continued collaboration among public-sector institutions and across the broader payments community will be essential for fostering progress toward a more inclusive, effective, and efficient crossborder payments system that works for everyone.

Conclusion

The payments landscape is complex, and it continues to evolve in response to consumer and business needs. Policymakers must continue to consider opportunities to improve domestic and crossborder payment and settlement infrastructures and seek to further broader access to the financial system.

At the same time, we must recognize that these challenges present opportunities to refine public policy decisions understanding the tradeoffs and the distinct needs and circumstances across jurisdictions and among consumers

and businesses. Opportunities to discuss these issues are essential for creating opportunities to learn and collaborate.

Our progress will likely be incremental and slow, requiring a longer-term view. The safety of our financial system requires that we get this right, and our pursuit of improvements in the payments system must avoid the temptation to rely on new technology alone. This will require us to thoughtfully consider the many policy choices that lead to these improvements. ■

Michelle W Bowman is a Member of the Board of Governors of the Federal Reserve System

Endnotes

1. See Financial Stability Board, [Enhancing Cross-Border Payments: Stage 1 Report to the G20 \(PDF\)](#) (Financial Stability Board, April 2020).
2. For more information on the G20 crossborder payments improvement roadmap and its progress, see Financial Stability Board, [Enhancing Cross-border Payments: Stage 3 Roadmap](#) (Financial Stability Board, October 2020), and Financial Stability Board, [G20 Roadmap for Enhancing Cross-border Payments: Consolidated Progress Report for 2023](#) (Financial Stability Board, October 2023).
3. See Board of Governors of the Federal Reserve System, [Money and Payments: The U.S. Dollar in the Age of Digital Transformation \(PDF\)](#) (Washington: Board of Governors, January 2022).
4. See Michelle W Bowman, [“Responsible Innovation in Money and Payments”](#) (speech at Roundtable on Central Bank Digital Currency, Harvard Law School Program on International Financial Systems, Washington, DC, October 17, 2023).
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6. Gemechu Ayana Aga and Maria Soledad Martinez Peria, [“International Remittances and Financial Inclusion in Sub-Saharan Africa,”](#) Policy Research Working Paper (Washington: World Bank Group, Development Research Group, July 2014). David Malpass, [“Remittances Are a Critical Economic Stabilizer,”](#) World Bank Blog, December 6, 2022.
7. The World Bank, [Remittance Prices Worldwide Quarterly \(PDF\)](#), Issue 47, September 2023, p. 20.
8. See United Nations Department of Economic and Social Affairs, [Transforming Our World: the 2030 Agenda for Sustainable Development](#) (United Nations), and Financial Stability Board, [Targets for Addressing the Four Challenges of Cross-Border Payments: Final Report \(PDF\)](#) (Financial Stability Board, October 2021).
9. See “Bank On,” Cities for Financial Empowerment Fund. In the United States, approximately 95.5 percent of US households were ‘banked’ in 2021, meaning that at least one member of the household held a bank account. Federal Deposit Insurance Corporation, [“2021 FDIC National Survey of Unbanked and Underbanked Households \(PDF\)”](#) (July 2022).

10. Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, National Credit Union Administration, Office of the Comptroller of the Currency, [“Interagency Lending Principles for Making Responsible Small-Dollar Loans,”](#) SR letter 20-14 / CA letter 20-8 (May 20, 2020).
11. Board of Governors of the Federal Reserve System, Consumer Financial Protection Bureau, Federal Deposit Insurance Corporation, National Credit Union Administration, Office of the Comptroller of the Currency, [“Interagency Statement on the Use of Alternative Data in Credit Underwriting,”](#) CA letter 19-11 (December 12, 2019).
12. See Michelle W Bowman, [“Building a More Inclusive Financial System through Collaboration and Action”](#) (speech at the Aspen Institute, Washington, D.C., December 5, 2023).
13. For more information on the March 2025 implementation date, see Board of Governors of the Federal Reserve System, [“Federal Reserve Board Announces Final Timeline and Implementation Details for Adoption of New Fedwire Funds Service Message Format,”](#) press release, June 27, 2022.

Thank you to Priyanka Slattery and Alex Sproveri of the Federal Reserve Board for their assistance in preparing this text. The views expressed here are my own and not necessarily those of my colleagues on the Federal Reserve Board. This article is based on a [speech](#) delivered at the 19th BCBS-FSI High-Level Meeting for Africa, Cape Town, South Africa, February 15, 2024.

Taxing the wealthy

Taxing the wealthy effectively and equitably presents a choice between wealth and capital income taxes. Spencer Bastani and Daniel Waldenström compare the effectiveness of the two forms of taxation

The search for optimal taxation of the wealthy is central to the fiscal policy debate, reflecting broader concerns about inequality, economic growth, and social welfare. Previous studies, including Saez and Stantcheva (2018), Cnossen and Jacobs (2020), Scheuer and Slemrod (2021), Boadway and Pestieau (2021), and Guvenen *et al* (2023), have explored the benefits and limitations of various tax strategies aimed at reducing wealth inequality.

These studies underscore the delicate balance required in tax-system design to reconcile redistributive goals with economic growth and highlight the complex trade-offs between taxing capital income and wealth.

Comparing wealth and capital taxes to tax the rich

Wealth taxes, which tax the stock of wealth itself, have been studied for their potential to address unrealised capital gains – a significant but often untaxed component of wealth accumulation among the wealthiest individuals.

Capital income taxes, which target investment income such as dividends, interest, and capital gains, are instead advocated for their direct approach to taxing the economic benefits derived from wealth.

In our recent study (Bastani and Waldenström 2023), we compare wealth and capital income taxes to assess their effectiveness in taxing the rich (see also Slemrod and Chen 2023 and Piketty *et al* 2023). Our analysis reviews theoretical insights, empirical evidence, and practical considerations to examine the conditions under which wealth taxes could be an effective complement to capital income taxes.

Conceptual issues regarding taxing capital income and wealth

The economic literature offers arguments both for and against the taxation of capital and, in particular, the use of capital income or wealth taxes.

A central argument against capital taxation is that it distorts the intertemporal allocation of consumption and physical investment, thereby hampering capital accumulation and possibly long-run growth. Proponents of capital taxes emphasise that they allow for both more and less distortionary redistribution than if labour income alone were taxed, as well as a more effective way of taxing economic rents.

The central theoretical motivation for a wealth tax is to reduce the incompleteness of the tax code when it comes to taxing unrealised capital gains, which can be enormous in advanced economies. A wealth tax would be levied regardless of any voluntary realisations and could thus broaden the overall tax base and enhance redistribution.

The main message is that fair and workable taxation of the rich requires a balance between economic ideals and practical realities

However, it is clear that a wealth tax can lead to inefficient or inequitable outcomes precisely because it ignores actual cash flows. A wealth tax becomes difficult for anyone who owns illiquid assets or assets with uncertain valuations that do not generate regular cash flows, such as houses, works of art, and shares in unlisted companies, especially start-ups.

Our analysis reconciles theoretical arguments and past experience with capital income and wealth taxation in the Western world. The previous research literature is not extensive, and most empirical analyses can only examine the short-term reporting effects of these taxes rather than their long-term effects on capital accumulation and economic growth.

The problematic wealth tax

A first-pass sanity check on the usefulness of capital income and wealth taxes is how widely they are practised among today's countries. It turns out that capital income taxes account for the vast majority of capital tax revenues, led by the corporate income tax (about half of all capital taxes).

By contrast, wealth taxes are rare and have been abolished in almost all countries that previously used them. The motivations for abolishing wealth taxes are the same everywhere: difficulty of implementation, economic inefficiencies, valuation problems, unequal treatment of different types of assets, and liquidity problems in paying the tax (Bastani and Waldenström 2020a, 2020b, Schmidheiny *et al* 2019, Brühlhart *et al* 2022).

The imposition of wealth taxes disproportionately affects owners of closely held businesses, especially in growth sectors, where asset valuations are both large and volatile. The resulting liquidity squeeze during economic downturns often forces the sale of assets or the incurrence of debt, undermining the viability of the wealth tax.

In response to these problems, many countries have attempted to provide valuation discounts or special tax rate schedules for closely held businesses, not infrequently family businesses. But because many of these firms are quite large, the exemptions introduced regressive elements into the tax code that provoked protests from non-exempt, moderately wealthy taxpayers, further undermining political support for the wealth tax.

Evidence from Sweden: the concentration of corporate capital at the top

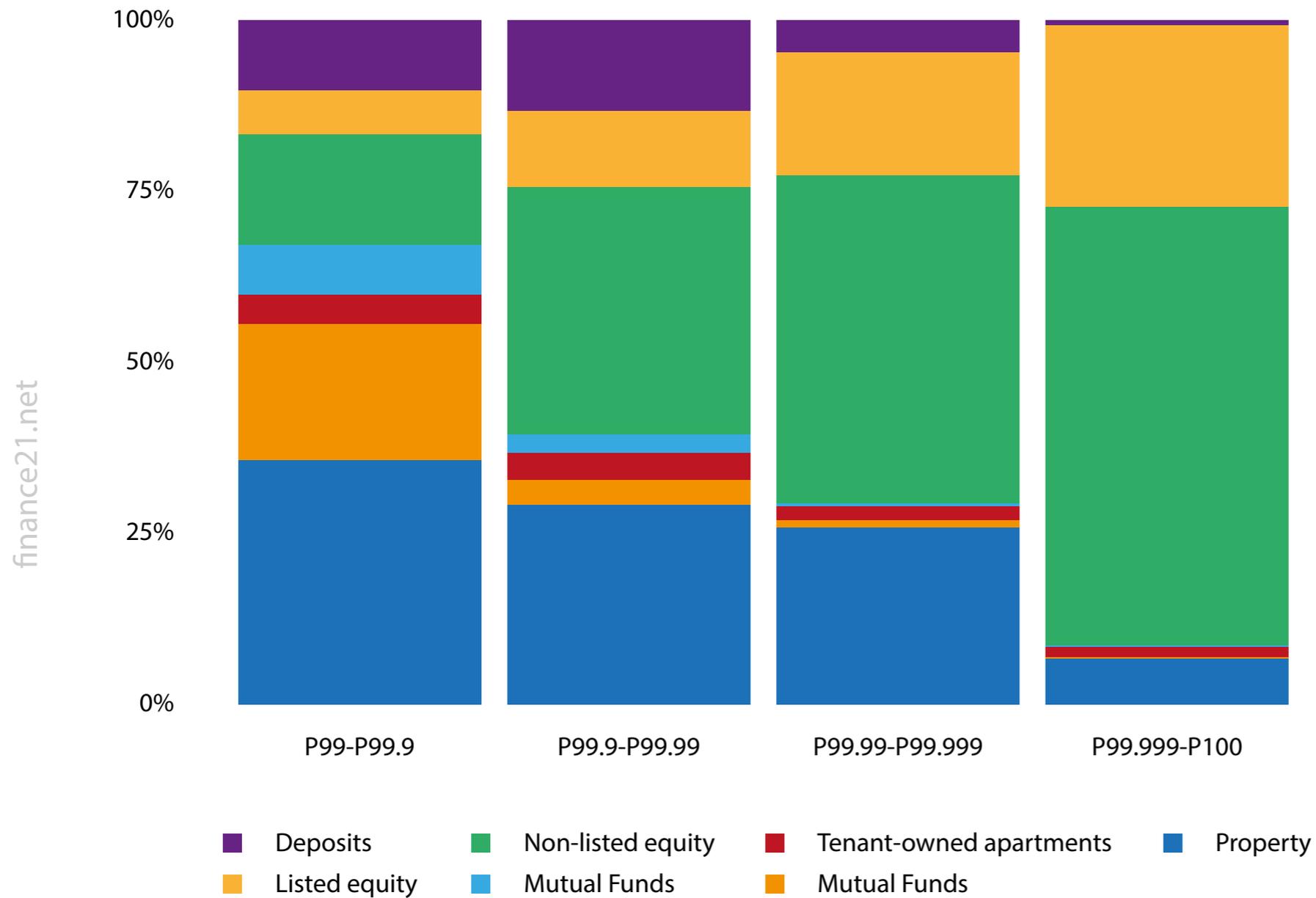
Using Swedish registry data, we examine the wealth composition of the top percentile and the distributive effects of different wealth and capital income tax systems.

Figure 1 provides a detailed look at the composition of wealth within the richest percentile of the household wealth distribution. The results show that the wealth of the rich is predominantly tied up in corporate equity, especially in privately held companies, with other assets such as real estate and financial instruments making up a smaller portion of their portfolios.

This composition underscores the complexity of effectively taxing the rich through wealth taxation without inadvertently affecting the broader economy.

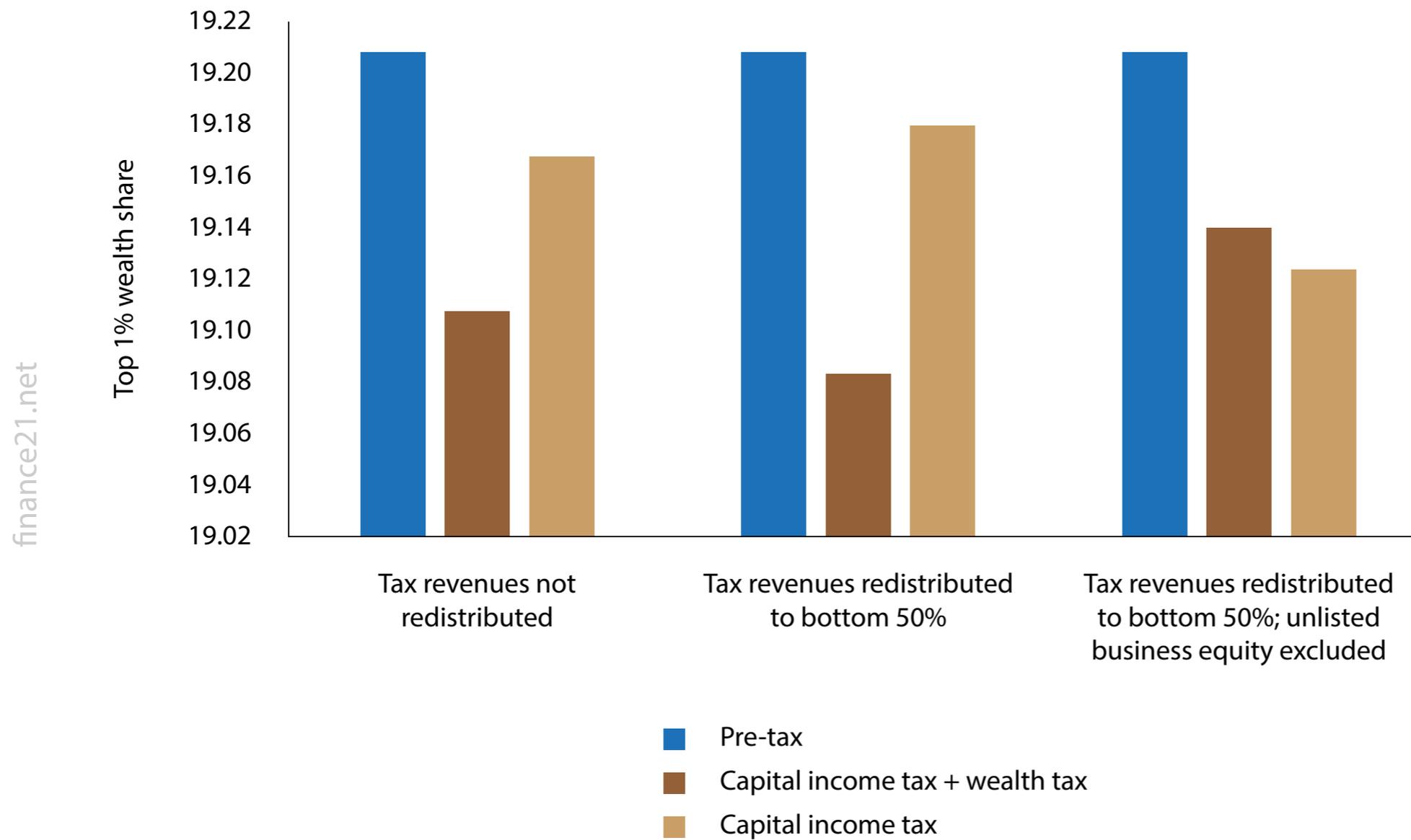
We also simulate the distributional consequences of introducing a 1% wealth tax on household net wealth for the Swedish adult wealth distribution. The wealth tax is added to the current capital income tax, and we compare it to a situation where we instead increase the capital income tax to match the additional revenue generated by the wealth tax. Because we assume no effects on asset prices, saving, or portfolio composition in this simple exercise, the results should be interpreted with caution.

Figure 1. Wealth composition of the rich: the top wealth percentile



Source: Bastani and Waldenström (2023, Figure 2).

Figure 2. Distributional impact of wealth composition of the rich: the top wealth percentile



Source: Bastani and Waldenström (2023, Figure 4).

Figure 2 shows the wealth share of the top 1% in three different situations: (1) when tax revenues are not redistributed at all (think of this as the government building statues for the money); (2) revenues are redistributed per capita to everyone in the bottom half of the wealth distribution; and (3) revenues are redistributed as in (2) but the wealth tax base now excludes all assets in unlisted corporations, which has been the going standard in wealth tax regimes.

Adding a wealth tax, in addition to having a revenue-equivalent capital income tax, equalises the distribution regardless of whether the revenue is redistributed progressively or not. However, the results are reversed if unlisted corporate equity is excluded from the tax base.

Conclusion: balancing economic ideals with practical realities

Our discussion of wealth and capital income taxation is embedded in a larger discourse on the role of fiscal policy in promoting equitable economic growth.

Through a detailed comparison of wealth and capital income taxes, this column discusses how fiscal instruments can be used to mitigate disparities in wealth accumulation. The main message is that fair and workable taxation of the rich requires a balance between economic ideals and practical realities, an insight that sometimes receives insufficient attention in the current discourse on wealth taxation. ■

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The dollar's international role

The dollar is by far the dominant currency. Christopher Waller does not expect to see the US dollar lose its status as the world's reserve currency anytime soon

My subject is the US dollar's primacy in global finance and the global economy, which some feel is under threat as never before. One headline asserts: *Why the Dollar's Reign Is Near an End*. Actually, it turns out this threat isn't so new. That headline was from 2011¹.

It is tempting to write off concerns about the dollar's status that never seem to come to pass, but I don't dismiss them. The role of the United States in the world economy is changing, finance is always changing, and I think it is important for policymakers to regularly consider if and why the dollar's role might change as well. That's what I aim to do in these remarks.

When people refer to the dollar and its reserve currency status, they typically mix together a variety of roles that it plays on the world stage. So I would like to start by clarifying these many roles. First, the term 'dollar' often refers to physical US currency and its use around the world. However, in certain contexts, it is used to describe financial assets, such as US Treasury securities, that are denominated in and promise redemption in US dollars.

Finally, the word 'dollar' is used to describe its use as the settlement unit of account in international transactions. I will use the word 'dollar' throughout this speech to refer to these various concepts, and I hope it will be clear which one I am referring to as I speak.

For many decades, the US dollar has had an outsized role in the global economy, supported by the size and strength of the US economy, its stability and openness to trade and capital flows, and strong property rights and rule of law. The dollar's international role has clear benefits for the United States, lowering transaction and borrowing costs for US households, businesses, and government and widening the pool of creditors and investors. The widespread use of the dollar can help insulate the US economy from shocks from abroad.

The rest of the world also benefits from the dollar's international role. The dollar serves as a safe, stable, and dependable form of money around the world. It serves as a reliable common denominator for global trade and a dependable settlement instrument for crossborder payments. In doing so, it reduces costs of engaging in international transactions for households and businesses including those outside of the United States.

Going forward, however, there are potential challenges to the dollar's international status, and some recent developments have the potential to boost the international use of other currencies

Recent commentary warning of a possible decline in the status of the US dollar raises concerns about the effects of sanctions against Russia, US political dysfunction, the rise of digital assets, and China's efforts to bolster usage of the renminbi.

Other commentary has warned of 'gloeonomic fragmentation' and whether trade and financial flows could realign in ways that adversely affect the dollar's outsized role. Against this backdrop, it's useful to review whether there has been any change in how the dollar stacks up against the standard measures by which we assess a currency's acceptance as an international currency.

Acceptance as an 'international currency' is typically assessed along three dimensions: its use as a store of value, as a medium of exchange, and as a unit of account. Alarmist headlines notwithstanding, the dollar continues to dominate in all three of these measures, and generally by a large margin compared with any other currency².

The 'store of value' dimension relates to the ability to save in a given currency and retrieve those savings in the future without a significant expected loss of purchasing power. A key measure of the confidence in a currency as a store of value is its use in official foreign exchange reserves. At almost 60 percent of global reserves in 2022, the US dollar is by far the dominant reserve currency³.

The next leading competitor to the dollar is the euro, with a share of roughly 20 percent. Although some have pointed to a decreasing share of reserves held in dollars, the dollar share—though down somewhat from the mid-2000s—is actually little changed from the mid-1990s. And while there has been an increase in the share held in renminbi, that share is trivial at about 2 percent.

To the extent that there has been gradual diversification in reserves since the mid-2000s, it has been into a wide range of other currencies, such as Canadian and Australian dollars.

The majority of global dollar reserves are held in US Treasury securities, with the depth and liquidity of the US Treasury market reinforcing the desirability of the dollar as a store of value. Currently, foreign investors hold about one-third of Treasury securities outstanding.

There has been a steady decline in this share: foreign investors held roughly half of Treasury securities outstanding 10 years ago. A major reason for the decline, however, is that over the past decade, the stock of global foreign exchange reserves has grown much more slowly than the stock of Treasury securities outstanding, so foreign official investors are accounting for a declining share.

Foreign private investor demand for US Treasury securities, by contrast, has been sustained and has kept pace with the increased issuance in recent years. The roughly one-third of Treasury securities currently held by all foreign investors is now broadly comparable with shares of sovereign debt held by foreign investors in the euro area, the UK, and Japan⁴.

The US benefits from foreign demand for US Treasury securities since it bids up the price of such securities, thereby lowering the interest expense paid on Treasury debt.

Another way to look at the dollar as a store of value for the global financial system is the demand for US dollar banknotes abroad. Determining exactly how much currency is held abroad is challenging, but research suggests that foreign investors hold roughly half of the dollar value of US banknotes outstanding⁵.

This share is similar to or a bit higher than for euro banknotes, where recent research estimates suggest that between 30 and 50 percent of euro banknotes are held abroad, primarily in countries that are geographically close to the euro area⁶.

‘Dollarization’ or ‘partial dollarization’ is a global phenomenon that refers to the use of dollars in foreign countries as a substitute for the domestic currency.

Typically, this practice occurs because of persistently high domestic inflation. While foreign citizens are free to use any other currency issued around the world, the dollar is the overwhelming choice for citizens in these countries. Fulfilling foreign demand for US currency allows us to earn seigniorage on banknotes held abroad.

So, by store-of-value measures, the dollar remains the most widely used currency, though its dominance may have edged down slightly over the past couple decades.

The dollar’s attractiveness to private investors and businesses is especially apparent in its role as a medium of exchange—that is, in its use in trade invoicing, global banking, international debt issuance, and foreign exchange transactions.

To start with trade invoicing, the dollar is by far the dominant currency. Trade invoicing in dollars means that the terms of the contract are specified in units of the dollar and the dollar is the settlement object for the trade. Dollar invoicing accounts for at least three-fourths of export invoicing in all regions, except in Europe, and over 96 percent in the Americas.

Not surprisingly, the euro is the dominant invoicing currency in Europe, but even there, the euro share is only about 50 percent once intra-euro-area trade is excluded⁷. Dollar dominance on this dimension has major benefits for US firms, as it removes exchange rate risk and eliminates the need for complicated and costly hedging strategies when they engage in international trade.

Invoicing dominance is linked to a similarly dominant role in international banking and debt issuance. About 60 percent of international banking loans and deposits are denominated in US dollars. For international debt securities, about 70 percent of bonds issued in a currency other than the issuer's home country currency are denominated in US dollars⁸.

These shares have been quite stable over the past 10 to 15 years. Dollar dominance in international banking has benefits for US households and businesses, since it means that foreign banks have strong connections to the US financial system, increasing the amount of credit available in the US and lowering the cost of borrowing.

For debt securities, dollar dominance means that when US firms issue debt in markets outside the United States, they can issue in dollars and don't have to bear exchange rate risk. And US investors can get exposure to foreign firms without incurring exchange rate risk.

The many sources of demand for US dollars show through to its very high share of foreign exchange transactions, where, according to the latest statistics from the Bank for International Settlements, the dollar remains by far the most commonly traded currency⁹.

The size and depth of dollar foreign exchange markets mean the dollar is frequently used as a 'vehicle' currency: Even when firms and investors around the globe want to transact in two currencies that don't include the dollar,

they typically find that it is easier and less expensive to first conduct a trade between the initial currency and the dollar and then conduct a second trade to exchange the dollars for the second currency¹⁰.

The final role for an international currency is as a unit of account, and an important measure on this dimension is its use as an 'anchor currency' against which other countries may attempt to limit their exchange rate movements. Here, the research finds that the dollar's usage as an anchor currency has increased somewhat over the past two decades.

Not including the US, economies anchored to the dollar accounted for roughly 50 percent of world gross domestic product (GDP) by 2015. By contrast, the share of world GDP anchored to the euro was only 5 percent (not counting the euro area itself)¹¹.

To recap, by standard measures of an international currency's use, there has not been any notable erosion in the dollar's dominance over the past couple of decades. Going forward, however, there are potential challenges to the dollar's international status, and some recent developments have the potential to boost the international use of other currencies.

A shifting payments landscape—for example, the rapid growth of digital currencies—could reduce reliance on the US dollar. People often conjecture that cryptocurrencies like Bitcoin may replace the US dollar as the world's reserve currency. But most trading in decentralized finance (DeFi) involve trades using stablecoins, which link their value one-for-one to the US dollar.

About 99 percent of stablecoin market capitalization is linked to the US dollar, meaning that cryptoassets are de facto traded in US dollars. So it is likely that any expansion of trading in the DeFi world will simply strengthen the dominant role of the dollar.

A second potential challenge to the dollar could be increased prominence of the euro, the second most widely used international currency. Like the US, the European Union (EU) is a large economy with fairly deep financial markets, generally free trade, and robust and stable institutions.

Wider use of the euro as a reserve currency may have been held back by the lack of a deep and liquid market for EU debt, though there have been some notable recent developments. During the COVID-19 crisis, the EU issued an unprecedented amount of jointly backed debt, reaching about €400 billion by May 2023. While this is a noteworthy development for the EU, this amount is tiny compared with the \$24 trillion outstanding in US Treasury securities¹².

The continued rapid growth of China and Chinese efforts to boost the use of their currency could make the Chinese renminbi a more attractive competitor to the dollar and increase its international use. Several factors currently weigh against the renminbi as an attractive asset for international investors: it is not freely exchangeable, the Chinese capital account is not open, and investor confidence in Chinese institutions is relatively low.

Recent endeavours by China to overcome these shortcomings include increased efforts to promote renminbi invoicing. For example, it reached an agreement with Brazil to allow Chinese and Brazilian companies to settle trade in their domestic currencies and has been in discussion with Saudi Arabia to potentially price oil trade in renminbi.

However, outside analysts generally view these agreements as symbolic and at most laying the groundwork for potential future use of the Chinese renminbi in very isolated instances.

Some commentators have also argued that sanctions imposed by the United States and its allies on Russia following the invasion of Ukraine could make the dollar less attractive as a reserve currency for the United States's geopolitical adversaries.

In practice, however, US adversaries have few practical alternatives to the dollar, as other prominent reserve currencies—such as the euro, Japanese yen, and British pound—are all issued by close US allies, who also participated in sanctions on Russia.

More generally, some worry that the dollar's role could be threatened by a move toward so-called geoeconomic fragmentation, in which trade and financial flows realign and become restricted within blocs of allied countries. The formation of a bloc that excludes the US—or even explicitly seeks to counter the United States' role in the global economy—could make some countries less likely to denominate international transactions in dollars.

This scenario sounds alarming, but thus far, trends that appear consistent with fragmentation largely can be explained by specific policy actions. One example is the dramatic reallocation of US–China trade in recent years, as firms in each country decrease reliance on imports sourced from the other.

While this shift has coincided with a period of heightened geopolitical tensions, the evidence suggests a simpler explanation: firms responding to changes in relative prices, in this case caused by the imposition of reciprocal tariffs by the two countries since 2018.

For example, while US imports of tariff-affected goods from China have plunged, imports of goods not subject to tariffs have continued to rise¹³. Despite the reallocation of trade flows across countries, at the end of the day, those trade flows continue to be invoiced mainly in dollars.

A final consideration regarding the international use of the dollar relates to financial stability concerns. In times of global financial stress, investors and governments seek a safe haven to protect the value of their assets and stabilize

their own financial markets. When this happens, there is almost always a 'flight to the dollar' and heightened demand for US dollar assets.

We saw this in 2008 and again in 2020. This is the ultimate vindication that the US dollar is the world's reserve currency and is likely to remain so—in times of global stress, the world runs to the dollar, not away from it.

To conclude, for the reasons I have laid out here, I do not expect to see the US dollar lose its status as the world's reserve currency anytime soon, nor even see a significant decline in its primacy in trade and finance. Recent developments that some have warned could threaten that status have, if anything, strengthened it, at least so far. ■

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

Endnotes

1. See Eichengreen (2011).
2. See Maggiori, Neiman, and Schreger (2019).
3. See Bertaut, von Beschwitz, and Curcuru (2023).
4. See Bertaut, von Beschwitz, and Curcuru (2023).
5. See Bertaut, von Beschwitz, and Curcuru (2023).
6. See Lalouette and others (2021).
7. See Bertaut, von Beschwitz, and Curcuru (2023).
8. See Bertaut, von Beschwitz, and Curcuru (2023).
9. See Bank for International Settlements (2022).
10. See Devereux and Shi (2013).
11. See Ilzetzki et al (2019).
12. See Bertaut, von Beschwitz, and Curcuru (2023).
13. See Bown (2022).

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