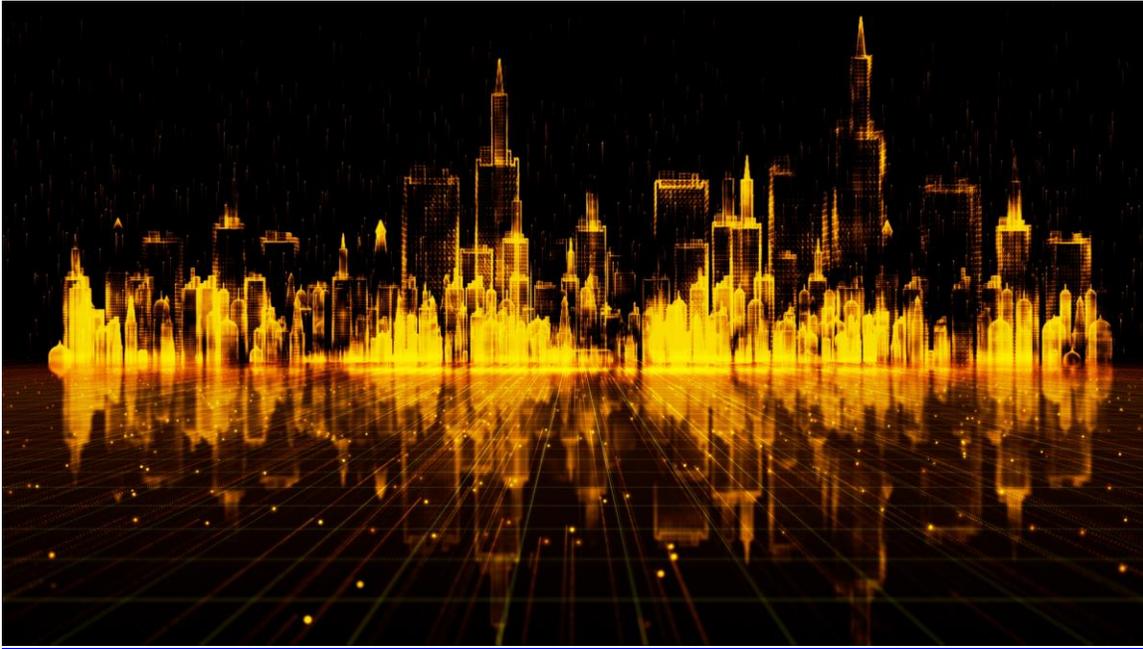


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Basel iii News, June 2022

Dear members and friends,

The Basel Committee has approved a finalised set of principles for the effective management and supervision of climate-related financial risks.



It also progressed its work on specifying a prudential treatment of cryptoassets and issuing a second consultation paper, and agreed on a way forward to reflect developments in the European banking union (EBU) on the assessment methodology for global systemically important banks (G-SIBs).

In addition, the Committee is continuing to assess risks to and vulnerabilities of the global banking system, including those ensuing from the conflict in Ukraine.

Climate-related financial risks

The Committee agreed to a finalised set of principles for the effective management and supervision of climate-related financial risks. This follows the consultation by the Committee on these principles last year.

The principles, which will be published in the coming weeks, seek to promote a principles-based approach to improving risk management and supervisory practices to mitigate climate-related financial risks.

They are designed such that they can be adapted to a diverse range of banking systems in a proportional manner.

The publication of these principles forms part of the Committee's broader assessment of potential measures – spanning disclosure, supervisory and regulatory measures – to address climate-related financial risks to the global banking system.

The Committee will provide an update on its work across these dimensions in due course. It will continue to collaborate with other global forums on climate-related financial risk initiatives.

Cryptoassets

The Committee progressed its work towards issuing a second consultation paper on the prudential treatment of banks' cryptoasset exposures, following its initial consultation last year.

Recent developments have further highlighted the importance of having a global minimum prudential framework to mitigate risks from cryptoassets.

Building on the feedback received by external stakeholders, the Committee plans to publish another consultation paper over the coming month, with a view to finalising the prudential treatment around the end of this year.

G-SIB assessment methodology

The Committee has completed its targeted review of the treatment of cross-border exposures within the EBU on the methodology for G-SIBs.

The Committee recognises the progress that has been made in the development of the EBU.

It agreed to give recognition in the G-SIB framework to this progress through the existing methodology, which allows for adjustments to be made according to supervisory judgment.

Under the agreement, a parallel set of G-SIB scores will be calculated for EBU-headquartered G-SIBs and used to adjust their bucket allocations.

The parallel scores recognise 66% of the score reduction that would result from treating intra-EBU exposures as domestic exposures under the G-SIB scoring methodology.

The Committee's agreement will not affect the classification of any banks as G-SIBs or the scores or bucket allocations of banks outside of the EBU.

In due course, the EU authorities will publish a more detailed description of the methodology and requirements for relevant EBU-headquartered banks to publish the cross-jurisdictional indicators needed to calculate the parallel set of scores.

Risks and vulnerabilities to the global banking system

Following the outbreak of the Ukraine conflict, the Committee held a series of meetings to discuss risks and vulnerabilities to the global banking system. Banks' direct financial exposures to Russia, Ukraine and Belarus are relatively limited and manageable.

In addition, banks are focusing on their operational resilience while processing sanctions and dealing with an increase in cyber threats. However, there are in principle several potential channels by which the banking system could be affected by the ongoing conflict.

These include indirect, second- and third-round, effects stemming from the conflict, such as developments in commodity markets and exposures to financial and non-financial institutions that are affected by the conflict.

The risks stemming from a worsening macroeconomic outlook, rising inflation and interest rates in a number of markets, and broad-based asset repricing also warrant close monitoring.

Against this backdrop, the Committee noted the importance for banks and supervisors to continue to closely monitor, assess and mitigate these risks and vulnerabilities.

You may visit: <https://www.bis.org/press/p220531.htm>

Inequality hysteresis and the effectiveness of macroeconomic stabilisation policies

Luiz Awazu Pereira da Silva, Enisse Kharroubi, Emanuel Kohlscheen, Marco Lombardi and Benoît Mojon



Chapter I

In the first chapter, we set the book's aims in context and summarise its findings.

Income inequality within countries has risen steadily in recent decades.

It has risen so inexorably that it is worth revisiting the question why inequality tends to increase through the business cycle.

We discover a two-way interaction between inequality and recessions. Higher levels of income inequality imply deeper recessions. And recessions tend to have a very persistent effect on income inequality.

The income share of the wealthiest 10% of the population generally increases after recessions, usually remaining higher for years afterwards.

In addition, we show that greater inequality makes monetary policy less effective when used either to stimulate or slacken aggregate demand.

Finally, fiscal policy has tended to become less redistributive and less countercyclical, putting more onus on monetary policy as a tool for macroeconomic stabilisation.

Taken together, these results suggest the importance of taking income inequality into account when designing and implementing both fiscal and monetary policy.

First, both types of policy should seek to reduce the frequency and depth of recessions.

Second, fiscal policy should seek to further limit the effects of recessions on the rise and persistence of income inequality.

Third, policymakers should keep in mind how income inequality can erode the effectiveness of monetary policy.

Chapter II

Chapter II presents income inequality trends in more detail, presenting some new stylised facts about their business cycle properties.

Inequality trends have been rising in the advanced economies since the 1980s. Income has also become increasingly concentrated within several large emerging market economies.

Much of this greater within-country income concentration relates to structural factors such as technological progress and globalisation, which greatly boost the returns to skills.

Inequality metrics then received a further boost from the Covid-19 recession. In many advanced economies, workers in the low-income bracket were more than three times more likely to lose their jobs than high-income workers.

We document that this pattern is far from atypical, as inequality metrics generally deteriorate persistently after recessions. This is due in large part to the associated rise in unemployment, which tends to hit poorer workers harder, besides depressing the bargaining power of those who have kept their jobs. We explore several channels for this “inequality hysteresis” after recessions, including changes in labour relations.

The chapter concludes by showing that high inequality has material macroeconomic implications, which manifest themselves during times of economic stress. In fact, countries and regions with higher levels of inequality typically experience deeper recessions. In other words, excessive inequality serves to erode macroeconomic stability.

Chapter III

Chapter III focuses on fiscal policy. Such policies have become less redistributive and less countercyclical.

Governments have cut back tax progressivity and unemployment insurance while running lower surpluses in expansions.

This chapter links these developments. It argues that reduced fiscal redistribution, through weaker tax progressivity and flatter tax systems, or the cutbacks in unemployment insurance benefits, have served not only to increase inequality but also to make fiscal policy less countercyclical, hence eroding its stabilising effect.

Lower tax progressivity means that, in expansions, rising incomes contribute less to government revenues.

Similarly, lower unemployment benefits imply less government expenditure in recessions but smaller government revenues in expansions – as reduced benefits usually go hand in hand with lower contribution rates for unemployment insurance.

The chapter provides empirical support for these intuitions. In addition, the evidence from advanced economies over the last two decades also shows that weaker redistribution affects fiscal policy differently in different phases of the business cycle.

Governments are now less able to run surpluses in expansions, while fiscal policy in recessions has been barely affected.

This suggests that governments must now rely more on discretionary fiscal measures to deal with downturns. The chapter then draws the implications of these changes for fiscal sustainability and the public debt burden.

Chapter IV

Chapter IV explores the interactions between inequality and monetary policy. It first explains how the main objectives of monetary policy – price stability and output stabilisation – are themselves related to inequality: inflation tends to hurt the poor disproportionately, because they are often the first to lose their jobs during a recession.

A key conclusion is that income inequality depends significantly on movements in and out of unemployment over the business cycle. Hence, by providing the necessary monetary stimulus, central banks can play an equalising role. Second, the chapter explores the hypothesis that inequality might obstruct the transmission of monetary policy.

The intuition is that, in an unequal society, income is concentrated in the hands of a few, whose consumption is high and largely insensitive to interest rates. By contrast, those with a much higher propensity to consume – the poorest – may find themselves credit-constrained if their income is too low or too uncertain due to unemployment risk.

We report empirical evidence for this intuition, relying on both a cross-country and a US cross-state analysis.

By showing how a monetary policy stimulus can lose traction, these results suggest that rising inequality can make it increasingly difficult and costly for central banks to stimulate the whole economy. In turn, an inadequate stimulus is likely to prolong a recession and aggravate its impact on inequality.

The weakening of monetary policy as inequality worsens is likely to amplify the hysteresis mechanism.

To read more (122 pages): <https://www.bis.org/publ/othp50.pdf>

Revisiting a paper that answers many questions asked in Davos Climate-related risk drivers and their transmission channels



This report explores how climate-related financial risks can arise and impact both banks and the banking system.

By synthesising existing literature, it illustrates how physical and transition climate risk drivers affect banks' financial risks via micro- and macroeconomic transmission channels. It also explores various factors that may determine the likelihood or size of the impact from climate-related risk drivers.

The report's main findings are as follows:

Banks and the banking system are exposed to climate change through macro- and microeconomic transmission channels that arise from two distinct types of climate risk drivers.

First, they may suffer from the economic costs and financial losses resulting from the increasing severity and frequency of physical climate risk drivers.

Second, as economies seek to reduce carbon dioxide emissions, which make up the vast majority of greenhouse gas (GHG) emissions, these efforts generate transition risk drivers. These arise through changes in government policies, technological developments, or investor and consumer sentiment. They may also generate significant costs and losses for banks and the banking system.

Credit risk

Climate risk drivers can impact household, corporate, or sovereign income and/or wealth. Physical and transition risk drivers increase a bank's credit risk as soon as they have a negative effect on a borrower's ability to repay and to service debt (the income effect) or on a bank's ability to fully recover the value of a loan in the event of default because the value of any pledged collateral or recoverable value has been reduced (the wealth effect). This credit risk impact takes many forms, which are explored in the examples drawn from the literature.

Physical risk drivers mainly impact banks' credit risk indirectly through their counterparties. The physical capital (housing, inventory, property, equipment or infrastructure 15) of households, corporates and sovereigns can be damaged or destroyed by physical hazards. This damage reduces the value of assets and, consequently, a counterparty's wealth. Physical risk drivers can also negatively impact cash flows of the affected entities as

damaged physical capital, such as impaired rental properties and factories, will generate less income.

The damage may be caused by acute physical risks, such as tropical storms, and also by chronic physical risks, such as rising sea levels. This section explores examples of how physical climate-related financial risks may crystallise in households, corporates and sovereigns.

Evidence shows that acute physical risks in the form of severe weather events reduce corporate profitability and potentially increase credit risk to lenders. Studies based on historical data find that natural disasters can result in short-term moderate decreases in corporate sales.

For example, US corporates have been shown to experience an average drop of 2 to 3 percentage points in sales growth following a major natural disaster that affects their suppliers, ultimately causing a 1% drop in corporates' equity value (Barrot and Sauvagnat (2016)).

An extensive body of literature and news articles have documented the impact of natural disasters on global supply chains, often referencing natural disasters in Japan and/or Thailand as case studies (Abe and Ye (2013); Park et al (2013); Bland and Kwong (2011)).

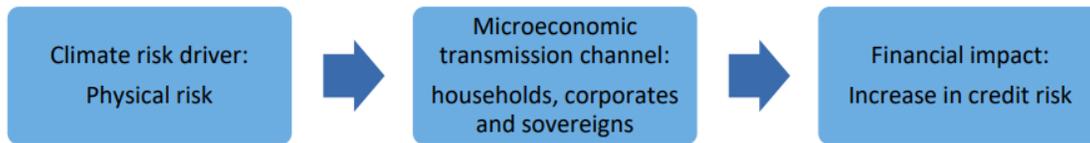
Global supply chains increase the potential for physical risks to impact banks' counterparties. This impact of climate change on corporates across countries is difficult to quantify, given the complexity of the global economic system, data gaps and methodological challenges (Andreoni and Miola (2014)).

However, the effects may be significant as developed countries are increasingly reliant on long supply chains and on supplies and services provided by countries vulnerable to climate risk. Companies in the S&P 500 index, for example, own physical assets across 68 countries globally, and 60% of these entities hold assets that are at high risk of at least one type of physical risk (Mattison (2020)).

Chronic physical risks, not necessarily reflected in historical data, are projected to negatively impact corporate credit portfolios primarily through income effects. A number of bank and industry scenario analyses project that incremental climate change, such as rising temperatures, drought and flood risk, may pose a greater risk to the financial health of borrowers than climate-related natural disasters (UNEP-FI (2018a,b)).

While severe droughts could increase bank corporate credit risk, the projected impact could vary by sector, geography, and reliance on hydropower (NCFA and GIZ (2017)).

The unprecedented nature of these changes increases the importance of climate-relevant data to better understand the ways in which chronic physical risks might impact economies and banks' financial risks.



To read more: <https://www.bis.org/bcbs/publ/d517.pdf>

Green Swan 2022, watch the videos!

A virtual conference co-organised by the Bank for International Settlements, the European Central Bank, the Network for Greening the Financial System and the People's Bank of China



Building on the foundation of the inaugural Green Swan Conference in 2021, which brought together a wide range of high-calibre policymakers, experts and practitioners from different sectors, Green Swan 2022 offers a deeper dive into the topics of:

- (i) monetary policy setting and operations in the context of climate change, and
- (ii) the role of finance in the climate transition, including transparency and disclosures, transition plans and financing green innovation.

After an introduction to the Green Swan Conference by Luiz Pereira, Ravi Menon explains why it is imperative for central banks and supervisors to consider climate-related risks in fulfilling their mandates. In his capacity as Chair of the Network for Greening the Financial System, he also highlights the 2022-24 work programme for the NGFS.

You may visit: <https://www.youtube.com/watch?v=fHmcp-cx-9M&t=3s>

Session 1: The role of finance in climate transition

The role and potential of the financial sector in climate change and the carbon market.

In his keynote speech, Zhou Xiaochuan highlights how a massive mobilisation of financial resources, as well as the appropriate incentives, are needed for the transition. Carbon pricing and trading have an important role to play on a global scale.

You may visit: <https://www.youtube.com/watch?v=CeY9EpAU5q8&t=7s>

What can the public and private sectors do to turn transition finance frameworks to actions?

In this roundtable discussion, experts from different fields analyse issues relating to financing the green transition, spanning from market failures to the need for climate justice, from regional considerations to the need for international cooperation.

You may visit: <https://www.youtube.com/watch?v=U3u3ItARu2w>

To find all the presentations you may visit:

https://www.bis.org/events/green_swan_2022/overview.htm

31 MAY - 1 JUNE

GREEN SWAN 2022

The Big Climate Question

- 2 Different Green Transitions
- 1. Reduce economic activity to cut back on CO2 Emissions
 - 2020 Covid Lockdown reduced CO2 emissions by 5.8%
- 2. Develop competitive renewable + sequestration technology and exploit economies of scale (across the globe)
 - Requires coordination due to QWERTY problem
- Illustrative example: Germany
 - Emits about 2% of global CO2
 - Example of scaling up solar power:
 - Early 2000s: German scaled up solar power (price of 1 kWh btw. 50 to 1€, now: .05€)
 - 2012-2015: Industry moved on to China, reducing costs further
- What policies incentivizes which approach?

31 MAY - 1 JUNE

GREEN SWAN 2022

Central banks and the green transition: what's next?

ESAs publish the joint Report on the withdrawal of authorisation for serious breaches of AML/CFT rules



The European Supervisory Authorities (EBA, EIOPA and ESMA – ESAs) published a joint Report, which provides a comprehensive analysis on the completeness, adequacy and uniformity of the applicable laws and practices on the withdrawal of license for serious breaches of the rules on anti-money laundering and countering the financing of terrorism (AML/CFT).

The joint Report advocates for the introduction in all relevant EU sectoral laws of a specific legal ground to revoke licences for serious breaches of AML/CFT rules.

The joint Report also calls for the inclusion of assessments by competent authorities of the adequacy of the arrangements and processes to ensure AML/CFT compliance as one condition for granting authorisation or registration.

For this purpose, cooperation and information exchange between prudential supervisors and AML/CFT supervisors should be ensured.

The joint Report highlights the importance of the appropriate integration of AML/CFT issues into prudential regulation and supervision, including in the proposal for the Markets in Crypto-Assets Regulation (MiCA), currently under negotiation.

Furthermore, the joint Report clarifies the nature of the decision to revoke licenses as a last resort measure, subject to a discretionary and proportionality assessment.

It also lays down uniform criteria for the notion of serious breach of AML/CFT rules, highlighting that the identification of a serious breach is subject to a case-by-case assessment by the AML/CFT supervisor.

Finally, the joint Report provides a preliminary analysis of the interaction between serious breaches of AML/CFT rules and the crisis management and resolution frameworks as well as a first mapping of operational and legislative criticalities.

Executive Summary

Recent cases have drawn attention to the significant impact that serious breaches of AML/CFT rules may have on the sound and prudent

management of supervised financial entities and their ability to continue meeting the conditions for authorisation (or registration).

Based on findings collected for the purposes of this Report, in the past 10 years competent authorities have withdrawn the authorisation (or registration) from financial entities for serious breaches of AML/CFT rules in 26 cases, alone or in combination with other grounds.

In the wake of such events the EU Council Action Plan on AML of 2018 (“AML Council Action Plan”) has requested the ESAs to clarify some aspects of the interaction between serious breaches of AML/CFT rules.

This Report examines the four action points articulated in Objective 5 of the AML Council Action Plan and illustrates the findings supervisory practices and national legislation.

Depending on the specific action point, it identifies areas where the framework could be improved in relation to some sectoral acts or areas where additional analysis is needed (eg. interaction between resolution and AML/CFT regime).

In respect of the notion of serious breach of AML/CFT the elements for a uniform interpretation are put forward.

There is consensus among competent authorities that the withdrawal of authorisation (or registration as the case may be) for serious breach of AML/CFT rules is a last resort measure and that has to respect proportionality requirements.

The degree of discretion supporting the decision to withdraw the authorisation (or registration) is thoroughly articulated in respect of the criteria of legitimacy, necessity, reasonableness and proportionality of the measure adopted and having regard that it is a last resort measure.

Only the CRD sets out an express ground to withdraw the authorisation for serious breaches of AML/CFT rules.

Based on the findings of the survey, the competent authorities across the financial sector may rely on non-specific grounds based on EU or national law.

However, for sake of legal certainty, this Report supports the introduction in the sectoral acts which are not yet covered, of a specific ground empowering competent authorities to withdraw the authorisation (or registration) solely on the ground of serious breaches of AML/CFT rules.

The interaction between prudential and AML/CFT regulation should be improved as at the moment of granting authorisation (or registration).

It is therefore opportune that all sectoral acts be amended to provide that - as one of the conditions for granting authorisation - competent authorities expressly consider the applicant's exposure to ML/TF risk, and be satisfied that the envisaged arrangements, processes and mechanisms enable sound and effective ML/TF risk management and compliance with AML/CFT requirements.

With regard to the notion of serious breaches of AML/CFT rules, the Report clarifies the criteria of a serious breach of AML/CFT rules that shall be considered and assessed by the AML/CFT supervisor, pointing out that the AML/CFT supervisor needs to take into consideration the context of the breach and therefore that it remains a case-by-case assessment.

It is underscored that there is no systematic correlation between a serious breach of AML/CFT rules and withdrawal of authorisation (or registration) which is a last resort measure.

Rather, the assessment of the serious breach made by the AML/CFT supervisor will be used by the prudential supervisor for the adoption of the appropriate measures within the supervisory toolkit, in accordance with its discretionary assessment.

In respect of the interaction between serious breach of AML/CFT rules, the preservation of critical functions and the involvement of the resolution authorities, attention is firstly directed at the interaction between withdrawal of authorisation and FOLTF assessment.

The importance of cooperation and exchange of information between the competent prudential supervisor and the RA is underscored, as well as the need for the RA to be consulted and to object to the withdrawal of the authorisation to the extent that it affects its prerogatives.

As to the interaction between the resolution regime and the AML/CFT framework, the focus has been placed on aspects that may give rise to operational and legal issues and that need further considerations, such as the identification of the competent authority, the timing and methodology to separate the legitimate from the illicit business, the coordination with the competent prudential supervisor when the bridge bank tool is used having regard to authorisation requirements; the supervisory and resolution remedies that may be used in the case of conversion of liabilities held by persons involved in ML/TF activities etc.

It is acknowledged that the discussion undertaken in this context has been of the essence to bringing such issues to the RAs' attention and to running a preliminary mapping of operational and legislative criticalities.

Such analysis will be useful also for other cases of crisis which are not triggered by solvency or liquidity issues but rather by breaches of qualitative rules, or that depend on exogenous rather than on idiosyncratic factors, like for instance sanction-related adverse effects.

However, at this stage, it is premature to draw conclusions, or to lay down specific criteria or guidance, prior to an overall examination from an operational and legal perspective.

The EBA stands ready to provide additional specific advice to the EU institutions as appropriate.

In respect of the interaction with the DGS framework, the Report supports and reiterates the recommendations laid down in the EBA Opinion on Deposit guarantee scheme payouts.

Lastly, concerning the measures available to prudential authorities to address prudential concerns stemming from money laundering / terrorist financing risks and breaches of AML/CFT rules, an overview of how the assessment of ML/TF risks is embedded in prudential regulation and supervision within the CRD/CRR framework, which has been recently updated and revised to embed AML/CFT requirements is carried out.

Such an overview may be a useful blueprint for other sectoral acts, in whole or in part considering the specificities of each framework. In particular, the EBA Guidelines on the cooperation between competent authorities, AML/CFT supervisors provide a useful example of how cooperation should be improved also in the context of the withdrawal of authorisation.

Considering the ongoing work in each relevant sector, it is concluded to defer to such reviews to better envisage which, if any, aspects may be appropriate to embed in each framework.

The paper:

https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2022/1033744/Joint%20ESAs%20Report%20on%20withdrawal%20of%20authorisation%20AML%20breaches.pdf

Staff Working Paper No. 984

An interpretable machine learning workflow with an application to economic forecasting

Marcus Buckmann and Andreas Joseph



BANK OF ENGLAND

Predictive machine learning models are increasingly being used at decision-making institutions, such as central banks, governments and international institutions (Doerr et al., 2021).

Major appeals of these models are that they often give more accurate predictions than conventional approaches and can handle high-dimensional data (Haldane, 2018).

On the downside, many machine learning methods suffer from the black box critique. It is not straightforward to assess the factors driving predictions and therefore to understand the relations between the inputs and output of the model. However, this understanding of a model is crucial, especially for decision making processes, for several reasons.

First, both decision makers and their audiences naturally have a desire to understand the inputs leading to decisions and legitimise them.

Second, decision making processes often involve multiple models. The information derived from different models should be compatible leading to a coherent picture. The understanding of all models involved is needed for this.

Third, models can ‘misfire’ for several reasons, for example by picking up spurious relations in the data.

This often can only be detected and prevented if one has a good understanding of a model.

Prediction models whose accuracy is a key motivation behind their deployment— which often holds for machine learning methods—should also help to inform the narrative approach behind any economic policy decision rather than providing mere black box predictions (George, 1999; Burgess et al., 2013; Independent Evaluation Office, 2015).

Machine learning models also can provide a richer set of information compared to more conventional statistical models, like linear regression models.

In particular, they can implicitly learn nonlinear functional forms and interaction from the data without the need to specify them a priori.

In this paper, we lay out a multi-step workflow for the use of machine learning models, which we deem suitable to inform decision making processes. It consists of three steps which can be directly applied to other contexts as well as those presented in the accompanying case study.

First, a model comparison is conducted between conventional statistical methods and machine learning models to provide prima facie evidence of whether a machine learning approach is likely to deliver benefits. If the primary objective is model accuracy, e.g. for forecasting, this would be a model horse race to minimise the forecasting error.

Second, the machine learning predictions are decomposed into the contributions of the individual model variables. This allows us to uncover the relative importance of variables and understand the functional forms learned by the different machine learning models. By a comparison across models, one can gauge how robust feature decompositions are to the choice of the algorithm.

Third, statistical inference is conducted to understand which variables make a statistically significant contribution to the accuracy of a model, providing a level of confidence for our interpretations and any narrative attached to them. This inference uses a parametric regression analysis, allowing for a standardised communication of statistical model results.

The paper:

<https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2022/an-interpretable-machine-learning-workflow-with-an-application-to-economic-forecasting.pdf?la=en&hash=829CF4A26BD34A1176432F07385890EB02A5EEB8>

Old dogs, new tricks: adapting central bank balance sheets to a world of digital currencies – remarks

Andrew Hauser, at Federal Reserve Bank of New York and Columbia SIPA Workshop on ‘Monetary Policy Implementation and Digital Innovation’, New York



Introduction

The explosion of interest in digital currencies poses deep and challenging policy questions on everything from monetary and financial stability, to privacy, competition, money laundering and social inclusion.

Public authorities are evaluating the arguments for and against introducing their own Central Bank Digital Currencies (CBDCs).

And in the private sector there’s a lively debate about what it might take to make so-called ‘stablecoins’ genuinely stable.

Up to now, though, there’s been less discussion about how central bank balance sheets might need to adjust to support the safe and effective provision of fiat-based digital currencies. This workshop is therefore well timed.

I will focus my remarks today around five main messages.

1. Retail CBDCs could be a big deal for central bank balance sheets
Let’s start with retail CBDC – a central bank liability, in digital form, held directly by individuals, and used to make day to day payments.

Many of the raw ingredients of a CBDC are already familiar to central banks: individuals can already hold our liabilities, in the form of physical banknotes; and we already provide digital liabilities, albeit to only a few depositors (predominantly banks).

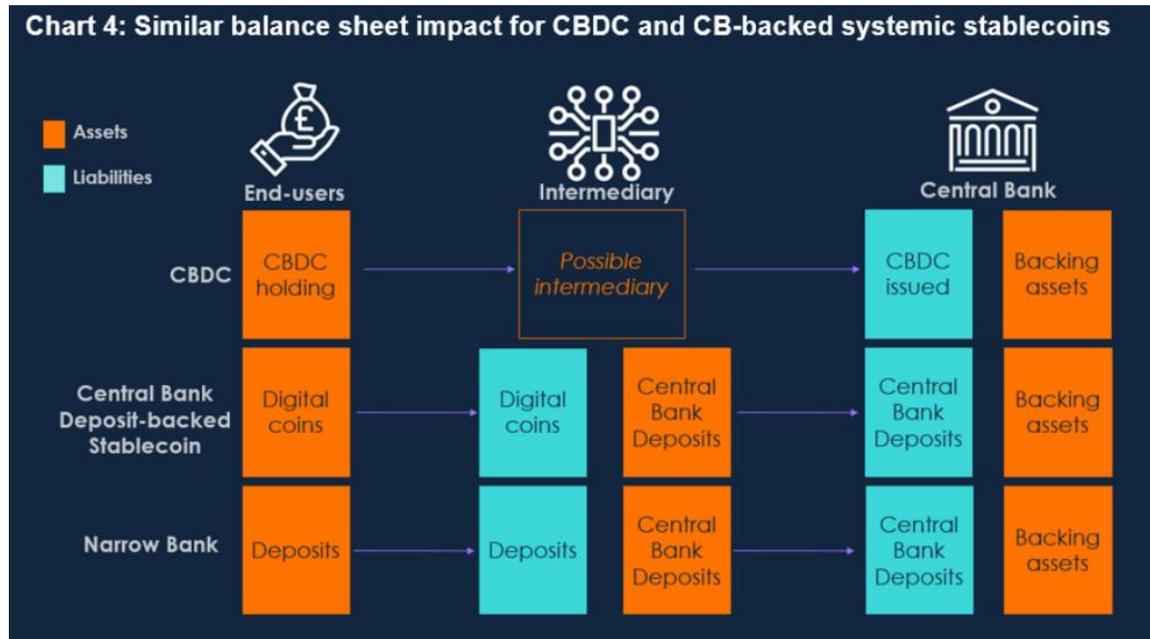
The new thing would be to combine those ingredients together, at scale. The question of whether to do so is complex, and beyond the scope of my remarks today.

The UK will publish a consultation on this issue later this year. But the implications for central bank balance sheets will also depend heavily on

how any CBDC is designed: on who can hold it, where it can be used, how much can be held, and whether it is interest-bearing.

To read more:

<https://www.bankofengland.co.uk/-/media/boe/files/speech/2022/june/old-dogs-new-tricks-adapting-central-bank-balance-sheets-digital-currencies-remarks-by-andrew-hauser.pdf?la=en&hash=D4A4EF45267990AF596B1D416138FF42D48A6D03>



Revisiting an important paper from March 2022 IOSCO DECENTRALIZED FINANCE REPORT



“Decentralized Finance” (“DeFi”) is an important, evolving and expanding technological innovation.

DeFi commonly refers to the provision of financial products, services, arrangements and activities that use distributed ledger technology (“DLT”) in an effort to disintermediate and decentralize legacy ecosystems by eliminating the need for some traditional financial intermediaries and centralized institutions.

Currently, there is no generally accepted definition of “DeFi,” or what makes a product, service, arrangement or activity “decentralized.”

Regardless of any characterization or assertion of “decentralization,” applicable regulatory frameworks still apply to participants and activities. IOSCO and its Fintech Network established the DeFi Working Group to focus on understanding the current state of the DeFi market, its typologies, and policy implications.

DeFi products, services, arrangements and activities rely upon systems built on top of public permissionless smart contract platforms, such as the Ethereum blockchain.

DeFi involves a multi-layered technology “stack.” In summary, at the base, or settlement layer, is the underlying blockchain.

On top of the settlement layer, multiple systems of smart contracts (and auxiliary software) create financial products and services (protocols).

As described in more detail in this report, these smart contract and software applications may include, among others, activities that are or are akin to offering, trading, lending, borrowing, and asset management activities.

End-user applications, such as web interfaces, are built on top of the smart contract layer. Often, end-user applications may aggregate multiple protocols to provide access and interoperability.

Financial innovation may lead to benefits for investors and others, but it may also present risks. DeFi appears to present many similar risks to investors, market integrity and financial stability as do other financial products and services, and it also poses specific and unique risks and challenges for regulators to consider.

Understanding the regulatory implications arising from DeFi requires analyzing the totality of a DeFi ecosystem as it exists currently, its interrelationship with centralized crypto-asset trading platforms and service providers and traditional markets and activities, and how it may continue to develop in the future.

Developing a comprehensive understanding includes identifying and analyzing, among other things, the structural components of each type of DeFi financial product, service, arrangement and activity; what aspects of these may be “decentralized” and why; what are the roles of each of the components and participants involved at each of the different layers or levels, including their incentives and motivations; how participants engage with the various components and each other; and the roles that centralized cryptoasset trading platforms and service providers play.

Many of the financial products, services, arrangements, and activities in DeFi mirror, and in some cases overlap with, more traditional securities and derivatives products, services, arrangements and activities. In some cases, these may be novel to DeFi.

One primary characteristic of DeFi is its peer-to-peer nature and resulting ability to create alternatives to traditional and centralized financial market infrastructures, products or services, and potentially to complicate the application of existing regulatory frameworks to DeFi market participants and activities, including those that govern issuers, offerings, products, intermediaries, and trading markets.

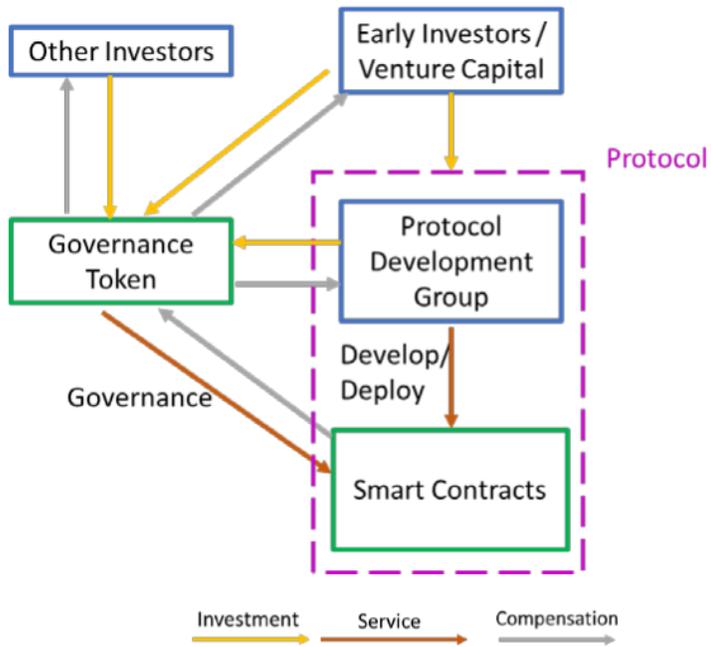
As DeFi continues to expand, both a granular and holistic understanding of the DeFi market will improve authorities’ ability to understand the regulatory implications of this emergent market with respect to their own jurisdictions.

This report is based on currently available information as of the date of publication. The purpose of this report is to provide a general understanding of DeFi, including some areas of potential regulatory concern.

The descriptions contained in this report are meant to describe typical features of DeFi protocols currently available. Actual features of any particular DeFi protocol in existence may vary.

You may visit:

<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD699.pdf>



BIS Bulletin No 56

Blockchain scalability and the fragmentation of crypto

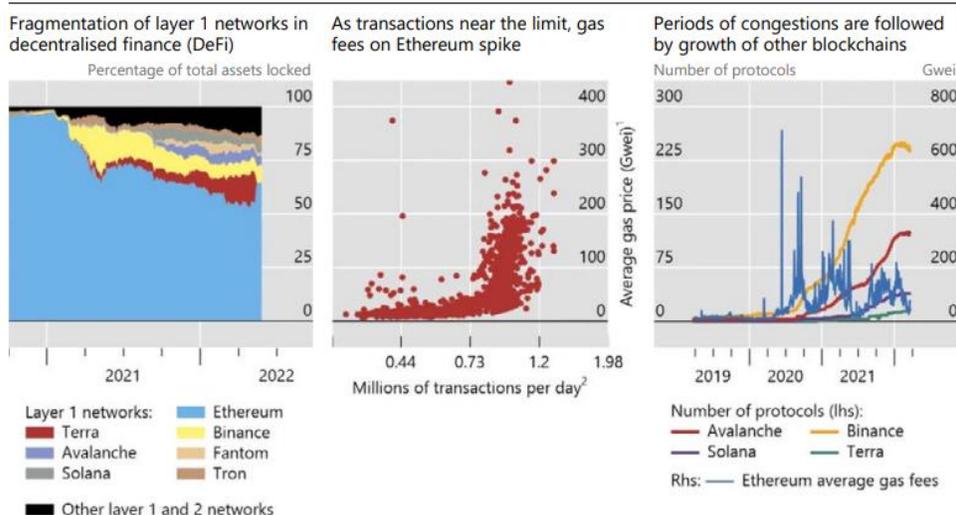
Frederic Boissay, Giulio Cornelli, Sebastian Doerr and Jon Frost

*Key takeaways*

- Permissionless blockchains work by providing monetary incentives to decentralised validators. Yet the mechanism for maintaining these incentives necessarily entails congestion effects and high fees. These high fees encourage the use of alternative chains, leading to a fragmentation of the crypto landscape.
- Newer blockchains have higher capacity, even if these come at the cost of greater centralisation and weaker security. Differences in the design also preclude blockchain interoperability.
- Limited scalability and a lack of interoperability not only prevent network effects from taking root, but a system of parallel blockchains also adds to governance and safety risks.
- Despite fragmentation, cryptocurrencies on different blockchains exhibit strong price co-movements, as they often share the same investor base, and growth is sustained by speculative buying of coins.

The more the sorrier: fragmentation rather than network effects

Graph 1



¹ One Gwei corresponds to 10^{-9} ETH (ie 0.000000001 ETH). Outliers larger than 450 Gwei are excluded from the graph. ² Transactions per day are shown on a logarithmic scale.

Sources: CoinGecko; Defi Llama; Etherscan; authors' calculations.

The crypto universe saw explosive growth in the last two years. From January 2020 to November 2021, the value of cryptocurrencies rose more than tenfold, peaking at \$2.8 trn, before crashing to \$1.2 trn in June

2022. Assets locked in the decentralised finance (DeFi) space rose 180 times, to \$109 bn.

As the system grew, it started to fragment. Initially, most DeFi protocols ran on the Ethereum blockchain, which has relatively high fees. Yet since early 2021 newer rival networks, touted as “Ethereum killers”, have gained market share (Graph 1, left-hand panel).

In particular, Binance, Avalanche and – until recently – Terra rapidly increased their footprints. In early May 2022, the total value of cryptocurrencies associated with protocols on Ethereum made up just half of the overall assets locked into DeFi.

The fragmentation of the crypto landscape stands in stark contrast to traditional (payment) networks, which benefit from strong network effects. In the traditional system, the more users flock to a particular platform, the more attractive it becomes for new users to join that platform, creating a virtuous circle. This drives costs down, improves service quality and promotes financial inclusion (BIS (2021)).

The recent launch and rapid adoption of Brazil’s Pix instant payment system illustrates these dynamics. In just over a year since its launch, Pix has seen 114 million users sign up, or 67% of the adult population (Duarte et al (2022)).

This bulletin argues that fragmentation arises from inherent limitations of blockchains. To maintain a system of decentralised consensus on a blockchain, self-interested validators need to be rewarded for recording transactions. Achieving sufficiently high rewards requires the maximum number of transactions per block to be limited.

As transactions near this limit, congestion increases the cost of transactions exponentially. While congestion and the associated high fees are needed to incentivise validators, users are induced to seek out alternative chains. This leads to a system of parallel blockchains that cannot harness network effects, raising concerns about the governance and safety of the entire system.

Blockchains, crypto and DeFi

Crypto is built on permissionless distributed ledger technology (DLT), ie blockchains.

Crucially, rather than putting trust in centralised intermediaries, eg banks and the central bank, the blockchain is sustained by a multitude of pseudo-anonymous, self-interested validators incentivised via rewards and fees.

The use of blockchains and cryptocurrencies is essential in the move towards a decentralised system. With a blockchain, any participant can transact on a public ledger – whether in the form of fund transfers, locking of assets as collateral or other functions – without the need for a centralised intermediary that keeps track of transactions.

Since all transactions are public, blockchains must feature pseudo-anonymity. As the history of transactions is publicly observable and tied to a specific wallet with a corresponding address, the true identity of the party behind transactions (ie the owner of the address) remains hidden.

Cryptocurrencies are the means of exchange among users and are also essential to reward validators for running and maintaining the decentralised system.

Suppose Juanita wants to sell cryptocurrencies to Hiro. The buyer, Hiro (whose identity is hidden behind his cryptographic digital signature), would first broadcast the transaction details (addresses, amount, fees).

Validators will then compete to verify the transaction, and whoever finishes first (ie emerges with a valid proof-of-work (PoW)) adds the transaction to the blockchain. The updated blockchain is then shared among all miners and users, who verify that the transaction does not violate the past history.

However, this process is costly, as it requires computing power or, in the case of proof-of-stake (PoS), significant amounts of staked cryptocurrency (ie “skin in the game”).

Validators need to be compensated through monetary incentives, ie block rewards and fees. Fees are denominated in the cryptocurrency underpinning the specific blockchain network and are usually paid by the parties involved in a transaction. In Ethereum these are called “gas fees”.

The level of gas fees, which is determined primarily by the demand for transactions, fluctuates widely. DeFi is a range of financial applications that aim to provide services and products similar to those of traditional finance, but in a decentralised manner built on blockchains (Aramonte et al (2021)).

Transactions are executed in cryptocurrencies, often through self-executing code that triggers transactions if specific events occur (“smart contracts”), and they are recorded on the blockchain. Smart contracts were made possible by the development of Ethereum, the first major blockchain that allowed for programmability.

This means that transactions or transfers can be made contingent on meeting certain pre-specified conditions. Blockchains with

programmability thus underpin decentralised applications (dApps) that offer services such as lending or trading in cryptocurrencies.

To read more: <https://www.bis.org/publ/bisbull56.pdf>

Testimony at Hearing before the Subcommittee on Financial Services and General Government U.S. House Appropriations Committee

SEC Chair Gary Gensler



Good morning, Chairman Quigley, Ranking Member Womack, and members of the Subcommittee. I'm honored to appear before you for the second time as Chair of the Securities and Exchange Commission. It is good to be here alongside Federal Trade Commission Chair Khan. As is customary, I'd like to note that my views are my own, and I am not speaking on behalf of my fellow Commissioners or the SEC staff.

The Gold Standard of Capital Markets

I'd like to open by discussing two key years in economic policymaking: 1933 and 1934.

We were in the midst of the Great Depression. President Franklin Delano Roosevelt and Congress addressed this crisis through a number of landmark policies.

Amongst them, in 1933 and 1934, Congress and FDR came together to craft the first two federal securities laws. These statutes created requirements and regulations around disclosure, registration, exchanges, and broker-dealers, and established the SEC to oversee the markets.

Additionally, in 1933, President Roosevelt formally suspended the use of the gold standard. Then, in 1934, the Gold Reserve Act was enacted, prohibiting government and financial institutions from redeeming dollars for gold.

Though it takes constant vigilance to protect investors, maintain fair, orderly and efficient markets, and facilitate capital formation, the U.S. laws became the gold standard for capital markets around the world.

In other words, in those two key years, one could say we replaced one gold standard with another gold standard: the securities laws.

The core principles of the securities markets laid out in these statutes were important for issuers and investors in our domestic markets. I believe they also contributed to America's geopolitical standing around the globe.

We are blessed with the largest and most innovative capital markets in the world. The U.S. capital markets represent 38 percent of the globe's capital markets. This exceeds even our impact on the world's gross domestic product, where we hold a 24 percent share.

What's more, U.S. market participants rely on capital markets more than market participants in any other country. For example, debt capital markets account for 80 percent of financing for non-financial corporations in the U.S. In the rest of the world, by contrast, nearly 80 percent of lending to such firms comes from banks.

We are the destination of choice for companies seeking to raise money in both public and private markets. Private capital markets, such as venture capital, have brought new ideas to market quickly and flexibly.

We can't take our leadership in capital markets for granted, though.

New financial technologies and business models continue to change the face of finance for investors and issuers. More retail investors than ever are accessing our markets. Other countries are developing deep, competitive capital markets as well, seeking to surpass ours.

Further, market participant incentives, economic cycles, and the nature of finance itself will constantly challenge even a gold standard. In recent years, we've seen as much — whether the market events of March 2020, the meme stock-related volatility in early 2021, the speculative crypto markets, the boom of special purpose acquisition companies (SPACs), or the collapse of Archegos Capital Management, which we recently charged with fraud and market manipulation.

What's more, we are in the midst of uncertain geopolitical events. On top of that, around the globe, central banks have started to transition from an accommodating to a tightening policy stance.

Given these trends, I think we should do everything we can to maintain and enhance that gold standard of the markets.

Maintaining the Gold Standard

There are two broad ways to do that, in my view.

One is to work with the Commission and staff to update our rules for modern markets and technologies as we execute our mission: to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation. We must remain vigilant to opportunities to enhance competition, transparency, fairness, and resiliency.

The other way — and the main focus of today’s testimony — is to ensure that the SEC is adequately resourced so we can remain the cop on the beat. The SEC is deficit-neutral, fully funding ourselves with fees on securities transactions.

Having worked in finance for decades, I’d long respected the SEC and its tremendous staff. What I couldn’t fully appreciate is the sheer magnitude of this agency’s work on a daily basis.

We oversee 24 national securities exchanges, 99 alternative trading systems, nine credit rating agencies, seven active registered clearing agencies, five self-regulatory organizations and other external entities.

We look after the accounting and auditing functions of the public markets, process thousands of periodic filings and registration statements, and work through thousands of examinations and enforcement actions each year. We review the disclosures and financial statements of more than 8,200 reporting companies.

Markets don’t stand still. The world isn’t standing still. Our resources can’t stand still, either.

And yet, as I will detail, our agency has shrunk. When I testified you last year, the agency had 4 percent fewer staff than it did in 2016; it remains modestly below where it was in 2016. We can’t shrink when we’re trying to maintain a gold standard. The best athletes in the world still practice — generally, even more than their competitors.

Our capital markets are a national treasure. We, at the SEC, must work to maintain them as the envy of the world. But we can’t do it alone. We need the help of Congress.

Growth in the Markets

The last five years have been a remarkable time in our \$100-trillion capital markets. Thus, while there are many measures of market activity, by most objective measures, we should have grown during the past five years.

Instead, the opposite has happened. As our capital markets have grown, this agency has shrunk.

As just a few examples:

In the past five years, the number of registered entities we oversee has grown by 12 percent (from 26,000 to 29,000), even though the SEC has shrunk in that time.

Since 2016, the number of private funds managed by registered investment advisers has increased 40 percent, to 50,000.

The amount of data that the SEC processes has swelled by 20 percent annually for each of the last two years.

Moreover, the highly volatile and speculative crypto marketplace has mushroomed, attracting tens of millions of American investors and traders.

In 2016, there were an estimated 644 crypto tokens on the worldwide market. Five years later, that number had gone up more than tenfold.

The volatility in the crypto markets in recent weeks highlights the risks to the investing public.

Technology is rapidly changing as well. Predictive data analytics, including machine learning, are increasingly being adopted in finance — from trading, to asset management, to risk management.

Growing cybersecurity risks have implications for the financial sector, investors, issuers, and the economy at large.

Beyond that, our responsibilities have grown. Important legislation, such as the Holding Foreign Companies Accountable Act of 2020 (HFCAA), has placed additional demands on our resources. Rules implementing certain mandates of the Dodd-Frank Act of 2010 recently went into effect. Such mandates, designed to protect investors, often have been unfunded.

SEC FTE (FY 2016 - FY 2023)

	FY 2016 Actual	FY 2021 Actual	FY23 Request
SEC Overall	4,554	4,459	4,808
Corporation Finance	477	388	438
Economic and Risk Analysis	151	140	174
Enforcement	1,380	1,315	1,365
Examinations	1,023	1,061	1,100
Investment Management	183	200	222
Trading and Markets	258	256	290

Figure 1: Headcount (FTEs) at the SEC and in individual Divisions. Overall SEC headcount includes all Offices and Divisions.

Thus, I am pleased to support the President's Fiscal Year 2023 (FY23) budget request for SEC operations, totaling \$2.149 billion, an 8 percent increase over FY22. This request would allow us to maintain current services, add full-time equivalents in critical growth areas, and devote more resources to technology. This number would support a modest growth of

(about 6 percent) in full-time equivalents (FTEs) above our previous peak in FY16, assuming consistent vacancy rates.

This increase would be modest, given the major trends affecting our markets since 2016. Moreover, to fund our operations, the agency collects fees on securities transactions at a rate intended to fully offset our appropriation.

Thanks to the work of the remarkable staff, the SEC has faced the challenges of limited resources well.

For the SEC to continue to succeed in carrying out our mission, our personnel level must continue to grow commensurate with the expansion and complexity in the capital markets around the globe.

To read more:

<https://www.sec.gov/news/testimony/gensler-testimony-fsgg-subcommittee>



Monetary policy and inflation in times of war

Henry Ohlsson, Deputy Governor of Sveriges Riksbank, at the Uppsala University



The 2020s could certainly have begun better. Following a pandemic, which we still haven't quite seen the end of, another war has broken out in Europe.

As information now spreads faster than ever before, via news channels and social media, and as it is a country quite close to us that has been affected, the war in Ukraine has shaken us more than usual in our safe Swedish everyday lives. That, at least, is how I feel.

However horrific the war in Ukraine may be, it is not the war as such that I intended to talk about today, but its economic consequences – and those of war in general.

After all, it is in the field of economics that I have my comparative advantages, and as policy-maker at a central bank, monitoring the economic consequences is, of course, something that is part of my job. I will focus on the effects on inflation, as they are particularly important for a central bank.

When major and unusual events such as a war occur, there is no 'manual' for how to act as an economic policy decision-maker.

All wars are different – in terms of their scale and duration, their location and their impact on the world around them. Instead, we must brush up on our possible knowledge of history and try to see if there are past historical episodes from which we can learn something for the current situation.

It is of course also important to study the available literature on the economic consequences of war to see whether it is possible to find common denominators that can give clues regarding the situation that has arisen.

What I intend to do today is to first briefly review what research literature has to say about the connection between war and inflation. Then I will look back at previous episodes when war was associated with rising inflation in Sweden and draw some conclusions from this.

Finally, I intend to say something about how I view the current situation from a monetary policy perspective. As usual, it is my personal views that I am expressing.

War often leads to inflation

The fact that war and inflation often go hand in hand has been known for a very long time. Back in 500 BC Sun Tzu, Chinese general and author of a book on the art of war, observed: “Where the army is, prices are high; when prices rise the wealth of the people is exhausted.”

What this refers to is, of course, that an army of perhaps tens of thousands of soldiers requires a lot of resources just to stay alive and these can be difficult to raise in a geographically restricted area.

Demand simply rises in relation to the available supply of food and other necessities, and this causes inflation to rise. If, as has often been the case throughout history, the army supports itself by looting, it may be able to survive for a while, but for the civilian population, prices will rise because supply decreases.

Of course, an army could not survive indefinitely in one place, because resources sooner or later run out. In his book “Ofredsår” (“Years of Trouble”), Peter Englund has likened the Swedish army during the Thirty Years’ War to a shark that must be constantly on the move to avoid succumbing.

Once a war had started, the armies of the time lived partly their own lives, separated from the state, and largely organised their own supplies, especially of course during campaigns abroad. Inflation therefore increased more locally depending on where the armies happened to be, as a result of the demand for food and other necessities exceeding supply.

Rising demand and printing money

When a country rearms and fights a war, inflation can also rise in the whole economy for the same reason, that is, demand rises in relation to supply.

A sharp increase in public expenditure as a result of rearmament or war effort increases capacity utilisation in the economy and can therefore lead to higher inflation.

In connection with the Second World War, the US economy approached full capacity utilisation, which contributed to a rise in inflation. Some economists argue that it was the US rearmament in connection with the war that finally put an end to the 1930s depression.

The way in which a rearmament or war is financed is also of great importance to the way in which inflation develops. The financing can entail increasing taxes or decreasing expenditures other than military, by raising loans or by making the central bank print more money. If a war is financed by increasing taxes or decreasing other expenditure, public purchasing power will be reduced.

This counteracts the inflationary effect of increased public expenditure. At the same time, tax financing may be politically difficult to implement. In the short term, the politically easiest way of financing war, but in the longer term perhaps the most harmful, is through the printing of money, as this almost inevitably results in higher inflation.

A fairly large share of the literature on the effects of war on inflation is about the financing of war. A review of the effects on inflation of the United States' wars from the American Revolution to the First Gulf War shows that when the US has been involved in more limited wars, they have usually been financed through higher taxes or increased borrowing or a combination of these.

However, in the case of major wars, the point where these two methods of financing have been considered exhausted has often been reached, and the government therefore turned to the printing press. The result has often been a considerably higher inflation rate.

The two world wars are examples of this. After a war, sovereign debt has often increased considerably. At the same time, it may be difficult to raise tax revenue in the same way as before the war.

This may be because the political situation has become more unstable or the economy's production capacity has declined. In such a situation, there may be a great temptation for a government to try to alleviate the situation by using the printing press to finance current expenditure and pay off the loans.

Difficulties in generating sufficient tax revenues are considered to be an important explanation for the high inflation in countries such as Germany, Austria, Hungary, Poland and Russia after the First World War and also for the highest rate of hyperinflation in the modern age, that in Hungary in 1945- 1946. According to some estimates, prices at their fastest then doubled in fifteen hours.

To read more:

<https://www.riksbank.se/globalassets/media/tal/engelska/ohlsson/2022/ohlsson---monetary-policy-and-inflation-in-times-of-war.pdf>

Bank of England publishes results of the 2021 Biennial Exploratory Scenario: Financial risks from climate change

Bank of England

The Bank of England (the Bank) has run its first exploratory scenario exercise on climate risk, involving the largest UK banks and insurers.

This exercise supports the Financial Policy Committee (FPC) and Prudential Regulation Committee (PRC) in the pursuit of their statutory objectives. The financial risks from the physical effects of climate change and the transition to a net-zero economy have the potential to affect the vulnerability of banks and insurers to shocks, and the stability of the wider financial system.

The Prudential Regulation Authority's (PRA's) primary objectives are to promote the safety and soundness of firms that it regulates, and to contribute to the protection of insurance policyholders.

The FPC's primary objective is to protect and enhance the stability of the financial system of the United Kingdom. The FPC also has a secondary objective to support the economic policy of Her Majesty's Government, which includes ensuring the financial system can support the transition to a net-zero economy.

The Climate Biennial Exploratory Scenario (CBES) includes three scenarios exploring both transition and physical risks, to different degrees.

The exercise considered two possible routes to net-zero UK greenhouse gas emissions by 2050: an 'Early Action' (EA) scenario and a 'Late Action' (LA) scenario. A third 'No Additional Action' (NAA) scenario explores the physical risks that would begin to materialise if governments around the world fail to enact policy responses to global warming.

The CBES scenarios are not forecasts of the most likely future outcomes. Instead, they are plausible representations of what might happen based on different future paths of climate policies, technological developments and consumer behaviour, aimed at limiting the rise in global temperatures. Each scenario is assumed to take place over a period of 30 years.

In line with the stated aims of the exercise, the CBES has:

1. Assisted participants in enhancing their management of climate-related financial risks (hereafter 'climate risks'), including by fostering engagement with their large corporate customers to understand their vulnerability to climate risks.

The CBES has shown that UK banks and insurers are making good progress in some aspects of their climate risk management, and this exercise has spurred on their efforts further. But the Bank's assessment is that UK banks and insurers still need to do much more to understand and manage their exposure to climate risks.

The lack of available data on corporates' current emissions and future transition plans is a collective issue affecting all participating firms. The Bank will give firm-specific feedback to participants, and will use findings from the CBES to help target their efforts.

2. Sized the financial exposures of participants to climate risks. Climate risks captured in the CBES are likely to create a drag on the profitability of banks and insurers, particularly if they are unable to manage these risks effectively.

But there is substantial uncertainty around the true magnitude of these risks. And climate risks outside the scope of the CBES (such as trading losses for banks and mortality risk for life insurers) could be material.

3. Allowed policy makers to gauge challenges to banks' and insurers' business models from climate risk, to understand their likely responses, and to analyse the implications of those responses for the system as a whole.

All participating banks and insurers have published climate strategies or net-zero transition plans, which they broadly followed in their responses to all three of the CBES scenarios. Individual plans involve reducing finance, and in some cases insurance, to the most carbon-intensive industries, as well as engaging with corporate clients and counterparties to help facilitate their transition to net zero.

There is a risk, however, that the collective impact of such plans could have negative consequences for the wider economy. For example, there could be economic consequences if limits on lending and insurance to corporates involved in the supply of more carbon-intensive energy run ahead of the expansion of renewable energy supply and other measures to improve energy efficiency.

A transition to net zero would materially impact a number of sectors that banks and insurers are exposed to, forcing those in such sectors to adapt their business models or potentially risk becoming unviable over time. It will be in banks' and insurers' collective interests both to support the adaptation of those counterparties across the economy that have credible transition plans, and to gradually reduce their exposures to sectors of the economy that become less economically viable as a result of the transition to net zero. Banks and insurers noted that they will be better able to prepare

and plan for the transition if the evolution of climate policy is clear and well communicated.

Some responses – to the NAA scenario in particular – implied a material reduction in access to lending and insurance for sectors and households which were most exposed to physical risks.

In the NAA scenario, banks would reduce lending to properties facing greater physical risks, and insurers would substantially increase the premiums they charge to insure against such risks, making insurance coverage unaffordable for many of these households.

Key lessons and next steps

One recurrent theme across participants' submissions was a lack of data on many key factors that participants need to understand to manage climate risks. Another was the range in the quality of different approaches taken across organisations to the assessment and modelling of these risks.

All participating firms have more work to do to improve their climate risk management capabilities. The Bank will engage with firms individually and collectively to help them target their efforts, and share good practices identified in this exercise.

Inside the Bank, the findings from this exercise will inform the FPC's thinking around system-wide policy issues related to climate risk and the Committee's work in supporting the financial system's role in the economy's transition to net zero. The findings will also inform the PRA's supervisory policy and approach.

Outside the Bank, key lessons and themes emerging from the exercise will be shared with the UK Government and the Bank's international peers, helping to advance global thinking on how to manage climate-related financial risks, including around the appropriate role of bank and insurer capital requirements.

Scope

Given the focus of the exercise on driving improvements in risk management and understanding how firms may respond to the risks they could face, the CBES incorporated some key differences in design relative to climate stress tests run elsewhere. The exercise required participants to make granular assessments of their largest counterparties; particular emphasis was placed on banks' and insurers' ability to evaluate the net-zero transition plans of their corporate counterparties; and the exercise focussed on participants' responses to climate risks to a greater extent.

For banks, loss projections were focussed on the credit risk associated with their lending activities, with an emphasis on detailed analysis of risks to large corporate counterparties. For insurers, the focus was on changes in the value of invested assets and the impact on insurance claims.

Given the difficulties inherent in accurately assessing climate risk, and the fact that this was the first detailed climate exercise involving both banks and insurers that the Bank has run, the CBES did not aim to evaluate the full impact on participants' income and capital positions.

Some factors were not included in the CBES. Examples of omissions include potential trading losses, and detailed projections of the impact of climate risks on banks' risk-weighted assets.

Loss projections for the CBES scenarios are based on the balance sheets of participants as they stood at the end of 2020. So they represent an expectation of losses that might materialise if banks and insurers do not act to reduce the climate risks they face.

This design feature makes interpretation of the results more straightforward and allows a clear, separate focus on specific actions that participants might take in response to the scenarios. But it is also likely to push projected losses upwards, as over the thirty year horizon of the CBES participants would likely be able to adjust their business models, and may reduce or mitigate some of the risks they face.

Scenarios

There are two key types of risk associated with climate change: the risks that arise as the economy moves from a carbon-intensive one to net-zero emissions, known as transition risks; and risks associated with the higher global temperatures likely to result from taking no further policy action, known as physical risks.

The CBES includes three scenarios exploring both transition and physical risks, to different degrees. These scenarios build on the climate scenarios developed by the Network for Greening the Financial System (NGFS). The CBES also includes an exercise to explore climate litigation risk facing general insurers, separate from these three scenarios.

The exercise considered two possible routes to net-zero carbon dioxide emissions globally by 2050: an Early Action scenario and a Late Action scenario. These scenarios primarily explore transition risks from climate change:

Early Action (EA): Under this scenario, climate policy is ambitious from the beginning, with a gradual intensification of carbon taxes and other policies over time.

Global carbon dioxide emissions are reduced to net-zero by around 2050 and global warming (relative to pre-industrial levels) is successfully limited to 1.8°C by the end of the scenario, falling to around 1.5°C by the end of century.

The required adjustment in the economy creates a temporary headwind to growth but this dissipates in the latter half of the scenario once a significant portion of the required transition has occurred, and the productivity benefits of green technology investments begin to be realised.

Late Action (LA): The implementation of policy to drive the transition to a net-zero economy is assumed to be delayed by a decade under this scenario.

Policy measures are then more sudden and disorderly as a result of the delay. Global warming is limited to 1.8°C by the end of the scenario (2050) relative to pre-industrial levels, but then remains around this level at the end of the century.

The more compressed nature of the reduction in emissions also results in material short-term macroeconomic and financial markets disruption. UK unemployment rises to 8.5% and the economy goes into recession for a short period. Falls in output are particularly concentrated in emissions-intensive sectors.

In both these scenarios, climate risks have been managed by 2050. In reality, however, the effectiveness of climate policy is not certain.

Based on climate simulations and modelling of the impact of policy, the early action policy path has the highest probability of success in terms of limiting climate change.

From a practical perspective, acting late would leave less time to fine-tune policy as its effectiveness was revealed, and leave governments more exposed to the risk of policy co-ordination failure.

A third scenario explores the physical risks that would begin to materialise if governments around the world fail to enact policy responses to global warming and no additional action is taken to address climate change.

In contrast to the two transition scenarios, risks in the NAA scenario continue to build beyond the end of the scenario, making it more difficult to compare the effects of such a scenario.

Furthermore the scenario does not factor in other potential geopolitical impacts of severe climate change such as increases in migration and conflict, which alongside their enormous human costs, are likely also to result in further financial losses.

No Additional Action (NAA): This scenario primarily explores physical risks from climate change. It is a deliberately severe scenario, being based on climate outcomes that would only occur later this century under the assumption that no additional action is taken to address climate change, and represents a worse than expected outcome even under such conditions.

The absence of transition policies in this scenario leads to a growing concentration of greenhouse gas emissions in the atmosphere and, as a result, global temperature levels continue to increase, reaching 3.3°C higher relative to pre-industrial levels by the end of the scenario.

This leads to chronic changes in precipitation, ecosystems and sea-levels, which are unevenly distributed globally, and in some cases irreversible. There is also a rise in the frequency and severity of extreme weather events. There are permanent impacts on living and working conditions, buildings and infrastructure. As a result, UK and global GDP growth is permanently lower and macroeconomic uncertainty increases.

Reflecting the fact that the future looks materially worse at the end of the scenario, with the adverse effects of climate change set to worsen further, UK and US equity prices are respectively just under 20 and 25% lower than they might otherwise be.

Climate Risk Management

UK banks' and insurers' approaches to projecting losses in the CBES, taken together with other qualitative information provided, suggest that participants are making good progress in some aspects of climate risk management. And there is evidence that this exercise has spurred on participating firms to develop their risk management capabilities further. But the Bank's assessment is that UK banks and insurers still need to do much more fully to understand and manage their exposure to climate risks, including through getting data on and understanding their counterparties' and customers' transition plans.

The findings are consistent with the PRA's assessments in relation to firms' progress against a Supervisory Statement the PRA issued in 2019 (SS3/19), which sets expectations for how banks and insurers should incorporate climate risks into their risk management practices and governance arrangements, which were set out in the PRA's Climate Change Adaptation Report 2021.

In order to produce better estimates of climate risks in their portfolios, banks and insurers will need to prioritise investment in their climate risk assessment capabilities, both by focusing on their internal modelling and data capabilities and doing more to scrutinise data and projections supplied by third-party providers (upon which participants have relied heavily to compile CBES submissions).

The inability to capture appropriate and robust data in certain areas is a common limitation, which means many climate risks are only being partially measured.

Examples of gaps include information about the location of corporate assets to permit physical risk assessment, and a lack of standardised information about value chain emissions relating to corporate counterparties.

Banks and insurers will need to prioritise progress on data and will need to put in place interim measures to inform risk management until these data challenges are resolved. The Bank will continue to be supportive of co-ordinated initiatives to fill such data gaps.

A more developed and nuanced approach to risk management would allow banks and insurers to reflect climate risks more accurately in their business decisions (for example by explicitly incorporating possible future carbon prices and their impact on counterparties in pricing, lending and investment decisions).

This is important for their own long-term profitability and hence financial resilience. And it is also important to ensure that banks and insurers can support the economy in the transition to net zero. Absent these improvements, there is a risk that banks and insurers may resort to actions that do not appropriately reflect climate risks, such as withdrawing finance to those carbon-intensive businesses in need of external finance to support their transition to less carbon-intensive production. This could give rise to wider macroeconomic risks.

The Bank will help the banks and insurers it regulates to use the results of the CBES to improve their climate risk management capabilities, both through individual firm supervisory dialogue and by sharing and discussing key thematic findings with the banking and insurance industry more broadly (including through the Climate Financial Risk Forum (CFRF)).

Exposures to climate risks

The loss estimates presented here are based on the simplifying assumption that banks' and insurers' balance sheets stay fixed over the scenario horizon, remaining as they stood at end-2020. In reality, banks and

insurers business models are likely to respond to climate risks over time. These responses may act to mitigate some of the losses projected.

Across scenarios, participants' projections show that if banks and insurers do not respond effectively, climate risks could cause a persistent and material drag on their profitability.

Loss projections vary across participants and scenarios, but are equivalent to an annual drag on profits of around 10-15% on average. Losses of this magnitude could make individual firms, and the financial system overall, more vulnerable to other future shocks.

Due to the relative immaturity of firms' approaches and the complexity of modelling the impact of these risks, the uncertainty bands around projected losses are very large.

For example, participating firms' estimated loss rates on the same corporate customers can differ substantially, with the most conservative estimates for losses around ten times higher on average than the least conservative.

The impact of climate-related losses will depend on the time horizon over which they occur, which is also uncertain in reality. More clustered losses would have a bigger impact on banks and insurers.

Based on banks' and insurers' projections in this exercise, the overall costs to these firms from the transition to net zero should be bearable without substantial impacts on firms' capital positions – for example through a combination of lower retained earnings and increases in lending rates to sectors where risks increase, and also because not all of the losses on insurers' investments would ultimately fall on shareholders (Section 4). Firms' projections suggest that these costs will be lower if early, well ordered action is taken.

In the case of banks, for which projections were focused on realised credit losses only, as opposed to forward-looking asset prices, loss rates were projected to rise appreciably in all three scenarios.

Banks' projected climate-related credit losses were 30% higher in the Late Action (LA) scenario than the Early Action (EA) scenario. Loss rates in the LA scenario were projected to more than double as a result of climate risks – equivalent to an extra c.£110 billion of losses for participating banks over the period. Around 40% of these losses were realised during the first five years of transition.

Key drivers were the large increase in carbon prices contained in this scenario, which leads to large corporate loan losses across energy users and

energy producers, and the economy-wide recession, including a rise in unemployment and fall in house prices caused by the sharp adjustment process, leading to significant mortgage impairments. These household losses were particularly heavily concentrated in the first five years after the delayed start of the transition.

At a corporate sectoral level, the industries in which banks projected the highest loss rates in the two transition scenarios were mining (including extraction of petroleum and natural gas), manufacturing, transport and wholesale & retail trade.

On average these sectors were projected by banks to have cumulative impairment rates of 35%, more than twice the aggregate projected impairment rate on corporate portfolios.

Insurers projected heavy corporate bond and equity losses in similar sectors, with assets in the mining of gas and oil sector suffering by far the largest losses. These sectoral results were in line with expectations given the carbon intensity of these industries' supply chains.

The NAA scenario also results in significant costs for banks and insurers during the scenario horizon, as the intensification of physical risks leads to higher losses on lending and insurance activities, and lowers the return on financial assets.

In contrast to the two transition scenarios, the NAA scenario only captures a subset of the costs of climate change, which would build far into the future beyond the 30-year horizon of the exercise and persist indefinitely. And the scenario does not factor in other potential geopolitical impacts of severe climate change such as increases in migration and conflict, which alongside the enormous human cost, are likely also to result in further financial losses.

Under the NAA scenario, impairments rates projected by banks were just over 50% higher than normal levels. But these estimates are particularly uncertain. In part that is because banks appeared less well equipped to assess thoroughly the impact of physical risks prominent in the NAA scenario, particularly those arising from corporate vulnerabilities.

The aggregate results show that, for life and general insurers, the NAA scenario would be likely to have a more significant impact than either of the transition scenarios, even within the 30-year window of the exercise. For life insurers, this was because forward-looking asset price impacts are greatest at the end of that scenario with an overall impact worth just over 15% of total market value.

Such falls in asset prices would of course affect all holders of assets and participants in these markets. For general insurers, the key way that losses materialised was via a build-up in physical risks, which resulted in higher claims for perils such as flood and wind-related damage.

UK and international general insurers, respectively, projected a rise in average annualised losses of around 50% and 70% by the end of the NAA scenario. Staff analysis on UK insurance losses suggests increases could be as much four times higher than firms submitted.

Insurers reported that the impact of these increased domestic and international insurance claims would fall, ultimately, on households and businesses through higher insurance premiums or through lower availability of insurance cover.

Projected loss rates from individual banks and insurers spanned a wide range. This suggests significant uncertainty around the true magnitude of these risks, reflecting the fact that participants' climate risk assessment techniques are still developing, as well as the wide range of approaches taken by participants. The significant degree of uncertainty is corroborated by sensitivity analysis conducted by the Bank.

This exercise also highlighted data gaps and potential risks to international general insurers from climate-related litigation, which could impact the cost and availability of Directors' & Officers' liability insurance cover.

An increase in climate litigation risk would clearly also affect those businesses being litigated against beyond the insurance sector.

Challenges to business models and participants' responses to scenarios
By examining jointly the potential responses of banks and insurers to climate risk, the results of the CBES shed light on the possible collective impact of participants' behaviours, including whether they may give rise to unintended or undesirable system-wide consequences.

UK banks and insurers typically expected to respond to the scenarios in this exercise by following their existing plans around the transition to net-zero emissions, including in this instance by increasing counterparty engagement to support the transition.

In this exercise, banks and insurers planned to reduce their exposure to carbon-intensive sectors, with banks projecting the largest reductions in the petroleum and gas extraction, petroleum manufacturing, and mining and quarrying sectors. The sectors that banks and insurers planned to reduce their exposure to were broadly similar across all three scenarios.

These strategies raise the possibility that some corporate sectors (particularly some carbon-intensive ones) may struggle to access finance as the transition progresses, especially from banks. Unless the transition is carefully managed, this could have significant impacts on businesses and consumers, and through them the financial sector.

For example there could be potential macroeconomic consequences if limits in the supply of finance and insurance to fossil fuel producers could outpace the new investment in sustainable energy alternatives and improvements in energy efficiency.

Participating firms identified more business opportunities in the transition scenarios than in the NAA scenario. And banks were able to quantify more new opportunities than life insurers in this exercise.

Life insurers noted that their ability to seize some investment opportunities would be dependent upon improvements in disclosures. Some insurers expressed a concern that a surge in 'green' investment could unduly raise asset prices.

In the two transition scenarios, banks planned to increase lending substantially to some components of the gas and electricity supply sector, specifically to renewable energy firms and those developing technology for electric vehicle batteries.

At the same time, banks planned to reduce lending to firms within this sector that were particularly reliant on revenues from fossil fuels. They also envisaged increasing lending to the construction sector, reflecting greater investment in retrofitting and flood defence improvements.

Banks also planned to expand into retail lending opportunities created by the transition, including offering green mortgages, and providing financing products for home energy efficiency improvements.

General insurers also planned to expand further into opportunities that would be created by a net-zero transition, for example by providing insurance to renewable energy projects, and to companies developing battery and fuel cell technology.

In the NAA scenario, banks and insurers generally sought to reduce their exposures to similar sectors as in the transition scenarios. General insurers planned to increase the price of insurance to reflect the increases in physical risk in the scenario.

These firms' insurance contracts are typically written to cover one year, allowing them to alter pricing relatively quickly as risks change. And insurers noted that UK household flood insurance coverage could fall

sharply in such a scenario, particularly as insurance on some properties would become unaffordable once the Flood Re scheme ended as per current legislation in 2039, though the vast majority of households would still be able to afford insurance.

In the NAA scenario participants' responses indicated that around 7% of UK households that they currently cover could be forced to go without insurance – because their properties become uninsurable, or because they cannot afford insurance at the prices offered. The share of households affected could be greater than this, to the extent that general insurers have underestimated the physical risk impact of the NAA scenario.

Households and corporates that insurers become unwilling to insure, or where insurance premiums become unaffordable, may face difficulty in accessing finance from banks. UK households in regions most exposed to physical risk would face challenges re-mortgaging their properties in the NAA scenario because they would fall in value due to severe flooding and/or become uninsurable.

45% of the mortgage impairments in the scenario are accounted for by just 10% of the 4-digit postcode areas analysed. Affected households may find themselves stranded on the more expensive Standard Variable Rate mortgages.

Both banks and insurers noted that these risks could be in part mitigated by investment in flood defences, increasing flood resilience measures for properties, and encouraging flood-resilient repairs. They also noted their support for a continuation of a publicly supported UK flood reinsurance pool in such a scenario, and an extension to include properties built after 2009.

The Bank will work with the Government and the FCA to support greater understanding of risks to the provision of financial services highlighted by the CBES exercise.

To read more:

<https://www.bankofengland.co.uk/stress-testing/2022/results-of-the-2021-climate-biennial-exploratory-scenario>

FSB Europe Group discusses regional vulnerabilities, crypto-assets and climate change



The Financial Stability Board (FSB) Regional Consultative Group for Europe held their first in-person gathering since the onset of the COVID-19 pandemic.

Members discussed the outlook for global and regional financial stability considering recent developments, including rising and volatile commodity prices triggered by Russia's invasion of Ukraine, higher inflation, vulnerabilities in the non-bank financial sector and other areas that warrant particular attention over the coming months.

Members received an update on the FSB's 2022 work programme, and discussed items of particular relevance to the European region.

The group discussed regulatory and supervisory issues related to crypto-assets, and the associated challenges for policymakers.

Members were briefed on the FSB's recently established workstream to examine supervisory and regulatory issues raised by "unbacked" crypto-assets which complements continuing FSB work on issues raised by stablecoins.

The group provided feedback on the areas that could benefit most from international cooperation.

Finally, the group discussed work on a number of fronts to address financial risks related to climate change, which the FSB is coordinating through its Roadmap published in July 2021.

This included an overview of the International Sustainability Standard Board's (ISSB) work on developing global baseline sustainability disclosure standards, beginning with climate.

Members considered ways they could further support the ISSB in finalising its exposure draft.

Members also provided feedback on the recommendations set out in the FSB's consultative report on regulatory and supervisory approaches to climate-related financial risks that was published last month. They also exchanged views on the financial stability implications of wider sustainability issues, including nature and biodiversity.

The meeting was preceded by an Informal Seminar on Climate Change and Energy Market Dynamics to discuss the implications for financial stability of climate transition risks and recent energy market challenges and the role the financial sector can play in supporting the climate transition.

Notes

The FSB Regional Consultative Group for Europe is co-chaired by Henry Ohlsson, Deputy Governor, Sveriges Riksbank, and Lowri Khan, Director, Financial Stability at the UK Treasury.

Membership includes financial authorities from Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Ukraine, United Kingdom and the Group of International Finance Centre Supervisors.

The European Commission, the European Central Bank (ECB) and the ECB Banking Supervision also attended the meeting.

The FSB has six Regional Consultative Groups, established under the FSB Charter, to bring together financial authorities from FSB member and non-member countries to exchange views on vulnerabilities affecting financial systems and on initiatives to promote financial stability.

Typically, each Regional Consultative Group meets twice each year.

The FSB coordinates at the international level the work of national financial authorities and international standard-setting bodies and develops and promotes the implementation of effective regulatory, supervisory, and other financial sector policies in the interest of financial stability.

It brings together national authorities responsible for financial stability in 24 countries and jurisdictions, international financial institutions, sector-specific international groupings of regulators and supervisors, and committees of central bank experts.

The FSB also conducts outreach with approximately 70 other jurisdictions through its six Regional Consultative Groups.

The FSB is chaired by Klaas Knot, President of De Nederlandsche Bank.

The FSB Secretariat is located in Basel, Switzerland, and hosted by the Bank for International Settlements.

Regulation and Supervision of Fintech: Considerations for EMDE Policymakers



Fintech is transforming the global financial landscape. It is creating new opportunities to advance financial inclusion and development in Emerging Markets and Developing Economies (EMDEs), but also presents risks that require updated supervision policy frameworks.

Fintech encompasses new financial digital products and services enabled by new technologies and policies.

Although technology has long played a key role in finance, recent fintech developments are generating disruptive innovation in data collection, processing, and analytics.

They are helping to introduce new relationship models and distribution channels that challenge traditional ways of finance, while creating additional risks.

While most of these risks are not new, their effects and the way they materialize and spread across the system are not yet fully understood, posing new challenges to regulators and supervisors.

For example, operational risk, especially cyber risk, is amplified as increasing numbers of customers access the financial network on a 24/7 basis. Likewise, increased reliance by financial firms on third parties for provision of digital services, such as cloud computing, may lead to new forms of systemic risks and concentration on new dominant unregulated players such as big tech firms.

This note aims to provide EMDE regulators and supervisors with high-level guidance on how to approach the regulating and supervising of fintech, and more specific advice on a few topics. Preserving the stability, safety, and integrity of the financial system requires increased attention to competition and ensuring a level playing field and to emerging data privacy risks.

As a general principle, policy response should be proportionate to risks posed by the fintech activity and its provider. While striking the right balance can be challenging in the absence of global standards, the IMF-World Bank Bali Fintech Agenda (BFA), along with guidance by Standard Setting Bodies, provides a good framework for reference.

A sound policy design must start with assessment of the fintech landscape, its risks and regulatory gaps. Simplicity and pragmatism—for example

combining simple regulations with supervisory judgment—increases the odds of successful policy.

In practice, this will mean different things, depending on local context. In many cases, a clarification or review of existing frameworks will be sufficient and is easily done through enhanced supervisory guidance.

In others, a full regulatory overhaul might be required. In some systems, an activities-based, technology-neutral approach, based on the function of the financial service can help balance stability and innovation goals.

In others, a combined approach, taking into account the activity and the entity, might be necessary to ensure financial stability.

In any case, there needs to be clear definition of which activities are under the regulatory perimeter and which requirements apply, including the need for licenses.

Some fintech activities will require licences with integrity (AML/CFT) and conduct requirements. The introduction of data protection provisions in licensing frameworks is common. Activities that could potentially pose risks to stability should face prudential requirements.

Competition and inclusion objectives will become more relevant from a financial policy view, given the growing interdependencies and trade-offs with core priority mandates of preserving stability, integrity, and safety of the financial sector.

The multiplicity of new entrants and the potential for dominant players (for example, incumbents, big tech firms, platforms) and first movers (for example, M-Pesa) to create barriers and generate distortions has led to an increased recognition of the strong links between inclusion, competition, and financial stability.

Indeed, a targeted participation by financial service authorities in competition policy matters is increasingly being observed in EMDEs. The potential role of prudential and conduct regulation in mitigating barriers to market access and reining in abusive dominant practices should not be understated.

Cooperation, both interagency and cross-border, can help in the design and implementation of a sound supervisory response to fintech, which can be particularly challenging for EMDE countries suffering from supervisory capacity constraints or juggling competing policy priorities.

An effective supervisory function for fintech activities is as essential as an appropriate regulatory regime. Supervisory processes and methods

may need significant changes.

Supervisors' knowledge, skills, and tools should keep pace with the speed of innovation and related risks, including cyber threats.

Building proper expertise is crucial and suptech and regtech solutions could be excellent catalysts for this. Fintech is cross-sectoral and cross-country, making cooperation among agencies at the national and international levels essential for sound supervision.

To read more (please choose download full report) at:

<https://www.worldbank.org/en/publication/fintech-and-the-future-of-finance>



The screenshot shows a web browser window with the URL [worldbank.org/en/publication/fintech-and-the-future-of-finance](https://www.worldbank.org/en/publication/fintech-and-the-future-of-finance). The page features a large blue header with the title "Fintech and the Future of Finance". Below the header, there is a navigation menu with "Notes" and "S". The main content area is divided into two columns. The left column contains a thumbnail image of the report cover, which has the title "Fintech and the Future of Finance" and the World Bank Group logo. The right column is titled "Overview" and contains a blue arrow pointing downwards. Below the arrow, there is a brief description of the report's content and a list of links: "Download Full Report", "Executive Summaries", "Overview Paper", "Technical Notes", and "Glossary".

What Does Digital Money Mean for Emerging Market and Developing Economies?



Physical cash and commercial bank money are dominant vehicles for retail payments around the world, including in emerging market and developing economies (EMDEs).

Yet payments in EMDEs are marked by several key deficiencies—such as lack of universal access to transaction accounts, widespread informality, limited competition, and high costs, particularly for cross-border payments.

Digital money seeks to address these deficiencies.

This note categorizes new digital money proposals. These include crypto-assets, stablecoins, and central bank digital currencies (CBDCs). It assesses the supply and demand factors that may determine in which countries these innovations are more likely to be adopted.

It lays out particular policy challenges for authorities in EMDEs. Finally, it compares these with digital innovations such as mobile money, retail fast-payment systems, new products by incumbent financial institutions, and new entrants such as specialized cross-border money-transfer operators.

Proposals for global stablecoins have put a much-needed spotlight on deficiencies in financial inclusion, and in cross-border payments and remittances in EMDEs. Yet stablecoin initiatives are no panacea.

While they may achieve adoption in certain EMDEs, they may also pose particular development, macroeconomic, and cross-border challenges for these countries and have not been tested at scale.

Several EMDE authorities are weighing the potential costs and benefits of CBDCs. We argue that the distinction between token-based and account-based money matters less than the distinction between central bank and non-central bank money.

Fast-moving fintech innovations that are built on, or improve existing financial plumbing, may address many of the issues in EMDEs that both private stablecoins and CBDCs aim to tackle.

Introduction

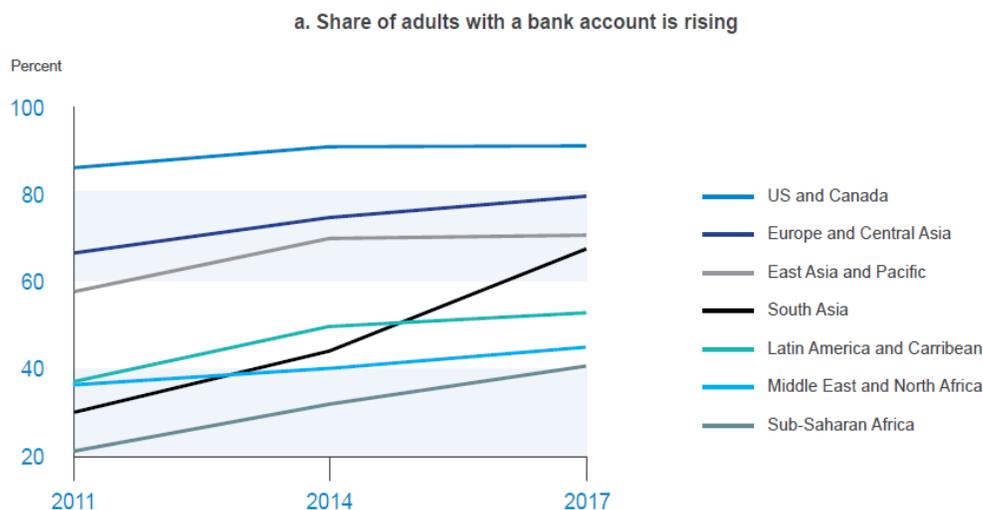
From the ancient Indian rupya, to cacao beans in the Aztec empire, to the first paper money in China, money and payments have been evolving for

centuries. The countries that are today called emerging market and developing economies (EMDEs), which collectively make up 84 percent of the world's population but only 37 percent of GDP at current prices, are no exception.

In recent decades, physical cash and claims on commercial banks (deposits) have become the main vehicles for retail payments around the world (Bech et al., 2018). Compared to physical cash, commercial bank money provides more safety, enables remote transactions, and allows banks to extend other useful financial services. This may ultimately benefit economic efficiency and enhance economic policy oversight (Listfield and Montes-Negret, 1994).

Yet for retail users, especially in EMDEs, commercial bank money poses at least three key challenges.

Figure 1. Access to Bank Accounts and Bank Services Is Heterogeneous, but Rising



First, it requires a bank account—access to which is rising (figure 1, left-hand panel) but is still far from universal. The poor often lack the proper documentation to comply with banks' customer due diligence (CDD) requirements.

In some cases, they live too far from a bank branch, or find the maintenance costs or minimum balances too onerous. E-money, which can be seen as a variant of commercial bank money, seeks to address these challenges.

Together with simplified CDD and networks of agents, e-money has improved access to transaction services. Still, in countries where bank accounts and e-money have not reached universal levels, the poor rely heavily on cash.

This reliance on cash helps perpetuate informality, also known as the shadow economy—economic activities hidden from authorities for monetary, regulatory, and institutional reasons (Medina and Schneider, 2019).

Indeed, informality is higher in countries with lower use of digital payments like bank accounts and e-money (figure 1, right-hand panel).

To read more (please choose download full report) at:

<https://www.worldbank.org/en/publication/fintech-and-the-future-of-finance>



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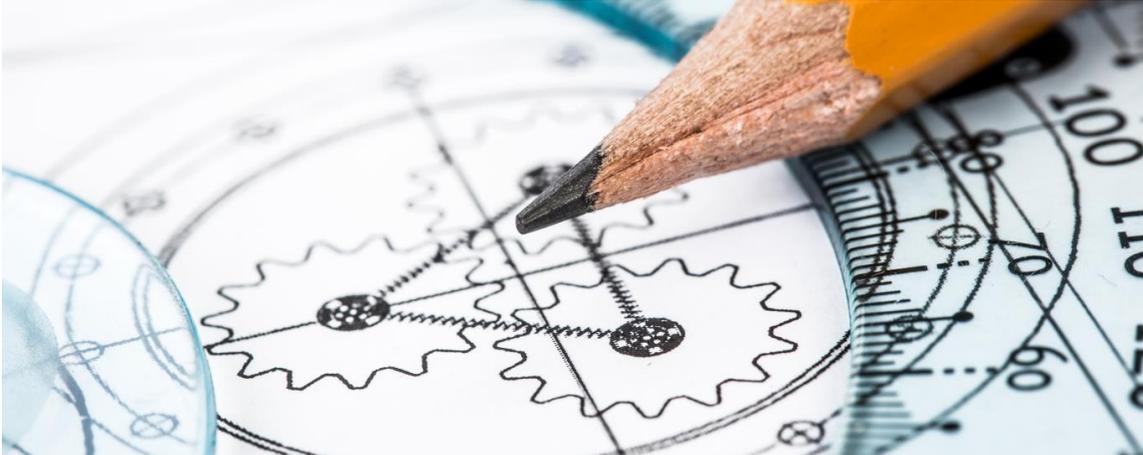
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