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UNITED KINGDOM

FINANCIAL SECTOR ASSESSMENT PROGRAM

FINANCIAL SYSTEM STABILITY ASSESSMENT

February 2022

This paper on United Kingdom was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time the FSAP Assessment was completed in November 2021. This paper was discussed by the IMF Executive Board on February 16, 2021.

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February 2, 2022

KEY ISSUES

Context: The U.K. financial sector is globally systemic, open, and complex. It has weathered the COVID-19 pandemic fittingly, thanks to the post-GFC reforms, a proactive macroprudential stance, and an effective multipronged response to maintain financial stability. Brexit uncertainties are being handled appropriately as the U.K. and EU authorities and the financial industry collaborate to prevent undesirable financial stability outcomes. The endpoint of the pandemic remains unclear, as does the actual impact on the financial system once support measures wane. At this juncture, therefore, financial stability conditions in the United Kingdom are being shaped by three key considerations: (i) the evolving U.K.-EU relationship on financial services; (ii) securing a sustainable and robust post-pandemic economic recovery; and (iii) successfully managing ongoing structural transitions.

Findings: The U.K. financial system is benefiting from a robust financial stability framework. The FSAP team has assessed capital and liquidity levels at core banks and insurers as strong—even under some severely adverse scenarios, including the re-emergence of the pandemic, and a tighter monetary policy stance. The financial stability institutional framework rests upon effective interagency collaboration. The globally critical market infrastructures remain in good form, and the authorities have shown leadership in the global LIBOR transition. With these positives, the FSAP recognizes five areas that could bear upon financial stability as the pandemic subsides and global financial conditions change: (i) the strength of banks and insurers could give way to potential risks posed by their counterparties; (ii) a buoyant housing market may encourage overborrowing; (iii) financial interconnectedness may add new channels of market interactions and contagion; (iv) surfacing of liquidity mismatches in the internationally active NBFIs; and (v) the post-Brexit operating models of international banks and financial firms. Collectively or singularly, these pose a challenge for the financial stability authorities.

Policies: Fully recognizing the strengths, the FSAP has proposed four directions going forward: (i) bolstering management of systemic risks; (ii) continued strengthening of regulation and supervision; (iii) minimizing risks of transitions and future crises; and (iv) securing institutional safeguards for financial stability and market integrity. A few of the FSAP recommendations necessitate active cooperation from cross-border central banks, financial stability authorities, and regulators.

- The FSAP team was led by Udaibir Das (Mission Chief). It comprised of Juan Solé (Deputy Mission Chief), Atilla Arda, Kelly Eckhold, Tamas Gaidosch, Pierpaolo Grippa, Vikram Haksar, Jan Moeller, Paola Morales, Jiří Podpiera, Luc Riedweg, and Peter Windsor (all MCM); Ruo Chen (EUR); Jonathan Pampolina (LEG); and Sigridur Benediktsdottir, Timo Broszeit, Thomas Curry, Greg Feldberg, and Stathis Tompaidis (experts). The FSAP team received valuable supplemental inputs from Hans Weenink and Ender Emre (both LEG). In addition, Marika Santoro (RES) and Federico Grinberg, Romain Bouis, Priscilla Toffano, Hou Wang, Matyas Zoltan, Ken Zhi Gan, and Pavel Lukyantsau (all MCM) provided targeted analytical help. Dan Cheng and Lamia Khandker provided research and administrative support, respectively.

- The mission met with Chancellor Sunak, Governor Bailey, and CEO Rathi, as well as their respective staffs at Her Majesty's Treasury (HMT), the Bank of England (BOE), the Prudential Regulation Authority (PRA), and the Financial Conduct Authority (FCA). It also met staff at the Competition and Markets Authority (CMA), the Financial Services Compensation Scheme (FSCS), and The Pensions Regulator (TPR), and representatives of the U.K. financial industry.

- FSAPs assess the stability of the financial system as a whole and not that of individual institutions. They are intended to help countries identify key sources of systemic risk in the financial sector and implement policies to enhance its resilience to shocks and contagion. Certain categories of risk affecting financial institutions, such as operational or legal risk, or risk related to fraud, are not covered in FSAPs.

- The United Kingdom is deemed by the IMF to have a systemically important financial sector according to SM/10/235 (9/16/2010), and the stability assessment under this FSAP is part of bilateral surveillance under Article IV of the IMF's Articles of Agreement.

Approved By
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Prepared By
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This report is based on the assessment work under the Financial Sector Assessment Program (FSAP) conducted virtually in June and November 2021. The findings were discussed and concluded, with the authorities in November 2021 (the close of the FSAP) and in December 2021 (the close of the Article-IV Consultation).

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ACS	Annual Cyclical Scenario
AFS/FVO	Available for Sale/Fair Value Option
AIF	Alternative Investment Funds
AIFMD	Alternative Investment Fund Managers Directive
AML/CFT	Anti-Money Laundering/Combating the Financing of Terrorism
API	Application Programming Interface
AT1	Additional Tier 1
BIS	Bank for International Settlements
BMA	Bayesian Model Averaging
BOE	Bank of England
CAR	Capital Adequacy Ratio
CCB	Capital Conservation Buffer
CCP	Central Counterparty
CCyB	Counter-Cyclical Capital Buffer
CEO	Chief Executive Officer
CET1	Common Equity Tier 1
CIB	Corporate and Investment Banking
CJRS	Coronavirus Job Retention Scheme
COREP	Common Reporting Framework
CRE	Commercial Real Estate
CS01	Risk of Spread Over the Benchmark Rate Moving By 1 Basis Point.
CSD	Central Security Depository
CVA	Credit Value Adjustment
DV01	Risk of The Risk-Free/Benchmark Rate Moving 1 Basis Point
ECL	Expected Credit Loss
EEA	European Economic Area
ESMA	European Securities and Markets Authority
ETF	Exchange Traded Fund
EU	European Union
FCA	Financial Conduct Authority
FATF	Financial Action Task Force
FINREP	Financial Reporting
FMIs	Financial Market Infrastructures
FPC	Financial Policy Committee
FRF	Future Regulatory Framework
FSMA	Financial Services and Markets Act 2020
FSSA	Financial System Stability Assessment
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FSCS	Financial Services Compensation Scheme
FSR	Financial Stability Report

FVA	Fair Value Accounting
FX	Foreign Exchange
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFM	Global Macro Financial Model
G-SIB	Global Systemically Important Bank
GTAP-E	Global Computational General Equilibrium Model
HMT	Her Majesty's Treasury
IAIS	International Association of Insurance Supervisors
ICP	Insurance Core Principle
IFRS	International Financial Reporting Standards
IM	Initial Maturity
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IRS	Interest Rate Swaps
JMLIT	Joint Money Laundering Intelligence Taskforce
KA	Key Attributes of Effective Resolution Regimes for Financial Institutions
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
LIBOR	London Interbank Offered Rate
LME	London Metal Exchange
LTV	Loan to Value
MA	Matching Adjustment
ML/TF	Money Laundering/Terrorism Financing
MMF	Money Market Fund
MoU	Memorandum of Understanding
MPC	Monetary Policy Committee
MTM	Mark-to-Market
NBFI	Non-Bank Financial Institutions
NECC	National Economic Crime Centre
NFC	Nonfinancial Corporates
NGFS	Network of Greening the Financial Sector
NPL	Non-Performing Loan
O-SII	Other Systemically Important Institutions
OB	Open Banking
OBR	Office for Budget Responsibility
OEF	Open-ended Fund
OFI	Other Financial Intermediary
OIF	Other Investment Fund
ONS	Office for National Statistics
OPBAS	Office of Professional Body Anti-Money Laundering Supervision
OTC	Over the Counter

PBS	Professional Body Supervisor
PD	Probability of Default
PiT	Point-In-Time
PNFC	Private Non-Financial Corporation
PRA	Prudential Regulation Authority
PRC	Prudential Regulation Committee
PSC	People with Significant Control
PVA	Present Value
RAF	Resolvability Assessment Framework
RAM	Risk Assessment Matrix
RBB	Risks Beyond Banking
RFRs	Risk Free Rates
RLF	Resolution Liquidity Framework
RRP	Recovery and Resolution Plan/Planning
RWA	Risk Weighted Assets
SCR	Solvency Capital Requirement
SEC	U.S. Securities and Exchange Commission
SMEs	Small and Medium-Sized Enterprises
SOA	Systemic Oversight Assessment
SRA	Systemic Risk Analysis
SRB	Systemic Risk Buffer
STeM	Stress Test Matrix
SVAR	Structural Vector Auto Regression
TCA	Trade and Cooperation Agreement
TMTP	Transitional on Technical Provisions
TPR	The Pensions Regulator
TR	Trade Repository
UCITS	Undertakings for the Collective Investment in Transferable Securities
TTC	Through-The-Cycle
U.K.	United Kingdom
WTO	World Trade Organization
WEO	World Economic Outlook
y-o-y	Year-on-Year

EXECUTIVE SUMMARY

The U.K. financial system enjoys a strong reputation for the quality of oversight and the design of the financial stability framework set up after the 2007-09 Global Financial Crisis (GFC). The multipronged response to manage the exit from the EU, and the pandemic was effective (Section II-A). Financial market infrastructures stood resilient. The U.K. authorities demonstrated leadership in the global LIBOR transition, and with the latest reactivation of the countercyclical capital buffer policy as a preemptive macroprudential measure. These, along with other initiatives and a spate of public consultations on proposed reforms, seek to maintain the high level of resilience tested throughout Brexit and the pandemic.

Overall, the financial stability framework is well positioned to step up to the macrofinancial and related vulnerabilities identified by the FSAP. An effective prudential and supervisory structure is helping support the safety and soundness of the United Kingdom's banking and insurance system. The strong foundations, built over time, are helping support the U.K. economy and bettering the functioning of global finance. Reforms in the post-Brexit and post-pandemic period must only help strengthen the foundations and ensure that the institutional oversight and regulatory setup remains strong, independent, and efficient. This is a prerequisite for effectively managing three key ongoing financial stability challenges:

- The United Kingdom has addressed risks relating to the exit from the EU dexterously, but some key details regarding the EU-U.K. financial services remain open and are work-in-progress (Section III-A);

- Economic recovery has resumed, but the macrofinancial outlook is confronting uncertainty, including the resurgence of COVID-19, supply-side disruptions, demographic shifts, inflationary pressures, and tightening of global financial conditions; and

- Ongoing structural shifts and transitional issues including: (i) the rising intermediation by nonbank financial institutions (NBFIs);[1] (ii) the permeation of financial technology and product innovation; (iii) the full passthrough of the 2019 separation between retail and investment banking; (iv) the complete switching out of Sterling LIBOR; (v) the mitigation of climate-related financial risks; and (vi) the handling of the ubiquitous threats from economic and financial crimes, and cyber-attacks.

[1] NBFI refers to all types of investment funds, finance companies, broker-dealers, structured finance vehicles, central counterparties, money lenders, captive funds, and bank holding companies. NBFI credit providers comprise investment funds, insurers, pension funds, money lenders, and finance companies.

While the three challenges intersect and interact, contagion risks across the sovereign-nonfinancial-financial channel remain muted for the present. However, given the nature of the U.K. financial system, financial stability remains sensitive to exogenous factors and cross-border channels.

The FSAP has identified the following risk factors that would benefit from continuing vigilance:

- *Pandemic obfuscated financial risks*. Under FSAP stress scenarios, corporate and household vulnerabilities could materialize. (Section III-B). Banks' capital ratios could decline by up to 4.9 percentage points under the most severe scenario (Section III-C), and the solvency ratios of a few insurers could fall below the 100-percent threshold (Section III-D). These potential losses are prima facie absorbable in the near term with their current capitalization levels.

- *Surge in house prices*. Imbalances in the housing market are not apparent yet, but prices have continued to rise. Under some FSAP stress scenarios, mortgage arrears could rise sharply and peak at 2.8 percent in 2022, higher than the GFC levels (Sections III-B and III-I).

- *Deepening interconnectedness*. NBFIs are now sizeable credit providers to the real economy, including in riskier market niches less served by banks. They are already interconnected among themselves and with banks, including cross-border firms and asset managers (Sections III-E and III-G). Active use of financial technology is deepening these linkages, and data gaps preclude identification and a more definitive assessment of such risks.

- *Liquidity in core markets*. The risk to core financial markets remains primarily via liquidity mismatches in the internationally active NBFIs. It is desirable to actively consider strengthening backstops and allowing access to some central bank facilities to appropriately regulated, and systemically interconnected NBFIs (Section III-H).

- *Regulatory predictability*. Market fragmentation risks remain amplified in the areas of derivatives clearing, and international banks and insurers' choices of post-Brexit operating models. Both could impact systemic liquidity pools and heighten volatility. Uncertainties surrounding the long-term access of EU clearing members to the U.K. CCPs remain a source of market unease, albeit not viewed as a financial stability risk in the short term for the United Kingdom. (Section III-F).

On the institutional side, the Financial Policy Committee (FPC) is a world-class macroprudential authority. The FPC runs robust interagency processes to monitor financial stability conditions (Section IV-A). The quality of interagency coordination on prudential and related financial policies is thorough. There is seamless data-sharing within and between the BOE/PRA and the FCA. The United Kingdom also has a transparent approach to macro- and micro prudential, and conduct regulation.

The government's ongoing Financial Services Future Regulatory Review (FRF review) seeks to redesign the post-Brexit framework for rules, regulations, and regulatory setup. The expectation is that the United Kingdom's financial stability foundations will be strengthened further, but tension with policies to enhance "the competitiveness" of the U.K. financial system has surfaced. The FSAP has urged the authorities to remain mindful of the ultimate limits of explicit or implicit fiscal support for the financial sector, and to persevere with their demonstrated commitment, in support of highest standards of prudence and good governance of domestic and international finance. Similarly, while maintaining a competitive financial sector is an important policy goal, financial stability should not be compromised for the objectives of competitiveness.

To continue to effectively traverse multiple challenges to financial stability and make the United Kingdom's systemic risk oversight and financial stability framework fitter for the future, the FSAP identified four areas where enhancements could be beneficial:

- *Expand the scope of systemic risk surveillance by the FPC* on a continuing basis to assess risks from market-based finance, private markets, and cross-border channels (Section IV-A). It will be paramount to *close the data gaps* that limit mapping, identifying, and analyzing such risks (Sections IV-A and VI-B).

- *More "on the ground" supervision* would provide better assurance that risks arising from digital money, green finance, technology-based intermediation and investment services, and cross-border risks are known early (Section IV-B), including risks from financial crimes (Section V-D).

- *Preserve the primacy of PRA and FCA's objectives* of safety and soundness and market integrity, and the FPC's financial stability objective—in principle and practice—and *ensure* that the final set of accountability mechanisms adopted under the FRF review poses no constraints for independent and effective oversight of entities and financial markets.

- *To sustain the intensity and alacrity of oversight, maintain*, always, the necessary level of skills and resources for systemic risk monitoring, oversight, and supervision of all systemically important financial firms and the core markets.

The FSAP thus recommends targeted measures outlined in in Table 1. The FSAP recognizes that, apart from its endeavor, the United Kingdom will have to rely upon active regional and international cooperation to manage cross-border and NBFI-related vulnerabilities, as well as risks from the emerging areas that are critical not only for the United Kingdom but for the safety of the international financial system.

Table 1. United Kingdom: Key Recommendations

Recommendations		Paras	Time[1]
	A. Further Bolster Management of Systemic Risks		
1	*Strengthen backstops* to the functioning of core markets in times of stress by considering *allowing* appropriately regulated and systemically interconnected NBFIs access to repo and/or Gilt purchase operations; *clearly communicating* the objectives, instruments, eligible participants, and the exit criteria. (BOE)	¶34–36	MT
2	*Enhance and further strengthen* the existing stress testing framework by consolidating the internal toolkit and run independent full-fledged top-down exercises covering all systemically relevant components of the financial system. (BOE/PRA, with FCA)	¶17	MT
3	*Seek additional statutory* powers to review and examine the resilience of all critical services (including, but not limited to, cloud services) that third parties provide to regulated firms. (BOE/PRA, FCA, and HMT)	¶54	MT
	B. Continue Strengthening Regulation and Supervision		
4	Further develop "on the ground" reviews of systemically important financial firms' exposures and risk management practices for early identification and remediation of supervisory issues, including AML/CFT risks, and to also support macroprudential surveillance. (BOE/PRA and FCA)	¶53, ¶59 and ¶71	NT
5	*Enhance* cyber risk technical risk reviews on technology risk management expectations for all financial firms, and by conducting additional cybersecurity control verification activities to complement CBEST security testing. (BOE/PRA, and FCA)	¶68 and 69	NT
6	*Enhance* entity transparency through improved verification of beneficial ownership information on the PSC Register and augment, as needed, ongoing support to Crown Dependencies and British Overseas Territories in operationalizing similar registers. (HMT, BEIS/Companies House, and FCDO)	¶71	NT
	C. Minimize Potential Risks of Ongoing Transitions and Future Crises		
7	*Continue to encourage* the conversion of remaining legacy LIBOR exposures of U.K. regulated firms and support foreign efforts to migrate from non-Sterling LIBOR, mindful of the needs of emerging markets users. (FCA, HMT, and BOE)	¶62–64	NT
8	*Continue preparing* for diverse failure scenarios; eliminate rules that may constrain the bank resolution regime; and accelerate and expand the work on recovery and resolution planning for insurers and CCPs. (HMT, BOE/PRA, FCA, and FSCS)	¶72–75	MT
	D. Secure Institutional Safeguards for Financial Stability and Integrity		
9	*Preserve* the primacy of the FPC's financial stability objective and *strengthen* its focus on global financial standards and cross-border surveillance. (HMT, BOE, PRA, and FCA)	¶91–93	I
10	*Preserve* the primacy of PRA and FCA's objectives of safety and soundness and market integrity, in principle and in practice, over any secondary objectives and ad hoc policy priorities. (HMT and FPC)	¶82	I
11	Review and estimate the expected workload in core and new financial stability and supervisory risk areas and determine how to align BOE/PRA and FCA capacity and resources accordingly. (HMT, BOE/PRA, and FCA)	¶83	NT
12	*Ensure* that the final accountability and transparency mechanisms adopted under the ongoing FRF review seek to safeguard regulatory independence and pose no constraints for operational and oversight effectiveness. (HMT, PRA, FCA with other agencies)	¶80-81	NT

[1] I = Immediate (within one year); NT = Near Term (within 1 to 3 years); MT=Medium Term (within 3 to 5 years).

Table 1. United Kingdom: Key Recommendations (concluded)
(*With Other Jurisdictions*)

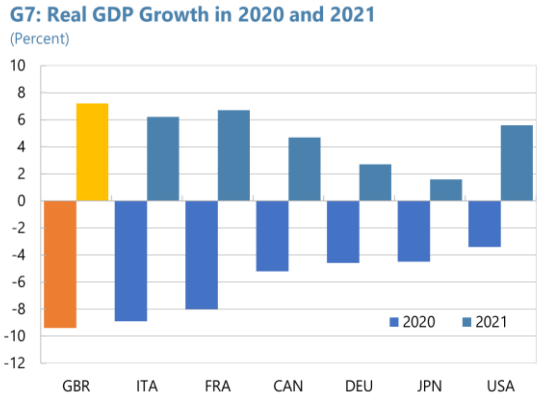
Recommendations		Para#s	Time[1]
	A. Further Bolster Management of Systemic Risks		
13	*Accelerate the efforts to close* data gaps on NBFI activities, including data on all Sterling asset holdings and data needed to improve the management of liquidity demands by fund managers; *continue improving* flow-of-funds data including all cross-border NBFI exposures. (FPC, BOE/PRA, and FCA)	¶25-26, ¶31-32, ¶34	MT
	B. Continue Strengthening Regulation and Supervision		
14	*Strengthen information sharing* with relevant third-country authorities, including reviewing the approach to monitor and supervise hybrid cross-border transactions, private market activities, and internationally active mixed financial groups. (FPC, BOE/PRA, and FCA)	¶56, ¶78	MT
	C. Minimize Potential Risks of Ongoing Transitions and Future Crises		
15	*Maintain* the United Kingdom's commitment to mutual cooperation with the EU, post-Brexit, including intensifying regulatory dialogue to support financial stability and mitigate market fragmentation risks, including the regulatory status of the U.K. CCPs over the long term. (HMT, BOE, and FCA)	¶8-10, ¶29, ¶75	I

[1] I = Immediate (within one year); NT = Near Term (within 1 to 3 years); MT =Medium Term (within 3 to 5 years).

FINANCIAL STABILITY CONTEXT

A. Pandemic Shock and Macrofinancial Conditions

1. The United Kingdom is recovering from an unprecedented pandemic-related contraction. With comprehensive policy support, vaccinations, and removal of mobility restrictions, the economy is recovering fast and expected to grow by about 7¼ percent in 2021, returning to its pre-pandemic level by end-2021 (Table 2). Inflation has been rising markedly recently, spurred by supply bottlenecks and a recovery in demand, and could peak at about 7 percent in early 2022.



Sources: IMF 2022 January WEO.

2. The authorities swiftly launched a multipronged response to support financial stability. Direct and indirect budget support measures helped safeguard households' and corporates' balance sheets. Exceptional prudential measures were adopted to ensure continued lending to households and corporates via banks and securities markets and to prevent amplification of the crisis by mitigating procyclicality of regulations. The BOE, in concert with other central banks, deployed a range of tools to restore market liquidity. The FCA set new reporting thresholds on the shorting of securities.

3. With swift and strong policy support, financial conditions progressively reversed the initial sudden tightening following the outbreak (Figure 1). Supported by central bank asset purchases and liquidity measures, asset prices recovered, the yield curve flattened, and credit spreads fell from the peaks seen during the March 2020 "dash-for-cash." The credit-to-GDP gap declined to about zero for the first time in a decade. Bank lending rates remained low, and corporate credit growth was strong—partly on the back of publicly guaranteed loans. Residential real estate prices rose sharply since mid-2020, although the share of new mortgages issued at high loan-to-value (LTV) ratios remains low relative to the pre-pandemic period (Section III-H).

4. A materialization of risks could reverberate through sovereign-financial-corporate linkages, particularly with increased contingent liabilities to the sovereign (Figure 2). Banks and insurance companies started the pandemic well capitalized and with sufficient liquidity buffers (Table 3). The limited impact of the pandemic so far on the aggregate balance sheets of nonfinancial corporates (NFCs), thanks to the extraordinary support measures, may bely the real strength of the corporate sector and pockets of household vulnerabilities. Materialization of macrofinancial risks could weaken the NFC sector and transmit via the financial sector (largely banks) to the sovereign, notably via state guaranteed loan schemes. Conversely, higher Gilt yields due to fiscal concerns would result in higher funding costs economy-wide and slow down the recovery.[2] Both scenarios would exacerbate risks to financial stability

[2] The public Debt Sustainability Analysis (DSA) in the Staff Report for the 2021 Article IV Consultation highlights that higher government financing needs would call for higher demands on NBFIs' and banks' gilt holdings, with implications for crowding out private credits, raising interest rates, and tightening sovereign-financial links.

Table 2. United Kingdom: Selected Economic Indicators, 2018–25

(Percentage change, unless otherwise indicated)

	2018	2019	2020	2021 Est.	2022	2023	2024	2025
					Projections			
Real GDP	1.7	1.7	-9.4	7.2	4.7	2.3	1.3	1.6
Level rel. to Jan 2020 WEO		100.0	89.3	94.4	97.3	98.1	97.8	97.8
Real domestic demand	1.2	1.6	-9.9	8.1	6.3	2.2	1.1	1.7
Private consumption	2.4	1.3	-10.5	5.2	6.7	2.2	1.9	1.9
Government consumption	0.4	4.2	-6.5	14.7	2.0	1.5	1.2	1.7
Fixed investment	-0.1	0.5	-9.4	5.5	8.0	3.5	-2.0	1.0
by sector:								
Public	1.5	5.0	3.5	14.7	-2.1	6.5	-1.0	1.1
Residential	8.2	-0.1	-11.4	12.6	4.0	2.6	-1.3	0.5
Business	-2.0	0.9	-11.4	-1.3	14.2	3.2	-3.0	1.0
Stocks and net acquisition of valuables 1/	-0.5	0.2	-0.7	0.6	0.3	-0.1	0.2	0.0
External balance 1/	-0.1	0.1	0.8	-1.1	-1.7	0.1	0.2	-0.2
Net exports 2/	-1.3	-0.9	0.1	-1.1	-2.4	-2.1	-1.9	-2.0
Exports of Goods and Services	2.8	3.4	-13.9	-1.4	3.9	8.5	3.5	2.6
Imports of Goods and Services	3.1	2.9	-15.9	2.4	9.7	7.3	2.6	3.0
Terms of trade	0.2	0.8	1.1	-0.6	0.6	0.4	0.0	0.1
Current account 2/	-3.9	-2.7	-2.6	-3.4	-4.7	-4.3	-4.0	-4.0
CPI Inflation, end period	2.1	1.3	0.6	5.4	5.0	2.2	2.0	2.0
GDP deflator, period average	2.0	2.0	5.3	1.1	6.1	3.2	2.2	2.1
Output gap 3/	0.3	0.6	-3.6	-0.1	0.4	0.2	-0.1	0.0
Potential output	1.4	1.4	-5.4	3.4	4.1	2.6	1.6	1.5
Employment and productivity								
Employment	1.2	1.1	-0.8	-0.3	1.1	1.0	0.2	0.9
Unemployment rate 4/	4.1	3.8	4.5	4.5	4.3	4.2	4.5	4.2
Productivity 5/	0.5	0.6	-8.6	7.6	3.5	1.3	1.1	0.7
Memorandum items:								
Private final domestic demand	1.3	0.9	-11.4	6.2	7.8	2.2	1.1	1.7
Household saving rate 6/	4.8	4.6	15.8	12.1	6.0	4.2	4.4	4.5

Sources: Office for National Statistics; and IMF staff estimates.
1/ Contribution to the growth of GDP.
2/ In percent of GDP.
3/ In percent of potential GDP.
4/ In percent of labor force, period average; based on the Labor Force Survey.
5/ Whole economy, per worker.
6/ In percent of total household available resources.

Table 3. United Kingdom: Financial Soundness Indicators, 2015–2020

(in percent)

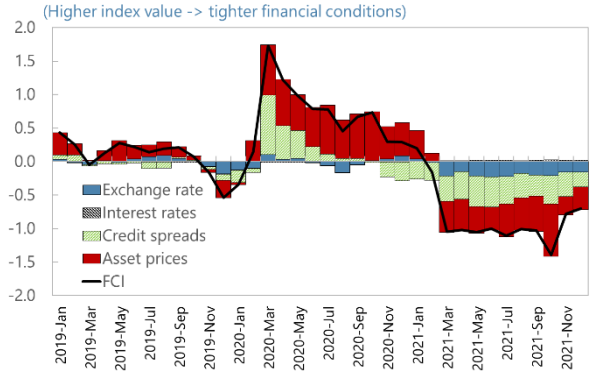
	2015	2016	2017	2018	2019	2020
Capital adequacy						
Regulatory capital to risk-weighted assets	19.6	20.8	20.5	21.4	21.3	21.6
Regulatory tier 1 capital to risk-weighted assets	15.7	16.9	17.1	17.9	17.9	18.5
Capital to total assets	6.5	6.8	6.6	6.8	6.4	6.2
Credit Risk						
Non-performing loans net of provisions to capital	3.9	3.4	2.9	6.8	6.4	6.8
Nonperforming loan to gross loans	1.0	0.9	0.7	1.1	1.1	1.2
Foreign currency denominated loans to total loans	55.3	58.1	57.6	59.2	57.7	57.1
Specific provisions to nonperforming loans	43.7	43.6	45.6	30.5	32.9	33.9
Sectoral distribution of loans						
Residents	51.5	47.9	47.4	46.4	47.5	47.5
Deposit takers	11.2	10.0	9.3	7.7	8.3	6.4
Central bank	0.0	0.0	0.0	0.0	0.0	0.0
Other financial corporations	11.8	11.7	12.1	12.9	13.3	13.8
General government	0.2	0.2	0.7	0.2	0.2	0.2
Nonfinancial corporations	7.2	6.8	6.1	6.6	6.7	7.2
Households	21.1	19.2	19.3	19.0	19.1	19.9
Nonresidents	48.5	52.1	52.6	53.6	52.5	52.5
Earnings and profitability						
Return on assets	0.3	0.3	0.5	0.5	0.5	0.6
Return on equity	4.4	3.8	7.6	7.5	7.1	10.1
Interest margin to gross income	51.0	46.2	45.9	48.1	42.4	40.6
Trading income to total income	11.7	11.3	14.5	14.9	21.2	22.0
Noninterest expenses to gross income	71.1	76.3	70.8	75.1	61.8	67.0
Personnel expenses to non-interest expenses	51.2	48.2	44.8	39.8	46.6	46.2
Liquidity and funding						
Liquid assets to total assets	19.5	19.6	22.3	25.1	23.5	23.7
Liquidity assets to short-term liabilities	35.9	37.9	37.8	40.7	44.4	49.4
Non-interbank loans to customer deposits	87.6	83.4	79.1	77.5	81.4	76.5
Foreign currency denominated liabilities to total liabilities	20.3	20.5	22.4	22.8	21.1	21.4
Real estate markets						
Residential real estate loans to total loans	21.4	19.8	19.8	19.7	20.7	20.9
Commercial real estate loans to total loans	3.2	2.9	2.8	2.8	2.9	3.0
Net open position in foreign exchange to capital	3.1	-3.4	-3.7	-3.4	-1.1	-8.4
Gross asset position in financial derivatives to capital	484.7	537.5	447.3	400.5	562.3	554.3
Gross liability position in financial derivatives to capital	478.9	530.1	441.1	393.1	554.0	545.6

Source: IMF, *Financial Soundness Indicators;* and IMF staff estimates.

Figure 1. United Kingdom: Macrofinancial Indicators

Financial Conditions Index

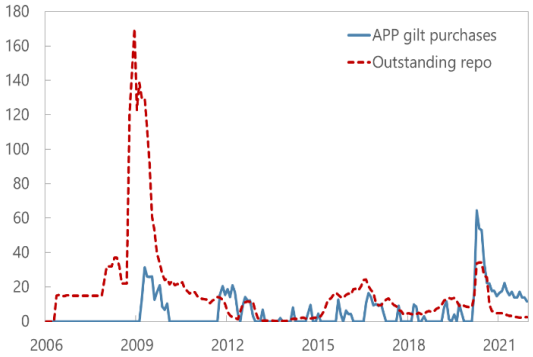
(Higher index value -> tighter financial conditions)



Sources: Bank of England, Bloomberg, and IMF staff calculations.

Gilt Purchases and Repo Operations

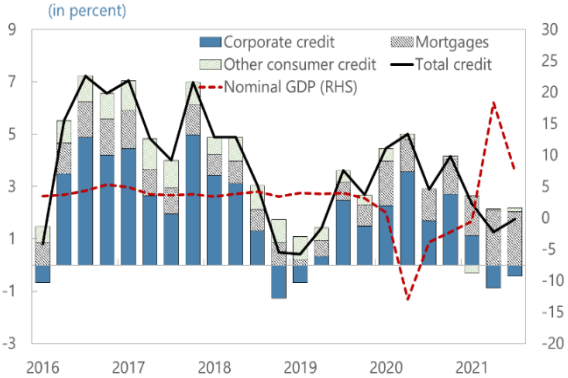
(in billion £)



Sources: Bank of England.

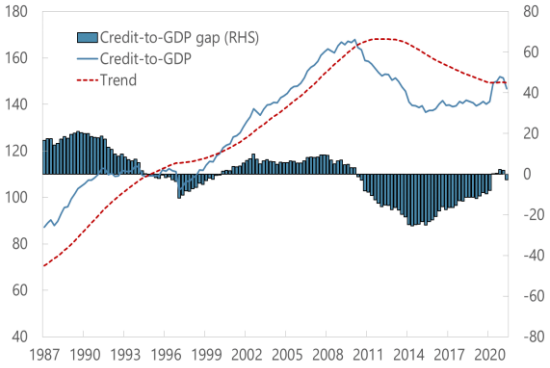
Private Sector Credit Growth

(in percent)



Sources: ONS.

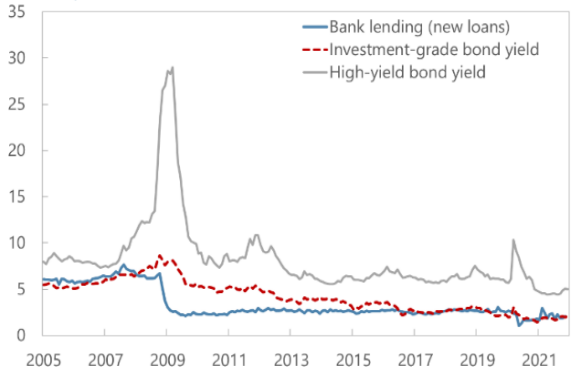
Credit-to-GDP Gap



Sources: Bank of England via Haver.

Non-Financial Corporations Borrowing Cost

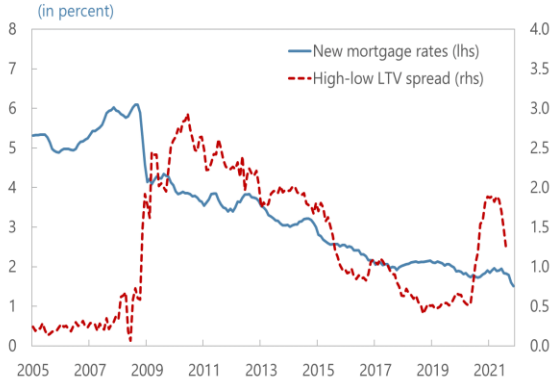
(in percent)



Sources: Bank of England, Bloomberg.

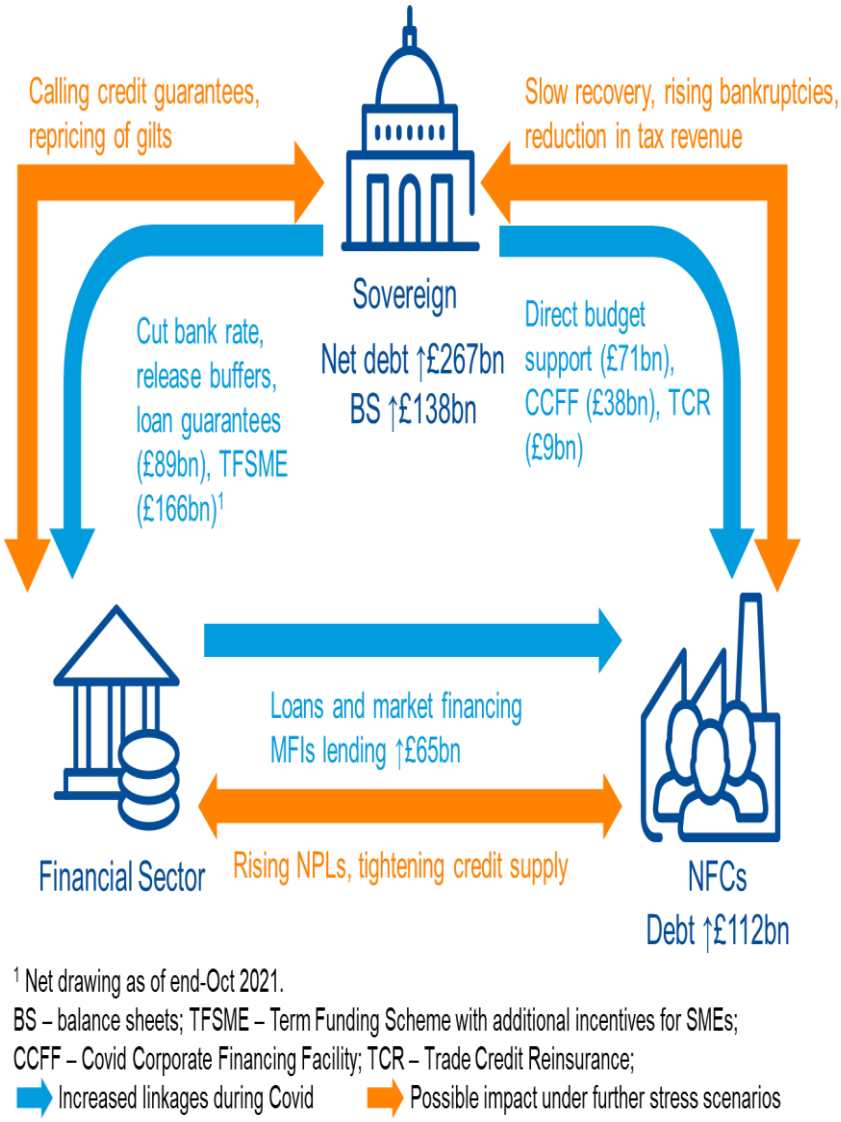
Mortage Rates

(in percent)



Sources: Bank of England via Haver.

Figure 2. United Kingdom: Macrofinancial Linkages



[1] Net drawing as of end-Oct 2021.
BS – balance sheets; TFSME – Term Funding Scheme with additional incentives for SMEs;
CCFF – Covid Corporate Financing Facility; TCR – Trade Credit Reinsurance;
Increased linkages during Covid Possible impact under further stress scenarios

Source: ONS, BOE, HMT, OBR, and IMF staff calculations.

B. United Kingdom in Global Finance

5. The United Kingdom remains a vital global financial hub. At end-2020, the United Kingdom was by far the largest trading marketplace for credit, foreign exchange, and interest rate derivatives. U.K.-based entities are involved in 30 to 40 percent of the world's cross-border credit, currency, and interest rate derivatives contracts (Table 4). EU-U.K. financial linkages are strong (Figure 3, Box 1). The EU13 provides approximately between 20 and 60 percent of cross-border funding obtained by the United Kingdom, depending on the type of instrument.[3] For instance, for derivatives, the outstanding volume of cross-border contracts involving an EU-based and a U.K.-based counterpart ranged between 19 percent (for currency derivatives) to 26 percent (for interest rate derivatives) of the United Kingdom's total cross-border outstanding amounts.

Table 4. United Kingdom: Core Global Financial Network and Degree of Interconnectedness

(In percent of each instruments' total cross-border amounts within the network)

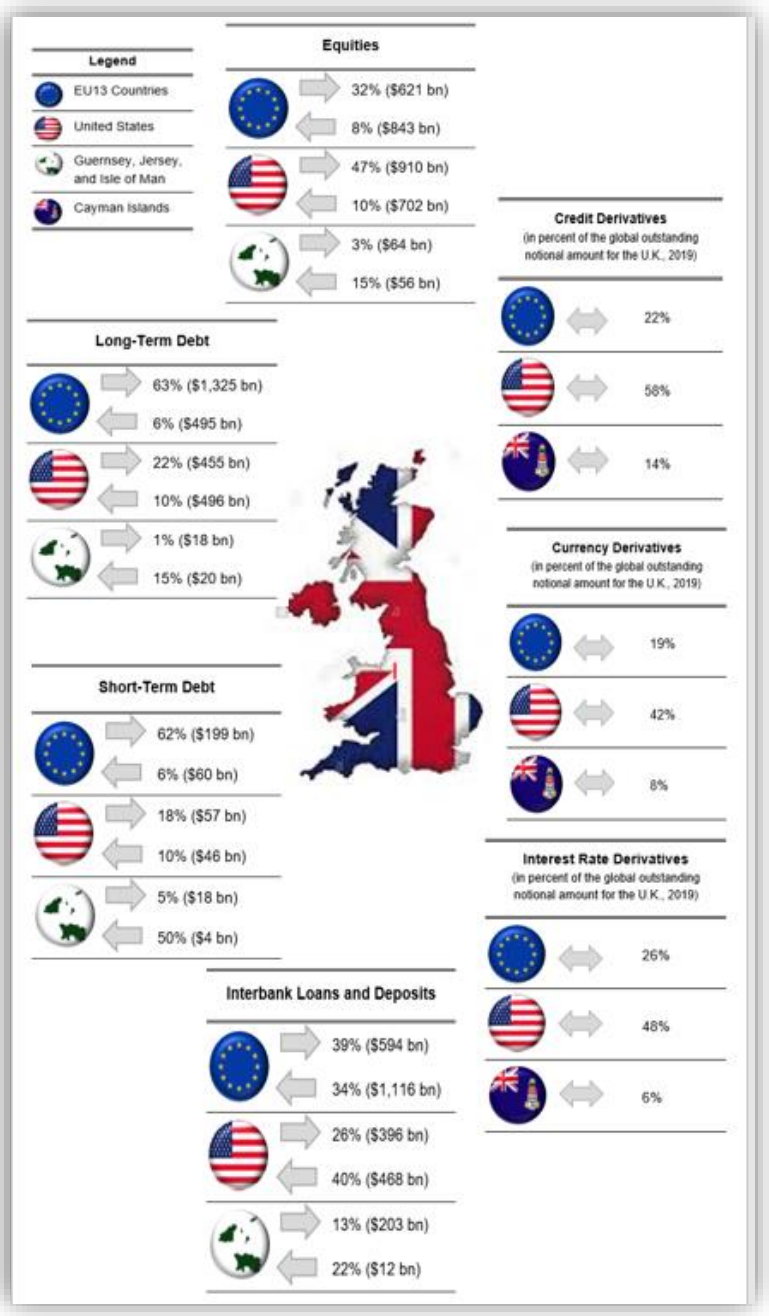
	Long-Term Debt		Short-Term Debt		Equities		Bank Loans and Deposits		Credit Derivatives 1/		Currency Derivatives 1/		Interest Rate Derivatives 1/	
	Degree	Rank	Degree	Rank	Degree	Rank	Degree	Rank	Degree	Rank	Degree	Rank	Degree	Rank
France	9.4	2nd	11.5	3rd	4.2		12.9	3rd	10.2	3rd	7.4	3rd	6.0	3rd
Germany	8.9	3rd	3.8		5.1		10.5		5.4		5.7		5.9	
Ireland	6.1		13.1	2nd	7.3	3rd	2.6		1.4		1.6		0.3	
Luxembourg	7.3		10.0		11.4	2nd	3.4		1.7		5.0		0.4	
United Kingdom	8.7	4th	9.5	5th	7.2	4th	23.0	1st	38.3	1st	30.7	1st	43.6	1st
United States	18.9	1st	19.2	1st	26.2	1st	15.8	2nd	29.2	2nd	21.8	2nd	23.5	2nd

Sources: IMF Coordinated Portfolio Investment Survey, BIS Banking Locational Statistics, ESMA Annual Derivative Statistics.
Note: The latest date available for data on derivatives is December 2019.
Degree is the average of a jurisdiction's in-and out-degree. In-degree measures all cross-border claims on a jurisdiction in percent of the total cross-border claims of all jurisdictions. Out-degree measures all cross-border claims from a jurisdiction in percent of the total cross-border claims of all jurisdictions.

[3] The EU13 are the 13 members of the EU for which data across the three databases used here (IMF CPIS, ESMA Annual Statistics, and BIS BLS) could be obtained.

Figure 3. United Kingdom: United Kingdom and the Core Global Financial System

Outstanding amounts of each financial instrument between the U.K. and the EU13, U.S., and selected Offshore centers (Guernsey, Jersey, Isle of Man, and Cayman Islands) at end-2020 (in percent of recipient's total cross-border liabilities in that specific instrument).

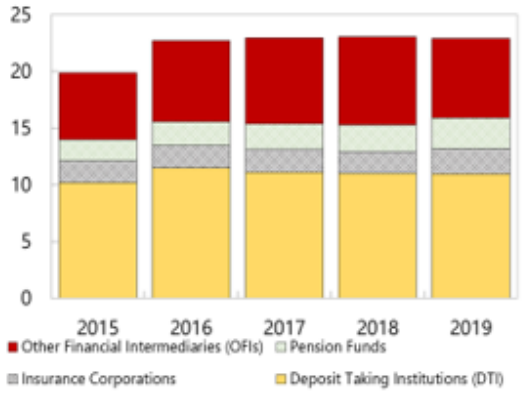


Sources: IMF CPIS, BIS BLS, and ESMA Annual Statistics, and IMF staff calculations.
Notes: EU13 comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Spain, and Sweden. Figures show outstanding amount of each financial instrument in percent of recipient's total cross-border liabilities in that specific instrument at end-2020. E.g., Claims in the form of equity from entities located in the EU on entities located in the U.K. amounted to US$621 billion, equivalent to 32 percent of the total cross-border equity claims on entities located in the U.K. Conversely, equity claims by U.K. residents on EU residents amounted to US$843 billion, or 8 percent of the total cross-border claims on EU residents. Equities include shares, stocks, and other ownership participations (e.g., American Depositary Receipts); short-term debt includes treasury bills, negotiable certificates of deposit, commercial paper, and bankers' acceptances; long-term debt includes bonds, debentures, and long-term notes; interbank claims include non-negotiable loans and deposits (including the cash leg of repo agreements), working capital and inter-office business.

Box 1. United Kingdom: Structural Features of the Financial System

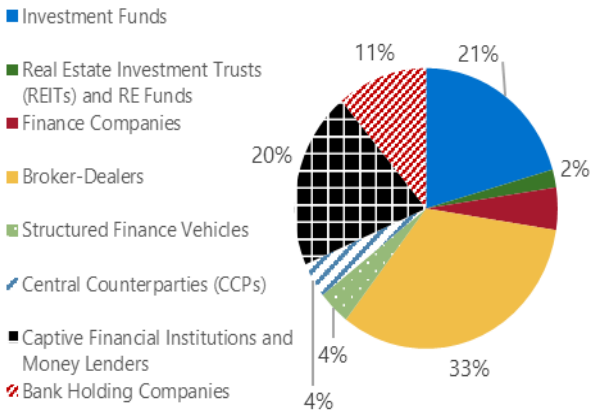
Since the last FSAP, the U.K. financial system has grown in complexity, sophistication, and in the effective management of financial stability. It is a system of roughly equal asset size split into banks and NBFIs. Although banks continue to play a central intermediation role—including through market-making, brokerage, and wholesale funding—NBFIs are also important providers of retail and corporate credit and are a core part of the United Kingdom's onshore and offshore financial system. [1] Banks and NBFIs are interlinked through both activities and ownership structures.

United Kingdom Financial System Assets (in trillion £s)



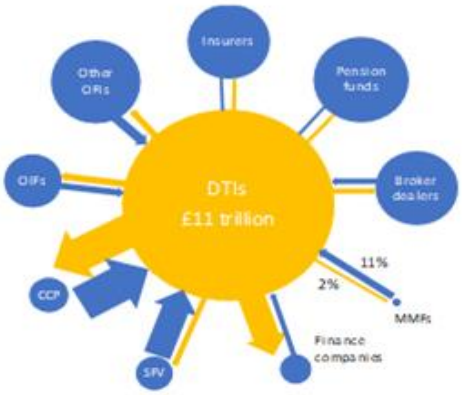
Sources: Bank of England.

Other Financial Intermediaries (Percent of assets in 2019)



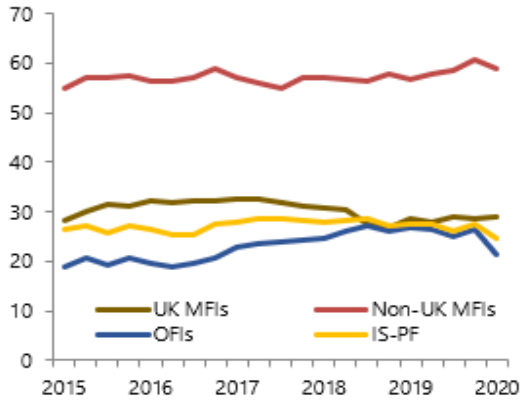
Sources: Bank of England.

Interconnectedness



Sources: Bank of England; and IMF staff calculations.
Notes: Size of circles reflects size of entities; Size of arrows in percent of the respective NBFI assets; includes only entities domiciled in the U. K

Offshore assets (Q1 2020, percent of total assets in each group)



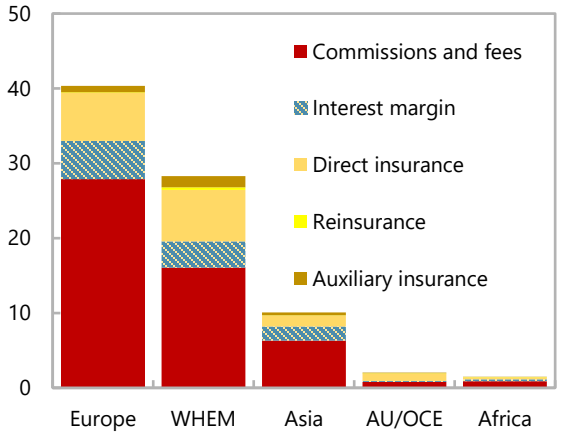
Sources: Bank of England; ONS; and IMF staff calculations.

[1] NBFIs hold one third of corporate bonds, half of corporate loans, and one-half of unsecured consumer loans.

Box 1. United Kingdom: Structural Features of the Financial System (concluded)

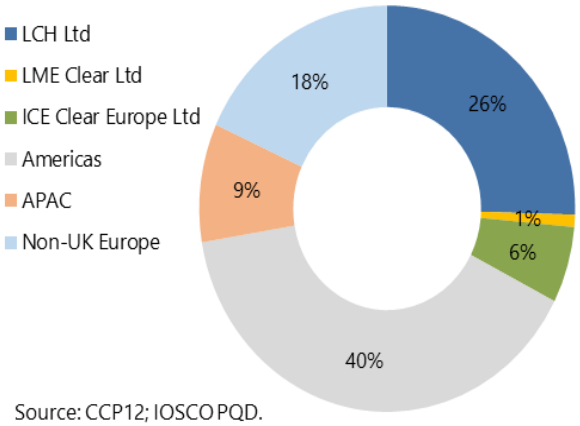
The United Kingdom financial system is central to global finance. About half of the banking sector's assets and one third of NBFIs' assets are offshore. The United Kingdom is the largest host jurisdiction to foreign financial firms as subsidiaries or branches.[2] These features facilitate cross-border intermediation, product innovation, and an array of cross-border and cross-firm intragroup transactions. One-third, and sometimes even one-half, of the world's currencies and derivatives are traded and cleared in London, and most of the global broker dealers are concentrated in the United Kingdom. The United Kingdom also hosts two global systemically important CCPs (LCH, ICE Clear), and LME Clear.

U.K. Export of Financial/Insurance Services
(Billions of GBP, 2018)



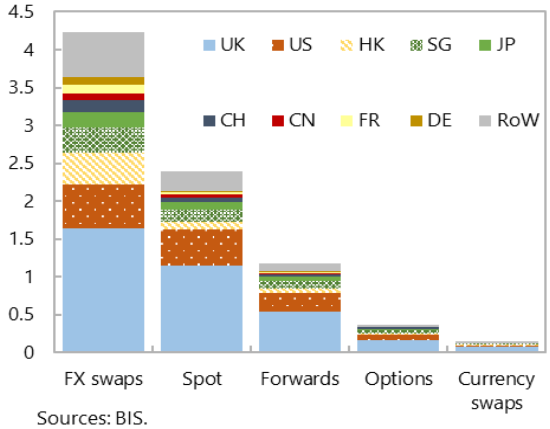
Sources: ONS U.K.; and IMF Staff calculations.

Global CCP market
(Percent of total IM, 2019)



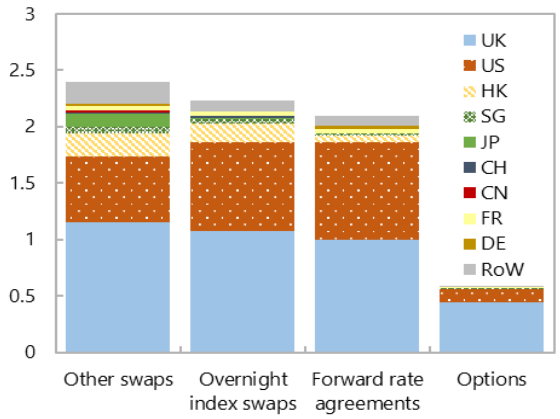
Source: CCP12; IOSCO PQD.

Global Currency Market
(Average daily volume, in trillion USD)



Sources: BIS.

Global Market for IR Derivatives
(Average daily volume, in trillion USD)



Sources: BIS.

[2] Branches of international banks in the United Kingdom has £8.4 trillion in assets, which puts the United Kingdom in a category by itself as a large host of international activity.

ISSUES IN SYSTEMIC RISK AND RESILIENCE

A. Brexit and Financial Stability

6. The Brexit transition period ended without a materialization of risks for financial stability. The United Kingdom closely monitored risks, engaged with the industry, and provided necessary regulatory certainty in a timely manner (see Table 5 for measures taken by the U.K. and EU authorities). The United Kingdom has replicated most of the equivalence determinations in respect of overseas jurisdictions made by the European Commission pre-Brexit. In November 2020, the United Kingdom also granted a package of equivalence decisions in respect of the EEA states. As of November 2021, 32 jurisdictions plus the EEA benefit from equivalence decisions under the United Kingdom's framework.[4]

Table 5. United Kingdom: High-Priority Exit Risks and Other Selected Exit Risks

	Risk Description	United Kingdom Actions	EU Actions
Legal Framework	The absence of a functioning legal and regulatory framework for financial services.	An "onshoring" process to convert the operative EU law into domestic law, with only minor adjustments.	Not relevant to the EU.
Cooperation	A breakdown of cross-border cooperation in supervision and resolution.	An extensive network of Memoranda of Understanding (MOUs) agreed with EU authorities. Ongoing authority level cooperation in a range of forums.	See U.K. actions.
Banking Services	Inability of U.K. and EEA banks to access U.K. and EEA markets.	A temporary permission regime for the continuity of the provision of EU firms' services, while they seek permanent authorization in the United Kingdom.	No EU level action. Some member states have introduced temporary regimes. As a result, major U.K.-based banks transferred their EU clients to subsidiaries in the EU to continue to service them.
Insurance	Inability of U.K. and EEA insurance companies to service cross-border insurance contracts.	Legislation to allow EEA companies to service policies held by U.K. households	Some member states introduced run-off regimes. EIOPA guidance issued to facilitate servicing of existing contracts
Uncleared Derivatives	Inability to perform certain lifecycle events.	Legislation to ensure EEA banks can perform life-cycle events on contracts with U.K. firms. U.K. firms repapered clients. ISDA advice.	Temporary exemptions to facilitate novation contracts with EEA counterparties without triggering clearing and bilateral margin obligations.
CCPs	U.K. CCPs unable to provide clearing services to EEA clearing members and vice-versa.	Temporary recognition regime allows EEA CCPs to provide services to U.K. clearing members, while they apply for permanent recognition.	Equivalence and recognition for U.K. CCPs until June 2022. The EU recently provided public reassurance that it will extend the CCPs' temporary equivalence (details still unknown). ESMA has refrained from recommending the derecognition of U.K. CCPs and advised measures to mitigate financial stability risks.

[4] Note that the EEA Agreement extends the EU single market for financial services to EEA countries (Iceland, Liechtenstein, and Norway). However, as EU institutions are the relevant authorities shaping together with the United Kingdom, the development of cross-border financial services between the United Kingdom and the EU/EEA, this FSSA refers to the EU.

Table 5. United Kingdom: High-Priority Exit Risks and Other Selected Exit Risks (concluded)

	Risk Description	United Kingdom Actions	EU Actions
Asset Management	Inability to market/operate cross-border and to delegate portfolio management to the United Kingdom (vice-versa).	A temporary permission regime for the marketing of EEA UCITS and Alternative Investment Funds (AIFs), and cooperation agreements between the FCA, and EEA National Competent Authorities enable portfolio management delegation and access to the U.K. National Private Placement Regime.	Cooperation agreement between National Competent Authorities and FCA. Some member states adopted temporary regimes for the marketing of U.K. UCITS and AIFs. U.K. AIFs may access National Private Placement Regimes. Recent Commission proposal continues to allow delegation portfolio management under somewhat stricter reporting rules.
Personal Data	Transfer of personal data disrupted.	Legislation to allow United Kingdom to EEA transfers and firms put contractual clauses in place to allow transfers from the EU to United Kingdom. U.K. FCA signed IOSCO-ESMA Administrative Arrangement.	Following the TCA's "bridging mechanism." the Commission adopted adequacy decisions for United Kingdom privacy legislation until 2025.
Central Securities Depositories (CSDs)	CSD cross-border services may have been disrupted.	Transitional regime allows CSDs outside the U.K. to continue providing services in the United Kingdom.	U.K. CSD completed its migration of Irish securities to Euroclear Bank in March 2021, after a temporary equivalence decision.

Sources: HMT, BOE, and IMF staff.

7. At the time of the FSAP the impact of the exit from the EU on the U.K. financial system is not creating financial instability, but the risk of market fragmentation, and uncertainty remain. In anticipation of the loss of EU passports, some U.K. firms set up EU establishments or restructured existing ones to access EU clients. Relocation of assets and jobs is below initial estimates. Some market fragmentation has already occurred. For instance, following EU and U.K. rules requiring trading of certain shares and derivatives on domestic venues or equivalent third-country venues, EU share trading in the United Kingdom. largely migrated to the EU, and some OTC derivatives trading (notably EUR interest rate swaps) shifted to EU and U.S. venues). Temporary U.K. relief mitigated the impact of fragmentation on U.K. firms. The industry sees Brexit's current impact as leading to increased costs (e.g., reallocation of internal capital and cost of new authorizations). It expects further optimization of their EU footprints informed *inter alia* by future U.K. and EU regulatory developments and supervisory expectations.

8. The United Kingdom's structured regulatory cooperation with the EU is of mutual and global interest, and the institutional framework continues to evolve. Each party maintains its regulatory autonomy, including equivalence decisions to grant unilateral cross-border market access and mitigate regulatory overlaps and duplications. The United Kingdom issued a package of equivalence decisions for the EU. A Memorandum of Understanding (MOU) providing a cooperation framework was agreed at the technical level but is not signed yet.

9. The long-term ability of U.K. CCPs to operate in the EU remains an open issue. Currently three U.K. CCPs, two of which are globally systemic, serve EU clearing members based on a Commission equivalence decision and ESMA recognition decisions expiring on June 30, 2022. The Commission recently signaled that it would avoid cliff-edge risks by March 2022 through an extension of its equivalence decision; also, a recent ESMA review of the "substantial systemic importance" of two U.K. CCPs refrained from a recommendation to derecognize while adopting mitigating measures for risks relating to these CCPs serving EU market participants. Yet, while the EC intends a 3-year extension to June 2025, there is no clarity yet on the details of the extension of equivalence and mitigation measures. However, the status of U.K. CCPs in the long run remains uncertain, mainly in relation to some EUR products. In any event, no financial stability risks appear evident over the short term, and the United Kingdom is expected to remain a primary clearing center for derivatives given that non-EU clearing members—accounting for over 70 percent of activity—will stay in the United Kingdom at least until 2025. That said, a broader concern is that increased costs to clear derivatives in case of market fragmentation—due to loss of multi-currency netting benefits, higher margin requirements, and concentrations in fragmented local markets—may create pressures globally to relax the clearing mandate, a key post-GFC reform that is important for financial stability.

10. Cooperation on the prudential supervision and resolution of banks works well. While U.K.-EU cooperation on supervision and resolution matters is no longer a *mutual* obligation legally, the U.K. authorities' cross-border cooperation mandate with the EU remains strong, supported by obligations in U.K. primary legislation, and parties have agreed an extensive network of cooperation arrangements. However, the effectiveness of crisis management arrangements will be tested in times of stress.

B. Macrofinancial Linkages

11. Despite having endured the crisis well, economic agents continue to face interlinked risks ranging from the effects of a prolonged pandemic to rising global inflation and post-Brexit uncertainties. Thus, to assess the resilience of the U.K. financial system, the FSAP considered a baseline scenario aligned to the October 2021 WEO, and two adverse (tail) scenarios covering a five-year span (2021–25) upon which stress tests were built for corporates, households, banks, and insurers (Appendices I, II and Figure 4). The results from the corporates and household stress-tests fed into those for banks and insurers to account for second-round effects.

- The first adverse scenario entails a **recession with lasting economic scars** from a protracted pandemic.
- The second scenario considers a surge in global inflation and consequent tightening of global financial conditions.

12. Recent developments suggest that both macrofinancial risk scenarios considered in the FSAP remain very present. Omicron is impacting global growth and derailing some aspects of the budding recovery. Global trade could be further undermined as the pandemic continues to dislocate international supply chains. Supply-demand mismatches combined with a rise in energy and commodity prices could generate further inflationary pressures and lead to a tightening of global financial conditions which could weaken the corporate, and household balance sheets, and in turn impact financial firms. The BOE increased its policy rate in December 2021 and has announced its Quantitative Tightening strategy, and expectations for policy tightening in the U.S. have increased. Since current

account deficits were largely financed by portfolio investment, the volatility of capital flows is a potential source of vulnerability (Appendix III).[5]

Nonfinancial Corporate Vulnerabilities

13. NFC vulnerabilities are concentrated in SMEs and sectors hardest hit by the pandemic (Figure 5).[6] In the baseline scenario, the FSAP team estimates that SMEs would face a liquidity shortfall of 2 percent of turnover and an equity gap of 1.5 percent of turnover in 2022–23.[7] The liquidity and equity gap would reach 4 percent and 3 percent in the accommodation sector.

14. NFC vulnerabilities could amplify financial stability risks through macrofinancial linkages.[8] Under the two adverse scenarios described above, firms' financial positions would be weakened through lower revenues due to lower GDP growth and rising financing costs. Also:

(a) Under the **recession with scarring** scenario, the share of firms experiencing financial stress would almost double (Figure 6). The public balance sheet would accumulate losses if guaranteed loan defaults increased, and public debt would rise further, increasing the government's need to secure financing. This would further tighten financial conditions, slow down NFCs' recovery, and weigh on growth.

(b) Under the **inflationary and tightening of financial conditions** scenario, the impact on NFCs is more concentrated in leveraged firms, where higher interest rates and risk premia outweigh stronger near-term growth. Fiscal financing needs would still rise (even without assuming government guarantees being called) given elevated interest rates. Private credit would be constrained on the back of more Gilt purchases and rising NPLs.

[5] The Risk Assessment Matrix (RAM) shows events that could materially alter the baseline path. The relative likelihood is the staff's subjective assessment of the risks surrounding the baseline ("low" is meant to indicate a probability below 10 percent, "medium" a probability between 10 and 30 percent, and "high" a probability between 30 and 50 percent). The RAM reflects staff views on the source of risks and overall level of concern as of the time of discussions with the authorities. Non-mutually exclusive risks may interact and materialize jointly. The conjunctural shocks and scenario highlight risks that may materialize over a shorter horizon (between 12 to 18 months) given the current baseline. Structural risks are those that are likely to remain salient over a longer horizon.

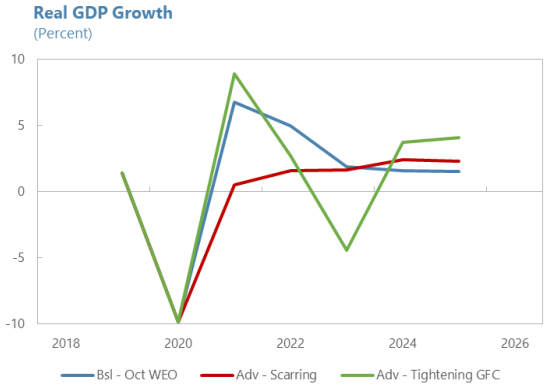
[6] BOE's analysis indicated that the increase in SME indebtedness substantially outpaced large businesses during the pandemic. Total debt increase in large firms from Dec 2019 to Mar 2021 is about 2 percent, compared with a 25 percent increase in SMEs. Therefore, the FSAP's analysis focuses on SMEs' financial vulnerabilities. Firm and household-level financial indicators were estimated using structural models using individual-level data and macrofinancial indicators. For further details of NFC and household analyses, please see the Technical Note on the balance sheet resilience and financial stability.

[7] Firms' financial positions were projected up to 2025 in both baseline and two stress scenarios.

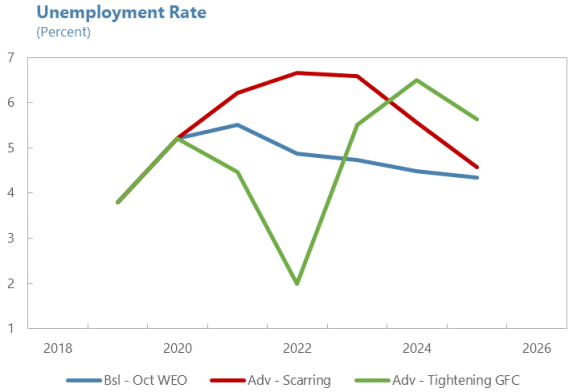
[8] Due to data limitations, the FSAP team can only map firm-level financial vulnerabilities to major banks. Therefore, the analysis cannot quantify NBFIs' exposures to NFCs' financial vulnerabilities.

Figure 4. United Kingdom: Systemic Stress Scenarios

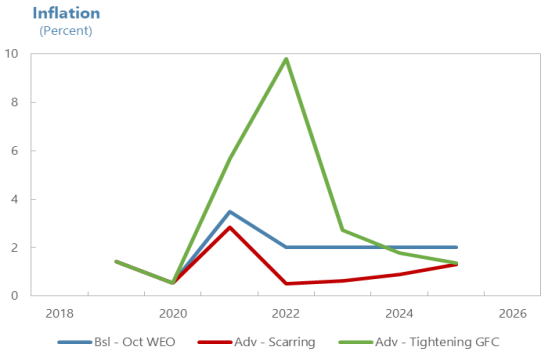
Real GDP growth is 0.5 (8.9) percent in 2021 under the first (second) adverse scenario. The strong recovery under the second adverse scenario is followed by a contraction of -4.4 percent in 2023…



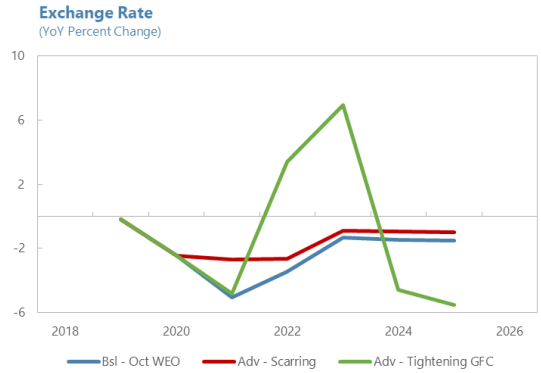
…. unemployment rate increases to 6.7 under the first adverse scenario, and while it initially drops under the second adverse scenario it increases towards the end of the horizon.



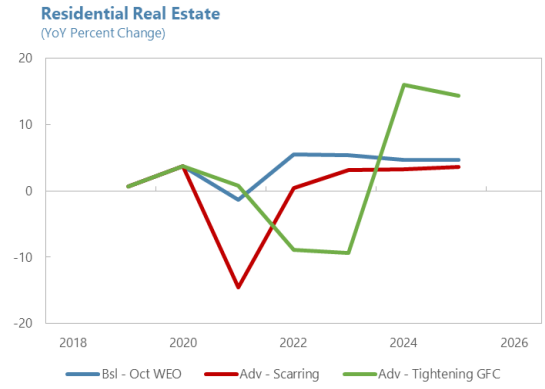
Inflation peaks at 9.8 percent under the second adverse scenario ….



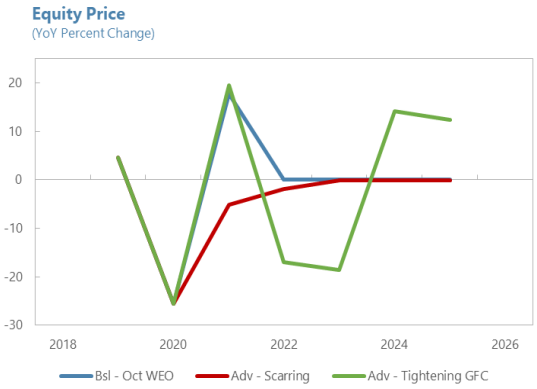
…. while the pound appreciates in 2021, it depreciates during the following two years of the scenario horizon.



House prices drop by -14.6 percent in 2021 under the first adverse scenario and by -9 percent in 2022 and 2023 under the second adverse scenario…



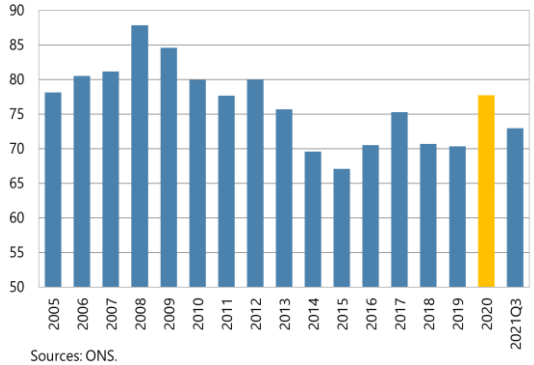
…. equity prices drop by -5 percent in 2021 under the first adverse scenario and by -17 and -18.5 percent in 2022 and 2023, respectively, under the second adverse scenario…



Sources: IMF Calculations.

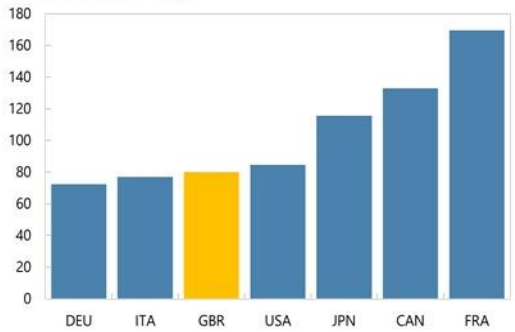
Figure 5. United Kingdom: Nonfinancial Corporates

NFC Debt
(Percent of GDP)



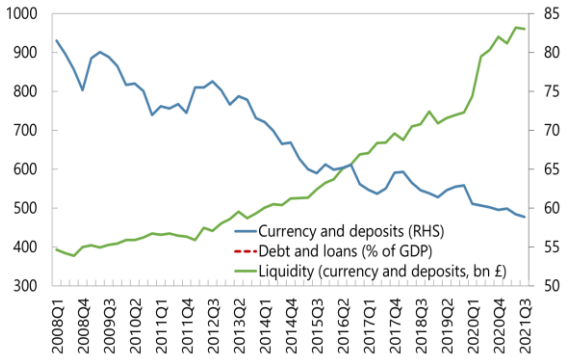
Sources: ONS.

G7: Non-Financial Corporate Debt
(Percent of GDP, end-2020)



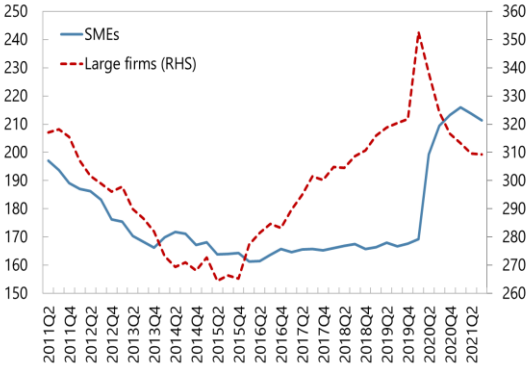
Sources: BIS

NFC Liquidity and Leverage



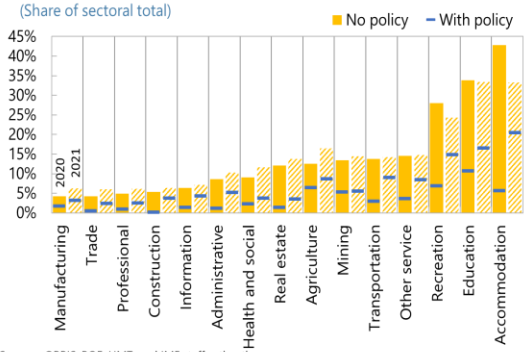
Sources: ONS and IMF staff calculations.

MFIs Net Lending to SMEs and Large Firms
(EOP, billion £)



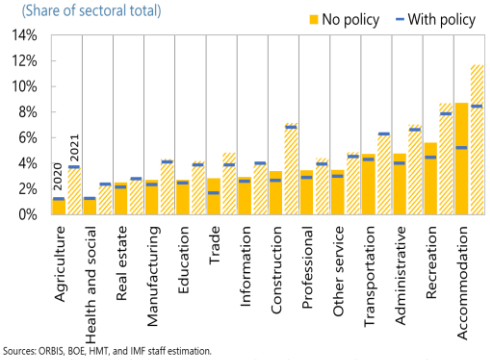
Sources: Bank of England.

Estimated Number of SMEs with Liquidity Gaps
(Share of sectoral total)



Sources: ORBIS, BOE, HMT, and IMF staff estimation.
A liquidity gap refers to when a firm's liquid assets are insufficient to cover the cash-flow deficit. No policy results assume no policy interventions from 2020 onwards. With policy results include key policy measures: the Coronavirus job retention scheme, business rates relief, grants, and government loan guarantees.

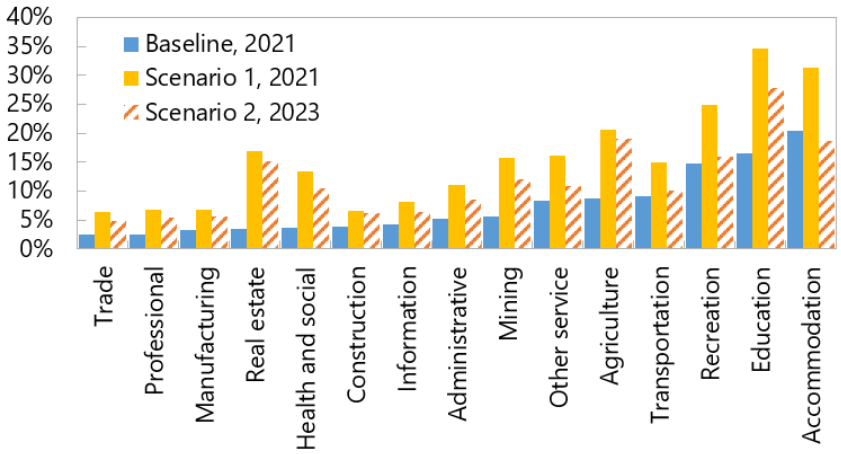
Estimated Number of SMEs with Equity Gaps
(Share of sectoral total)



Sources: ORBIS, BOE, HMT, and IMF staff estimation.
An equity gap refers to when a firm has negative equity. No policy results assume no policy interventions from 2020 onwards. With policy results include key policy measures: the Coronavirus job retention scheme, business rates relief, grants, and government loan guarantees.

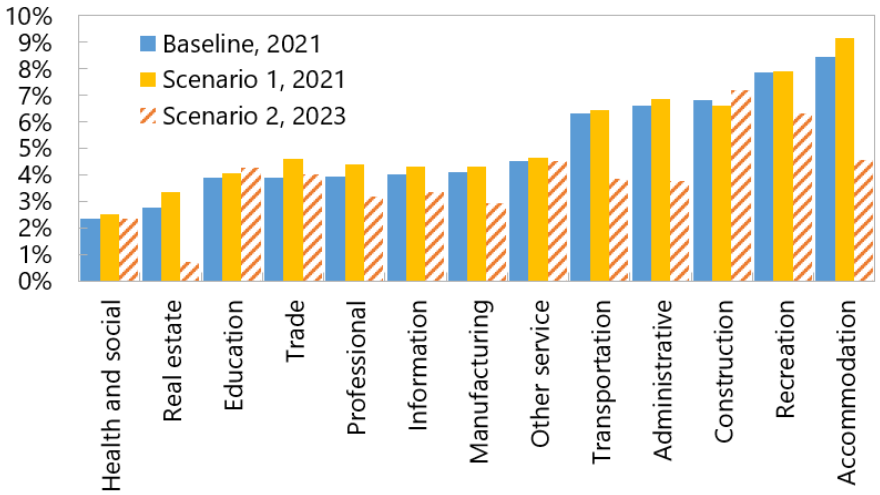
Figure 6. United Kingdom: Nonfinancial Corporates Under Stress Scenarios

Estimated SMEs Liquidity Gaps under Baseline and Stress Scenarios (Shares of sectoral total in the number of firms)



Sources: ORBIS, BOE, HMT, and IMF staff estimation.
A liquidity gap refers to when a firm's liquid assets are insufficient to cover the cash-flow deficit. The baseline is consistent with the IMF 2021 October forecast. Scenario 1 entails a protracted recession with lasting economic scars from the pandemic. And scenario 2 considers a surge in global inflation and consequent tightening of global financial conditions. The year is selected when the number of firms under stress is the largest in each scenario.

Estimated SMEs Equity Gaps under Baseline and Stress Scenarios (Shares of sectoral total in the number of firms)

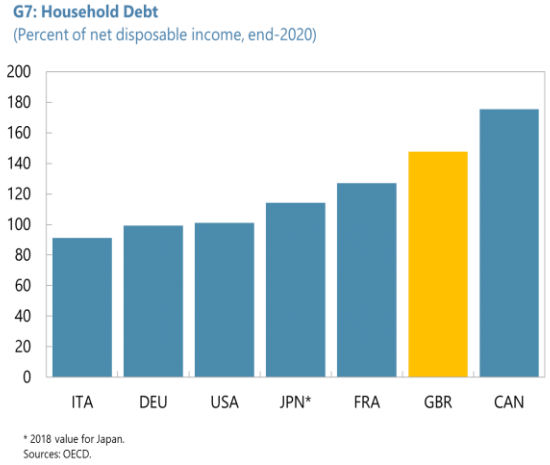


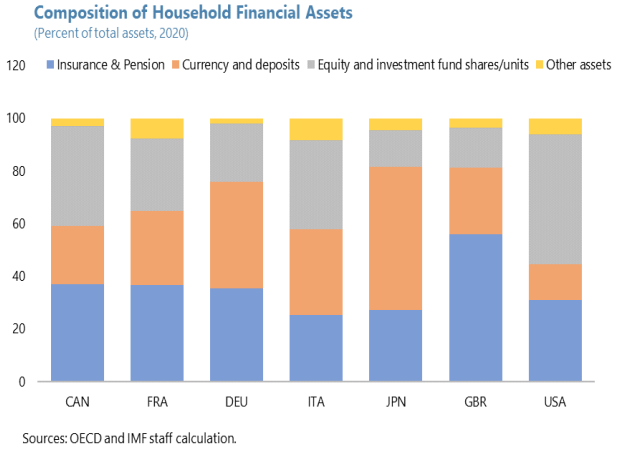
Sources: ORBIS, BOE, HMT, and IMF staff estimation.
An equity gap refers to when a firm has negative equity. The baseline is consistent with the IMF 2021 October forecast. Scenario 1 entails a protracted recession with lasting economic scars from the pandemic. And scenario 2 considers a surge in global inflation and consequent tightening of global financial conditions. The year is selected when the number of firms under stress is the largest in each scenario.

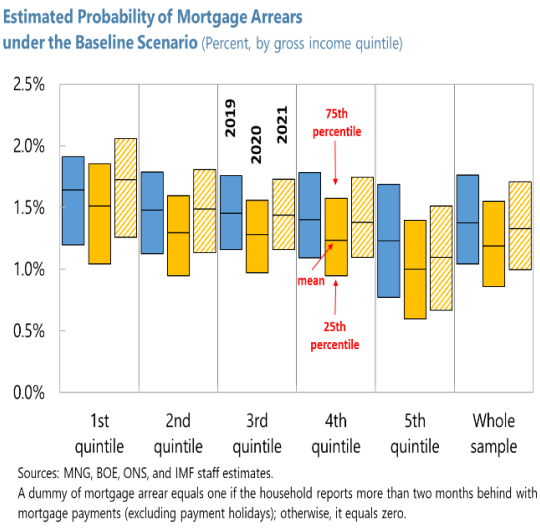
Household Vulnerabilities

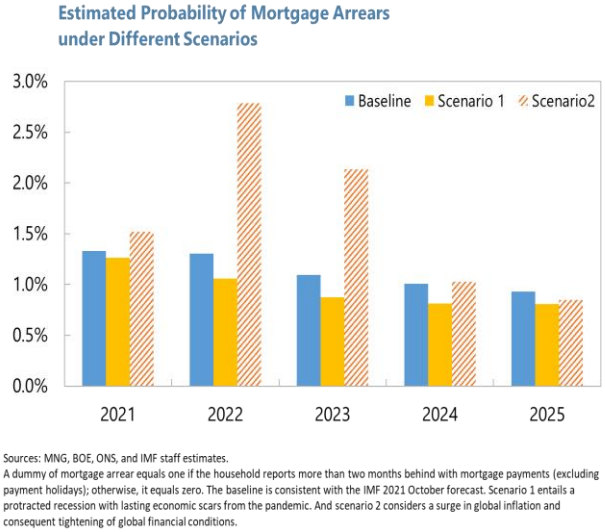
15. Household indebtedness could become a source of financial vulnerability (Figure 7). Although households' net financial wealth is high, many of their assets are illiquid and sensitive to valuation changes. Households' indebtedness largely stems from mortgages. The FSAP estimates that the average mortgage arrears would increase moderately in 2021 and 2022 under the baseline scenario (thanks to the policy support), remaining comparable with historical averages. The bottom quintile income group has the highest average probability of mortgage arrears. The risk of household mortgage arrears would increase sizably under the inflationary and tightening of financial conditions scenario. With 80 percent of mortgages lent by banks, household mortgage vulnerabilities are relevant mostly for banks.

Figure 7. United Kingdom: Household Balance Sheets





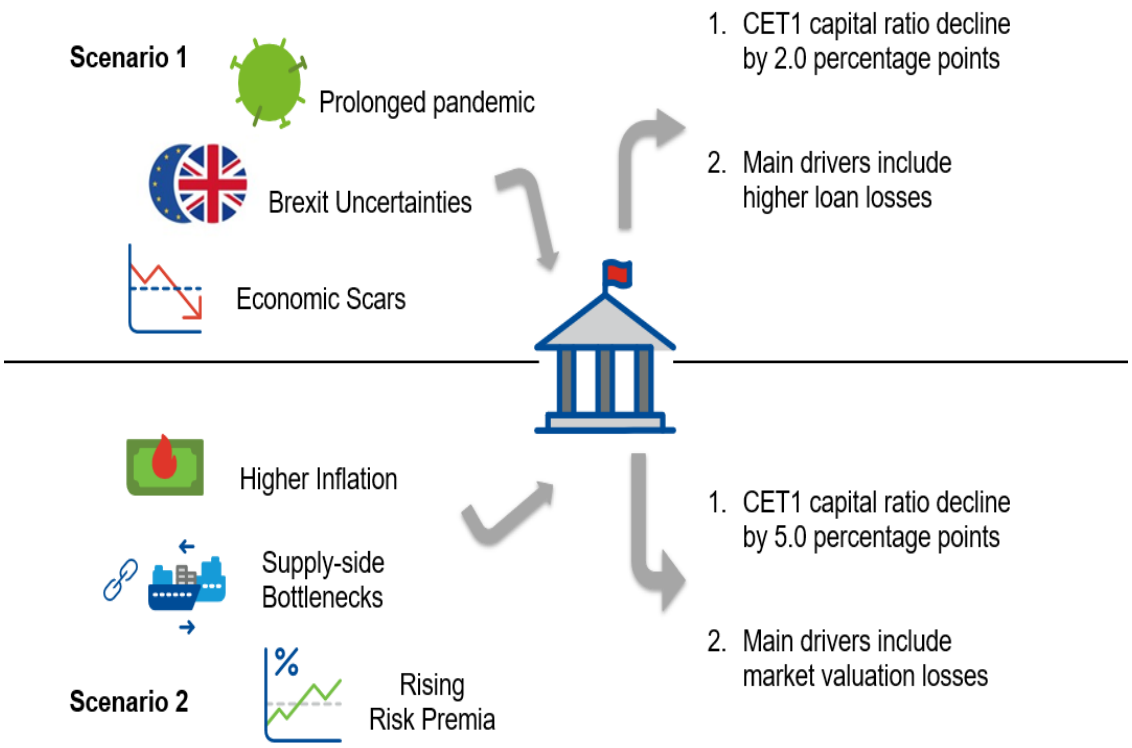




C. Banking Sector Solvency and Liquidity

16. The results from solvency stress tests of the eight largest U.K.-based banks suggest the banking system is resilient to some severely adverse scenarios (Appendix I, Figures 8–11). At the individual level, all banks would remain above their hurdle rates under Adverse Scenario 1; under Adverse Scenario 2, two banks would fall below their hurdle rates but with very small capital CET1 shortfalls amounting to 0.08 percent of GDP at the peak (or 0.035 after additional tier 1 (AT1) conversion).[9] Factoring in feedback effects, the initial macroeconomic shocks could be amplified through weaker credit growth. This would translate into higher probabilities of default (PDs) and lower capital ratios (by about 57 basis points throughout the scenarios' horizon).

Figure 8. United Kingdom: Bank Stress Tests At-A-Glance: Scenarios and Results



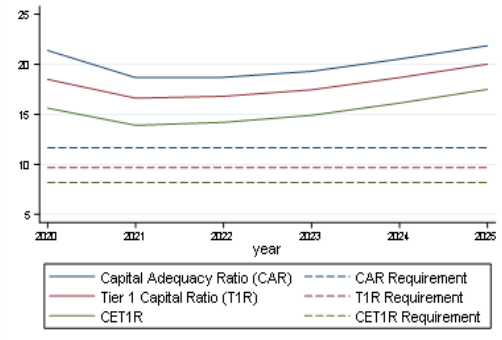
Source: IMF staff calculations.

[9] Credit risk is one of the most important risk factors for the U.K. banking system, as the loan portfolio accounts for about 56 percent of total assets. By type, mortgage loans account for about 54.9 percent of the total exposures at default (EAD). Corporate loans correspond to 32.5 percent of credit exposures and retail to 12.6 percent. Under the first adverse scenario, domestic mortgage PDs increase by 4pp at the start of 2022. Under the second adverse scenario they initially fall and then peak at 7.7 percent by the end of 2023. This is consistent with the scenario paths for house prices and unemployment. Similarly, foreign mortgage PDs peak at 8.1 in 2022 under the adverse scenario 1 and reach 9.9 percent in 2023 under scenario 2.

Figure 9. United Kingdom: Bank Solvency Stress Test Results

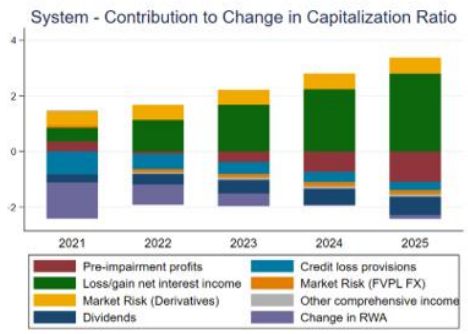
Under the baseline, October WEO, the CET1 ratio will increase by 1.9 percentage points by the end of the scenario horizon …

Total Capital Adequacy Ratio (CAR, %)



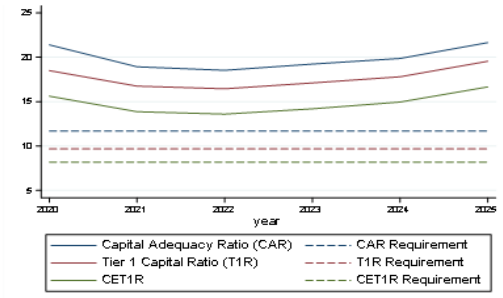
…reflecting an increase in net interest income

System—Contribution to Change in Capitalization Ratio



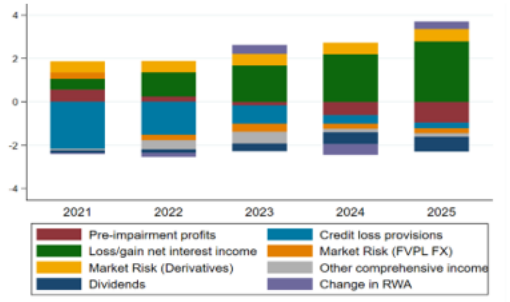
Under the Adverse Scenario 1, the CET1 ratio reduces to 13.6 percent in 2022…

Total Capital Adequacy Ratio (CAR, %)



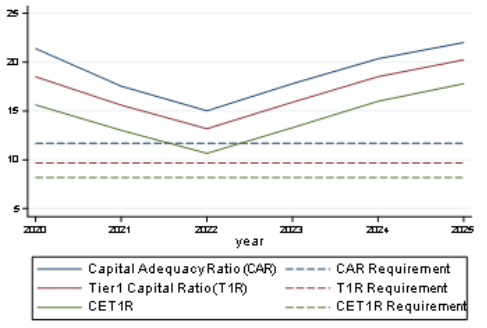
…due to higher loan losses and lower net interest income compared to baseline

System—Contribution to Change in Capitalization Ratio



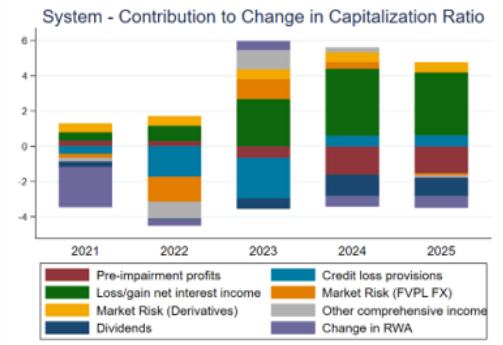
Under the Adverse Scenario 2, the CET1 ratio reduces to 10.7 percent in 2022…

Total Capital Adequacy Ratio (CAR, %)



…driven by market and credit losses

System—Contribution to Change in Capitalization Ratio

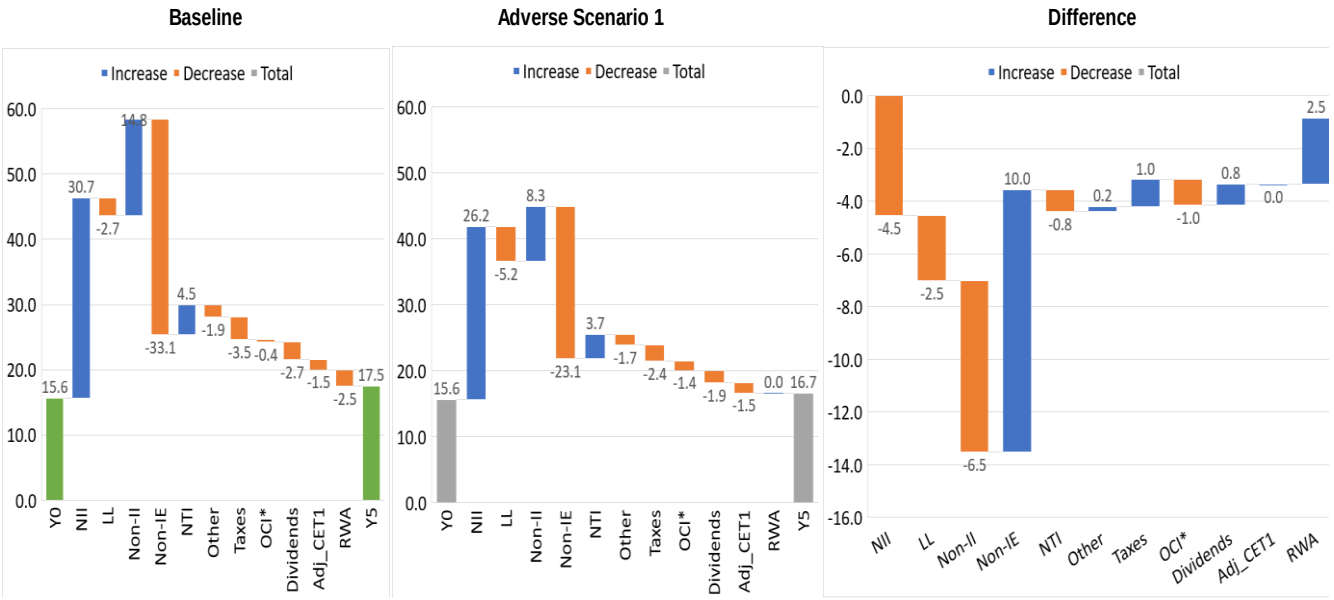


Sources: BOE, FINREP, COREP, and IMF staff calculations.

Figure 10. United Kingdom: Solvency Stress Test Results

Cumulative Decomposition 2020–2025

Under Adverse Scenario 1, over the five-year horizon, banks face lower net interest income, higher loss loan provisions, higher non-interest income and lower RWAs compared to the Baseline Scenario.



In the first two years of Adverse Scenario 2, banks experience higher loss loan provisions and lower other comprehensive income (OCI) and trading income compared to the Baseline Scenario. This is more than compensated, in the following years, by higher net interest income and market gains.

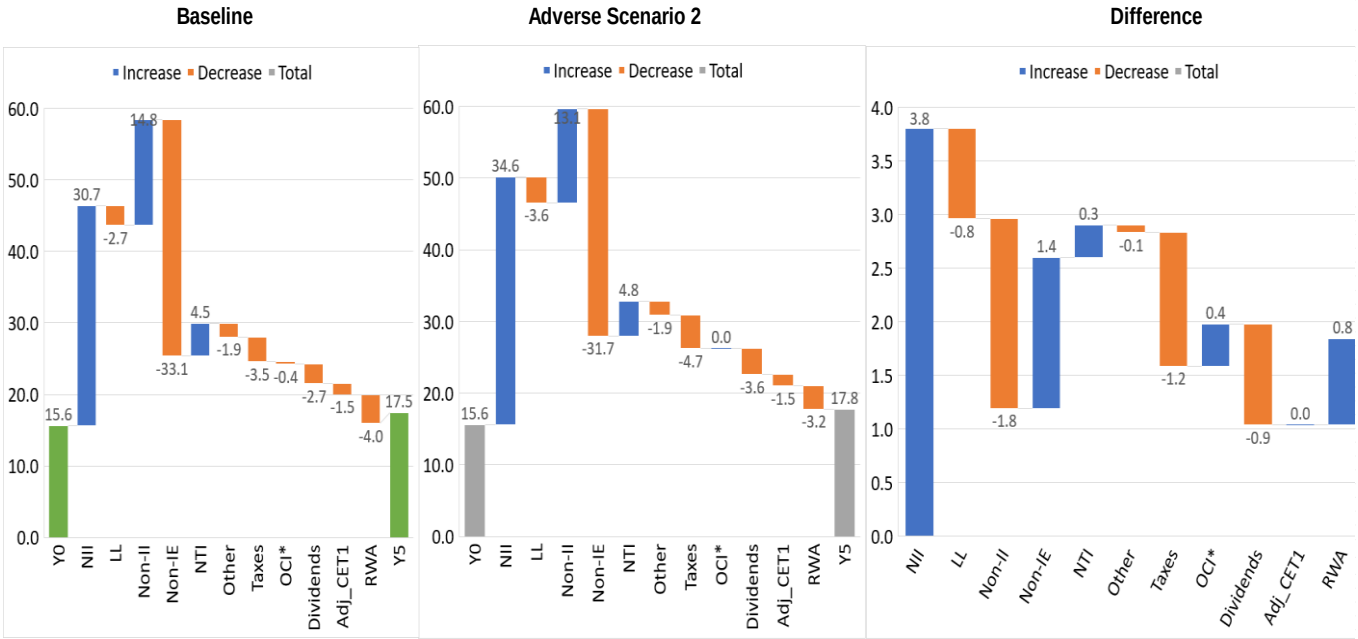
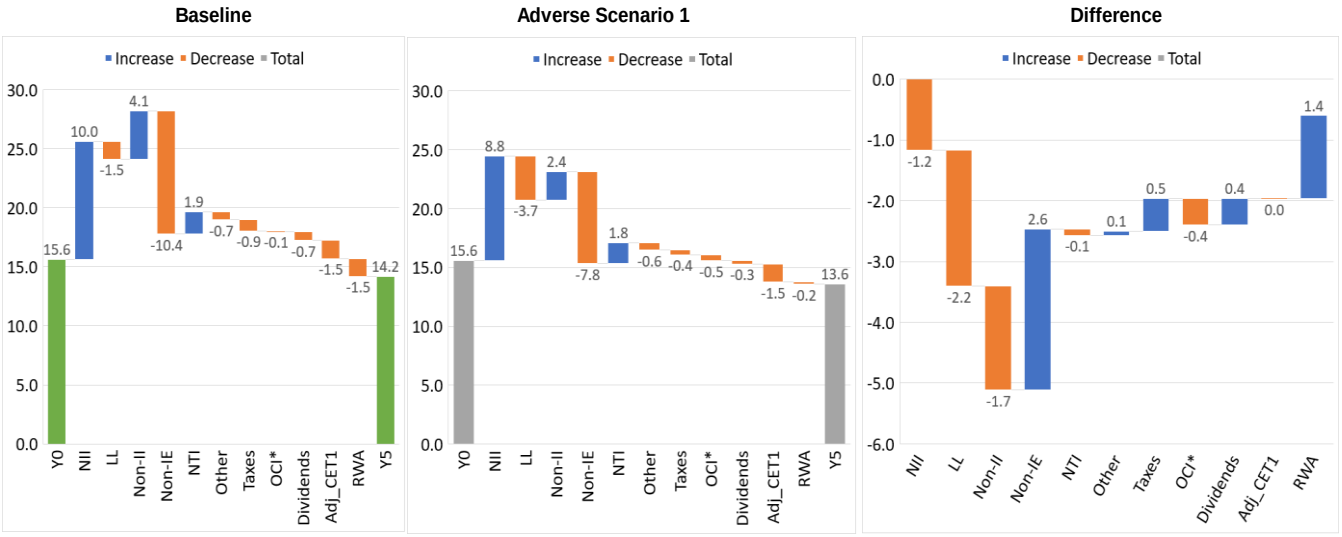


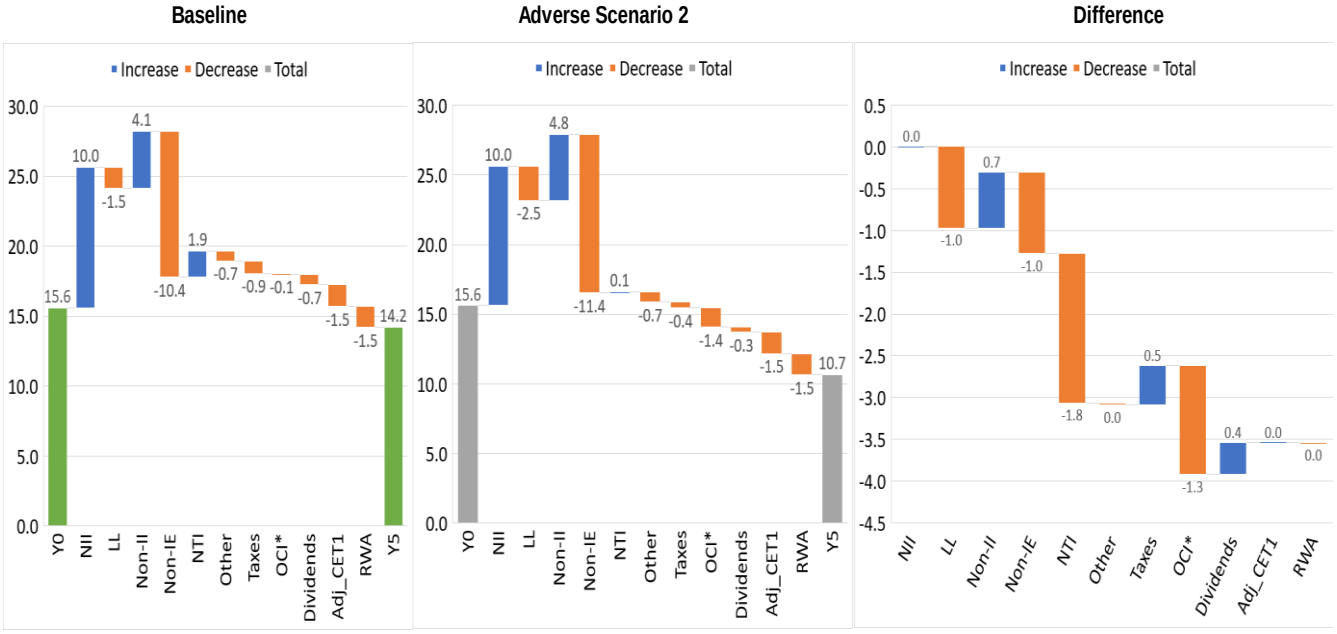
Figure 10. United Kingdom: Solvency Stress Test Results (concluded)

Cumulative Decomposition Up to the Low Point

Under the Adverse Scenario 1, up to the low point, banks face lower net interest income, higher loss loan provisions, higher net non-interest income and lower RWAs compared to the Baseline Scenario.



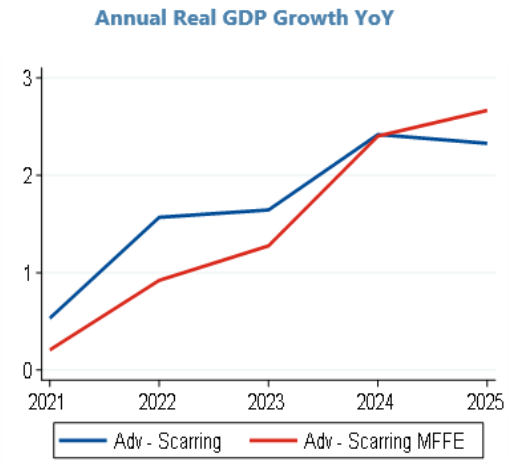
Under the Adverse Scenario 2, up to the low point, banks experience higher loss loan provisions, lower trading income and lower OCI compared to the Baseline Scenario.



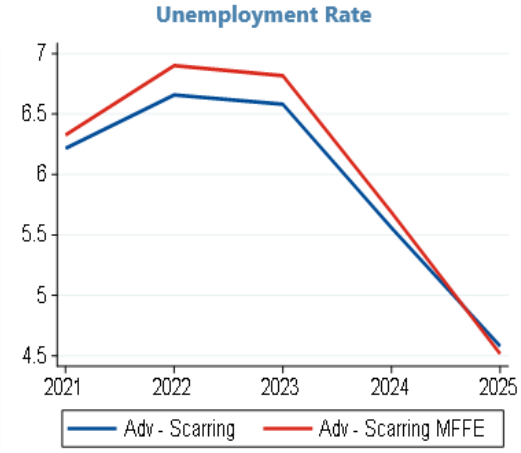
Source: BOE, FINREP, COREP, and IMF staff calculations.

Figure 11. United Kingdom: Macrofinancial Feedback Effects

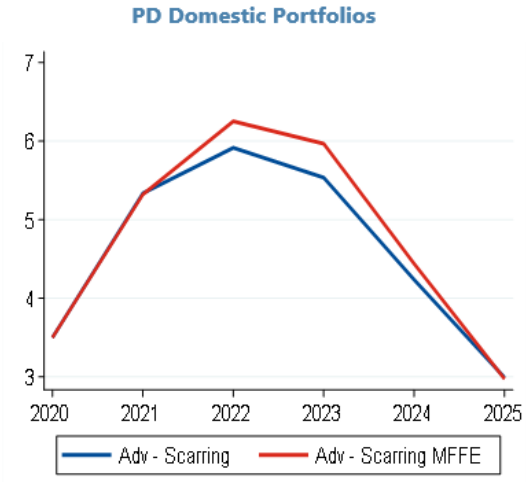
GDP would be reduced by additional 0.65 p.p. in 2022 and 0.37 p.p. in 2023…



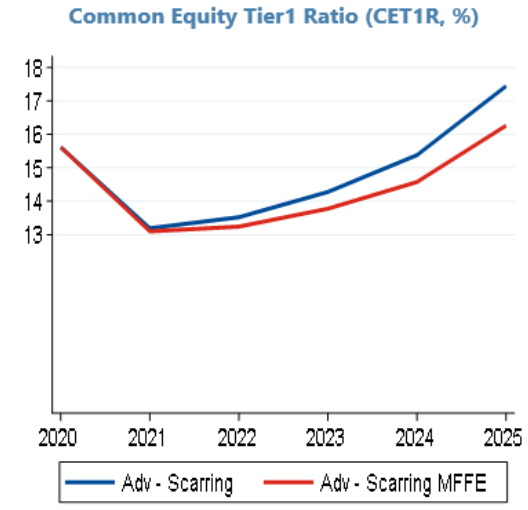
…while the unemployment would be higher by 0.24 p.p. in 2022 and 2023.



This in turn would increase the PD of domestic portfolios by 33 and 43 bps in 2022 and 2023, respectively…



…as a result, capital ratios would reduce by 57 bps on average across the scenario horizon.



Source: BOE, FINREP, COREP, and IMF staff calculations.

17. After having consolidated its approach to" *bottom-up*" stress testing, the BOE could invest in strengthening its "*top-down*" stress testing capacity. The BOE has been running its program of annual cyclical scenarios (ACS) and biennial exploratory scenarios (BES) since 2016. The framework is well-consolidated, and it has produced interesting results through the years. The exercises are run in bottom-up modality, with the BOE employing some internal tools to validate the banks' own results. Its internal toolkit is wide, but it does not cover the whole spectrum of portfolios and P&L components that would be needed to run a full-fledged top-down stress test. The BOE could invest in completing and consolidating its in-home analytics to be able to independently run stress tests at a higher frequency, when needed, and progressively cover all systemically relevant components and their mutual interactions

18. The results of LCR-based stress tests show that the U.K. banking system is overall liquid and resilient to sizable withdrawals of funding and haircuts to liquid assets. Liquidity Coverage Ratios (LCRs) are currently well above the regulatory minimum of 100 percent for all banks surveyed. The FSAP team conducted a stressed LCR simulation, based on the combination of "haircut" and "outflows" scenarios. It showed that banks generally maintain high "total currencies" liquidity ratios under all scenarios. The analysis by single currency revealed potential FX liquidity shortfalls but would require more granular information to quantify them accurately. The addition of further details to the PRA own reporting scheme on liquidity (PRA 110) would help provide a better sense of the potential liquidity gaps in foreign currency.

D. Insurance Sector Solvency and Liquidity

19. During the pandemic, insurers' balance sheets proved stable, with solvency ratios declining only temporarily when markets became more volatile in February/March 2020 (Figure 12). Earnings of life insurers declined due to lower sales amid lockdown restrictions. General insurers were moderately affected, mainly through business interruption claims.

20. A top-down stress test of 14 larger U.K. insurers showed vulnerabilities from lower interest rates and equity price declines, particularly for life insurers. The analysis applied two severe scenarios to insurers' balance sheets at end-2020, covering about 70 percent of the market. The instantaneous top-down modeling does not recognize hedging instruments and management actions—companies would normally have different options to de-risk their balance sheet and improve solvency positions.

21. In the "scarring" scenario, which involves a downward interest rate shift, life insurers are considerably more affected than general insurers (Figure 12). Solvency ratios of two firms would drop below the 100 percent threshold with an aggregated capital shortfall of almost £9 billion, highlighting the need for recovery plans. Among general insurers, the balance sheet impact is much smaller. The increase in corporate bond spreads contributes most to the reduction in available capital.

22. With tightening financial conditions, the aggregate impact on both sectors is milder and even positive for life insurers (Figure 13). Lower life insurance liabilities compensate for investment losses, while for general insurers the results are diverse, as interest rate exposures differ across companies—further stress (not modeled) could stem from higher claims inflation

23. Life insurers are largely resilient to variation margin calls in their interest rate swap portfolio, but cash buffers differ markedly across firms. An analysis of five large life insurers shows that even sizable upward shifts in interest rates would not cause systemic liquidity stress (Figure 14).

24. For a comprehensive analysis of liquidity risks, the PRA should enhance its supervisory reporting and monitor cash pooling arrangements within insurance groups. Liquidity risks could stem, besides margin calls, from higher outflows following policy surrenders or catastrophe events, or from lower premiums. To analyze combined liquidity drains, more granular data and a monitoring framework is needed.

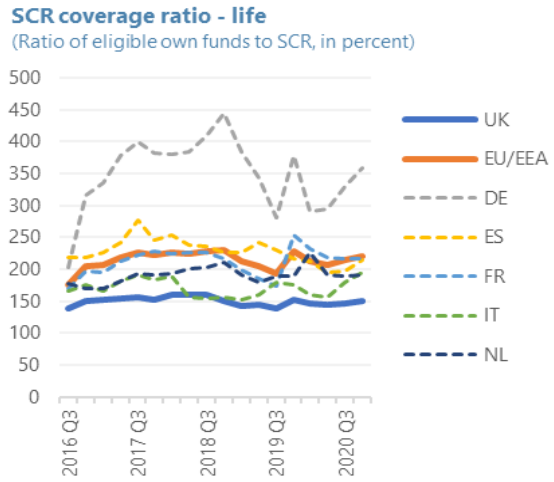
E. Market-Based Finance

25. NBFIs play an important role across several lending segments, including in the riskier market niches less served by banks. NBFI lending has expanded domestically and cross-border, especially in the CRE and SME sectors, and in specific mortgage products and unsecured consumer credit. Some nonbank lending, such as buy-now-pay-later schemes and corporate loans, remain outside the regulatory perimeter and lack granular data for an in-depth risk analysis, including interconnectedness through key market segments. Some nonbank lenders rely heavily on bank funding and on securitizations, creating interlinkages with the rest of the financial system, including banks, that could amplify contagion. For instance, nearly half of funding of U.K. finance companies comes from banks. Balance sheet linkages exist with overseas banks and asset managers as well.

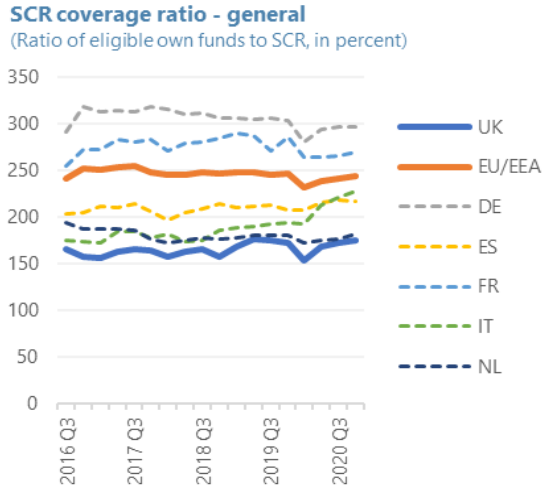
26. The lending cycles of nonbanks and banks are synchronized to a large degree, but lack of data could mask important variation within the NBFI segment. The analysis of aggregate lending shows a high degree of co-movement (71 percent) between bank and nonbank credit. Nonbank lending under stress is assessed using the estimated determinants of nonbank lending applied to the two stress scenarios considered for the bank stress tests. Under the recessionary scenario with "scarring" effects, nonbank credit contracts less and resumes growth faster than bank credit. In the scenario of tightening global financial conditions, nonbank lending overall also contracts less and is less procyclical than bank lending (Figure 15). This analysis could be even more informative if data were available at the level of individual firms, as aggregated data masks variability across the heterogenous NBFIs. Each type of NBFI is subject to different prudential requirements and thus may show different procyclicality, hence disaggregated analysis could bear important macroprudential implications.

Figure 12. United Kingdom: Insurance Sector—Solvency and Profitability

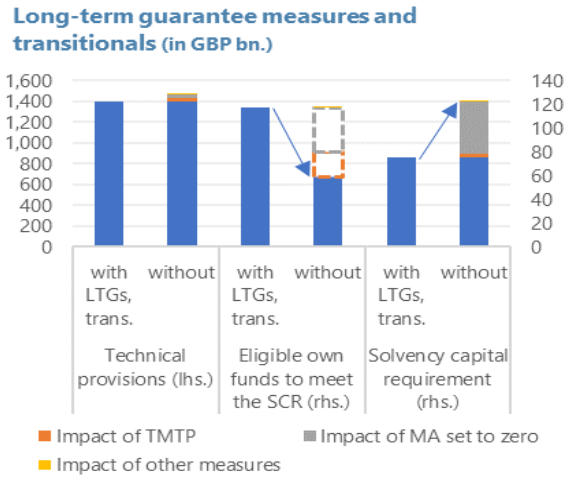
Solvency ratios of life insurers are below those of European peers, but considerably less volatile.



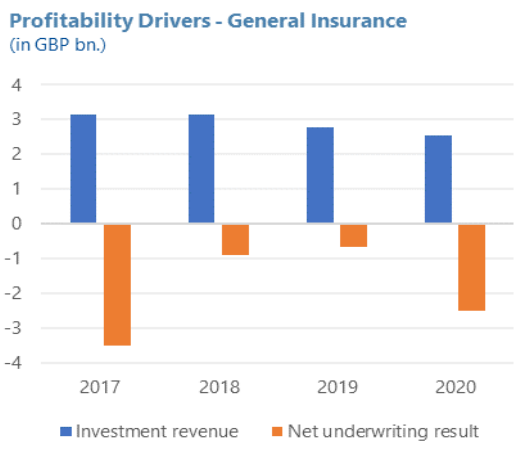
Also, in the general insurance sector, SCR coverage ratios are below those of peers.



Long-term guarantee measures and transitionals, part of Solvency II, benefit U.K. insurers through lower technical provisions, higher own funds, and lower capital requirements.



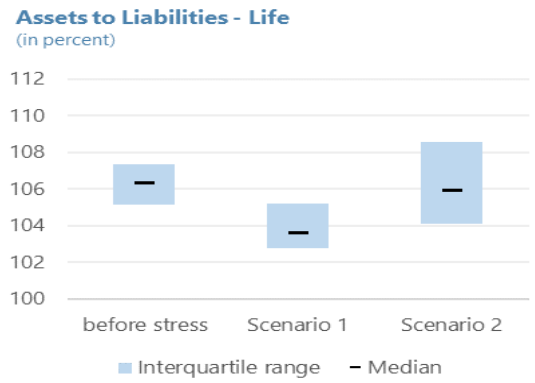
Underwriting business of general insurers is persistently causing losses, increasing the dependence of companies on positive investment returns.



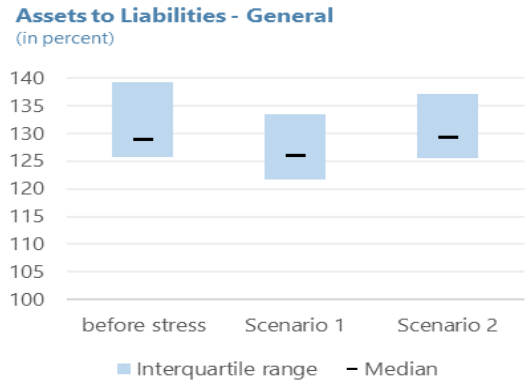
Sources: IMF staff calculations based on PRA and EIOPA.
Notes: Insurers may apply a matching adjustment (MA) to the risk-free interest rate when valuing their life insurance obligations if they hold bonds or other assets with similar cash-flow characteristics, immunizing them against spread risk on those assets. The MA is calculated by each insurer based on the spreads between the interest rate that could be earned from the undertaking's assets and the risk-free interest rate. Until 2031, insurers may apply the transitional measure on technical provisions (TMTP), a deduction to insurance obligations concluded before the start of Solvency II, based on the difference between technical provisions under Solvency I and technical provisions under Solvency II. Over a period of 16 years the transitional deduction is reduced to zero.

Figure 13. United Kingdom: Insurance Solvency Stress Test

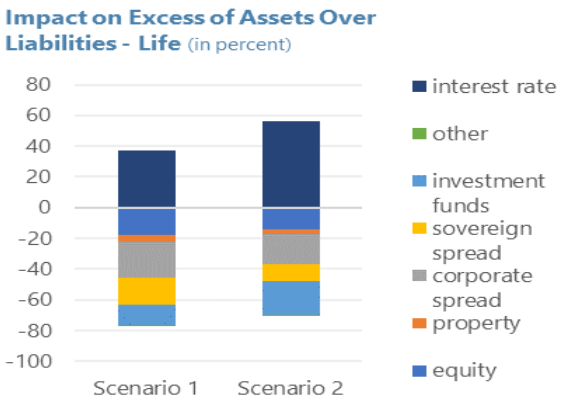
Asset-to-liability ratios of life insurers decline in Scenario 1 and become more dispersed in Scenario 2.



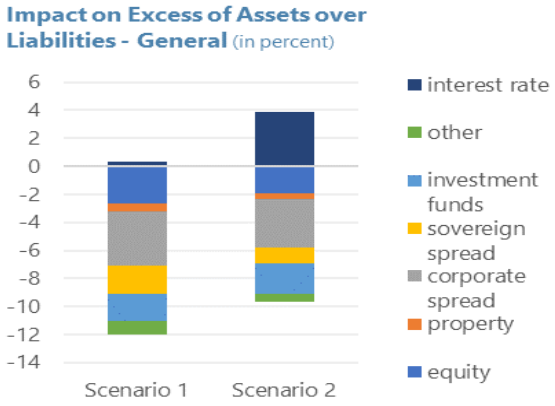
Balance sheets general insurers are more resilient than life insurers in both scenarios.



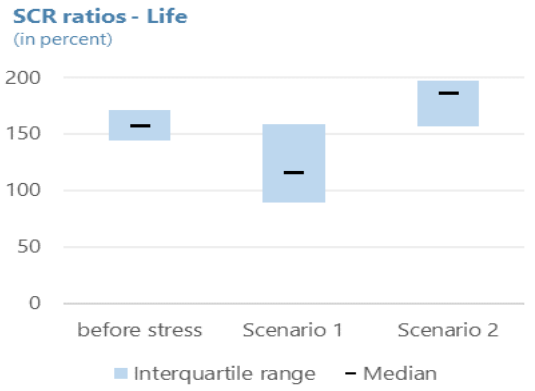
Life insurers benefit in both scenarios from the interest rate change—either through the Matching Adjustment (Scenario 1) or through lower liabilities (Scenario 2).



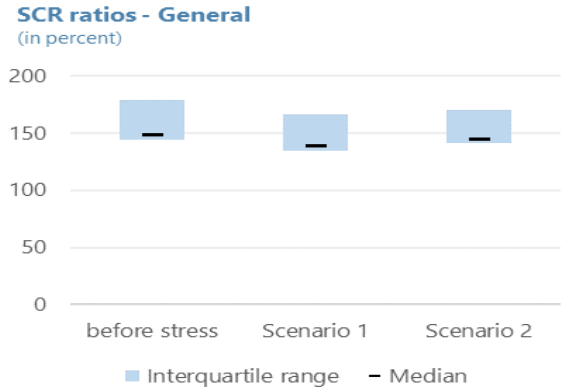
To a more limited extent, also general insurers benefit from higher interest rates in Scenario 2.



The median life insurer's solvency ratio remains above 100 percent in Scenario 1 and increases in Scenario 2...



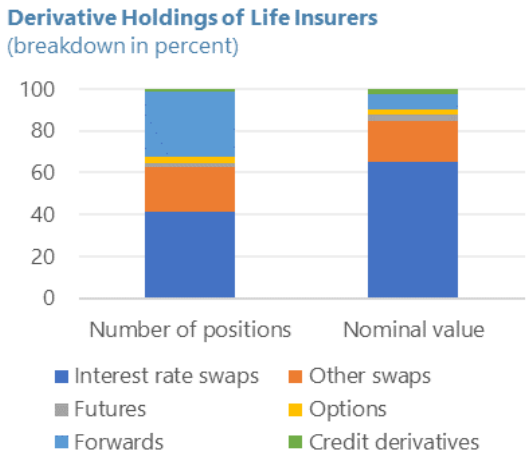
...while general insurers' solvency ratios are more stable in both scenarios.



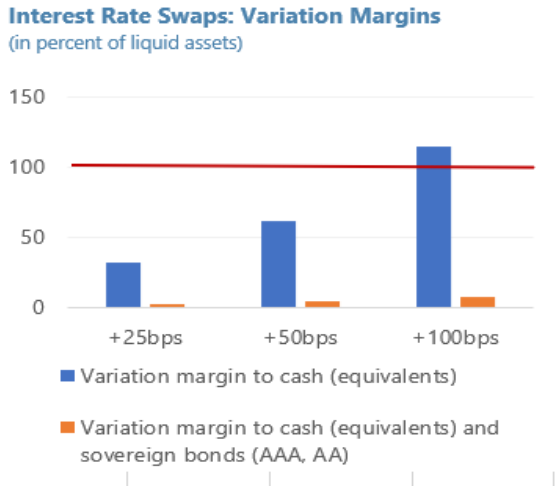
Sources: IMF staff calculations based on PRA supervisory reporting data.

Figure 14. United Kingdom: Insurance Liquidity Risk Analysis

Derivative exposures of life insurers comprise mainly interest rate swaps.



Variation margins caused by a 100-basis-point interest rate increase would exceed cash buffers, but highly rated sovereigns' bonds serve as an additional liquidity buffer.



Sources: IMF staff calculations based on PRA supervisory reporting data.

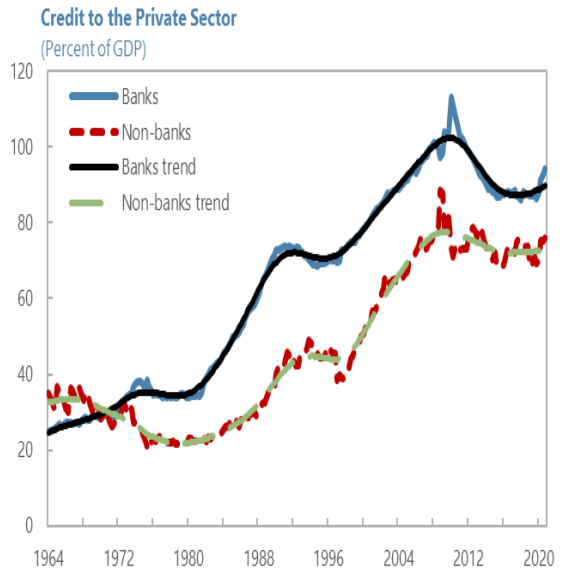
F. Central Counterparties

27. U.K.-based CCPs are among the largest in the world. LCH Ltd., ICE Clear Europe Ltd., and LME Clear Ltd. are CCPs domiciled in London with clearing members in 23 jurisdictions. The aggregate initial margin (IM) they collect is close to around 33 percent of total IM collected by CCPs worldwide. U.K. regulators have significant experience supervising them and participate actively in international regulatory bodies.

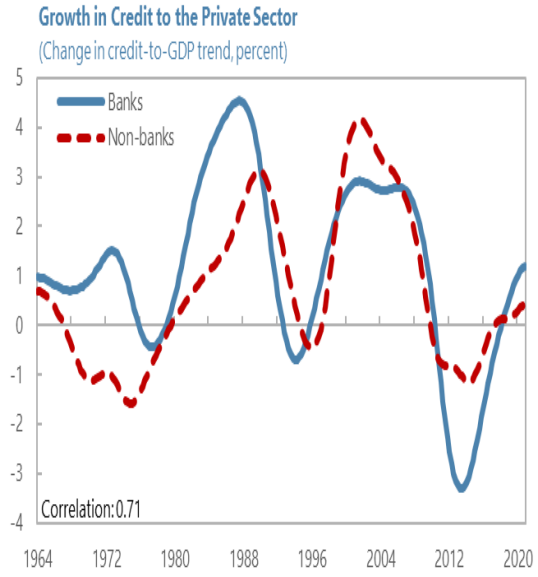
28. U.K.-based CCPs proved resilient during March 2020, but spikes in margins exposed differing abilities by clearing members and clients to cope with higher liquidity needs. Increased volatility saw the IM and variation margin (VM) surge, resulting in margin calls for which clearing members' and clients' preparedness was mixed (Figure 16). Nevertheless, the ability to deal with higher margin calls varied among clearing members and clients.

29. The BOE's proposed supervisory CCP stress testing framework could be augmented. This could be done by increasing transparency under stress conditions, and reporting stressed margin demands on clearing members and especially clients. Lack of information on potential liquidity needs could be at the heart of members' and clients' different abilities to plan. CCPs provide limited information regarding potential IM increases in advance of a stress, particularly towards clients. Increasing transparency on liquidity demands, for example by providing estimates of increases in IM under stressed conditions, would help balance the need for resilience of CCPs and the potential effects on clearing members, clients, and markets.

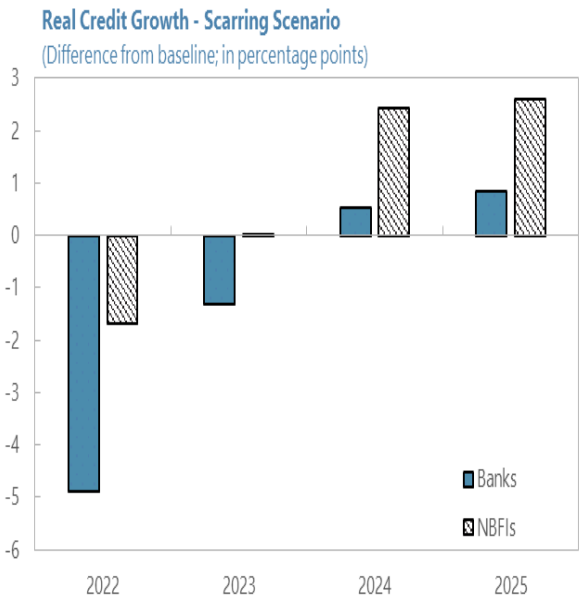
Figure 15. United Kingdom: Credit Cycles



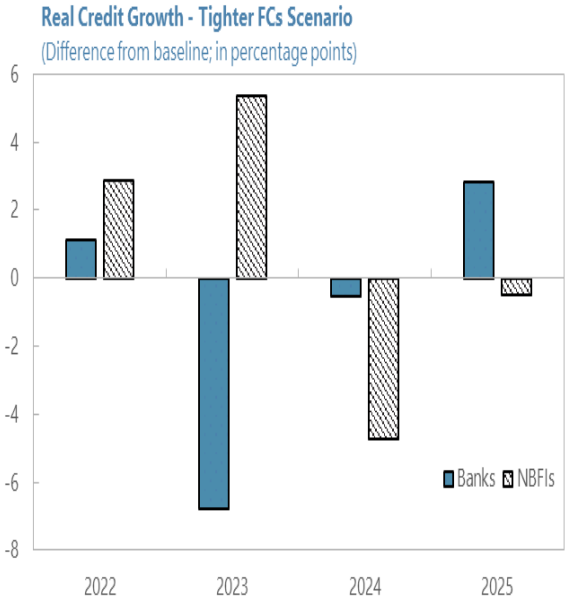
Sources: BIS.



Sources: BIS.

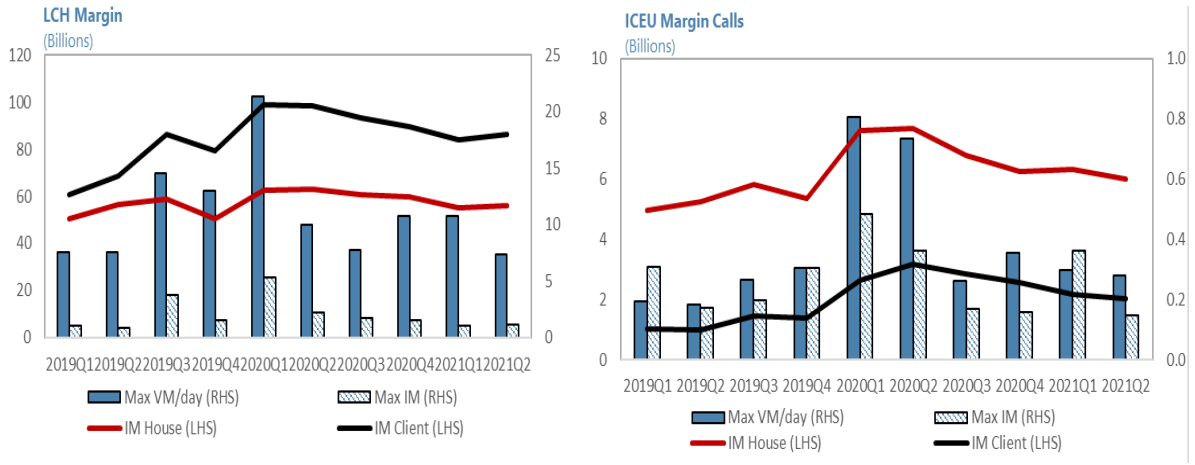


Sources: IMF Staff calculations.



Sources: IMF Staff calculations.

Figure 16. United Kingdom: IM and VM Margin Calls



Sources: LCH Ltd., ICEU PQDs, and IMF staff calculations.
Note: Max VM, Max IM right axis; IM house, IM client left axis, all values in billions. The figure only captures IM and VM. Clearing members may have faced additional requirements due to their contributions to various buffers meant to guarantee CCP resilience.

G. Asset Managers

30. The U.K. asset management industry is the second largest in the world. Its assets under management of £11 trillion consist of savings, pensions, and investments of millions of clients across the world. The industry supports 114,000 people, including 42,200 directly employed, and contributes about 1 percent to the United Kingdom's GDP. The U.K. government announced a review in early 2021 to make the United Kingdom more attractive to set up, manage, and administer funds.[10] The United Kingdom is also leading the transition to green the financial system as part of its net-zero commitment.

31. The global nature and complex structures complicate monitoring by the U.K. supervisors alone. Many funds used by U.K. investors and/or investing in U.K. assets are domiciled outside the United Kingdom. U.K. regulators rely partly on fund surveys and on commercial databases for simulations to assess the market impact of the actions of non-U.K. domiciled funds that may be relevant to U.K. markets. In relation to U.K. domiciled funds, the U.K. authorities can and do collect information through both regular regulatory reporting requirements and ad hoc data requests. The U.K. authorities have several MOUs on cooperation in place and are exploring data sharing agreements with regulators in funds' domiciles. A complete assessment of market liquidity will require collecting more information on Sterling holdings. An international consensus on regulation and U.K.'s engaging in data sharing agreements with regulators of funds operating in the United Kingdom will need to continue to better monitor and address liquidity vulnerabilities.

[10] https://www.gov.uk/government/publications/review-of-the-uk-funds-regime-a-call-for-input.

32. Assessing liquidity risks posed by asset managers ought to be based on fund specific risks–redemptions, increased margins, funding risks, and de-levering:

- Money Market Funds (MMFs)—especially non-government MMFs—faced large withdrawals in March 2020. Decoupling regulatory thresholds from fees and gates during stress periods while permitting them at critically low liquidity buffer levels would help MMFs to use cash buffers instead of liquidating assets. Access to BOE liquidity support could also help encourage MMFs to use buffers.

- Available data for sterling MMFs and open-ended funds (OEFs) used to calculate liquidation demands under the March 2020-size shock indicate that risks are limited (Figure 17 and 18, Tables 6 and 7). Using the data in AIF Managers Directive (AIFMD), Figure 19 shows that aggregate expected losses for AIFs, expressed as a percentage of assets under management, in a March 2020-sized shock are limited. Nevertheless, large variations may exist for individual funds. Hedge funds are leveraged, although the overall exposure is small. OEFs may have significant liquidity mismatch. Liquidity demands would be best assessed under a scenario of simultaneously increasing redemptions, declining leverage, and rising IMs and funding costs, e.g., using historical information or by considering specific stress scenarios.

33. The authorities should continue to push for a more consistent use of liquidity management tools, calibrated to the liquidity of underlying assets. In response to the findings of inconsistent application of swing pricing—which could exacerbate systemic risks—in July 2021, the BOE and FCA proposed a framework that includes enhanced swing pricing, which would aim to reduce the potential financial stability risks associated with first-mover advantage. The new framework would also introduce a more consistent liquidity classification of funds' assets. The FPC should ensure for the open-ended fund sector that both sensible swing pricing and redemption notice periods are calibrated to the liquidity of underlying assets. This is in line with its 2019 principles on liquidity mismatch.

H. Systemic Liquidity and Core Markets

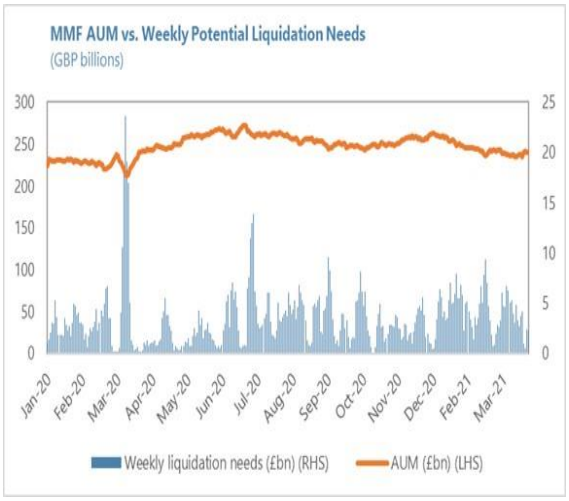
34. The pandemic shock roiled core U.K. markets, and the BOE, with other central banks, effectively responded to restore liquidity. Gilt market liquidity was pressured, reflecting a significant imbalance of supply and demand for Gilts that market makers could not effectively balance, while the FX and cross-currency swaps markets reflected a global desire for U.S. dollars. While global drivers such as deleveraging among NBFIs and liquidity demands from official sectors investors pressured U.K. markets, a particularly important issue in the United Kingdom was liquidity mismatches among liability driven NBFIs who were poorly prepared for the shock. The BOE (with peer central banks) quickly augmented its regular repo operations and front-loaded bond purchases to support market liquidity (Figure 20). Non-financial firms' liquidity was backstopped via the Covid Corporate Financing Facility (CCFF) and Term Funding Scheme with SME incentives (TFSME; Figure 20).

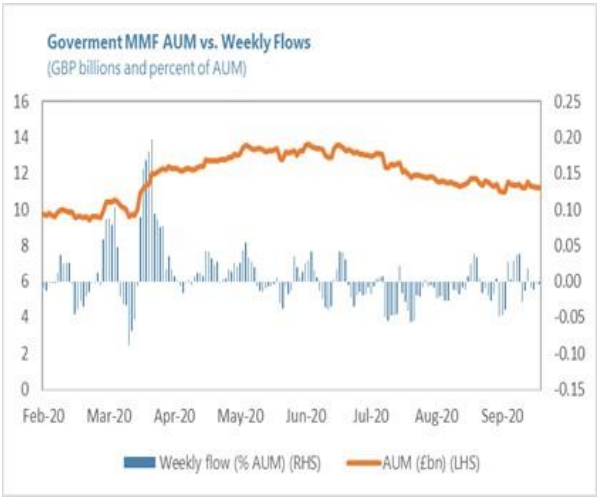
35. The BOE's toolkit would be reinforced by including some key classes of appropriately regulated NBFIs. While ultimately effective, the BOE's toolkit was not ideally positioned to meet NBFI liquidity needs as most cannot directly access BOE liquidity. The BOE's main option is to use asset purchases to provide liquidity to the entire market, which, while effective, results in a significant long-term expansion of the BOE's balance sheet, even if liquidity stresses are transitory and concentrated. Incorporating NBFIs into the BOE's operational framework would improve the BOE's options in future stress situations if the first best approach of mitigating the impact of NBFI stress on markets—beefing up regulation and supervision—falls short. Allowing appropriately regulated and systemically interconnected NBFIs—which could include firms such as MMFs, insurance companies, asset managers, and pension funds—access to at least some of the BOE's facilities would widen the range of options available to counteract future market-wide stresses. Not all NBFIs would be eligible for access to BOE liquidity as the focus should be on those that are large and have the most significant holdings of sterling securities in core markets and the greatest degree of interconnectedness with the wider financial system. Support should be focused on instruments traded in the United Kingdom's most interconnected markets (Gilts and Gilt repos especially). Strengthening the BOE's liquidity support toolkit could be valuable if the BOE's move to tighten policy (via interest rate increases and Quantitative Tightening) increases risks of bumps in the level and distribution of liquidity around the financial system. Any backstop will need to balance the risks posed to the BOE's balance sheet against limitations on the scope of the facility.

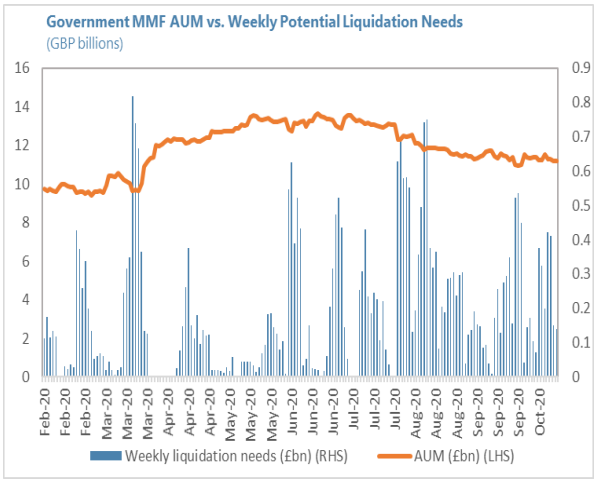
36. The design of facilities accessible to NBFIs should reflect their diverse nature and adequately address moral hazard risks. Both asset purchase operations and lending facilities are needed as some NBFIs are unable to use repo facilities.[11] Backstops should only be provided to NBFIs that are adequately supervised and subject to more prescriptive liquidity requirements to manage risks that BOE backstops give rise to increased NBFI liquidity mismatches. This will involve close coordination with the PRA and FCA as NBFI supervision is shared among agencies. Backstops should be priced to encourage a stronger link between ex-post support and ex-ante risk taking, encourage users to use market funding but not discourage use in stressed conditions to avoid asset fire sales. Clearly defined exit criteria should be developed and communicated ex ante to better align market expectations of support with the BOE's short-term backstop role. Since foreign NBFIs play an important role in core Sterling markets, they could be factored into the BOE's operational framework, supported either by arrangements with foreign supervisors or through direct information sharing requirements to ensure that any foreign counterparts provided access to BOE liquidity meet standards equivalent to U.K. based counterparties.

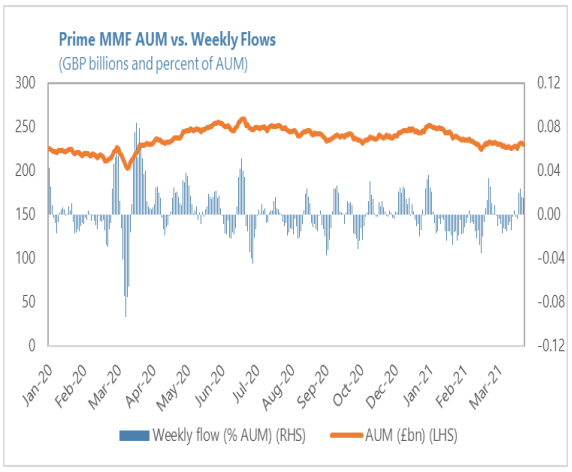
[11] Other central banks have used both lending facilities (for example, the Primary Dealer Credit Facility in the United States) and asset purchase facilities (the U.S. Secondary Market Corporate Credit facility) to good effect.

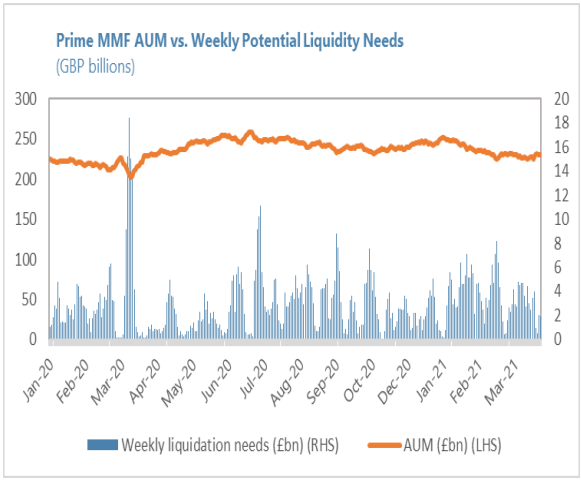
Figure 17. United Kingdom: Money Market Funds





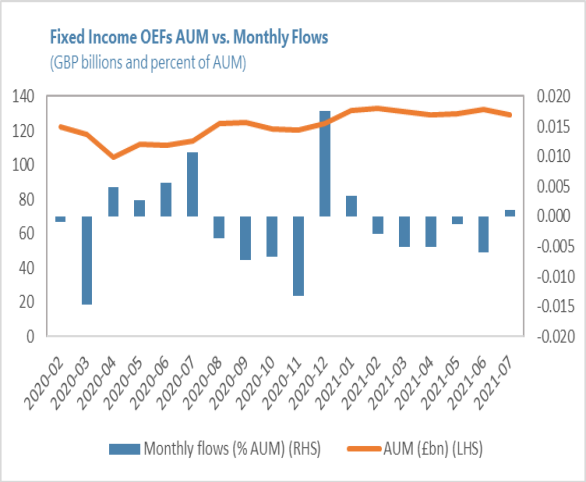


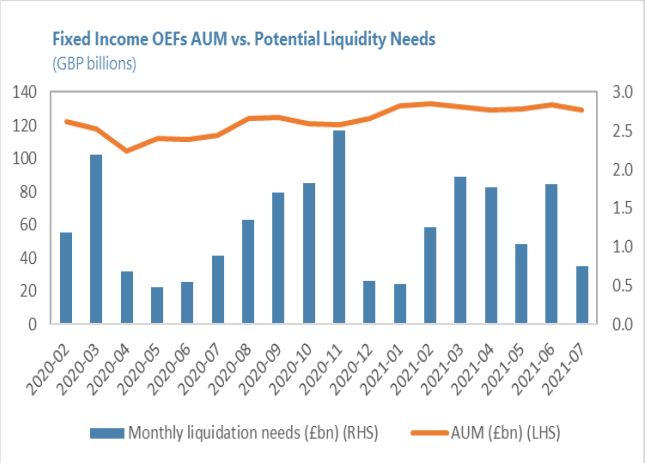


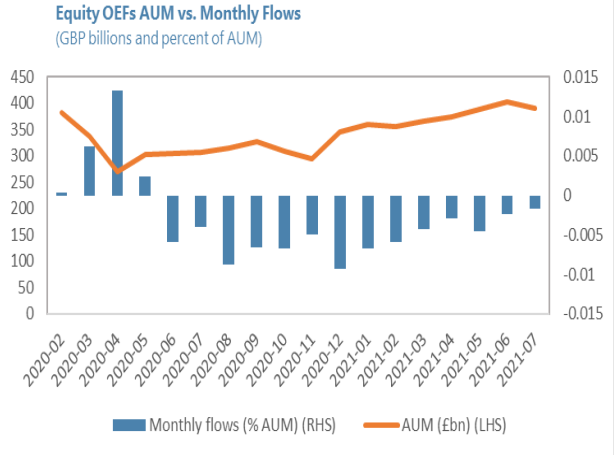


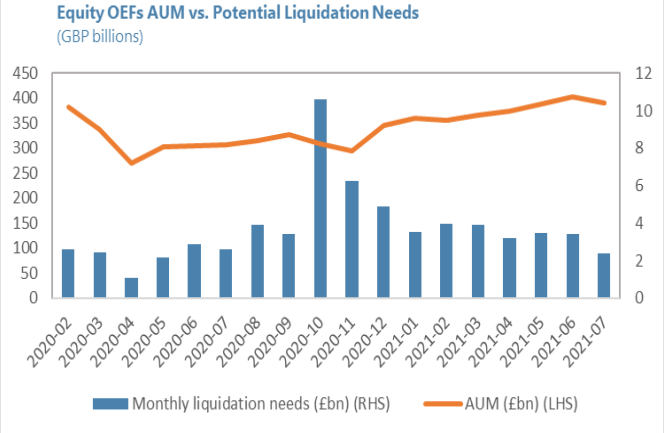
Source: Crane.
Note: While Crane is the best source available it does not cover 100 percent of the market.

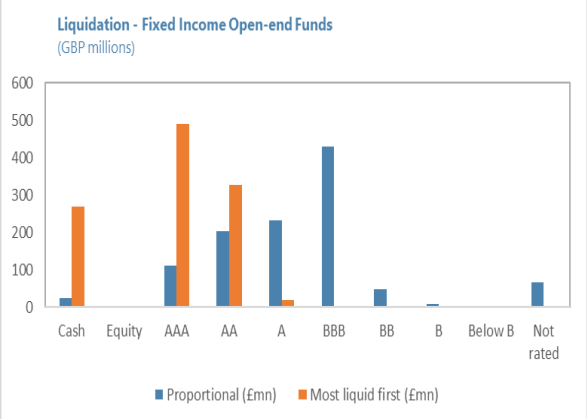
Figure 18. United Kingdom: Fixed Income and Equity Open-Ended Funds

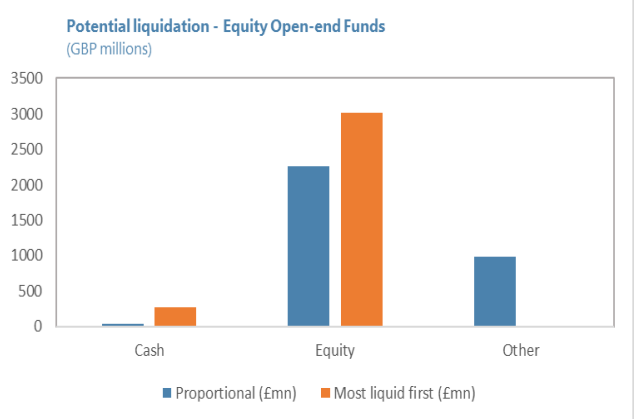






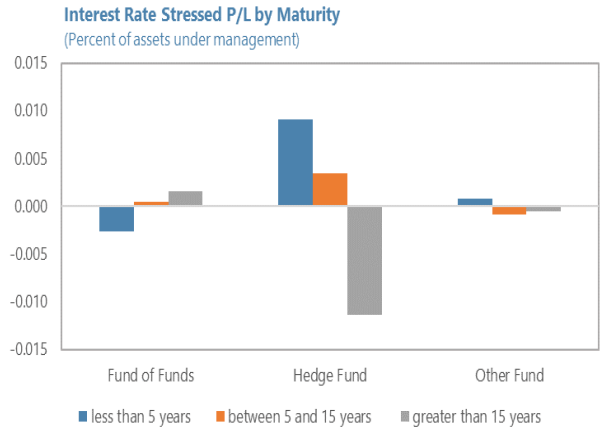


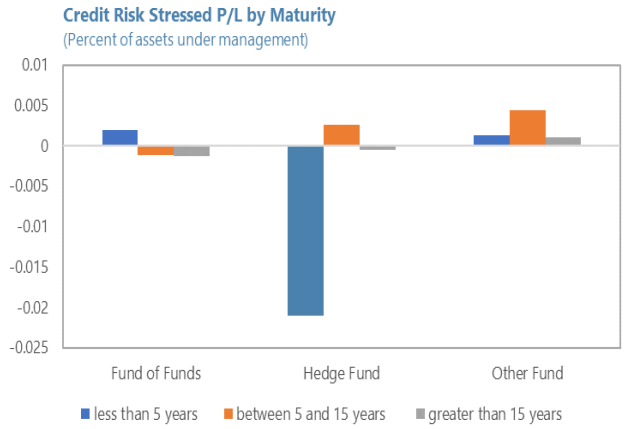


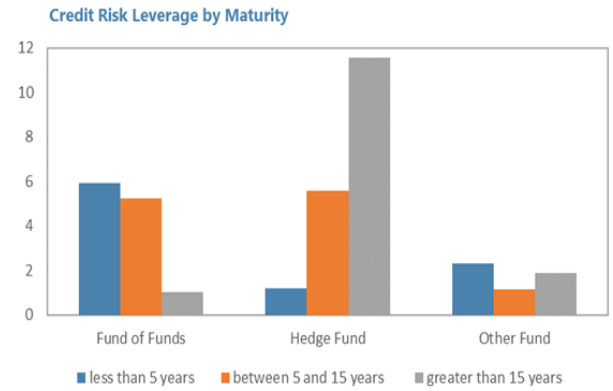


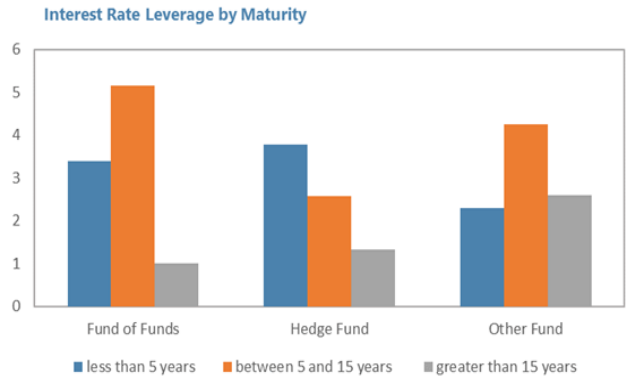
Source: Morningstar.
Note: While Morningstar is the best data source available, it does not cover 100 percent of the market.

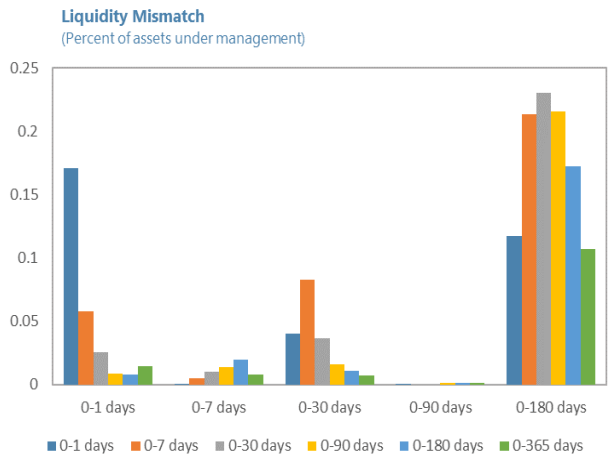
Figure 19. United Kingdom: Alternative Investment Funds

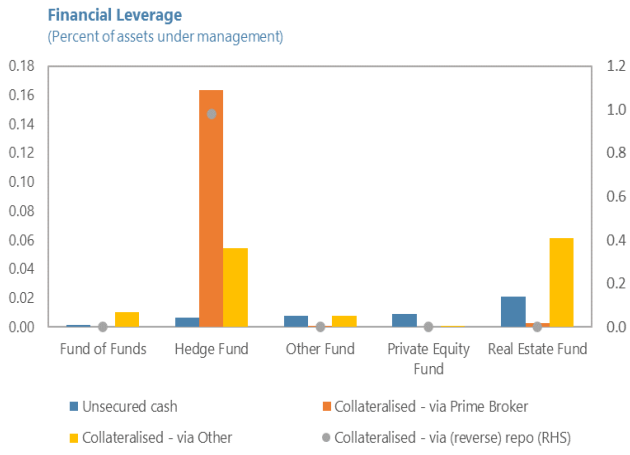












Sources: AIFMD.
Note. Stressed P/L is calculated by applying a shock similar to March 2020 to reported sensitivities. Credit Risk and Interest rate leverage are defined as the ratio of the sum of the absolute value of DV01 (CS01) for short and long positions over the absolute value of the net DV01 (CS01). Liquidity mismatch is the share of assets of a fund whose liquidation would have a market impact if all investors, at a certain time horizon, redeemed their investments in the fund. Financial leverage is the amount borrowed by a fund relative to a fund's AUM.

Table 6. United Kingdom: Proportional Liquidation Asset Profile for MMFs Under a Weekly Redemption Shock

	Treas	Government	Repo	CD	CP	ABCP	TD	Other	Total
Total Liquidation Needs	0.3	0.0	5.1	8.2	3.6	0.5	3.5	0.8	22.0
Liquidation Needs Government	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.8
Liquidation Needs Prime	0.2	0.0	4.4	8.2	3.6	0.5	3.5	0.8	21.3
Total Asset Government	1.5	0.0	8.3	0.0	0.0	0.0	0.0	0.0	9.9
Total Assets Prime	3.3	0.3	42.2	88.1	41.2	7.1	37.9	10.8	231.0
Liquidation Needs Government (In percent)	8.9		7.4		0.8			1.7	7.6
Liquidation Needs Prime (In percent)	4.8	6.2	10.5	9.3	8.8	6.9	9.3	6.9	9.2

Sources: Crane data and IMF staff calculations.
Notes: MMF portfolio reference date April 9, 2021, values in £ billions.

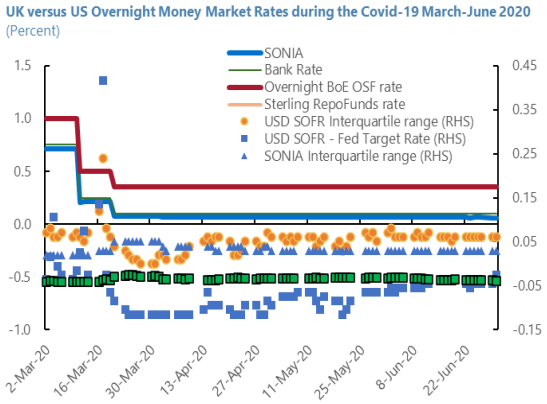
Table 7. United Kingdom: Proportional Liquidation Maturity Profile for MMFs Under a Weekly Redemption Shock

	1 day	2-7 days	8-30 days	31-60 days	61-90 days	91-180 days	181-365 days
Total Liquidation Needs	8.1	2.0	2.4	2.7	2.8	3.1	1.0
Liquidation Needs Government	0.5	0.1	0.1	0.1	0.0	0.0	0.0
Liquidation Needs Prime	7.6	1.9	2.4	2.6	2.8	3.0	1.0
Total Asset Government	5.8	1.1	0.7	0.9	0.3	0.9	0.1
Total Assets Prime	79.0	21.4	28.6	27.8	28.7	31.8	13.8
Liquidation Needs Government (In percent)	9.0	4.3	8.4	8.8	1.0	3.5	5.0
Liquidation Needs Prime (In percent)	9.6	9.0	8.3	9.4	9.6	9.6	7.0

Sources: Crane data and IMF staff calculations.
Notes: MMF portfolio reference date April 9, 2021, values in £ billions.

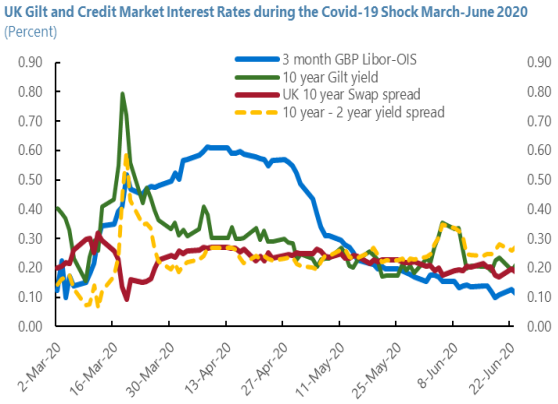
Figure 20. United Kingdom: Systemic Liquidity Stresses and the BOE's Response

Sterling money markets showed only moderate stresses….



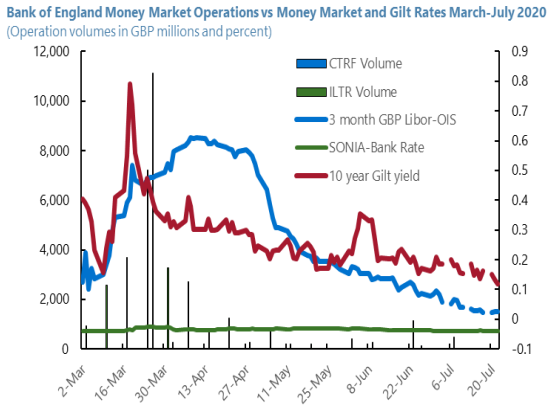
Sources: Bank of England. Bloomberg, IMF Staff calculations.

…but pressures in the Gilts and corporate credit markets were more significant and persistent.



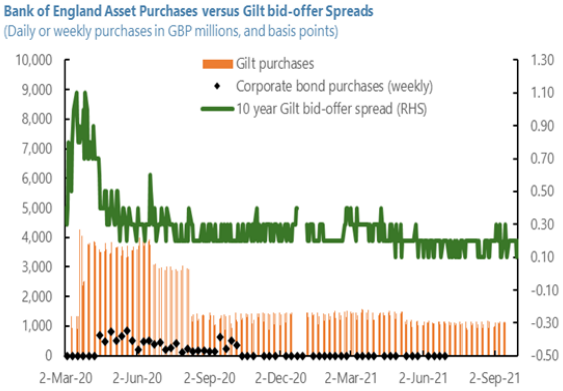
Sources: Bloomberg.

The BOE quickly employed repo operations to combat liquidity strains…



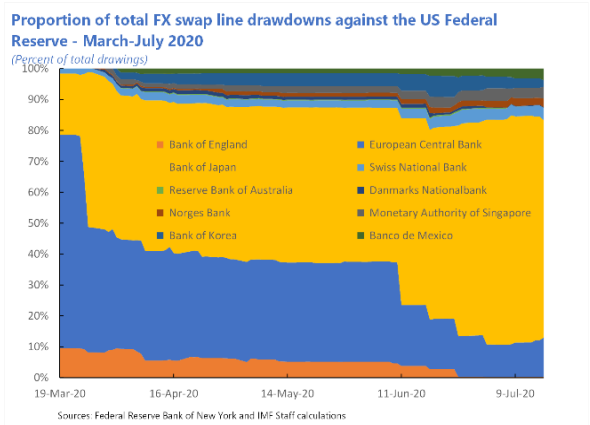
Sources: Bank of England, Bloomberg, IMF Staff calculations.

…and front-loaded bond purchases to provide monetary accommodation and ease market dysfunction.



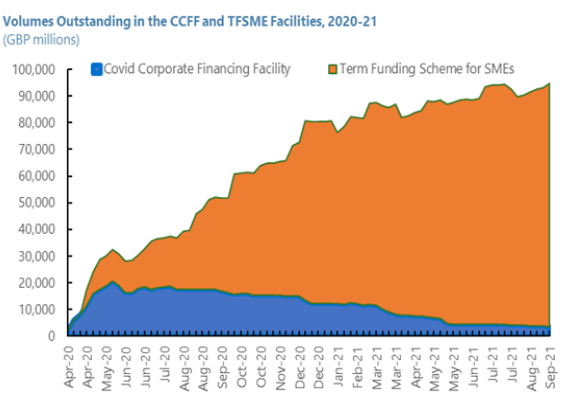
Sources: Bloomberg, Bank of England.

The BOE provided FX via expanded and enhanced FX swaps lines in concert with other central banks.



Sources: Federal Reserve Bank of New York and IMF Staff calculations

The government's Corporate COVID-19 and Term Funding Schemes backstopped needs of nonfinancial firms.



Sources: Bank of England.

I. Real Estate Markets

37. The continued surge in house prices warrants closer monitoring (Figure 21). House prices have posted the strongest gains since November 2004 and the house price-to-earnings ratio, at 5.6, surpassed historical highs from 2007. The house price increase is more pronounced outside London. The share of new mortgage lending at high-LTI ratios also continues to rise. Booming transactions reflect support measures (Stamp Duty Land Tax (SDLT), Mortgage Guarantee Scheme (MGS)) and other factors—larger household savings, demand for additional space, lower construction activity, and advantageous financing conditions. Nonetheless, the share of new mortgages issued at high-LTV ratios remains low relative to the pre-pandemic period. In December 2021, the FPC judged that the LTI flow limit—which restricts the number of mortgages that lenders can extend at LTI ratios of 4.5 or higher to 15 percent of their new mortgage lending—plays a strong role in guarding against unsustainable household indebtedness through the housing market cycle. In the first half of 2022, the FPC will therefore consult on withdrawing its affordability test, noting that the FCA's Mortgage Conduct of Business Framework still plays an important role.[12] This would not constitute a significant change in the macroprudential stance through the housing cycle, as the FCA's Mortgage Conduct of Business Framework still requires that in many cases mortgage providers stress interest rates over a minimum five-year horizon. Any removal of the FPC's affordability test, at this juncture, will require careful consideration, as housing prices have been rising markedly and inflation risks loom.

38. The Commercial Real Estate (CRE) market continues to cool down. The CRE market slowed sharply following Brexit. The BOE recognized a potential fall in CRE prices as a domestic financial stability vulnerability in December 2019. The slowdown in the CRE market has accelerated during the pandemic. The BOE considered the risk of a potential third decline in CRE prices in its 2021 stress test. The FPC concluded that the banking sector is resilient to the overall stress scenario, including the sharp decline in CRE prices. Against this background, the FSAP sees the potential systemic impact of CRE risks as contained.

J. Climate-Related Vulnerabilities

39. Climate-related balance sheet risks for financial institutions were assessed through a separate scenario-based analysis for transition risk, and sensitivity analyses for physical risks. This covered the eight largest banks, eight largest life insurers, seven large general insurers, and a sample of investment and pensions funds.

- **Transition risk.** The transition risk of financial institutions is measured as the potential materialization of credit and market losses in a "climate Minsky moment," through the impact on their exposures to corporate counterparts (Figure 23). The source of shock is a policy change, i.e., a switch in the economic agents' expectation from a low and relatively flat carbon price path to a high and steep one, in the United Kingdom and globally.

[12] The analysis substantiating this decision by the FPC was based on the FCA maintaining its affordability stress testing rules, which call for a stress on interest rates based on expected interest rate paths for the next five years or 100bps, whichever is higher.

- **Physical risk.** For "chronic" physical risk (reduction in GDP levels and growth because of global warming), a sensitivity analysis was done on banks' sovereign bond portfolios. For acute physical risk (intensification of natural disasters because of climate change) a sensitivity analysis was conducted on general insurers' technical reserves (see Figure 22).

40. For transition risk, the evolution of the relevant risk factors was simulated up to 2050. The estimation of the impacts is based on a revision of asset valuations and risk repricing, which is assumed to occur within a five-year horizon (Figure 23). Sectoral Gross Value Added (GVA) and companies' cash flows have been simulated via a sectoral model (GTAP-E) and a financial model suite for climate risks (CCA), respectively, under the NGFS scenario "National Determined Contributions" (representing the "status quo") and two alternative scenarios representing a new status, with the expectation of more ambitious decarbonization policies and a steeper carbon price path: "1.5°C with Carbon Dioxide Removal" and "Net Zero 2050". The difference in valuations between the status quo and alternative scenarios represents the potential asset price correction affecting all marketable assets and the probabilities of default of companies.

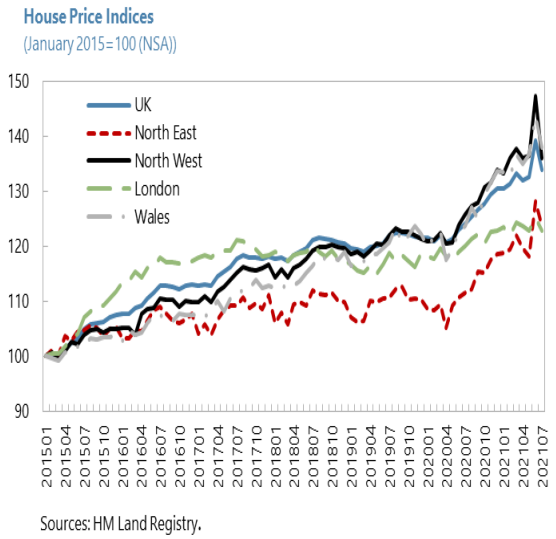
41. The FSAP analysis shows that, under a switch to orderly transition scenarios, financial institutions would be affected significantly but with modest financial stability effects. Under a switch from "National Determined Contributions" to "1.5°C with Carbon Dioxide Removal", banks would suffer credit losses on their corporate loans higher, on average, than 1 percent, and market losses of 3.5 and 1.6 percent, on average, on their equity and corporate bond holdings, respectively. For insurers, the loss on investments would range between 1 and 3 percent of total investments. Losses would be modest for U.K.-domiciled investments funds and defined benefit pension schemes. Under a switch to an orderly scenario with an even higher carbon price path and more dispersion across industries (Net Zero 2050), the impact could be significantly larger: for banks, credit losses would more than triple and market losses would almost double. It is to be expected that losses would be even higher under a switch to a disorderly transition scenario.

42. The impact of chronic physical risk on banks' sovereign bond portfolios is strongly dependent on assumptions about the future variability of global surface temperature. The change in credit spreads could determine an overall drop of 0.6 percent in the aggregate value of banks' sovereign bond portfolios. However, if the increase in mean temperature is accompanied by an increase in its variability, the average impact could rise to 3 percent.

43. Physical risks in the general insurance sector are driven by disaster risks. U.K. insurers are materially exposed to U.S. hurricanes, European windstorms, and domestic floods; but reinsurers—mostly located outside the United Kingdom—provide effective risk mitigation. Expected annual losses from natural disasters would increase by up to 50 percent (before reinsurance) if frequency and severity were to increase by 30 percent each (Figure 24).

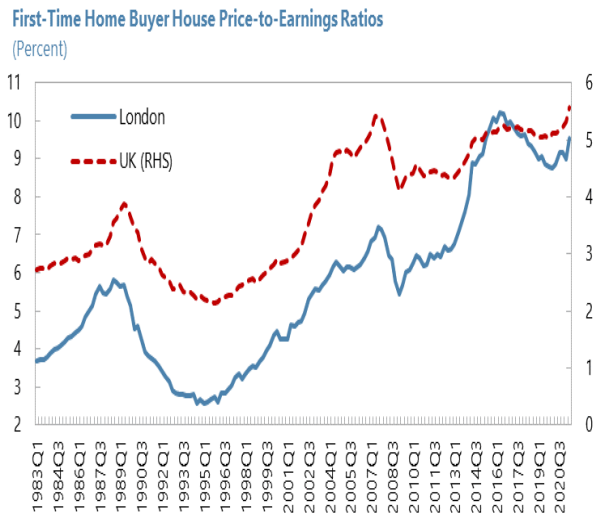
Figure 21. United Kingdom: Housing Price Developments and Household Debt Indicators

House prices have sharply increased outside of London and other city centers…



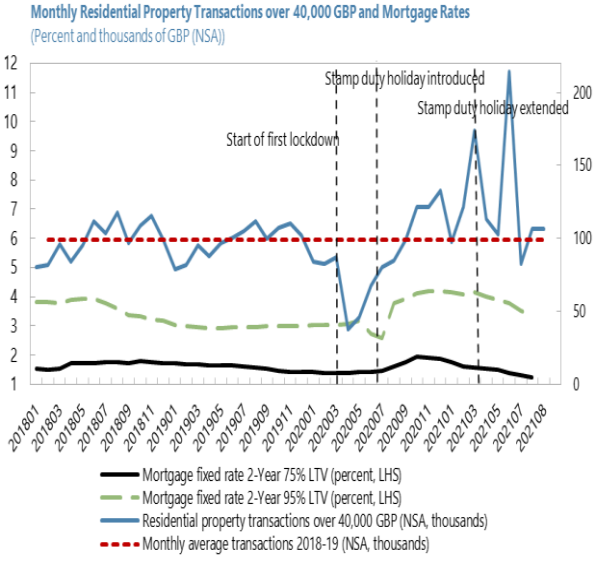
Sources: HM Land Registry.

… contributing to a further deterioration of house price affordability.



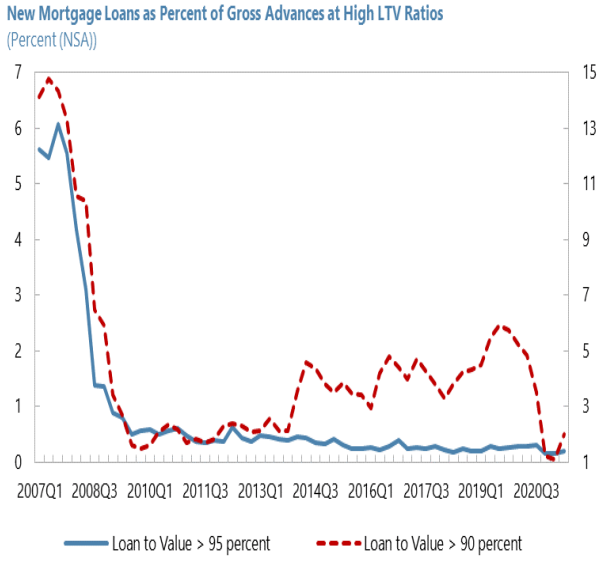
Sources: Nationwide.

Higher activity reflects several factors, including the stamp duty holiday and easy credit conditions…



Sources: HM Revenue and Customs and Haver Analytics.

…but mortgage debt vulnerabilities seem so far contained as high-LTV loans remain a small share of the market.



Sources: BoE Mortgage Lending and Administration Return (MLAR).

Figure 22. United Kingdom: Methodological Approaches for Climate Risk Analysis

	Scenario-based Analysis		Sensitivity Analysis
	NGFS 'Phase I' + GTAP + CCA [a]	NGFS 'Phase II' + GTAP + CCA [a]	
Banks (8 largest banks)			
• Corporate loan portfolio	T	T	
• U.K. mortgage loan portfolio			T [b]
• Securities portfolio	T (stocks, corporate bonds)	T (stocks, corporate bonds)	P [c] (sovereign bonds)
Life Insurers (8 large insurers)			
• Securities portfolio	T (stocks, corporate bonds, funds)	T (stocks, corporate bonds, funds)	
General Insurers (5 large insurers + Lloyd's)			
• Securities portfolio	T (stocks, corporate bonds, funds)	T (stocks, corporate bonds, funds)	
• Technical reserves			P [d]
U.K.-domiciled funds (~2000 funds)			
• Securities' holdings	T (stocks, corporate bonds)		
Pension funds (~70 DB schemes)			
• Securities' holdings	T (stocks, corporate bonds)	T (stocks, corporate bonds)	

T = Analysis of transition risk

P = Analysis of physical risk

NGFS = Network for Greening the Financial Sector

NGFS 'Phase I': 'National Determined Contributions' and '1.5°C with Carbon Dioxide Removal' scenarios, published in June 2020

NGFS 'Phase II': 'National Determined Contributions' (NDC) and 'Net Zero 2050' (NZ2050) scenarios, published in June 2021

GTAP = Global Trade Analysis Project model, used by IMF staff to simulate sectoral Gross Value Added under different NGFS scenarios up to 2050

CCA = Oliver Wyman + Standard & Poor's Climate Credit Analytics platform, used to simulate companies' financials up to 2050 under different NGFS scenarios

[a] = impact on companies' financials simulated in CCA under the NGFS scenarios up to 2050, conditional on GTAP's simulated GVA paths; impact on probabilities of default, ratings, and credit spreads based on S&P Global Market Intelligence PD Model Fundamentals and IMF staff calculations

[b] = impact on U.K. mortgage loss-given default (LGD) by U.K. region based on carbon price paths under NGFS Phase II scenarios (NDCs, NZ2050, and Divergent Net Zero) and buildings' Energy Performance Certificates (EPCs)

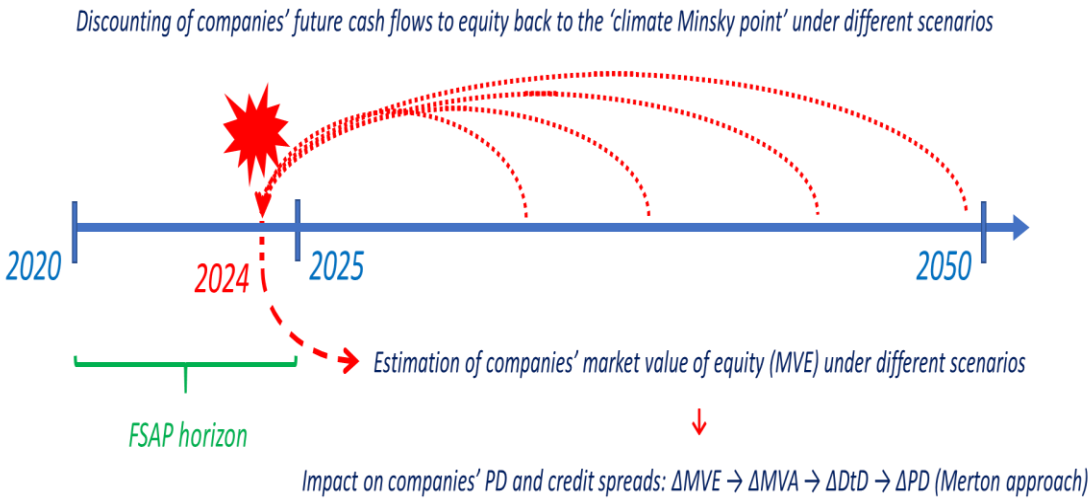
[c] = impact on sovereign bonds based on expected sovereign rating migration under RCP8.5 scenario (from Klusak et al., 2021) and IMF staff calculations

[d] = impact on loss distribution based on assumed increase in frequency and severity of U.K. floods, U.S. hurricanes and European windstorms

Sources: IMF staff calculations.

Figure 23. United Kingdom: The Logic of the 'Climate Minsky Moment'

"A wholesale reassessment of prospects, as climate-related risks are re-evaluated, [that] could destabilize markets, spark a pro-cyclical crystallization of losses and lead to a persistent tightening of financial conditions"



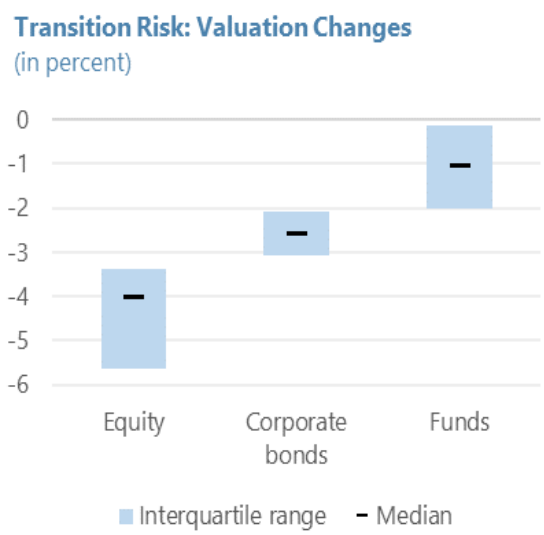
ΔMVE: change in market value of equity
ΔMVA: change in (unobserved) market value of assets
ΔDtD: change in Distance to Default
ΔPD: change in probability of default

Sources: Carney (2016) "Resolving the climate paradox," and IMF staff calculations.

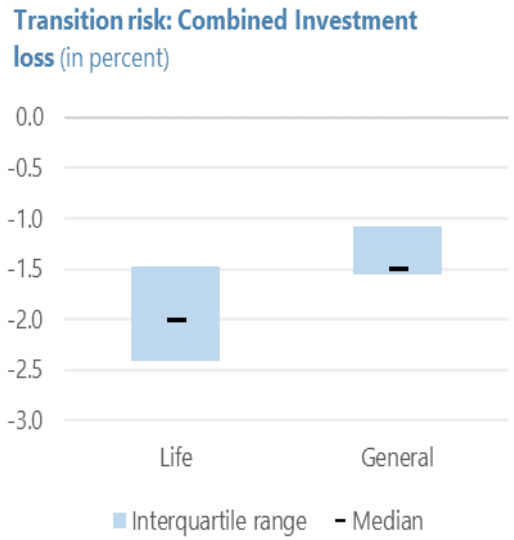
44. To retain its leadership on climate-related risk analyses, the BOE should accelerate the development of its own analytical toolkit. In the past years the BOE has led the global effort to fully incorporate the consideration of climate change in the financial industry and in the day-to-day activity of central banks and financial regulators. To remain at the frontier of the increasingly intense international dialogue on climate-related risks in the financial system, the United Kingdom must seek to complement its current framework with a larger suite of internal analytical tools: in particular, it could equip itself with a full-fledged suite of in-home models (at macro, sectoral, and micro levels) to run independent (top-down) scenario-based analyses of the impact of climate-related risks on financial institutions—as a few other central banks have recently done—and, in perspective, their propagation across the whole financial system. It will also be important to deepen the understanding of how financial firms' climate-related risks will be influenced by public policies, particularly around transitions risks (e.g., use of revenues from carbon taxes, energy efficiency measures, other decarbonization policies), but also for physical risks (e.g., future role of Flood Re and general disaster prevention policies).

Figure 24. United Kingdom: Insurance Climate Risk Analysis

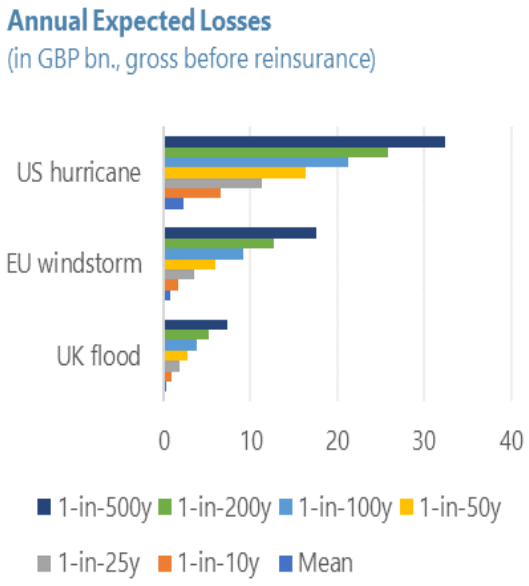
Equity holdings are most impacted by the transition risk scenario, while funds include also sovereign bonds, which were not shocked in the scenario.



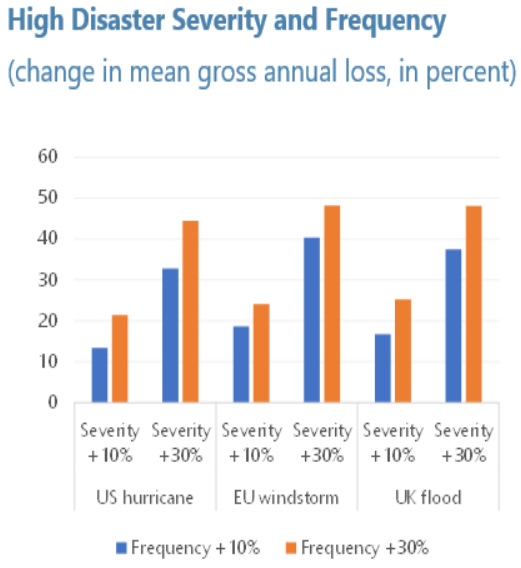
The relative impact of the transition risk scenario is slightly larger for life insurers, mainly due to longer bond durations.



U.K. insurers are materially exposed to U.S. hurricanes, European windstorms, and U.K. floods, but more than 70 percent of the losses from a 1-in-200-year event would be recovered from (mostly international) reinsurers.



Assuming a 30 percent increase of both severity and frequency of natural disasters, the annual expected loss of U.K. insurers would increase by up to 50 percent (before reinsurance).



Sources: IMF staff calculations based on PRA supervisory reporting data.

ISSUES IN SYSTEMIC RISK MITIGATION, OVERSIGHT, AND SUPERVISION

A. Macroprudential Framework

45. Financial stability considerations are at the center of the institutional framework in the United Kingdom. This has helped make the U.K. banking and insurance system more resilient post-GFC. There is effective collaboration and almost seamless data-sharing among departments within the BOE and across regulators, supporting macro- and microprudential objectives. The BOE's policy committees meet regularly and have overlapping membership to enhance coordination. The FPC relies on information-sharing and substantive analytical contributions from the PRA and the FCA, each of which runs its own regular "horizon scanning" exercise (Table 8). Joint meetings with the MPC or PRC are conducted where needed and became more frequent, for example, during the pandemic crisis.

Table 8. United Kingdom: FPC's Annual Assessment of Risks Banking and Selected Inputs

	Details	Timing
BOE (FSSR)	FPC's Risks Beyond Banking exercise	Q2 FPC discussion; publish in FSR
	Close monitoring and deep dives for FPC	Continuous; publish in FSR
PRA (PPD)	Horizon Scanning to monitor evolving cross-firm risks and threats	SRPC discussion three times p.a.
	Input from SRS, IBD, and insurance supervisors	Continuous
FMID	Review of potentially systemic payment systems	Annual paper for FMI Board
BPI	Horizon Scanning to monitor emerging payment risks and threats	Report to Risk Committee twice p.a.
FCA	Perimeter Report	Annual public report
	Horizon scanning by FinTech Hub	Continuous

Notes:
FSSR=BOE Financial Stability Strategy and Risk Directorate
PPD=PRA's Prudential Policy Directorate
SRPC=PRA's Supervision, Risk, and Policy Committee
SRS=PRA Supervisory Risk Supervisors
IBD=PRA's International Banks Directorate
FMID=BOE's Financial Market Infrastructure Directorate
BPI=BOE's Banking, Payments, and Innovation Directorate

Sources: U.K. authorities, IMF staff.

46. The FPC runs interagency processes to monitor financial stability conditions on a regular basis. The FPC's annual interagency Risks Beyond Banking (RBB) exercise assesses risks of roughly 40 nonbank activities. Since the last FSAP, the FPC has conducted several thematic deep-dives and continues to conduct its regular in-depth reviews of its rules for the housing market, including on the rules' calibration. The FPC also reviews the appropriateness of the regulatory perimeter in its RBB exercise.[13] However, consideration of insurance matters, cross-border NBFIs, interconnectedness and contagion occur relatively less frequently at the FPC. The next natural step is to expand the scope of systemic risk surveillance by the FPC on a continuing basis.

47. FPC's primary objective in setting the Countercyclical Capital Buffer (CCyB) is to ensure that the U.K. banking system can withstand stress without restricting essential services. The FPC record from November 2015 states that the CCyB should be 1 percent after a period of recovery, but before risks are elevated. The judgment to set the CCyB's neutral or standard risk rate in the region of 1 percent was based in part on an analysis in Brook et al. (2015)[14] and later confirmed by the conclusion of the 2016 stress test. The FPC announced an increase in the CCyB to 0.5 percent in March 2016, in line with this policy. Three months later, before the increase had taken effect, it lowered the CCyB to 0 percent to prevent risks from materializing following the U.K. referendum to leave the EU.

48. The FPC announced in December 2019 that the new neutral, standard risk rate of the CCyB would be two percent, to take effect 12 months hence. The main objective of the increase in the standard risk environment CCyB was to improve the responsiveness of capital requirements to economic conditions, so that banks would be better able to absorb losses and maintain lending through the cycle. The FPC also expected to lower the economic cost of the buffer build-up by moving early before risks were elevated. It expected banks' overall loss-absorbing capacity to stay broadly unchanged, as the PRA reduced Pillar II capital requirements accordingly.[15] However, the combination of a higher CCyB and lower Pillar II requirement raised the overall quality of capital by replacing Pillar II capital with the Tier 1 capital that the CCyB requires. Once the pandemic hit, however, the FPC lowered the CCyB to 0 percent. In December 2021, the FPC raised the CCyB to 1 percent, effective December 2022, as it judged that domestic risks to U.K. financial stability had returned to around their pre-COVID levels. This is in line with the FPC policy of raising the CCyB in measured steps to the 2 percent standard risk environment levels.

[13] To date, it has not found it necessary to recommend expansions to the 'regulatory' perimeter, although it said in the December 2019 FSR that it was considering its first recommendation, to regulate new payment services. Parliament and HMT ultimately determine which activities and entities are subject to regulation.

[14] Financial Policy Committee. "The Financial Policy Committee's approach to setting the countercyclical capital buffer." London: Bank of England (2016).

[15] BOE/PRA Policy Statement PS15/20, *Pillar 2A: Reconciling capital requirements and macroprudential buffers*, Bank of England, July 2020.

49. Evaluating systemic NBFI and cross-border risks remain a challenge. Data gaps continue to impair the U.K.'s ability to monitor, identify, and analyze NBFI risks (Box 2). While the FPC has acknowledged these risks in its systemic risk work for many years, progress is still to be made on the material data gaps mentioned in the 2016 FSAP.[16] The BOE has expanded its use of external data providers and market intelligence to mitigate data deficiencies while regulators have cooperated on ad hoc information requests and surveys.

Box 2. United Kingdom: Select Financial Stability Data Gaps

A list of key aspects concerning data gaps:

1. Overall, data collection of NBFI lending activities and cross border operations should be enhanced. International cooperation is also key to share data from trade repositories across jurisdictions.
2. Flow of funds data for domestic and foreign NBFIs must be completed.
3. Data on holdings of Sterling-denominated instruments should be collected by each type of investor.
4. Regular use can be made of the data available at the FCA on trading of sterling Gilts and corporate bonds to assess liquidity conditions.
5. On insurers, derivatives data enhancements and quality-check are essential for assessment of financial stability risks.
6. Data on cross-border business and intermediation channels is limited. This complicates an assessment of the systemic relevance of large international active insurers in third-country markets.
7. Data on funds is insufficient (low frequency, non-verifiability, and limited coverage) to assess potential liquidity demands in stress events. International cooperation is key to share data across jurisdictions.

Sources: IMF Staff.

50. Since the GFC, U.K. authorities have often taken the lead in international efforts to improve data and surveillance of market-based finance and will need to redouble those efforts following the pandemic. The FPC has special powers to call for new data collections but has not yet used them. That is partly because the international nature of market-based finance would limit the value of domestic-only collections. The BOE and FCA have been proactive in elevating market-based finance issues at the FSB and IOSCO.

51. Regulatory practice, data, and supervisory requirements, as well as cross-border data sharing vary across funds (U.K. authorized, U.K. unauthorized, U.K. managed). The response to the pandemic sparked ad hoc international information-sharing initiatives. For example, Luxembourg authorities shared information with the BOE about registered money market funds active in the United Kingdom. The BOE is seeking to formalize such agreements for normal times.[17] Going forward, stronger, and ongoing international coordination appears essential to enable the U.K. and other authorities to monitor the spectrum of cross-border nonbank financial firms, as illustrated by recent failures of international firms not regulated in the United Kingdom.

[16] Enhanced financial accounts (flow-of-funds) activities of NBFIs and buy-to-let mortgage market.

[17] For example, the FPC noted in its July 2021 FSR that international regulators need to develop a way to aggregate and share trade repository data to better analyze cross-border exposures in derivatives markets.

B. Microprudential Framework

52. The United Kingdom operates a sound and transparent regulatory and supervisory framework for banks and insurers. The PRA uses an array of tools and techniques to implement its risk-based approach. It has taken steps to address key concerns raised during the 2016 FSAP and increased the intensity of supervision on non-systemic smaller banks. The regulatory framework for insurance supervision is sophisticated and the United Kingdom. are leaders in supervisory techniques. Regulators have also implemented reforms to enhance firms' operational resilience. The joint PRA-FCA Senior Manager and Certification Regime (SMCR) rolled out from 2016 designed to increase individual accountability of senior managers is producing positive results, but the PRA has not yet used the full range of powers provided for by the framework.

53. However, a stronger 'on-the-ground' focus on individual banks, insurers and other systemically important financial firms and their activities is highly desirable—a point also made in earlier FSAPs. The current supervisory approach is a blend of a cross-firm supervision and firm-level oversight. The PRA has significant engagement with the largest and most significant firms, meeting senior management and key function holders very regularly. The PRA should use the full range of existing tools on a more frequent basis while conducting in-depth investigations and providing timely and substantive feedback to firms. This would provide better assurance that risks arising from the most complex activities and those that could materialize later in the context of COVID-19 are adequately measured and mitigated by firms. The potential that firms' risk management becomes hubristic should not be underestimated in the current environment. In banking supervision, the Section 166 Skilled Persons Review authority should also be used in a more proactive supplemental manner while the PRA increasingly develops more competencies internally. Indeed, the S-166 Review should not be a long-term solution to inadequate resourcing within the professional staff involved in banking and insurance supervision.

54. Cloud outsourcing heightens the need for more direct supervisory attention and understanding of the underlying structures and practices. The PRA and FCA lack express statutory authority to directly review and examine any critical services from cloud and other third-party providers to regulated entities. Firms' increasing use of the cloud to perform core services raises operational (and potentially systemic) risks given the relatively small number of providers involved. The authorities should seek legislation granting direct supervisory access to third-party providers.

55. The PRA and FCA are proactively addressing the financial risks associated with climate change into their regulatory programs. The PRA set a deadline of end-2021 for firms to have fully embedded supervisory expectations for the management of climate-related financial risks. In June 2021, it launched a Climate Biennial Exploratory Scenario exercise to explore the resilience of major U.K. banks, insurers, and the financial system to these risks. The Climate Change Adaptation Reports published by the U.K. financial regulators conclude that financial institutions have made tangible progress against supervisory expectations on climate. However, more remains to be done, especially with respect to firms' risk management and scenario analysis capabilities. Banks' climate disclosures

remain incomplete despite tangible progress, but further initiatives have been launched.[18] As they advance their proposals, it will be very important for the U.K. authorities to specify regulatory standards and guidance with sufficiently detailed requirements and expectations, building on existing work and in accordance with international standards that are currently being developed.

Banking-Specific Issues

56. International banking activities are a major regulatory and supervisory responsibility of the United Kingdom. International banks, including G-SIBs undertaking corporate and investment banking (CIB) activities, can operate in the United Kingdom as either subsidiaries or branches. The United Kingdom's entity-neutral approach is largely unique among jurisdictions hosting large financial centers. This has implications for supervision as it presents certain limitations and may raise practical challenges in the case of branches. The U.K. authorities have recognized their global responsibility to maintain top-notch prudential standards and that openness must be accompanied by financial and operational resilience. It will be important, however, for the PRA to further enhance cooperation with relevant third-country home authorities to maximize information sharing and supervisory collaboration and review regularly whether the approach to supervising international banking firms delivers the expected supervisory outcome and preserves financial stability.

57. The post-Brexit challenge will include streamlining the prudential framework while continuing to meet internationally agreed standards. The process of preserving the EU legislation has been completed, but at the end of the Brexit transition period, the United Kingdom is left with a relatively complex regulatory structure that integrates core aspects of the EU regulatory framework into a multilayered mix of primary legislation, on shored regulations and other statutory instruments, as well as technical standards, and PRA and FCA rules and guidance. The post-Brexit challenge will include streamlining the prudential framework and introducing appropriate levels of proportionality without weakening internationally agreed requirements and creating opportunities for regulatory arbitrage. The PRA intends to introduce proportionality measures into the prudential framework for banks that are neither systemically important nor internationally active. The diversity of deposit-taking institutions that comprise the U.K. banking sector is conducive to a proportional approach to regulation, but non-internationally active banks must remain subjected to rigorous prudential standards, broadly consistent with the Basel framework.

[18] Building on previous initiatives, the U.K. government published in October 2021 its Roadmap to Sustainable Investing, setting out details on new Sustainability Disclosure Requirements (SDR) and on the U.K. Green Taxonomy. An indicative path towards "*integrated economy-wide disclosure*" under the SDR framework has been proposed.

Insurance Issues

58. The United Kingdom has a highly developed framework for insurance supervision, implemented by highly sophisticated regulators. This is borne out in a very good assessment outcome of the FSAP 'Detailed Assessment of the IAIS Insurance Core Principles (ICPs) where 17 ICPs were found to be observed, six largely observed, and only one partly observed. The Solvency II framework inherited from the United Kingdom's former membership of the EU is a rigorous prudential framework, and the conduct requirements are similarly robust and both regulators are advanced practitioners of supervision. Post-Brexit, the United Kingdom should take care not to reduce these high standards while tailoring the adopted European requirements to the domestic and international aspects of its insurance market.

59. The Society of Lloyds and the broader London Market for specialist insurance is important for the United Kingdom and for many insurance markets in advanced economies and emerging markets. While the Society plays a useful economic and market role, the PRA should consider setting up a platform for supervisory cooperation for Lloyds to allow interactions with supervisors where Lloyds operates both regulated operations and operates in markets without physical operations. This will allow for better understanding of the role played by Lloyds in insurance markets around the world and can build on existing systemic risk analysis performed in relation to Lloyds. It would also foster understanding among other cross border supervisors of the supervisory activity performed by the PRA with respect to Lloyds.

60. The institutional framework is strong and the independence of the PRA and FCA should continue to be preserved. The risks can clearly be seen in the Solvency II review with HMT running the consultation process with the PRA in a central but essentially supportive role. One way forward to address this issue would be to ensure that requests for advice from the PRA are made transparently by HMT and that the PRA can provide that advice in an independent and transparent way. Any variation in final policy compared to PRA advice would then be clear.

61. The mission encourages HMT and the BOE/PRA to proceed with the development of a resolution regime for insurers, as such regime does not yet exist in the United Kingdom. Practically, insurers can be resolved through market transfers of portfolios of insurance liabilities, sale of companies, or winding-up of companies. There is a vibrant market for portfolios of insurance liabilities in the United Kingdom with some significant companies specializing in the market. The risk of a failure of a large insurer not being easily resolvable through market mechanisms or run-off is currently not addressed, although work to address this issue is in train. Currently, the United Kingdom is assessed as partly observed for ICP 12 (exit from the market).

CROSSCUTTING CHALLENGES TO FINANCIAL STABILITY

A. LIBOR Transition

62. Most LIBOR settings ceased in December 2021 and all will end by June 2023, creating urgency to rebase all contracts to more robust risk-free rates (RFRs). A voluminous stock of legacy contracts (amounting to around U.S.$14 trillion) needs to be transitioned, mainly in U.S. dollars. Many Sterling-denominated LIBOR-based assets mature after the end of Sterling LIBOR (Figure 25).

63. The United Kingdom as the regulator of LIBOR's administrator, has shown leadership in the LIBOR transition effort, which is well advanced domestically. Transition is well advanced in Sterling markets, importantly supported by the strong adherence to new protocols that will govern how derivatives contracts operate post-LIBOR (Figure 25). The United Kingdom, as host and regulator of LIBOR, has also effectively sponsored the global transition. Progress is less advanced in the key U.S. dollar markets that trade in the United Kingdom risking fragmentation in some key FX markets traded in the United Kingdom to the detriment of third-country users who might not have backup funding and hedging options available.

64. Mitigating LIBOR-related financial stability risks requires ending production of new LIBOR exposures, active conversion of legacy instruments, and a forward-looking oversight regime to prevent re-emergence of LIBOR-like risks. As the Sterling markets have moved off LIBOR, the focus is on converting legacy instruments to RFRs, supported using synthetic LIBOR in a limited number of cases. In FX-denominated instruments, the U.K. authorities have an important advocacy and support role to play, as foreign regulators complete their transitions while also managing risks to U.K. entities and supporting emerging market users. Looking forward, a more permanent preemptive oversight and risk management infrastructure needs development to help minimize the costs of future problems with emerging financial benchmarks.

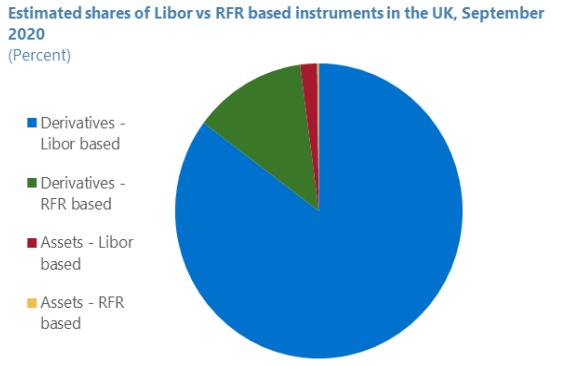
B. Open Banking and Crypto Assets

65. The United Kingdom's Open Banking (O.B.) initiative was launched in 2018 to increase competition.[19] The direct impact on banks' profitability from increased competition is contained by the relatively small size of U.K. banks' income from payment services (about 0.8 percentage points of return on equity) and the slow uptake of O.B. The entry of sizeable platform-based technology companies in future versions of O.B. could bring opportunities and risks. A gradual process should help contain risks, as the system adjusts to increased competition. However possible challenges to liquidity and income will bear minding within the current monitoring frameworks. Operational risks are mitigated by licensing and supervision of O.B. providers and safeguards for the Application Programming Interface (API) infrastructure underpinning O.B.

[19] O.B. allows consumers and SMEs to have more choices for certain financial services by securely sharing bank account information with regulated O.B. providers.

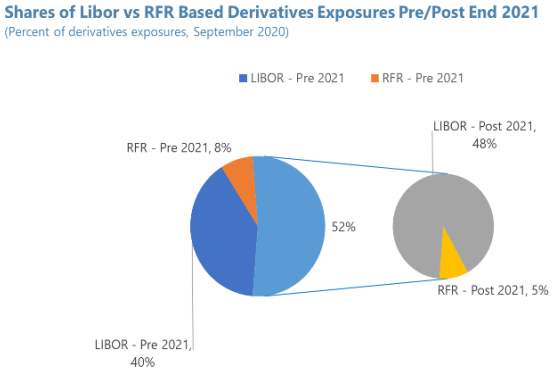
Figure 25. United Kingdom: Indicators of the Importance of LIBOR and Transition Progress

The bulk of LIBOR-based contracts are derivatives….



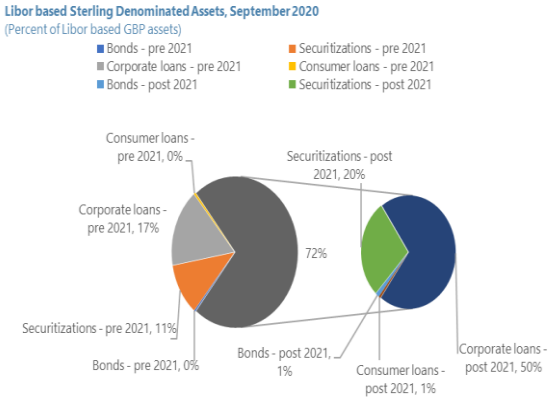
Sources: UK authorities and IMF Staff calculations.

Half of interest rate derivatives mature beyond 2021 and are mainly LIBOR based…



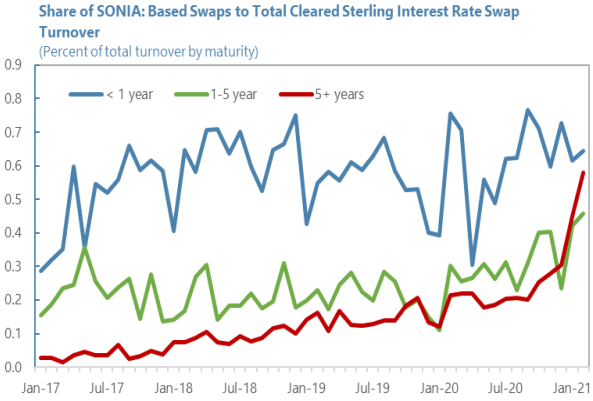
Sources: UK authorities and IMF Staff estimates.

Most Sterling-denominated LIBOR based assets expire post 2021 but are not retail instruments.



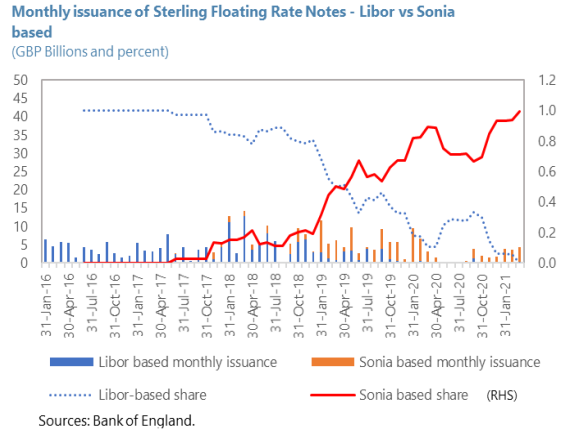
Sources: UK authorities and IMF Staff calculations.

Longer-term interest rate hedging instruments are well established for SONIA-based instruments ….



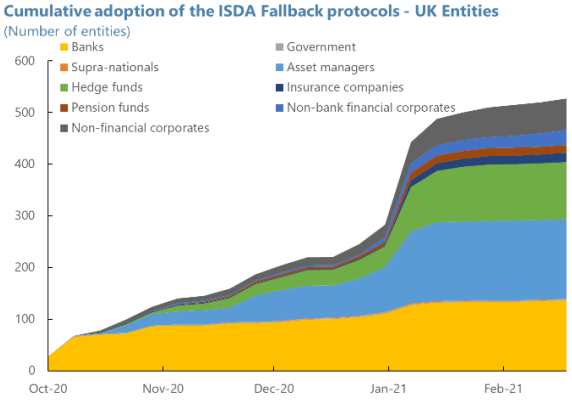
Sources: UK authorities.

The Sterling bond market has fully transitioned….



Sources: Bank of England.

There has been broad adoption of the ISDA fallbacks in the United Kingdom.



Sources: ISDA.

66. The acceleration of technological changes suggests a need to review policy coordination and develop more innovative and effective ways for the oversight of the digital finance markets. The ongoing structural transformation could increase competition in both domestic and cross border financial services and compound the existing sources of financial stability risks. Combined with a rapid entry of BigTech into financial services, the sector could face a considerable transformation. Building on the innovative Digital Regulation Cooperation Forum launched in 2020, formal mechanisms could be considered to ensure that the views from regulators are taken into consideration in deliberations on competition policy interventions as the needs for coordination across public policy interests in competition and stability continue to grow.

67. The United Kingdom has a proactive approach towards developing a policy framework and tracking risks posed by crypto asset innovation. The United Kingdom has issued regulations for crypto assets to ensure consumer protection, and regulations for stable coins are being developed following international guidance. As host of the most prominent global financial center, the authorities' commitment to innovation and robust regulatory standards will require a continued and special focus in containing emerging and possibly systemic financial stability risks arising from crypto's high-paced growth and increasing links to the financial system. Innovation will continue to challenge the status quo. While a steady state is presently hard to envision, policy and regulatory frameworks will need to remain nimble, and resources allocated appropriately and timely, allowing the oversight agencies to react quickly and prevent any rapid buildup of risks to financial stability.

C. Cybersecurity Threats

68. Safeguards against growing cyber threats are a top concern for U.K. authorities. Growing reliance on critical third parties to provide vital services is increasing risks, especially in the absence of greater direct regulatory oversight. In June 2017, the FPC set out a strategy to withstand and recover from cyber incidents. The authorities oversee cyber resilience by regulating and supervising the sector (macroprudential) and single firms (microprudential). The CBEST program, aimed at assessing the effectiveness of cyber defenses with simulated attacks, is the cornerstone of the testing strategy. The regulatory framework builds on good international practices and cross-sectoral cybersecurity standards.

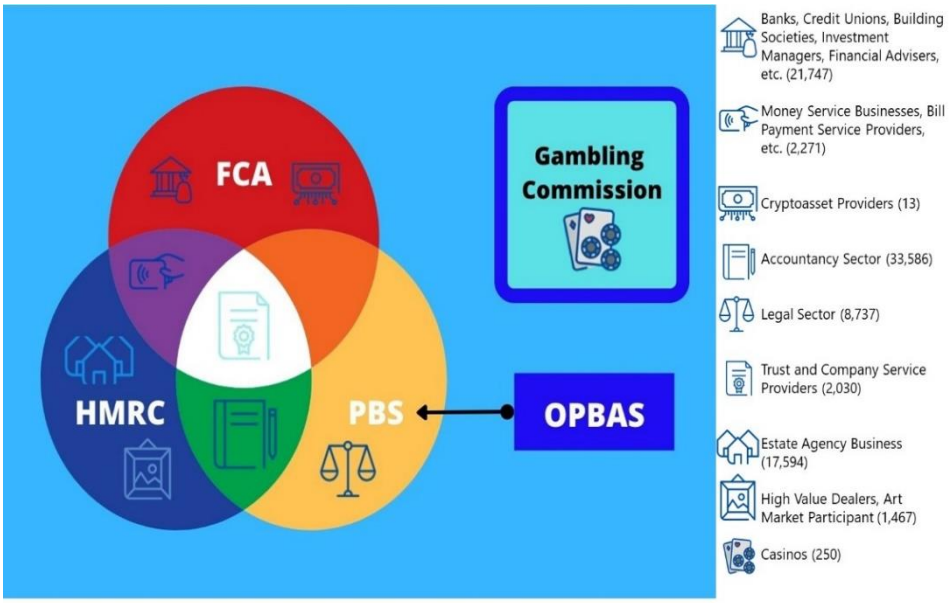
69. The cyber risk management framework must continue to be built to contain three financial stability concerns: (i) complexity of operational risks; (ii) unregulated third-party services; and (iii) span of entities covered. The United Kingdom must complement existing supervisory practices with onsite activities to verify the operational effectiveness of cybersecurity controls and to capture cyber incident underreporting. Statutory powers will allow a direct assessment of the resilience of any critical services provided by certain systemically important third parties (including cloud outsourcing). The FPC along with FCA and BOE/PRA should consider specific resilience standards for these providers and their inclusion in resilience testing.

D. Combating Financial Crimes and Safeguarding Financial Integrity

70. The United Kingdom continues to combat financial crimes across a wide range of activities (Figure 26). Its AML/CFT regime is one of the most effective worldwide (Figure 27). The FCA is strengthening proactive and reactive supervisory activities using modular/thematic approaches and data analysis. The People with Significant Control (PSC) Register allows public access to beneficial ownership information of legal entities and requires entities with AML/CFT obligations to report discrepancies. The authorities can share financial intelligence with foreign peers, and the Global Anti-Corruption Sanctions Regulations require the freezing of U.K. assets of designated persons involved in foreign corruption.

71. Several additional measures could boost the authorities' AML/CFT objectives. [20] To enhance the FCA's risk-based supervision, technology tools (e.g., machine learning) should be leveraged. Properly supervised "skilled persons" could supplement FCA's AML/CFT oversight functions for low-risk entities. Having OPBAS conduct direct AML/CFT supervision for low-capacity or high-risk PBS can maximize efficiencies and harmonize approaches. The proposed legislation to improve verification of information in the PSC register and for a beneficial ownership register for foreign entities owning U.K. properties should also advance, in addition to augmenting support to CDs and BOTs for adopting effective beneficial ownership registers. Unexplained wealth orders should continue to be utilized to confiscate illicit assets and generate financial intelligence for cross-border investigations.

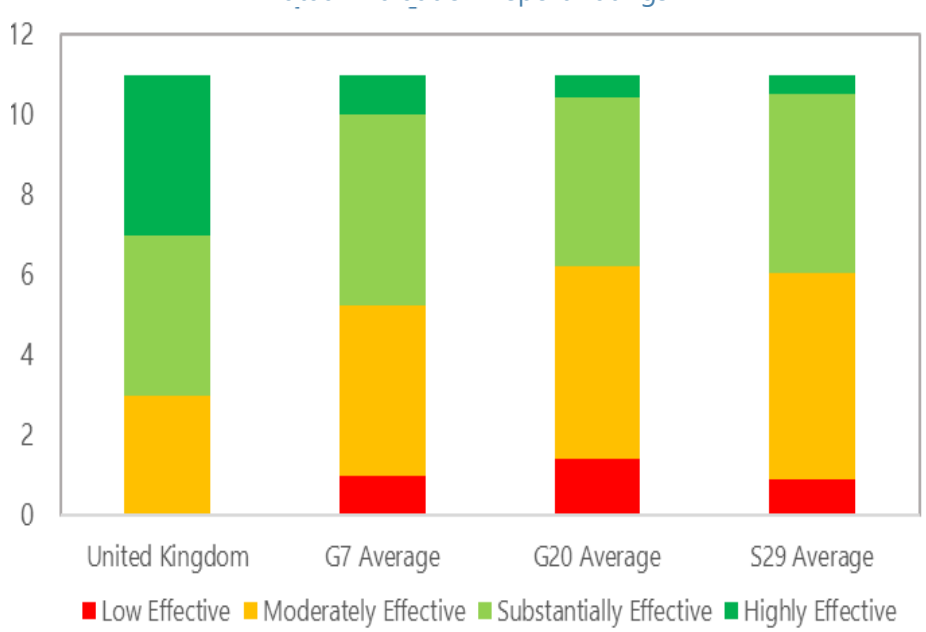
Figure 26. United Kingdom: Supervisory Population of Entities with AML/CFT Obligations
(as of end-December 2020)



Source: U.K. authorities and IMF staff calculations.

[20] 2019–22 Economic Crime Plan.

Figure 27. United Kingdom: AML/CFT: Comparison of Mutual Evaluation Report Ratings



Source: Financial Action Task Force.

PREPARING FOR FUTURE CRISES

A. Resolution Framework

72. Many of the 2016 FSAP recommendations on the financial safety net and crisis management have been followed by the United Kingdom. The United Kingdom is working towards the 2022 deadline to make all eight systemic U.K. banks resolvable. A comprehensive Resolvability Assessment Framework (RAF) supports the authorities and the firms in meeting this commitment. Material foreign subsidiaries and some mid-tier banks too are subject to the RAF, except for the reporting and disclosure requirements.

73. The authorities are strengthening their crisis readiness. The BOE has revamped its crisis readiness governance, including a Heightened Contingency Framework Project; HMT has furthered its Professionalizing Crisis Management Project. Similar developments are ongoing at the FCA and the FSCS. The authorities test and update their crisis readiness individually and collectively, including with U.S. and EU counterparts. The authorities should continue preparing for diverse failure scenarios, including fast-fail resolutions and concurrent failures of multiple systemic and mid-tier banks.

74. The special resolution regime (SRR) for banks appears robust but assigns HMT a critical role in firm-specific resolution decisions. The SRR includes modified insolvency regimes for banks, building societies, and investment firms. The BOE plays a crucial role in the court-based insolvency proceedings. Under certain conditions, HMT can also play a critical role in elements of firm-specific decisions although this remains untested, including in cross-border cases. Moreover, certain parts of the United Kingdom resolution regime that were introduced or maintained to comply with EU rules may constrain resolution funding. The authorities should eliminate these constraints from their rulebook, and review and explain to moderate HMT's involvement in firm-specific resolution decisions to focus on cases where public funds are at risk.

75. The authorities are considering enhancing the resolution regimes for CCPs and insurers. With modifications for CCP characteristics, the SRR applies to the three recognized U.K. CCPs, aiming to achieve the same objectives as the banks' SRR, under similar conditions and with similar powers. However, this regime predates pertinent international guidance issued since 2012; nor was the EU CCP RRP regime on shored prior to Brexit given it had not been yet implemented in the EU at that stage. HMT is considering statutory changes for an expanded CCP resolution regime with more powers for BOE. HMT, alongside the BOE, is also considering an SRR for insurers, and the PRA, together with the BOE, is developing an RRP approach for insurers. These legislative and policy efforts should be accelerated and complemented with a RAF-like regime.

B. Internationally Active Mixed Financial Groups

76. Internationally active financial groups are actively seeking arbitrage advantage through several demand-side and technology-based shifts. These entities seek to divert risk to areas where data, reporting, and oversight seem looser and avoid stronger regulation through regulatory arbitrage across jurisdictions. These entities (hybrid structures, finance companies, family offices, and other non-traditional forms) are also often CIB banks' counterparties (some of them are supervised in the United Kingdom). [21]

77. Recent cases that have garnered public attention involved excessive leverage in unregulated or lightly regulated entities, as well as limited disclosure requirements. While different, these cases illustrate the challenges of identifying vulnerabilities in dynamic cross-border NBFI activities. While the global supervisors later described the incidents as 'nonsystemic', the events point to neglected risks in cross-border activities that could have become systemic under different circumstances. The incidents have revealed that several banks and CIB branches did not have appropriate governance and risk management arrangements and were unable to monitor and mitigate risks arising from these activities. Moreover, supervisors did not systematically monitor these types of positions on a real-time basis and were not aware of the common exposures across banks globally. Elements in domestic regulatory regimes, such as the U.K.'s approach to "appointed

[21] As part of its international finance activities, private capital markets are also becoming a major force out of the United Kingdom for corporate and SME financing. This is routed mainly through "alternative asset managers", who offer private equity, venture capital and private credit funding options. Data on this practice is scant, and this trend needs to be fully explored with international cooperation.

representatives," also helped keep the risks off supervisors' radar. [22] Furthermore, these entities are not subject to detailed regulatory public disclosure requirements. Such or similar businesses, enhanced by ongoing technology transformation could amplify channels for arbitrage and bypassing of financial stability oversight.

78. The United Kingdom and peer foreign authorities should address data gaps and improve cross-border supervisory cooperation. The United Kingdom is already considering measures to address the data gaps, but any such effective reform will require international cooperation given the cross-border nature of these activities. The BOE could also expand its biannual survey of prime brokers to include in a more granular manner cross-border, cross-market, and cross-product exposures. The United Kingdom should consider whether its oversight over internationally active NBFIs operating in the United Kingdom should be expanded to include additional monitoring criteria. That would include the need to take a closer look at the unregulated entities of mixed cross-border groups to evaluate their impact on the regulated entities and any potential systemic implications. It also should review whether the existing supervisory cooperation arrangements provide sufficient information-sharing for effective monitoring of systemic risks. The authorities should also consider fundamental changes in the appointed representative regime.

C. Agency Independence and Resources

79. The U.K. financial regulators have separate mandates, with a clear focus on financial stability, safety and soundness, and market integrity. They also have, respectively, secondary objectives to facilitate effective competition and to support the economic policy of the government. Unlike the former Financial Services Authority, the PRA and the FCA do not have an express competitiveness mandate. However, this approach is being questioned increasingly. "Competitiveness" has been listed in Remit Letters issued by the Chancellor since 2015 as an aspect of government economic policy to which the FPC and PRA should have regard. The Financial Services Act of 2021 introduced additional considerations that the PRA must have regard to when making rules implementing Basel III standards, including the international competitiveness of the U.K. financial sector.

80. Moreover, HMT's Financial Services Future Regulatory Review (FRF review) has sought comments on redesigning the regulatory framework for financial services regulators.[23] Under the proposal, regulators would be empowered to set out the regulatory and supervisory requirements that apply to firms while being subject to enhanced accountability and other arrangements. The proposal also introduces a statutory secondary objective for the FCA and PRA to "facilitate the long-term growth and international competitiveness of the U.K. economy."

[22] Under U.K. laws, an appointed representative can carry out specific regulated activities without direct government oversight if a regulated firm, known as the appointed representative's "principal," has agreed to take responsibility for them.

[23] After a first consultation in October 2020, HMT has published for consultation in November 2021 a second package of detailed proposed measures.

81. Certain measures could constrain U.K. regulators' ability to discharge their new rulemaking responsibilities. Taken in totality, measures simplifying the rulebook, delegating rulemaking, and expanding the regulatory remit to new activities are beneficial. The process of repealing relevant retained EU law and replacing it with regulators' new rules will maintain continuity of regulatory requirements. Other proposals will need to be designed carefully, to ensure the FCA and PRA maintain their focus on their primary prudential objectives and can retain their operational independence.

82. Going forward, preserving the primacy of the U.K. regulators' general objectives in principle and practice will be paramount. Delegating responsibility to the regulators for setting requirements that are often technical and complex is beneficial, but the United Kingdom must avoid a proliferation of wider financial services policy priorities that could divert focus from financial stability. Enhanced accountability and transparency mechanisms should also operate in a way that preserves the independence of regulators and should not reduce operational and regulatory effectiveness. Concerning resolution, strengthening the operational autonomy of the BOE where public funds are not at risk and the FSCS regarding funding, and ensuring that the BOE undertakes the resolvability assessments of the banks with a high degree of autonomy will be critical. Maintaining robust and high-quality regulatory standards that naturally encourage investment and growth is the best way to preserve the United Kingdom's role as a major financial center.

83. Always maintaining adequate skills and resources for systemic risk oversight, and supervision of systemically important financial firms and financial markets is crucial. The current level of resources is fully deployed given the range and nature of the tasks outlined in the FSAP report. Going forward, new post-Brexit prudential rulemaking responsibilities, an increased number of firms to be supervised after Brexit, the need for more intrusive supervisory practices, new climate change responsibilities, rapid technological change, the need to deliver on major U.K. financial sector projects, and participating in international standard setting body activities will require the BOE/PRA and FCA to carefully evaluate and maintain the level of resources required to deliver on their objectives for regulated firms. The authorities should also continue to pursue staffing resources for resolution and crisis management that are commensurate in quantity and quality with increasing demands due to market developments and policy ambitions. Leveraging technologies (big data and machine learning) and exploring further data and platform synergies between the BOE/PRA and the FCA can support timely identification of risks, maximize oversight efficiencies, and move the financial stability framework to the next level. Finally, and related to agency independence and resources, the FSAP welcomes the progress made by the United Kingdom in taking forward the recommendations of the 2016 FSAP and urges the authorities to assign resources to complete the implementation of those FSAP recommendations where action has been initiated but work is underway (Appendix IV).

AUTHORITIES' VIEWS

84. The authorities welcomed the FSAP, offering their appreciation of the IMF's work, and remain highly supportive of FSAPs as financial stability tools. Overall, they agreed with much of the assessment and found the conclusions broadly reasonable. They welcomed the assessment's positive endorsement of the United Kingdom's effective financial stability framework, its prudential policies, and the overall stability of the United Kingdom as a global financial center which acts as a global "public good." They especially welcomed the strong emphasis placed by the FSAP on ensuring financial stability remained the primary objective of financial sector oversight. The authorities stressed their commitment to developing and adhering to the highest standards and practices for financial regulation and supervision. They welcomed the FSAP's recognition of the United Kingdom's unrelenting commitment to international cooperation and collaboration. The authorities indicated their intent to assess and follow up on the FSAP recommendations and agreed to publish the FSSA and FSAP Technical Notes and the Detailed Assessment Report (DAR).

85. The FSAP reviewed several high-profile challenges for global financial stability and the authorities welcomed the IMF's efforts both to share lessons learned with the international community and to help drive the necessary global response. The authorities welcomed the IMF's positive feedback on the authorities' mitigation of financial stability risks that could otherwise have resulted from the end of the Brexit transition period and on the United Kingdom's response to the pandemic, agreeing on the need to continue enhanced monitoring of risks to financial stability stemming from the protracted pandemic. Noting the IMF's detailed review of insurance and banking supervision, the authorities concurred with the FSAP's very positive assessment of their approach and the increased resilience of U.K. banks and insurers. The authorities appreciated the IMF's observation of the leading role they have played in the global transition away from LIBOR and welcomed the opportunity to share their leading approach to mitigating climate risks. On NBFIs, the authorities emphasized that while responsibility for addressing many of the key risks identified rests at a global level, the United Kingdom. intends to be at the forefront of this work. More broadly, the authorities acknowledged that the complexities of modern-day finance, with a more digital, cross-border business model, require stronger global cooperation to maintain effective systemic risk monitoring and mitigation. Finally, the authorities noted their confidence in current decision-making processes to deal with emerging risks but recognize that new technologies and emerging issues require continued analysis, consistent communication, and appropriate collaboration with all relevant domestic and international stakeholders.

Banking Sector: Solvency Test			
Domain		**Framework**	
		Top-down by FSAP Team	**Bottom-up by Bank of England[1]**
1. Institutional perimeter	Institutions included	Eight major banks and building societies.	Eight major banks and building societies.
	Market share	Approximately 75 percent of PRA-regulated banks' lending to the United Kingdom real economy.	Approximately 75 percent of PRA-regulated banks' lending to the United Kingdom real economy.
	Data and baseline date	Effective date: end-December 2020. Data: Banks' submissions as part of the Annual Cyclical Scenario (ACS), performed by the BOE, FINREP, COREP, HBRD. [2] Scope of consolidation: Global consolidated group basis, except for Santander U.K. plc, whose parent is supervised by a foreign authority.	Effective date: end-December 2020. Data: Banks' submissions as part of 2021 solvency stress test but banks will not be requested to submit baseline projections. Scope of consolidation: Global consolidated group basis, except for Santander U.K. plc, whose parent is supervised by a foreign authority.
2. Channels of risk propagation	Methodology	IMF Solvency Stress Test Workbox (Balance-sheet based approach)	Standard BOE approach that uses a dynamic balance sheet approach. Solvency stress test also includes a traded risk stress that is calibrated to be consistent with the shocks in the macro scenario.
	Satellite Models for Macrofinancial linkages	A comprehensive battery of econometric models. Credit Risk: Satellite models that link credit risk variables with macroeconomic variables per asset class for domestic exposures and per geographical location for foreign exposures. Different sample periods are considered in the estimations, including, and excluding 2020. When 2020 is included a dummy variable for the quarters affected by the pandemic is added as a regressor. Selected models are used to project loan losses under various scenarios. The estimates	Banks use their own models to comprehensively project their P&L and capital results. The Bank also uses its own set of econometric models to form a judgment around reasonableness of banks' results. These will be used for the 2021 solvency stress test. Credit Risk: A range of internal stress test models are used to project credit losses. The mechanics of the individual models vary, but

		are augmented with the output of the corporate stress testing exercise. Market risk: valuation losses from full revaluation of sovereign securities, corporate fixed income debt securities and equity holdings are calculated using a Mark to Market (MTM) approach for fair-valued securities. Valuation losses of securities held at amortized cost are calculated using a credit risk approach. Valuation changes in open positions in foreign currency, commodities and equities are estimated based on fluctuations in the exchange rate, the commodity prices, and the equity prices under the scenarios. Interest rate risk: A gap analysis is conducted based on data on the asset/liability structure of individual banks broken into types of funding sources and time to re-pricing buckets. Interest margin shocks vary per scenario. Other P&L components: Interest income is calculated via estimation and projection of lending/borrowing rates (via satellite models), applied to new and variable rate loans. Residual income components (e.g., net fee and commission income) are either estimated via satellite models. Non-performing loans do not generate any income. Macrofinancial feedback effects. The team developed a parallel exercise that accounts for macrofinancial feedback effects following a framework similar to Catalan and Hoffmaister (2020). The exercise is comprised of two modules that are integrated with the Workbox: Credit Growth model: Elasticities of credit growth to macroeconomic variables and bank sector variables (CAR and NPL). SVAR (Structural Vector Auto Regression): Elasticities of macroeconomic variables to aggregate bank loan.	each one takes various economic scenario variables as inputs, and ultimately aims to project credit impairment charge over the horizon. Model outputs are not necessarily used directly, but instead help us to form judgements on results, and the reasonableness of submissions received from participating firms. Three internal models cover U.K. mortgages (each designed differently, and so giving alternative views). Two alternate models cover corporate exposures, again primarily focusing on U.K. exposures. Interest rate risk: A gap analysis is conducted based on granular data on asset/liability structure of individual banks and time to re-pricing buckets. Net interest income: Net interest income will be calculated via estimation and projection of lending/borrowing rates. Other P&L components: Residual income components (e.g., net fee and commission income) will be either estimated/projected or assumed to stay at the level observed for 2020. Non-performing loans will not generate any income.

	Stress test horizon	5 years (2021-2025)	5 years (2021-2025)
3. Tail shocks	Scenario analysis	Three macroeconomic scenarios (baseline and two adverse) agreed with the authorities The baseline scenario is based on the October 2021 WEO projections. Scenario 1: Adverse with scarring. The pandemic recedes in the first half of 2021 as vaccination campaigns pick up, yet later in the year it becomes clear that new variants of the virus will continue to emerge across the world with increasing frequency. The new strains prove to be even more contagious or pathogenic, and resistant to existing vaccines and therapies. With the adaptation of vaccines taking longer than anticipated the pandemic is assumed to be under control not earlier than late 2022 for advanced economies, including The United Kingdom., and by the end of 2023 for the rest of the world. Global trade is depressed as asynchronous resurgences of the pandemic disrupt international supply chains and precipitate an acceleration of de-globalization (e.g., permanent reshoring, vaccine nationalism, long-lasting travel bans). Weaker global economy activity prompts sharp increases of risk premia, which in turn expose financial and fiscal vulnerabilities. Domestically, difficulties in adjusting to the new U.K.-EU agreement prove to be more severe than expected and further lower GDP growth over the short-term. Over the medium and long term, further market fragmentation increases the cost of financial services in the EU and the United Kingdom. The continuing uncertainty about the adjustment path leads to a decrease in business investment and weighs on potential growth. Despite the brief easing of COVID-related restrictions in the middle of the year, the compound effects of the pandemic and the post-Brexit adjustments results in real GDP growth of only 0.5 percent in 2021. Amid the intensifying pandemic real GDP recovers by only 1.6 percent in 2022. The scenario is also characterized by an	One macroeconomic scenario. The adverse scenario used for the 2021 solvency stress test is a severe path for the economy in 2021–25 on top of the economic shock associated with the COVID pandemic that occurred in 2020. It is broadly consistent with the 'double-dip' scenario generated in the FPC's reverse stress test of August 2020 and represents an intensification of the macroeconomic shocks seen in 2020. The traded risk stress will be consistent with the macroeconomic scenario – but there will be no separate traded risk scenario. The global stress causes financial market participants' perceptions of risk to increase, and their risk appetite to diminish. Credit risks rise in several markets. As in previous tests, participating banks will be asked to submit stressed misconduct costs for known issues.

		increase in unemployment and a drop in residential and commercial real estate prices. Scarring in the medium term is manifested by lower potential output growth by 0.3 percent with respect to the pre-COVID period and higher natural unemployment rate. Scenario 2. Adverse with sudden tightening of global financial conditions. With the pandemic in the global rearview mirror, consumer spending picks up, supported by the drawdown of savings accumulated during the pandemic (for continuously employed workers) and by government support that is receding only gradually (for workers in industries affected by lockdowns). Meanwhile, low investment during the pandemic, business failures, as well as skill mismatches on the labor market reduce global spare capacity. As the global recovery proceeds, energy and commodity prices rise on a sustained basis. The push by many countries to localize key value chains (including but not limited to medical products) reduces the role of globalization as a driver of productivity gains and disinflation. Cautious not to stifle the nascent recovery, major central banks around the world accommodate rising inflationary pressures in the near term, with the Fed showing the greater inflation tolerance among AE central banks in line with its new monetary policy framework. Thus, while policy rates remain near zero, term premia rise sharply as markets revisit inflation expectations, leading to an abrupt increase in the borrowing cost of corporates and sovereigns. This tightening of global financial conditions weighs further on already-low post-pandemic investment while unemployment, despite some initial improvement resulting from the relaxation of containment measures, remains elevated. Central banks finally raise short term rates rapidly [by 2022/2023] while uncertainty about the pace of quantitative tightening creates upwards pressure on term premia and long-term rates, exerting financial strains on households with variable rate mortgages. Equity prices, which	

		are flat over the near term due to the improvement in economic prospects counterbalancing the rise in long-term rates, decline as policy tightening becomes inevitable. In the United Kingdom, a reduction is risk appetite of foreign investors leads to sterling depreciation and further contributes to goods price inflation. Like the baseline, potential output recovers as pandemic-related supply restriction ease, yet intensifying supply-side snags prevent its full recovery to the pre-COVID path. The adverse scenarios are simulated using the IMF's Global Macro financial Model (GFM).	
4. Risks and buffers	Positions/risk factors assessed	<u>Credit risk (provision costs)</u> Estimated according to Basel III framework. Credit risk includes: (i) lending risk from exposures to sovereign, public entities, financial institutions, corporates, and other; (ii) mortgage-related lending. Positions include cross-border loan exposures; (iii) retail lending. <u>Sovereign risk</u> Mark-to-market valuation of securities (from shocks to interest rates and credit spreads) in trading book and Available for Sale/Fair Value Option (AFS/FVO) linked to macro scenario. <u>Market risk other than sovereign risk</u> Market stress from shocks to changes in interest rates, credit spreads, exchange rates, commodities, and equity prices. <u>Profits</u> Interest income declines for lost income from defaulted loans. Interest rate risk in the banking book Interest expenses increase due to rising funding costs linked to the macroeconomic scenario with empirically estimated pass-through. Net fee and commission income, other income and non-interest expense evolve with macroeconomic conditions. No change in business models (no rebalancing of portfolio)	<u>Credit risk (provision costs)</u> Estimated according to Basel III framework. Credit risk includes all credit risk exposures to ensure the entirety of balance sheet is captured. <u>Market risk</u> Direct losses due to market moves for fair valued banking book positions and on trading book positions Equity and debt including leveraged loans underwriting positions. Investment banking revenues. Losses from large single name defaults and defaults in specific groups of smaller counterparties. Changes in valuation adjustments, principally CVA, FVA and PVA. Changes to market risk, counterparty credit risk and CVA RWAs. <u>Profits</u> Banks' submissions should reflect their corporate plans, including any cost or business changes. These should be adjusted

			appropriately to reflect changes in the expected performance and execution of these plans in the stress scenario, including business-as-usual management actions 2021 solvency stress test will include a comprehensive of banks' profit projections that will include: Net interest income. Investment banking income. Net fee and commission income and other income Expenses. Misconduct costs and other non-underlying costs.
	Behavioral adjustments	Balance sheet growth assumptions: Loan portfolios are assumed to grow uniformly across the in-scope banks at the nominal GDP growth rate of the scenarios, with no change in composition (except for new NPLs). Balance sheet composition remaining constant over the stress test horizon. Banks can only accumulate capital through retained earnings. Maturing assets are replaced by exposures of the same type and risk. Statutory tax rates. Dividends are linked to banks' net profits. Under positive profits and capital ratios above hurdle rates, the dividend payout is set at 30 percent. Otherwise, no dividend payout is assumed. If a bank's capital ratio falls below regulatory minimum during the stress test horizon, no prompt corrective action is assumed. Management actions are not incorporated.	Balance sheet size and composition is dynamic. Banks' submissions should reflect their corporate plans, including any cost or business changes. These should be adjusted appropriately to reflect changes in the expected performance and execution of these plans in the stress scenario, including business-as-usual management actions and strategic management actions. Banks' stock of secured lending to U.K. individuals, consumer credit to U.K. individuals and lending to U.K. PNFCs should increase in each year of the stress projection by at least the growth rates provided by the Bank for these asset classes. The published growth rates

			assume there are no provisions or write-offs during the stress period. Effective tax rates. In the 2021 stress test, banks should include ordinary dividend payments that they project their boards would approve in the stress scenario There is no mechanical link between the stress test results and the setting of capital buffers or other regulatory response, the Bank will consider each bank's capital low point against their hurdle rates.
5. Regulatory and market-based standards and parameters	Calibration of risk parameters	<u>Parameter definition</u> Point-in-Time (PiT) PDs and LGDs for expected losses (numerator of the capital ratio) and Through-the-Cycle TtC PDs and LGDs for RWA (denominator). Transition rates between stages 1-2-3 (under IFRS 9) are inferred from available information. Domestic Corporate PDs are also derived from the output of the corporate stress test exercise, as a robustness check. <u>Parameter calibration</u> PDs and LGDs evolve with the macroeconomic and financial variables of the scenario.	<u>Parameter definition</u> Internal credit models will project PiT PDs and LGDs. Risk weighted assets are not modelled internally, and we do not have internal projections of regulatory parameters (TTC PDs, downturn LGDs etc.). However, participating firms do model these aspects, submit them as part of their projections. IFRS 9 stage transitions are again not modelled internally, and we do not request them as part of the results submission. <u>Parameter calibration</u> PDs and LGDs evolve with the macroeconomic and financial variables of the scenario.
	Regulatory standards	Capital definition according to Basel III/PRA rulebook, including CET1, Tier 1, and total CAR. Hurdle rates: Pillar 1 and 2A CET1 Requirements plus systemic buffers (G-SIB, O-SII, and SRB); leverage ratio requirements.	Capital definition according to Basel III/PRA rulebook – CET1, Tier 1 and Total capital ratios as defined in the CRR and end-point Tier 1 leverage ratio as per the U.K. leverage ratio framework

		Results are reported on a fully loaded basis, i.e., IFRS9 transitional arrangements are not accounted for.	Banks are required to apply IFRS 9 in their starting position and throughout the projection period. Hurdle rates/Reference points: Pillar 1 and 2A CET1 Requirements plus systemic buffers (G-SIB and SRB).
6. Reporting format for results	Output presentation	Evolution of CET1, Tier 1, CAR for the aggregate banking system. Decomposition of key drivers to aggregate net profits and aggregate CET1 capital ratios. Cumulative impairment charges by bank for The United Kingdom. and other specific countries impacted by the scenario. Number of banks and share of total assets below hurdle rates.	Individual firm-by-firm results from the stress test will published in Q4 2021. As in previous years, the Bank is committed to disclosing as much information as necessary to explain the results of the stress test. This will include at least as much bank-specific information about the headline impact of the stress on capital adequacy as was in the 2019 stress-test results publication (e.g., bank specific impairment charges and traded risk losses) Aggregate information will also be published in Summer 2021. The Q4 publication will also include details of the impact of the stress on the U.K. banking system in aggregate, including a decomposition of key drivers to aggregate changes in the CET1 and Tier 1 leverage ratio and further details of aggregate impairments by asset class and geography.

Refers to the 2021 Solvency Stress Test exercise rather than Annual Cyclical Scenario (ACS). Key differences with respect to the ACS are that the latter includes baseline projections and the approach to traded risk is different.

[2] de-Ramon, S., Francis, W., Milonas, K. (2017) An overview of the U.K. banking sector since the Basel accord: Insights from a Regulatory Database. Bank of England Staff Working Paper SWP 652, March 2017.

		Top-Down by IMF
Insurance Sector: Solvency Risk		
1. Institutional perimeter	Institutions included	• 8 life insurance groups. • 6 general insurance groups.
	Market share	• Life: 71 percent (gross premiums written) • Non-life: 70 percent (gross premiums written)
	Consolidation	• Group level
	Data	• Regulatory reporting
	Reference date	• December 31, 2020
2. Channels of risk propagation	Methodology	• Investment assets: market value changes after price shocks, affecting the solvency position • Insurance liabilities: impact on value of the best estimate by changing discount rate of future cash flows, proportionate change also for the risk margin • Recalculation of required capital after stress: approximated by the Solvency II standard formula also for internal model users
	Time horizon	• Instantaneous shock

3. Tail shocks	Scenario analysis	• Scarring scenario:
		  • risk-free interest rates (without volatility adjustment) -29 bps (1y GBP), -139 bps (10y GBP); -44 bps (1y EUR), -180 bps (10y EUR); -12 bps (1y USD), -143 bps (10y USD).
		  • sovereign bond spread +80 bps (domestic), +70 bps for other low-yield advanced economies, up to +160 bps for emerging and developing economies.
		  • stock prices -19.5 percent (domestic), -25.0 percent (United States and Euro area), -15.0 percent (other advanced economies), -25.0 percent (emerging and developing economies).
		  • property prices -14.6 percent (domestic, residential), -29.7 percent (domestic, commercial), -10.0 percent (foreign, residential), -18.0 percent (foreign, commercial).
		  • corporate bond spreads between +70 bps (AAA, non-financials) and +290 bps (B and lower, non-financials), and between +85 bps (AAA, financials) and +320 bps (B and lower, financials)
		• Tightening of financial conditions:
		  • risk-free interest rates (without volatility adjustment) +462 bps (1y GBP), +111 bps (10y GBP); +335 bps (1y EUR), +61 bps (10y EUR); +240 bps (1y USD), +68 bps (10y USD).
		  • sovereign bond spread +50 bps (domestic), +30 bps for other low-yield advanced economies, up to +180 bps for emerging and developing economies.
		  • stock prices -15.8 percent (domestic), -15.0 percent (United States and Euro area), -15.0 percent (other advanced economies), -30.0 percent (emerging and developing economies).
		  • property prices -8.4 percent (domestic, residential), -20.1 percent (domestic, commercial), -6.0 percent (foreign, residential), -8.2 percent (foreign, commercial).
		  • corporate bond spreads between +40 bps (AAA, non-financials) and +320 bps (B and lower, non-financials), and between +70 bps (AAA, financials) and +360 bps (B and lower, financials)

	Sensitivity analysis	• Default of largest financial counterparty
4. Risks and buffers	Risks/factors assessed	• Market risks: interest rates, share prices, property prices, credit spreads • Credit risks: default of largest financial counterparty • Summation of risks, no diversification effects

		Top-Down by IMF
Insurance Sector: Solvency Risk		

	Buffers	• Solvency II long-term guarantee measures and transitionals:
		  • Matching Adjustment (MA)
		  • Transition on Technical Provisions (TMTP)
		  • Unit-linked life insurance: Investment losses borne by policyholders

	Behavioral adjustments	• None
5. Regulatory standards and parameters	Regulatory/ accounting standards	• Solvency II • National GAAP
6. Reporting format for results	Output presentation	• Impact on valuation of assets and liabilities • Impact on solvency ratios (including and excluding the effect of long-term guarantee measures and transitionals) • Contribution of individual shocks to changes of eligible own funds • Dispersion measures of solvency ratios • Capital shortfall and possible de-risking of investment assets to re-establish a full coverage of solvency requirements
Insurance Sector: Liquidity Risk		
1. Institutional perimeter	Institutions included	• 5 life insurance groups: Aviva Group, Legal & General Group, M&G Group, Royal London Group, Scottish Widows Group
	Market share	• Life: 51 percent (balance sheet assets)
	Data	• Regulatory reporting
	Reference date	• December 31, 2020
2. Channels of risk propagation	Methodology	• Revaluation of derivative positions after interest rate shock,
	Time horizon	• Instantaneous (1 day, 5 days)
3. Tail shocks	Scenario analysis	• None
	Sensitivity analysis	• Parallel shift of the interest rate term structure (for all currencies): +25 bps, +50 bps, +100 bps
4. Risks and buffers	Risks/factors assessed	• Liquidity risk: Margin calls for interest rate swaps
	Buffers	• None
	Behavioral adjustments	• None
5. Regulatory standards and parameters	Regulatory/ accounting standards	• Solvency II • National GAAP
6. Reporting format for results	Output presentation	• Total amount of variation margin calls • Variation margin as percent of cash holdings • Variation margin as percent of high-quality liquid assets

Risks	Likelihood	Expected Impact of Risk
Conjunctural Shocks and Scenarios		
Global resurgence of the COVID-19 pandemic. Local outbreaks lead to a global resurgence of the pandemic (possibly due to vaccine-resistant variants), which requires costly containment efforts and prompts persistent behavioral changes rendering many activities unviable.	Medium	Demand for contact-intensive sectors remains low for longer. Firms face a prolonged increase in production costs. Corporate bankruptcies and longer-term unemployment increase, causing persistent scarring effects. Bank losses on domestic and cross-border exposures materialize due to higher debt service to income ratio for leveraged corporations and households. Banks' capital declines, in turn depressing the economic recovery with weaker credit growth for a prolonged period (second-round effects).
Disorderly transformations. COVID-19 triggers structural transformations, but the reallocation of resources is impeded by labor market rigidities, debt overhangs, and inadequate bankruptcy resolution frameworks. This coupled with a withdrawal of COVID-19-related policy support, undermines growth prospects, and increases unemployment, with adverse social/political consequences. Adjustments in global value chains and reshoring (partly driven by geostrategic and national security concerns) shift production activities across countries.	Medium	Reshuffling of global value chains increases production costs and contributes to inflation. Permanent reshoring and less trade reduce potential output. Prolonged unemployment and protracted corporate insolvencies weigh on banks' asset quality.
De-anchoring of inflation expectations in the U.S. leads to rising core yields and risk premia. A fast recovery in demand (supported by excess private savings and stimulus policies), combined with COVID-19-related supply constraints, leads to sustained above-target inflation readings and a de-anchoring of expectations. The Fed reacts by signaling a need to tighten earlier than expected. The resulting repositioning by market participants leads to a front-loaded tightening of financial conditions and higher risk premia, including for credit, equities, and emerging and frontier market currencies.	Medium	Higher debt service and refinancing costs lead to increasing defaults among corporates and households and mounting credit losses. A severe price correction in the real estate market leads to losses on residential and commercial real estate loans. Higher interest rates could lead to mark-to-market losses on debt securities.
Rising commodity prices amid bouts of volatility. Commodity prices increase by more than expected against a weaker U.S. dollar, post-pandemic pent-up demand and supply disruptions, and for some materials, accelerated plans for renewable energy adoption. Uncertainty surrounding each of these factors leads to bouts of volatility, especially in oil prices.	Medium	A persistent rise in the price of imports passes through to U.K. domestic inflation. Volatility in financial markets and a rise in risk premia leads to an increase in debt service burden for banks' counterparts and losses in banks' bond portfolios

Structural Risks		
Cyber-attacks on critical infrastructure, institutions, and financial systems trigger systemic financial instability or widespread disruptions in socio-economic activities and remote work arrangements.	Medium	Disruptions in the real economy and in financial services undermine consumer and business confidence and negatively affect asset quality. Amid concerns about counterparty risk, funding market freeze and risk premia spike.
Higher frequency and severity of natural disasters related to climate change cause severe economic damage to smaller economies susceptible to disruptions and accelerate emigration from these economies. A sequence of severe events in large economies reduces global GDP and prompts a recalculation of risk and growth prospects. Disasters hitting key infrastructure or disrupting trade raise commodity price levels and volatility.	Medium	Damages from increasingly frequent and severe hazards (esp. floods in The United Kingdom) and from increasing surface temperatures and extreme weather events (out of The United Kingdom) affect the probabilities of default of corporates and households and the value of their collateral, leading to an increase in banks' credit losses. The global policy response to mounting evidence of climate change impact on the economy leads to a sharp acceleration of the transition to a low-carbon economy, determining a drastic reassessment of asset values and causing significant losses in equity and bond portfolios with large concentrations in high-carbon sectors.
Stronger impact from Brexit. Greater implementation disruptions in the short term, and greater trade frictions with the EU (due to perceived regulatory divergence and EU location policies) and loss of financial and professional service business in the medium term**.**	Medium	Market fragmentation increases the cost of financial services and the continuing uncertainty about the adjustment path leads to a decrease in business investment and weighs on potential growth.

Appendix IV. Implementation Status of 2016 Key Recommendations

Key Recommendations		Status as of November 2021[1] (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
Financial stability policy framework		
1. Extend the Financial Policy Committee's (FPC) powers of direction to the buy-to-let market. [Her Majesty's Treasury (HMT)] (¶4, ¶21)	Near term	**Implemented**. Legislation came into force in early 2017.
2. Extend perimeter of concurrent stress tests to cover large foreign subsidiaries. [BOE, PRA] (¶41)	Medium term	**Not Implemented.** The BOE has reviewed the perimeter of concurrent stress tests as part of work to update its approach to stress testing. The BOE has decided not to include these banks in the concurrent stress test at this time, as a stress test of the United Kingdom entity alone is likely to be less informative than a group-level test and could provide false comfort if the legal entity is able to survive the stress test, but the group would not be able to survive a comparable stress event. For U.K. subsidiaries of foreign-owned banks that do not participate in the concurrent stress test, the BOE's supervisory approach is to focus on working with the home supervisory authorities of their groups to assess the extent to which the parent group can support its U.K. operations in the event of a stress.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
3. Complete core data template and enhance analytical infrastructure for concurrent stress tests. [BOE, PRA] (¶41)	Mediu mterm	**Implementation in progress.** A key feature of the BOE's ACS data strategy remains to clearly define a core set of stress-testing data. The transition to ensure that a higher proportion of data are within the core data set, and will therefore be more stable, continues. The number of core data templates has increased from 14 in 2019 to 27 in 2020. The BOE is in the final stages of a comprehensive review of the data firms need to report from the 2022 stress test onwards. Feedback from firms played a key role in this review, which aimed to reduce the reporting burden on firms. Following the review, nearly all templates will be core, and fully integrated with associated definitions and data quality rules. Data templates will be reviewed no more frequently than every three years, which will allow firms to invest in improved infrastructure to report more reliable data. Since the start of 2020, the Bank has used new strategic infrastructure to stress test reporting by firms more efficient. In addition, internal analytical processes are increasingly linked directly to the Bank's stress test database, increasing efficiency, and facilitating sensitivity analysis. Finally, the BOE aims to migrate all core data templates onto a common data format, with integrated data controls, by 2022. As part of its investment in model development, the BOE has continued to improve and expand its existing suite. New models of Net Interest Income (NII)—including modelling of lending and deposit rates—and a granular model of large U.K. corporate impairments are at an advanced stage of development. The BOE has further enhanced its toolkit for modelling financial market stresses and how banks' actions may amplify them, in U.K. government bond securities and repo markets. It has also updated and improved its model governance framework, to further align model development with the analytical requirements of concurrent stress testing. Model development continues.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented/Implementation in progress,Not Implemented)
Recommendations	**Time Frame**	
4. Develop a set of cross-sector interconnectedness indicators using flow of funds data, cross sector exposures, market-based indicators, and information produced by thematic analyses. [BOE, FCA] (¶15)	Medium term	**Implementation in progress.** On systemic interconnectedness, the BOE continues to collect granular data from banks that are involved in the annual concurrent stress test. This includes their borrowing and lending exposures to other financial institutions, including granular data on banks' tradeable asset holdings. To improve the United Kingdom's flow of funds data, the BOE, FCA, and Office for National Statistics (ONS) are engaged in a joint Enhanced Financial Accounts project. As part of this, by 2019, the ONS had published over 30 articles and experimental statistics as it researched and evaluated new data sources from commercial providers and regulatory sources as well as improving existing financial surveys. For example, it: published additional experimental sector granularity for the investment and other financial institutions sectors, which has helped inform the Bank of England Financial Stability Report; improved counterparty detail of the insurance sector using regulatory Solvency II data and improved the from-whom-to-whom statistics, reducing the unknown sectors across the financial accounts. At the end of 2019, the ONS also published for the first-time experimental data in a flow of funds matrix and within these matrices published for the first time "whom-to-whom" data for MMFs; non-MMF funds; OFIs; financial auxiliaries; captive financial institutions and money lenders; insurance corporations and pension funds. In October 2020, the ONS published experimental balance sheet statistics for many financial sectors outside of banking, investment funds, insurance, and pensions. In the August 2020 FSR, the FPC welcomed that the FSB has begun a mapping exercise of the critical connections in non-bank sectors in a cross-border setting, with BOE and FCA represented in this workstream. And as set out in the FPC's response to the remit letter it received from HMT in 2020, the FPC will publish a more detailed assessment of the oversight and mitigation of systemic risks from the non-bank financial sector, including setting out a list of possible indicators that the FPC could publish regularly to monitor and assess risks from the nonbank financial sector going forward. The BOE has also progressed in its work simulating stress in the financial system. Following the publication of Financial Stability Paper 42 'Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment funds,'https://www.bankofengland.co.uk/financial-stability- paper/2017/simulating-stress-across- the-financial-system-resilience-of-

		corporate-bond-markets. An extension of the model presented in that paper was published in Staff Working Paper 803, "Simulating stress in the corporate bond market" - https://www.bankofengland.co.uk/working-paper/2019/simulating-stress-in- the-uk-corporate-bond-market- investor-behaviour-and-asset-fire-sales. There is also work in progress on a more comprehensive model to simulate stress in the financial system, part of which has involved gathering and using a range of data on interconnectedness in the U.K. financial system. This work is described in Staff Working Paper 809, "System-wide stress simulation" - https://www.bankofengland.co.uk/work ing-paper/2019/system-wide-stress- simulation. Solvency II regulatory reporting and PRA ad-hoc reporting provides insight into the connections between regulated insurers and the wider financial system. For example, the PRA has: • Used firm data submissions in the Insurance Stress Test 2019 (an "ad hoc" request) and SII data to identify interconnectedness between U.K. general insurers and Bermuda based reinsurers for natural catastrophe risks. This was a jointly run exercise across the PRA and the BMA. • Calibrated system-wide stress test models for both internal as well as external use (e.g., the FSB SCAV Systemic Stress Initiative). Utilised SII data to identify potential for liquidity strains and wider market impacts from fire sales due to margin calls from non- banks (See Financial Stability Report June 2018) https://www.bankofengland.co.uk/- /media/BOE/files/financial-stability- report/2018/june-2018.pdf Used SII data to identify insurers' dependencies on other financial institutions during COVID stresses in the market.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
Financial sector oversight		
5. Increase the supervisory intensity on less systemicallyimportant banks, for example through more frequent onsite inspections and greater scrutiny of asset classification and provisioning. [PRA] (¶27)	Near term	**Implementation in progress.** The PRA's U.K. Deposit Takers senior leadership has been bolstered so that there are four Head of Divisions overseeing non-systemic firms. Over the past two years, the PRA has shifted 6 percent of supervisory resource from large to non-systemic firm supervision. The risk specialist teams supporting supervision have also been strengthened by three new senior technical specialist roles. In 2018/19, the BOE completed a thematic review of fast-growing firms (risk, credit, and stress testing). In 2020, during the COVID-19 pandemic, the BOE undertook a desk-based stress test of all non-systemic U.K. banks and building societies (over 100), which has informed the supervisory response to the pandemic. It also published a Consultation Paper on its supervisory approach to growing firms. During the COVID-19 crisis, the supervisory cycle on non-systemic firms has broadly been maintained. The number of non-systemic firms that are considered higher risk has more than doubled over the past five years to be 19 firms today, which has meant heightened supervisory intensity on these banks. Supervision of less systemically significant firms that are part of internationally headquartered groups has also been bolstered with enhanced data collection (the Branch Return) as well as the development of analytical tools and dashboards specifically designed to identify, and focus senior level engagement on, those firms most vulnerable to the effects of COVID-19. Furthermore, a Financial Resources and Credit pool has been established to conduct all the International Banks Directorate's (IBD's) CSREP and LSREP work, to lead on credit reviews and to provide peer analysis on capital, liquidity, and credit for IBD firms. Through this pooled approach IBD is implementing high common standards across all categories of firm, enabling peer comparisons, and ensuring there are appropriate analytics and information flows to inform oversight by the IBD senior leadership team. Since 2017, the PRA senior leadership has been meeting three times a year to scan the horizon for emerging and evolving risks (including from less systemically important firms) and to evaluate the functioning of the framework for unintended consequences. Where appropriate, PRA senior leadership takes action to address these risks.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
6. Extend, if legally possible, the scope of transparency reporting under the Alternative Investment Fund Managers Directive (AIFMD) to cover non-European Economic Area (EEA) managers and funds, where relevant for systemic risk monitoring, and strive for enhanced international exchange of information. [HMT and FCA] (¶34)	Near term	**Implemented.** Since July 2017, the FCA has obtained information from: (1) Non-EEA AIFMs on their quarterly- reporting non-EEA master funds if the corresponding feeder funds are marketed in The United Kingdom (2) U.K. AIFMs on all their non-EEA funds not marketed in the EEA.
7. Ensure that Broker Crossing Networks' (BCNs) activities are sufficiently supervised and monitored. [FCA] (¶33)	Near term	**Implemented**. The FCA completed a review of the structure of the equity market in 2019. As part of this work, the FCA visited several firms that operate as Systematic Internalisers (SI) including investment banks that previously operated broker-crossing networks (BCN). The review assessed the trading models of SIs and the systems and controls that had been implemented to meet pre-trade transparency and conflict of interest requirements. Feedback was given to all firms at the conclusion of the review, where the FCA set out its expectations for compliance with the SI regime. On an ongoing basis, the SI activities of firms are supervised according to the FCA's supervision model.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
8. Broaden the review of bank internal models to cover a greater sample of less material models and models of smaller banks. [PRA] (¶28)	Medium term	**Implemented in progress.** Since the 2016 FSAP, the PRA has continued to enhance the coverage of firms' internal models, seeking to review at least 60 percent of firm's modelled credit risk RWAs. Further, it is enhancing its programme by commencing a comprehensive cross-firm review of all IRB models (including material and less material) models to ensure firms meet the new regulatory standards set out in the Policy Statements 7/19 (definition of default) and 11/20 (PD and LGD estimation). This includes the expectation that firms reduce unwarranted variability in IRB model driven RWAs, and that all firms using IRB for mortgage exposures, whatever their size, will need to use a hybrid model by end January 2022. The programme for mortgage exposures is due to be completed by 2021 and by 2022 for other asset classes.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
9. Introduce agreements like those under the European Insurance and Occupational Pensions Authority (EIOPA) requirements for colleges for insurers with significant business outside the EEA. [PRA, FCA] (¶31)	Medium term	**Implemented**. The PRA supervisory practices are very much aligned to the IAIS ICP25 requirements including ComFrame. The PRA has put in place supervisory colleges for all significant groups it supervises (regardless of whether they are EU focused or not). For small groups with limited international footprint, the PRA has put in place supervisory coordination arrangements setting out how supervisory engagement will take place for purposes of group supervision. Where the PRA is the home supervisor, it organises and chairs the supervisory college. To be fully effective, colleges must operate in a manner that enables supervisors to be open and transparent with each other, and to address difficult issues. The PRA seeks to adopt this approach when it runs colleges and expects other authorities to participate on the same basis. As the lead authority and college chair for major U.K. firms, the PRA is prepared to tackle instances where it believes that other authorities are not acting in a manner consistent with the PRA's objectives, and expects to be similarly challenged in turn. The PRA is also an active participant in wider international co-ordination of supervision for major firms. Where invited to do so as host supervisor, it participates in supervisory colleges for all firms with significant operations in the United Kingdom, whether a legal entity or a branch. The PRA is the lead competent authority in The United Kingdom. The FCA does not lead on the colleges. The FCA decides on its participation in colleges, based on its assessment of the risks of harm posed by the firm, and the topics the college is seeking to address. Where it believes it will sufficiently advance its statutory objectives it will attend. The FCA participates in colleges from a conduct of business perspective, and to ensure that the impacts of prudential regulation on outcomes for consumers and the avoidance of harm are considered.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
Financial markets infrastructures		
10. Consider alternative structures for the oversight and management of risk within The United Kingdom. High-Value Payments system (HVPS) and finalize the self-assessment of the Real Time Gross Settlement System (RTGS) infrastructure against the Principles for Financial.	Near term	**Implemented.** In April 2017, the FPC agreed that there were financial stability risks arising from the current structure for delivery of The United Kingdom. High-Value Payment System (HVPS) and welcomed the BOE's proposed move to a direct delivery model for operating the HVPS. In November 2017, the BOE completed the transfer to direct delivery, becoming the HVPS scheme operator (previously CHAPS Co), alongside the BOE's existing responsibilities for operating the RTGS infrastructure. Direct delivery will enable a single entity to manage risks right across the system. The self-assessment of the Real Time Gross Settlement System (RTGS) infrastructure against the Principles for Financial Markets Infrastructures has been completed and published.

Key Recommendations		Status as of November 2021 (Implemented, Partly Implemented,Not Implemented)
Recommendations	**Time Frame**	
Markets Infrastructures.[BOE] (¶38)		
11. Continue with the de- tiering project for payment systems and EUI and consider, as part of the RTGS review, increasing settlement in central bank money for CCP-embedded payment system transactions by increasing the number of CCP members that are also members of the HVPS. [BOE] (¶37)	Medium term	**Partly implemented/Underway**. Firm-specific actions related to promoting de-tiering and opening access to payment systems have been taken. For example, the number of CHAPS and Faster Payments Services direct participants has increased significantly between 2016 and 2020. As part of the RTGS review the BOE has also engaged individually with CCPs and their clearing members for further discussions on whether direct membership of CHAPS would be beneficial and to ascertain the types of features and functionalities of a rebuilt RTGS that would promote broader usage in a clearing context. Further work on de-tiering is now likely to be a medium-term deliverable given RTGS rebuild and new policy challenges.
Crisis Management and Resolution		
12. Build on current arrangements to develop operating principles for funding of firms in resolution. [HMT, BOE, and the FSCS] (¶51)	Nearterm	**Implemented**. In 2017, the U.K. authorities set up a flexible Resolution Liquidity Framework for banks, building societies, and investment firms. The RLF offers liquidity support to these entities or their holding company in a BOE-led resolution. The RLF complements the existing Sterling Monetary Framework facilities and Emergency Liquidity Assistance, which remain available to firms before and after resolution, provided the firms qualify and meet the pertinent requirements.
13. Work with international partners to develop an effective resolution regime for insurance firms that could be systemically significant at the point of failure. [HMT, BOE, PRA] (¶47)	Medium term	**Not implemented.** The United Kingdom has not yet implemented a comprehensive insurer resolution regime. It has participated in international developments at the IAIS that has enhanced requirements of ICP 12. The 2021 Detailed Assessment Report found that the United Kingdom only partly observes ICP 12 in its updated form. The United Kingdom will need to focus on implementation of a comprehensive insurer resolution regime that meets the requirements of ICP 12 and considers the FSB's Key Attributes Assessment Methodology for the insurance sector both of which benefited from Bank of England input.

14. Establish an approach for engaging with countries that are not members of CMGs but where U.K. banks and CCPs have a systemic presence. [BOE] (¶39, ¶52)	Medium term	**Partially Implemented**. There is no regular (e.g., annual) process in place to identify—and engage with—non-CMG host jurisdictions where U.K. GSIBs have a systemic presence. The U.K. authorities do engage with host authorities that are not members of the global CMGs through (i) a regional CMG in Asia for one U.K. GSIB, (ii) regional and non-core supervisory colleges, and (iii) SRB-led resolution colleges for major EU banks; the BOE also continues to engage with EU NRAs that used to be members of U.K.-led colleges prior to Brexit. The BOE monitors U.K. GSIBs' global operations to determine whether their CMGs' composition should be adjusted, which has happened in Asia for one of the GSIBs. For systemic CCPs, the CPMI-IOSCO 'SI>1' process helps the U.K. authorities identify host jurisdictions where the two U.K. global systemically important CCPs have a systemic presence. Over three-quarters of these jurisdictions are members of the CCPs' CMGs; all jurisdictions are represented at the FSB fmiCBCM, which provides a platform for the authorities to engage with non-CMG jurisdictions.
Interim Status was reported in the 2018 Article IV Consultation – IMF Country Report No. 18/316. This Appendix reports developments as of end June 2021.		