'Climate change and central banks: mission impossible?'

PhD Conference, Oslo, October 2022

Professor Jay Cullen, Dean of Law, Edge Hill University; Research Professor, University of Oslo

Central strands

- Mandates
- Monetary policy tools
- Bank capital regulation
- Stress-testing
- Radical uncertainty

Strand 1: Central Bank Mandates – Monetary Policy

UK - BoE (March 2021):

"I am today updating the MPC's remit to reflect the government's economic strategy for achieving strong, sustainable and balanced growth that is also environmentally sustainable and consistent with the transition to a net zero economy"

US

FSOC, Report on Climate-Related Financial Risk (2021)

Supervision Climate Committee (SCC) and the Financial Stability Climate Committee (FSCC)

Powell (2022): *Climate stress-testing "on the way"*

EU

TFEU and ECB Statutes

Lagarde (2020): *"whatever we have"* to fight climate change

July ECB 2022: Alteration to monetary policy

Strand 1: Corporate bond buying; Oft-cited by academics, think-tanks and policy groups

Two issues, assuming legal mandate can cover this:

1. Role of bond-buying in unconventional monetary policy

2. Effect of such interventions

FOUNDATION FOR EUROPEAN PROGRESSIVE STUDIES
FONDATION EUROPÉENNE D'ÉTUDES PROGRESSISTES

FEPS Policy Brief
June 2020

GREENING THE EUROPEAN FINANCIAL SYSTEM

Three ideas for a progressive Sustainable Finance agenda

The ECB's monetary policies have an implicit carbon bias. The eligibility criteria for collateral or unconventional purchases do not consider climate risks but rather rely on traditional credit ratings that fail to factor in climate exposures. Thus, monetary policy implicitly sanctions the financial markets' mispricing of climate risks, amplifying the financial stability risks of extreme climate events. This requires the ECB to green its balance sheet.

ECB – Monetary Policy Stance

July 2022:

- (i) The Eurosystem will cap the assets from companies with a large carbon footprint which can be pledged as collateral at a certain share;
- (ii) The Eurosystem will start to consider climate risks, when adjusting the value of an asset for collateral (ie. the haircuts) by 2022.
- (iii) A revision to the ‘market neutrality’ principle, to allow the ECB to tilt its bond purchases away from polluting assets to ‘green’ assets to gradually green its corporate bond portfolio.

Bank of England monetary policy - 2022

Reduce the carbon intensity of its CBPS portfolio by 25% by 2025; full decarbonisation by 2050.

In addition, the BoE will require firms in high-emitting sectors (energy, electricity, gas and water) to have published an emissions reduction target in order to be eligible for purchase;

Further, bond purchases from the following firms will be ineligible:

- Any revenue from mining thermal coal; and
- Any revenue from using thermal coal, unless they meet all of the following criteria:

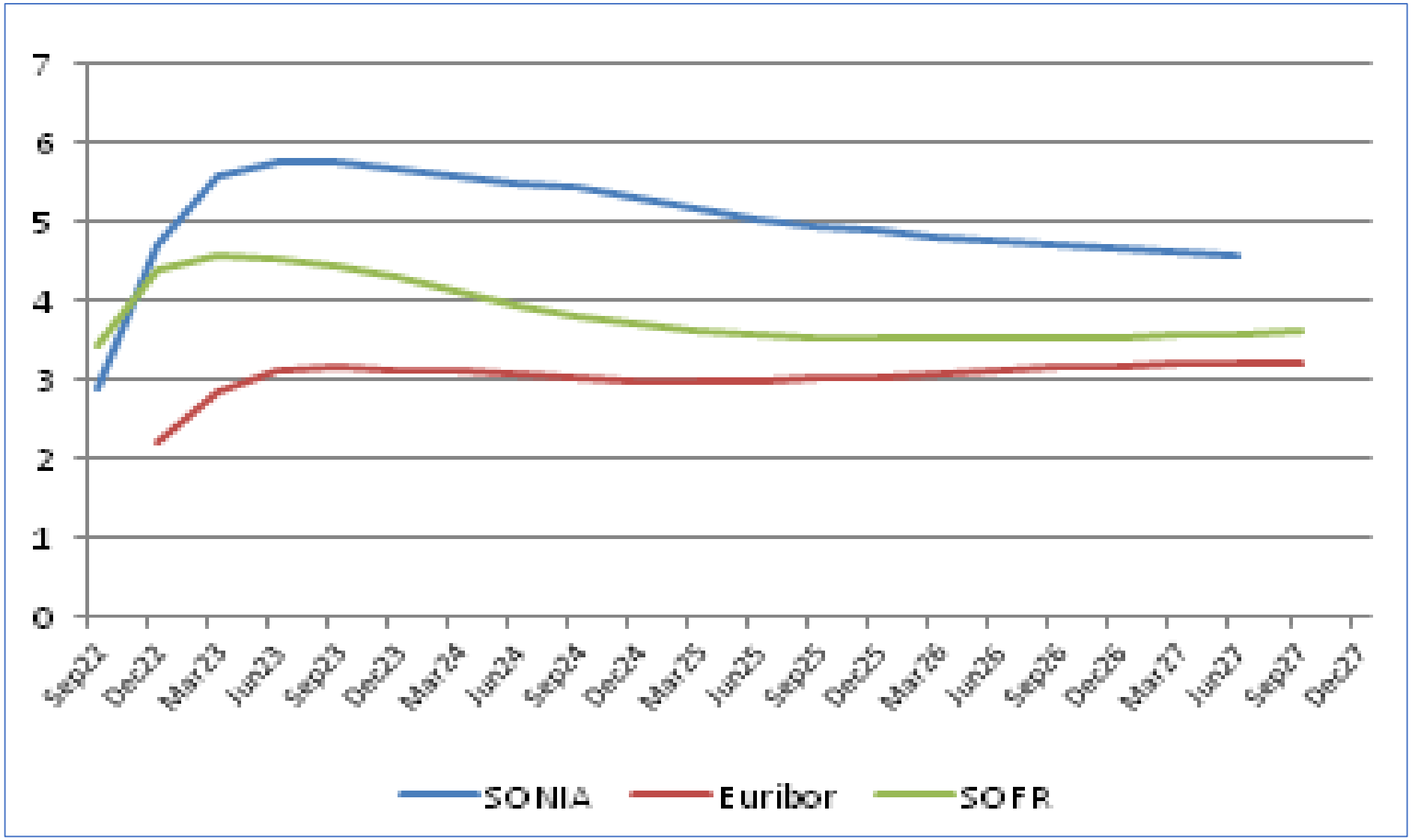
o No investment in new unabated thermal coal plants, with commitments to eliminate existing activity in the UK by 2025 and globally by 2030;

o Emissions falling over time consistent with appropriate sectoral net zero pathways;

o At least 20% of their energy mix must be comprised of renewable energy.

Forward Rates for Dollar, Euro, Sterling, 17 October 2022

Interest Rate %



Reserve Bank credit, related items, and reserve balances of depository institutions at Federal Reserve Banks	Week ended Mar 9, 2022
Reserve Bank credit	8,870,119
Securities held outright[1]	8,444,997
U.S. Treasury securities	5,751,291
Bills[2]	326,044
Notes and bonds, nominal[2]	4,960,714
Notes and bonds, inflation-indexed[2]	388,233
Inflation compensation[3]	76,300
Federal agency debt securities[2]	2,347
Mortgage-backed securities[4]	2,691,358
Unamortized premiums on securities held outright[5]	347,696
Unamortized discounts on securities held outright[5]	−20,412
Repurchase agreements[6]	0
Foreign official	0
Others	0
Loans	27,670
Primary credit	2,061
Secondary credit	0
Seasonal credit	0
Primary Dealer Credit Facility	0
Money Market Mutual Fund Liquidity Facility	0
Paycheck Protection Program Liquidity Facility	25,609
Other credit extensions	0
Net portfolio holdings of Commercial Paper Funding Facility II LLC[7]	0
Net portfolio holdings of Corporate Credit Facilities LLC[7]	0
Net portfolio holdings of MS Facilities LLC (Main Street Lending Program)[7]	28,998
Net portfolio holdings of Municipal Liquidity Facility LLC[7]	6,907
Net portfolio holdings of TALF II LLC[7]	2,526

Eurosystem holdings under the asset purchase programme					
Changes of holdings (previous month)	ABSPP	CBPP3	CSPP	PSPP	APP
Holdings* in January 2022	26,740	294,407	316,646	2,504,428	3,142,221
Monthly net purchases	-45	2,376	6,272	12,095	20,698
Quarter-end amortisation adjustment and redemptions of coupon STRIPS					
Holdings* in February 2022	26,696	296,783	322,918	2,516,523	3,162,919

UK QE (2021): Total £895bn

£875bn Gilts

£20 billion corporate bonds

HOUSE OF LORDS

Economic Affairs Committee

1st Report of Session 2021–22

Quantitative easing: a dangerous addiction?

Impact on spreads

- *"We find that a modest tilting approach could … lower the cost of capital of low carbon companies by 4 basis points…"*

- Schoenmaker (2019)

Strand 2: Capital regulation & Stress-tests

Second argument concerns financial stability

Focuses on two distinct regulatory instruments:

Capital requirements

Stress-testing

Bank capital

- Green supporting factor
- Brown assets and securities inconsistent with ESG frameworks
- HLEG Interim Report (2017):

'[a] 'brown-penalising' factor, raising capital requirements towards sectors with strong sustainability risks, would yield a constellation in which risk and policy considerations go in the same direction [as rewarding green projects]. Moreover, it would be more focused and easier to rationalise as capturing the risk of sudden value losses due to 'stranded assets'.'

Stress testing for banks and climate risks

- The stress test targets specific asset classes exposed to climate risk rather than banks' overall balance sheets. It focuses on exposures and income sources that are most vulnerable to climate-related risk, combining traditional loss projections with new qualitative data collections.

- Stranded assets

- Difficult to implement, although arguably 'the most powerful prudential tool we have at our disposal for safeguarding the resilience of the financial system.' S.G. Cecchetti (2015)

HSBC UK Bank plc: Pillar 3 Disclosures at 31 December 2021

Table 37: IRB Advanced – Credit risk exposures by portfolio and PD range (CR6)

PD scale	Original on-balance sheet gross exposure £m	Off-balance sheet exposures pre-CCF £m	Average CCF %	EAD post-CRM and post-CCF £m	Average PD %	Number of obligors	Average LGD %	Average maturity years	RWAs £m	RWA density %	Expected loss £m	Value adjustments and provisions £m
AIRB – Corporate – Other												
0.00 to <0.15	178	130	51.1	257	0.08	93	15.0	2.0	35	13.8	–	–
0.15 to <0.25	135	18	45.1	142	0.21	174	17.0	1.3	22	15.1	–	–
0.25 to <0.50	128	18	76.4	143	0.38	122	20.0	2.0	41	28.4	–	–
0.50 to <0.75	78	1	44.9	83	0.63	101	21.0	1.6	27	33.1	–	–
0.75 to <2.50	366	34	110.3	385	1.79	21,535	20.0	1.5	178	46.6	1	–
2.50 to <10.00	62	638	–	62	3.87	57	17.0	1.4	31	49.8	–	–
10.00 to <100.00	11	–	566.7	11	17.87	20	20.0	1.0	10	90.7	–	–
100.00 (Default)	72	–	856.3	72	100.00	18	21.0	1.0	129	179.2	7	6
Sub-total	1,030	839	14.9	1,155	7.34	22,127	19.0	1.6	473	41.0	8	6
AIRB – Corporate – SME												
0.00 to <0.15	–	–	–	–	0.13	–	37.0	1.0	–	12.8	–	–
0.15 to <0.25	2	2	21.0	2	0.22	25	15.0	1.6	–	7.0	–	–
0.25 to <0.50	–	–	–	–	0.37	–	45.0	1.0	–	1,484.1	–	–
0.50 to <0.75	–	–	45.4	–	0.63	–	45.0	1.0	–	37.5	–	–
0.75 to <2.50	–	–	57.0	–	0.91	6	36.0	4.1	–	59.6	–	–
2.50 to <10.00	–	–	–	–	3.69	–	45.0	1.0	–	72.5	–	–
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Sub-total	2	2	22.3	2	0.33	25	17.0	1.9	–	15.9	–	–

Morgan Stanley Int. Pillar 3 Regulatory Disclosures Report, 30 June 2021

Table 43: IRB approach – CCR exposures by portfolio and PD scale (EU CCR4)

MSI Group	EAD post-CRM $MM	Average PD %	Number of obligors #	Average LGD %	Average maturity Years	RWAs $MM	RWA density %
Corporates	**63,803**	**0.74%**	**10,647**	**45.21%**	**1**	**32,463**	**51%**
0.00 to <0.15	35,770	0.07%	4,900	44.97%	1	9,644	27%
0.15 to <0.25	6,212	0.20%	328	51.52%	2	3,729	60%
0.25 to <0.50	12,172	0.34%	2,954	42.77%	1	6,672	55%
0.50 to <0.75	1,535	0.71%	347	45.00%	1	1,305	85%
0.75 to <2.50	4,626	1.32%	243	45.00%	1	4,524	98%
2.50 to <10.00	3,212	6.99%	1,297	45.45%	1	5,966	186%
10.00 to <100.00	246	27.91%	574	45.00%	0	623	254%
100.00 (Default)	30	100.00%	4	45.00%	1	-	0%

Deutsche Bank, December 2020

EU CR6 – AIRB approach – Credit risk exposures by exposure class and PD range

in € m. (unless stated otherwise)	a	b	c	d	e	f	g	h	i	j	k	l
												Dec 31, 2020
Exposure class/ PD scale	EAD gross	Undrawn commitments	Weighted Credit Conversion Factor (CCF) (in %)	EAD net, post CRM and post-CCF	Average PD (in %)	Number of obligors (in 1,000s)	Average LGD (in %)	Average maturity (in years)	RWA	Average RW (in %)	Expected Loss	Value adjustments and Provisions
Corporates												
0.00 to <0.15	64,451	93,650	31.09	93,523	0.08	21.4	31.98	2.1	16,377	17.51	24	–
0.15 to <0.25	17,675	16,000	29.72	22,150	0.23	5.6	29.01	2.4	6,168	27.84	15	–
0.25 to <0.50	18,825	14,138	33.48	22,525	0.39	5.8	26.78	2.2	7,502	33.30	24	–
0.50 to <0.75	15,971	12,351	31.34	18,706	0.65	5.0	22.01	2.4	6,958	37.19	26	–
0.75 to <2.50	28,970	17,691	30.28	30,118	1.47	6.3	22.37	2.6	15,812	52.50	99	–
2.50 to <10.00	26,190	24,844	29.67	30,365	5.46	3.8	17.78	2.5	18,905	62.26	286	–
10.00 to <100.00	5,449	3,748	31.11	5,210	16.50	1.0	16.70	2.3	3,971	76.22	138	–
100.00 (Default)	14,681	2,868	32.68	13,285	100.00	1.8	34.38	2.7	2,684	20.20	4,309	–
Sub-total	**192,211**	**185,290**	**30.93**	**235,884**	**7.03**	**50.6**	**27.16**	**2.3**	**78,376**	**33.23**	**4,922**	**5,001**
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total incl. dilution risk	**192,211**	**185,290**	**30.93**	**235,884**	**7.03**	**50.6**	**27.16**	**2.3**	**78,376**	**33.23**	**4,922**	**5,001**

Stress tests: static vs Balance sheet assumptions

(i) A static balance sheet assumption assumes that balance sheets are ‘frozen’ over time, allowing only balance sheet changes that result directly from risks materialising in the scenario (e.g. assets going into default); or

(ii) A dynamic balance sheet assumption allows balance sheets to change over time, either because counterparty characteristics change (they may reduce their emissions or gain market share for example), or because the financial institution divests from existing counterparties, or invests in new ones.

NGFS: **three quarters of central bank regulators** use static balance sheet assumptions in their stress- and scenario-testing.

“insures against underestimating financial impacts, because under a static balance sheet approach financial institutions cannot mitigate risks through assumed management actions.”

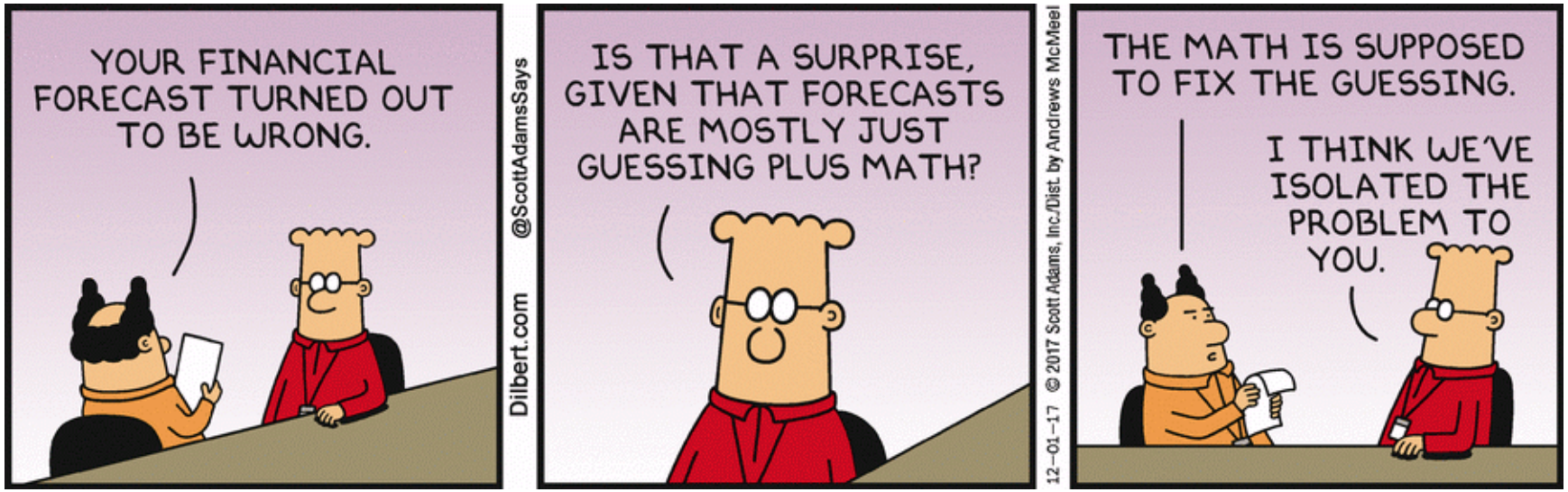
NGFS
Central Banks and Supervisors
Network for Greening the Financial System

Banque De France, *A first assessment of financial risks stemming from climate change: The main results of the 2020 climate pilot exercise*, Analyses et syntheses, No. 122-2021.

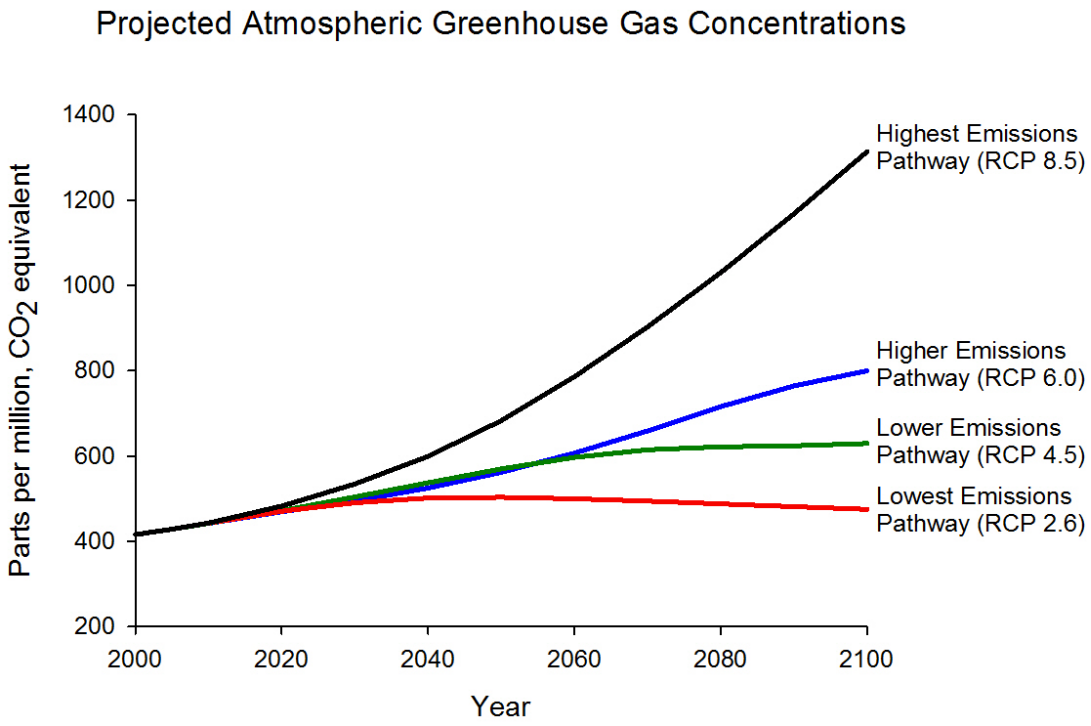
"Under [a] dynamic balance sheet assumption, institutions increase their exposures to sectors that benefit from the energy transition with a decrease in their level of risk (in the form of a probability of default). In the end, these different effects partially offset each other and the dynamic balance sheet assumption as such ultimately has little impact on the total cost of risk."

BANQUE DE FRANCE
EUROSYSTÈME

Strand 3: More philosophical problems



Uncertainty



1. Structural uncertainties
2. Data interpretation
3. Non-linearities in the climate system

- "We find that the expected 'climate value at risk' (climate VaR) of global financial assets today is 1.8% along a business-as-usual emissions path. Taking a representative estimate of global financial assets, this amounts to US$2.5 trillion. However, much of the risk is in the tail. For example, the 99th percentile climate VaR is 16.9%, or US$24.2 trillion."

- Simon Dietz, Alex Bowen, Charlie Dixon & Philip Gradwell, 'Climate value at risk' of global financial assets, April 2016

Thanks for listening