ASSESSMENT OF RISKS TO THE FRENCH FINANCIAL SYSTEM

JUNE 2021

BANQUE DE FRANCE

EUROSYSTÈME

CONTENTS

Overview

The French financial system's main short-term vulnerabilities have stabilised

Although they remain elevated, uncertainties connected with the Covid-19 crisis have eased. The main economies around the world are beginning to start up again as vaccination campaigns make headway.

Yet amid these hopeful developments, it is important not to lose sight of the fact that the French financial system's vulnerabilities have increased overall due to the crisis. The debt carried by the economy as a whole – but especially by non-financial corporations (NFCs) – remains the number-one area to watch in this regard. Most NFCs took a cautious tack in 2020 as they sought to obtain cash to get through a challenging period. This resulted in a sharp run-up in gross debt, but also brought a parallel and similarly sized increase in cash holdings.

By the end of the first half of 2021, gross debt was stabilising, while net debt remained at the levels reached in late 2019, owing to the simultaneous increase in cash. Although debt is still at record high levels, the fact that it is stabilising after years of trending upwards is welcome. However, initial analyses of cash accounts point to variety in corporate cash positions, notably according to sector and size, indicating that some firms have used the cash that they acquired during the crisis. The sustainability of debt taken on during the crisis is a major question. Some firms will need to strengthen their capital to facilitate the financing of productive investments whilst supporting their solvency and future profitability.

Financial markets adjusted their expectations to reflect the prospects of higher US inflation in light of the recovery taking shape globally, which looks set at this stage to be more vigorous in the United States than in Europe. This propelled US interest rates upwards, which did not make a structural difference to the low interest rate environment but which did exert a moderate upside impact on the euro area interest rate universe. The low interest rate environment also offers explanations for several volatility-generating market events reflective of a hunt for returns by investors. Although these one-off developments did not have systemic effects, they highlight intrinsic vulnerabilities.

If interest rates were to rise from their current low level in the euro area, the scale of the associated impact would vary across different categories of participant. Non-financial participants and the central government borrow at fixed rates and at medium/long-term horizons, so an interest rate shock would not be reflected in their overall borrowing terms unless it was permanent and gradually affected their interest burden. In the case of financial intermediaries, interest rate risk is covered by regulations, and higher market returns could ease asset/liability management restrictions for insurers, while rebuilding bank net interest margins. Meanwhile, market valuations would see greater volatility, with potential impairment for some financial assets, based on the magnitude of the shock.

The interest paid by the French central government has decreased over the last two decades, reflecting a fall in the cost of servicing government debt, despite an increase in the volume of that debt. In return for helping to cushion the blow of the health crisis for French economic participants, issuance of government debt went up sharply. The increase in interest rates during the first half of 2021 was sufficiently small that it did not affect the central government's repayment capacity. But it serves as a reminder that market conditions may change and that a long-term deleveraging strategy is a requisite condition for the central government to be able to play its role in absorbing economic shocks again in the future.

From the perspective of French credit institutions, the steepening yield curve could help to mitigate risks to future profitability. Against a backdrop of upbeat earnings reports in first half of 2021 and continued favourable Eurosystem refinancing conditions, the main French institutions saw their market valuations increase. While levels remain low from a historical perspective, the appreciation reflects a return not only of investor appetite but also

of confidence in the soundness of financial participants. And indeed, bank regulatory ratios remain solid: solvency levels edged upwards in 2020, leverage was steady and liquidity ratios rose significantly. Insurers are in a similar situation to banks, reporting regulatory ratios that are well above minimum levels.

Growing vulnerabilities linked to the adjustment to structural changes

The economy's digital transition, which is having a major impact on the financial sector and payment instruments, gained momentum amid the Covid-19 crisis. Traditional bank business models must adjust to respond to the emergence of new ways of consuming financial services and new competitors in the provision of these services, a process entailing major technological investments and impacting banks' profit & loss accounts in the short term.

The accelerated pace of digitalisation could also increase vulnerabilities to cyber-attacks, whose nature and size could take on systemic qualities.

Another key challenge concerns climate-related issues, particularly via the risks linked to the transition to a carbon-neutral economy, as well as the physical risks associated with climate change. While these risks may seem far off, initial analyses by the international community – in which the Banque de France and the Autorité de Contrôle Prudentiel et de Résolution (ACPR – Prudential Oversight and Resolution Authority) have played a trailblazing role – show that introducing measures immediately and smoothing them over time would create the fewest vulnerabilities and be most effective for financial stability. This was one of the findings of the pilot climate risk exercise for insurers and banks conducted by the ACPR and published in May 2021.

The financial system continues to display factors of resilience

In the face of these clearly identified vulnerabilities, which remain elevated, the financial system continues to display factors of resilience that allow it to perform its overall role in financing the real economy. The economic and financial stress of 2020 took place at a time when financial institutions were reporting high levels of solvency and liquidity; it nevertheless revealed that some segments of the non-bank sector needed to improve their resilience further. International work was begun in this area, led by the Financial Stability Board, with particular emphasis on money market funds.[1]

Authorities also deployed an arsenal of measures to combat the effects of the health crisis. These measures will have to be withdrawn gradually once the crisis is over. Reflecting this situation, the updated matrix of risks in this assessment shows factors of resilience alongside identified vulnerabilities.

[1] https://www.fsb.org/2021/01/fsb-work-programme-for-2021/

Matrix of risks to the financial system in June 2021

	Vulnerabilities	Resilience	Risk assessment
1. Exposure of the financial system to elevated and growing debt of economic participants	• High level of NFC gross debt, variety in cash positions • Divergence of government debt ratios within the euro area after a relatively uniform increase in the wake of the health crisis	• Public relief measures for companies and safety net for households • Macroprudential measures to help contain the banking sector's exposure to the most heavily indebted participants • Solvency remains high and sound among banks and insurers	
2. Elevated market valuations and exposure to liquidity shocks	• High valuations for risky financial assets, increasing the likelihood of a disorderly correction • Equity market valuations dependent on low interest rate environment	• Financial institutions have sound liquidity positions • International efforts to strengthen the existing regulatory framework for investment funds	
3. Weak bank profitability and asset/liability management constraints for insurance companies	• Prolonged low interest rate environment set to persist, impacting bank profitability and asset/liability management for life insurers	• Bank access to favourable Eurosystem refinancing conditions, coupled with the tiering mechanism, which limits some effects of negative interest rates	
4. Digital transformation and cyber-risks	• Digital transformation of financial participants creating the need for changes to business models • Increased digital surface area creates more exposure to cyber-attacks	• Initiatives to make the financial system more resilient to cyberattacks (crisis exercises, regulatory work)	
5. Exposure to climate change	• Risk that the financial sector could be weakened by an insufficient or delayed response to the accelerated transition to a carbon-neutral economy	• International coordination of climate initiatives for the financial sector • Climate stress testing exercises	

Very high risk **High risk** **Moderate risk**

The colour represents the level of risk based on an expert assessment reflecting the probability that the risk will materialise and its potential systemic impact. The arrow indicates how risk is expected to develop over the next six months.

Measures taken by authorities

According to the International Monetary Fund (IMF), budgetary, monetary and prudential measures taken by authorities made it possible to increase global growth by approximately six percentage points in 2020 compared with a situation in which no relief measures were taken.

On the budgetary front, European and domestic stimulus plans are being rolled out on the back of the emergency measures adopted in 2020. In the European Union (EU), execution of the Next Generation EU stimulus plan should help to support growth in 2021. Financed partly by common debt issued by the European Commission (although the cost is borne by Member States), the EUR 750 billion programme (EUR 360 billion in loans and EUR 390 billion in subsidies) is chiefly composed of a EUR 672.5 billion recovery and resilience facility, which will partly finance domestic stimulus plans. While the EUR 750 billion programme may look smaller than the Biden plan (approximately 6.05% of EU GDP vs. 9% of US GDP respectively), it is comparable when other relief spending not counted under the Next Generation EU plan is factored in (European multi-annual financial framework, domestic stimulus plans) plus automatic stabilisers, which play a bigger role in European economies than in the United States.[2]

Implementation of the Next Generation EU programme will make the EU one of the largest issuers of euro-denominated debt and result in approximately EUR 150 billion in borrowing per year between mid-2021 and 2026 (in addition to the EUR 75.5 billion from bond issuance under the SURE programme).[3] At the same time, France is deploying its own EUR 100 billion stimulus plan, EUR 41 billion of which will be financed by the Next Generation EU programme's recovery and resilience facility. In addition, in response to the deterioration in the health situation in the fourth quarter of 2020, business relief measures were extended to the first half of 2021 (including the partial unemployment scheme, exemptions from social security contributions, debt moratoria and state-guaranteed loans), shielding companies against some of the effects of the new restrictions linked to the health crisis. Some of these relief measures are being maintained in the second half (notably the state-guaranteed loan scheme).

Member States' budgetary measures continue to be supported by accommodative euro area monetary policy. In June, the European Central Bank (ECB) announced that it would hold policy rates at unchanged levels, provide ample liquidity, in particular via TLTRO III operations,[4] and continue to implement the EUR 1,850 billion Pandemic Emergency Purchase Programme (PEPP) at least until the end of March 2022 and in any case until the Governing Council judges that the Covid-19 crisis is over. At end-May 2021, purchases under the PEPP totalled EUR 1,104 billion. Persistently low interest rates have made it possible to contain vulnerabilities linked to the growth of public and private debt but have also eroded the profitability of financial institutions.

Regarding the prudential measures implemented by competent authorities in first half 2020 to safeguard financing for the economy, the ECB said in July 2020 that it would not require banks to rebuild their capital reserves until the end of 2022 and in any case not before the peak in capital depletion is reached. In France, the Haut Conseil de Stabilité Financière (HCSF – High Council for Financial Stability) announced following its June 2021 meeting that it would keep the countercyclical capital buffer rate at 0% until the end of 2022 at least.

European authorities (ECB, European Systemic Risk Board, European Banking Authority, European Insurance and Occupational Pensions Authority) and France's ACPR recommended that financial institutions continue to exercise the utmost caution on dividends until 30 September 2021.[5] European authorities additionally called on institutions to exercise extreme moderation on variable remuneration.

Finally, following initial targeted amendments adopted in June 2020 on the requirements for banks, in April 2021 the European Commission published new amendments centred in particular on market aspects. These are

[2] For example, USD 246 billion of the American Rescue Plan Act is earmarked for extending unemployment benefits and is counted under the US stimulus plan, whereas in the EU, unemployment insurance expenditures are considered to come under automatic stabilisers and are not included in the stimulus plan. European partial unemployment schemes are also partly financed by other mechanisms than the Next Generation EU programme (e.g. SURE programme, national budgets).

[3] The European Support to mitigate Unemployment Risks in an Emergency (SURE) programme was launched in April 2020 and provides financing through European loans for national partial unemployment and job protection schemes.

[4] Targeted Longer-Term Refinancing Operations (TLTROs) are targeted loans for banks covering longer maturities (three or four years). To encourage banks to lend to the real economy, the rates applied to these operations depend on the level of business or household lending by banks applying to the programme.

[5] ECB, press release, 15 December 2020

intended to modify the Markets in Financial Instruments Directive (MiFID), the Prospectus Regulation and the Capital Requirements Regulation (CRR) through targeted easing measures to support the economic recovery including, for example, the creation of a securitisation framework for non-performing loans.

Box: Prudential measures

In addition to responding to the crisis through monetary and budgetary policies, authorities used prudential levers set up after the economic and financial crisis of 2007-2008.

These fall into two categories:

- *microprudential* levers are designed to ensure the stability of individual financial institutions. Under this framework, supervisory authorities such as the ECB or the ACPR may set individual capital requirements (known as Pillar 2 requirements) that take into account the specific profile and risks of each institution.
- authorities can also pull *macroprudential* levers, whose purpose is to ensure the stability of the whole financial system. Among other things, the HCSF can use the countercyclical buffer mechanism to adjust the capital requirements applicable to financial institutions according to economic conditions.

The Banque de France and the ACPR are members of the HCSF, which is France's macroprudential authority. The Governor of the Banque de France proposes measures for adoption by the HCSF,[6] which is chaired by the Finance Minister.

[6] The Banque de France and the ACPR contribute, at national and macroprudential level, to decisions taken by the HCSF, particularly concerning the contracyclical buffer. The Banque de France also plays an important role at euro area level in decisions by the ECB and more specifically by the Single Supervisory Mechanism (SSM) on microprudential matters. Finally, the Banque de France takes part in discussions on changes to the prudential framework at international level within the Financial Stability Board and at European level within the European Systemic Risk Board.

1. Cross-cutting analysis of vulnerabilities

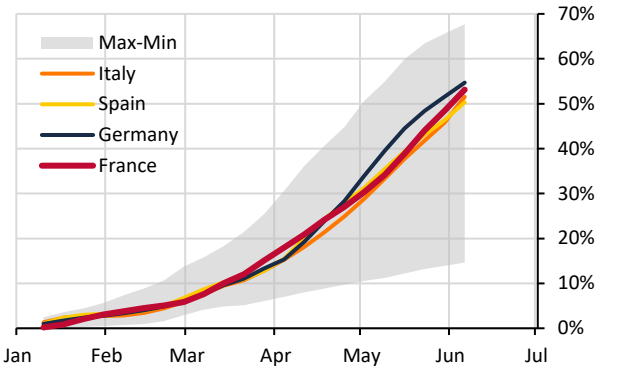
1.1 Vaccination reduces risks without eliminating uncertainty

Firming economic prospects

In the first quarter of 2021, new health measures had to be introduced to cope with a third wave of the virus, which put a damper on economic activity. Even so, since late 2020, progress by the vaccination campaign has improved economic prospects and reduced uncertainty about how long the pandemic may last. Following the 3.3% global economic contraction in 2020, the IMF is now forecasting a 6% rebound in 2021, i.e. eight-tenths of a percentage point more than it previously forecast in October 2020.

Chart 1.1: Vaccination rates in Europe

x: 2021 / y: % of the population aged over 18



Most recent value: 6 June 2021
Source: European Centre for Disease Prevention and Control.

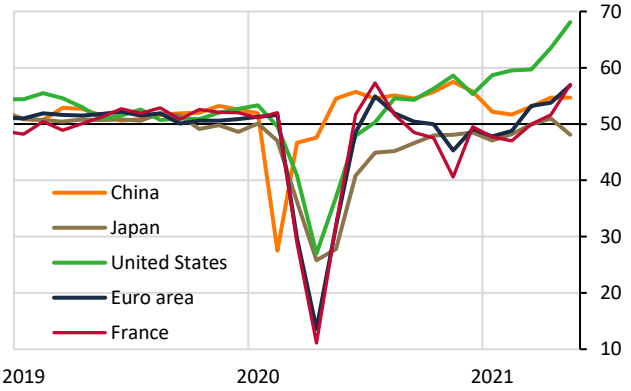
However, the upturn will be characterised by sizeable cross-country disparities as well as timing differences across sectors. Differences in the timing of exit trajectories from the health crisis increase the threat of capital flow volatility, which could hurt emerging economies in the event that global financial conditions tighten.

In the euro area, following a 6.8% contraction in 2020, the Eurosystem's latest forecasts are for real GDP to grow by 4.6% in 2021 and 4.7% in 2022.[7] The performance gap between manufacturing and services persisted in the first quarter in favour of the former and at the expense of the latter. When combined with the different health measures adopted to control the pandemic, this gap contributes to major cross-country variations in economic forecasts.

In France, following a record 8.0% economic contraction in 2020 and despite the reintroduction of health measures, activity is expected to see a pronounced recovery in 2021, driven by a rebound in household consumption, support from public demand and resilient investment (cf. Chart 1.2). The productive system is intact and will be able to restart once the health restrictions are lifted. Over 2021 as a whole, the Banque de France is forecasting GDP to grow by 5¾%, i.e. slightly more than in its March forecasts. The rebound is expected to continue in 2022 (approximately 4%), taking activity back to pre-pandemic levels by the first quarter of 2022.[8]

Chart 1.2: Composite PMIs

x: year / y: index



Note: Composite Purchasing Managers Indices (PMIs) track companies in the manufacturing and services sectors. A reading of 50 indicates stability, while a lower value denotes a contraction and a higher one signals expansion. Most recent value: May 2021.
Source: Bloomberg.

While firming economic prospects have narrowed the range of adverse scenarios, uncertainties remain. The macroeconomic situation will continue to be dictated by the exit trajectory from the health crisis.

Conversely, factors of resilience that could improve the outlook include the prospect of rapid deployment for Europe's stimulus plan as well as, to a lesser extent, associated benefits from the USD 1,900 billion American

[7] https://www.ecb.europa.eu/pub/projections/html/index.en.html
[8] https://publications.banque-france.fr/projections-macroeconomiques-juin-2021

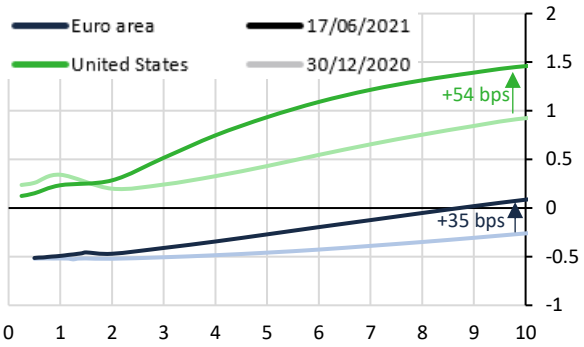
Rescue Plan adopted by the United States, which the Banque de France estimates will add 0.4% to euro area real GDP this year.

Financing conditions are expected to remain accommodative

Globally, financing conditions have stayed accommodative overall since the end of 2020, despite an increase in long rates on sovereign bond markets at the start of the year, especially in the United States (cf. Chart 1.3). Rates went up primarily because of the sharp economic upturn, which caused US inflation expectations to increase, albeit moderately. Progress in the vaccination campaign bolstered investor confidence, lifting risky assets and cyclicals, while spreads narrowed further to hit record lows on the corporate bond market.

Chart 1.3: EUR and USD swap curves

x: maturity in years / y: %



Note: bps = basis points

Source: Bloomberg, Banque de France calculations.

In the short and medium term, financing conditions should however stay accommodative in advanced economies, partly thanks to continued central bank support. In the United States, the Federal Reserve (Fed) is maintaining an accommodative policy and is now expected to hike rates beginning in 2023. The Eurosystem decided to step up the pace of monthly asset purchases in the second quarter under the PEPP in order to maintain accommodative financing conditions despite the influence of higher US interest rates. As far as the French financial system is concerned, an increase in market interest rates, if spread over time, would not necessarily be bad (cf. chapter on "The resilience of banks and insurers to interest rate risk").

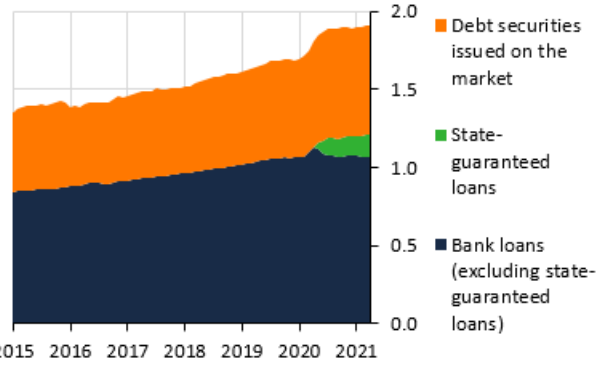
1.2 The trend increase in private debt is contained, but disparities persist

Corporate debt has held steady at a high level since the shock in March 2020

The consolidated debt of French NFCs has increased more rapidly than that of companies in other European economies since the 2008 crisis. Moreover, the growth rate has picked up recently, with an increase of 4.1 points of GDP between 2017 and 2019 compared with an increase of six-tenths of a point for the euro area as a whole. At end-2020, the consolidated debt of French NFCs was equivalent to 87 % of GDP.[9] This trend partly reflects relatively favourable conditions for debt financing owing to the decline in interest rates (cf. Chart 1.4).

Chart 1.4: French corporate debt

x: year / y: EUR trillion



Most recent value: end-April 2021

Sources: Banque de France, Ministry of the Economy and Finance

Over the period covering 2020 and the first four months of 2021, gross financial debt increased by EUR 220 billion, or 12% compared with the outstanding amount at end-2019, driven by growth in bank loans (up EUR 150 billion, mostly in state-guaranteed loans) and brisk issuance of debt securities (EUR 70 billion increase). NFC cash holdings increased by EUR 214 billion over the same period, up 30% compared with the level at end-

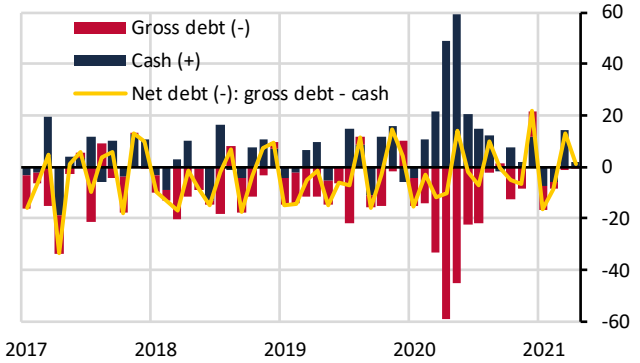
[9] www.banque-france.fr/statistiques/credit/endettement-et-titres/taux-dendettement-des-agents-non-financiers-comparaisons-internationales

2019, cf. Chart 1.5.[10] As a result, net debt (gross debt – cash) increased by a measured amount (net debt flows showed an increase of EUR 6.5 billion on outstanding net debt of approximately EUR 1 trillion) and grew at a rate that was below the pre-crisis average (EUR 48 billion annual increase over the period from January 2017 to February 2020).

This overall situation, however, masks differences between sectors of activity and even within some sectors. Companies that have built up cash are not necessarily also the ones that have accumulated debt. Accordingly, the growing divergence in corporate situations may hide pronounced imbalances that the small increase in overall net debt only partially reflects.

Chart 1.5: Monthly change in NFC (gross) debt and cash holdings

x: year / y: EUR billion



Most recent value: end-April 2021
Sources: Banque de France (monetary statistics)

These imbalances are largely sector-driven. Companies from the tourism, leisure and services sectors continued to suffer the heaviest revenue and earnings losses[11] in the first half of 2021, due to the extended restrictions to which they were still subject. Hotels and restaurants, along with retailers and the auto repair sector, made the greatest use of the state-guaranteed loan scheme (in terms of amounts loaned relative to the sector's share of value added). In addition, sectors do not share the same prospects of recovery. For some, such as hotels and restaurants, the pandemic is a temporary shock, while for others, such as online commerce and the airline sector, it will bring more lasting changes to demand.

Company size is another determining factor. Small firms use business models that are typically based more on physical proximity, which may be harder to square with digital solutions. They also have fewer financing and debt restructuring options. These companies have made heavy use of government schemes: at end-September 2020, micro-companies, which make up about 20% of total employment, accounted for 56% of social security contribution deferrals, the bulk of the solidarity fund (which was earmarked for them during the first wave) and about 27% of payments under partial activity furloughing schemes and of state-guaranteed loan volumes.[12]

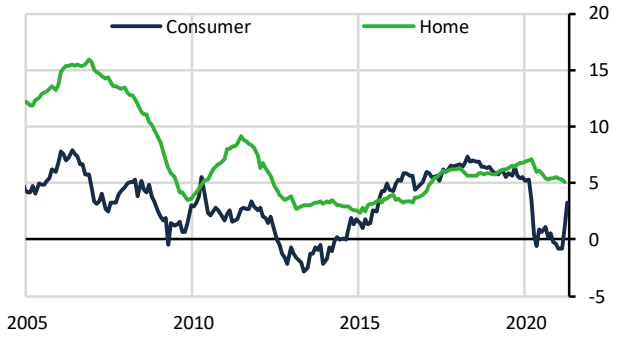
Household debt continues to increase, driven particularly by home loans

The risks linked to household debt look to be under control overall: over the first four months of 2021, the number of excess debt cases fell by 16% compared with the first four months of 2019, with 44,693 cases filed, down from 53,214.[13]

However, total debt in the household sector continued to head upwards. It grew during the crisis to reach 68.7% of GDP in the final quarter of 2020, up from 62.7% in the first quarter of 2020. While consumer lending stalled (cf. Chart 1.6), the increase in debt partly reflects the resilience during the crisis shown by home loans, which account for 84% of total outstanding loans to households.

Chart 1.6: Annual growth rate of lending to individuals

x: year / y: %



Note: Home loans account for approximately 80% of lending to households, while consumer loans make up about 15%. Most recent value: April 2021.
Sources: Banque de France.

[10] https://www.banque-france.fr/sites/default/files/medias/documents/impact_crise_covid_avril-2021.pdf
[11] https://www.banque-france.fr/statistiques/conjoncture/enquetes-de-conjoncture/point-de-conjoncture
[12] Progress report by the committee set up to monitor and assess financial relief measures for companies dealing with the Covid-19 epidemic, April 2021.
[13] For information, the total number in the first four months of 2020 was 35,499 cases,
cf. https://particuliers.banque-france.fr/sites/default/files/media/2021/05/11/210511-barometre-inclusion-mai_2021_0.pdf

The growth in debt increases several pre-identified vulnerabilities. A high level of debt affects the ability of households to absorb future economic shocks (without massive deployment of support measures). It likewise dampens the potential for economic rebound via demand from households, whose marginal capacity to consume more is reduced.

The continued provision of home loans during the crisis was paralleled by resilience on the residential property market in 2020, with prices climbing 5% year-on-year in the third quarter of 2020. However there were regional disparities in price growth, as prices stagnated in large cities while rising in small and medium cities, reversing the patterns of recent years.[14]

Although the trend in residential housing loans is consistent with previous years, credit standards are nevertheless gradually improving.[15] Monitoring of compliance with HCSF recommendations reveals the improvements in this regard: the share of loans with a debt-service-to-income ratio of over 35% was 23.5% in the first quarter of 2021 compared with 41.3% in the first quarter of 2020, while the share of loans maturing in more than 25 years was 7.3% in the first quarter of 2021 compared with 12.3% in the first quarter of 2020. Compliance with the recommendation issued by the HCSF to ensure that debt-service-to-income ratios are no higher than 35% and that loans mature in no more than 25 years continues to provide a form of collective insurance underpinning the robustness of France's home financing model, in which fixed-rate loans are provided at reasonable maturities, borrower solvency is ensured through an assessment of debt-service-to-income ratios, and borrowers have access to a system of guarantees that is both efficient and affordable. This recommendation is closely watched by the authorities, and credit institutions must be in compliance at all times.[16] The recommendation will be converted into a legal standard in summer 2021.

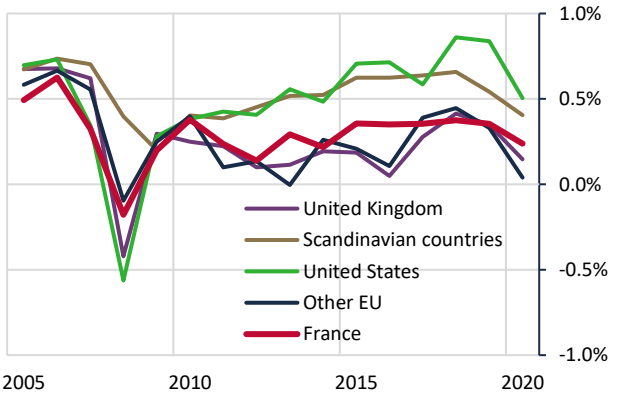
1.3 The private sector's financial risks are under control at this stage, but government debt has increased

French banks showed their resilience in the face of the crisis and continued to lend to the economy at a brisk pace

The economic consequences of the health crisis affected the banking sector over the course of 2020. The effects of the crisis were evidenced through two channels: the cost of risk doubled to EUR 19 billion and net banking income fell by 1.9% to EUR 147.8 billion. Overall net earnings at France's six main groups (BNP Paribas, Crédit Agricole Group, Société Générale, Crédit Mutuel Group, Banque Populaire – Caisse d'Épargne, La Banque Postale) decreased by 22.4% to EUR 22.2 billion, against a backdrop of lower RoA for French institutions, particularly compared with their US peers (cf. Chart 1.7).

Chart 1.7: RoA ratio

x: year / y: %



Note: Scandinavian countries = Norway, Sweden, Finland and Denmark. RoA = Return on Assets. EU = Europe. Most recent value: 31/12/2020
Source: ACPR.

Despite the earnings slide, the main French banking groups improved their solvency, with the aggregate capital ratio reaching 15.4% at end-December 2020. This was achieved in particular through retention of dividends on 2019 and 2020 earnings and a decrease in risk-weighted assets (RWA) owing to various budgetary (state-guaranteed loans) and regulatory (European Commission quick fix) support measures.[17]

[14] Year-on-year, Paris apartment prices went up by 1.7% at end-March 2021 compared with 7.9% one year previously, while houses outside the Paris region rose by 6.5% at end-March 2021 compared with 4.2% one year previously.

[15] The HCSF published an assessment of this risk in 2019.

[16] Source: CREDITHAB reporting (Instructions 2020-I-02 and 2021-I-02).

[17] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0873&from=EN

These measures, coupled with an accommodative monetary policy, enabled banks to continue financing the economy: between end-December 2019 and end-March 2021, their total assets swelled by 16.6% to EUR 8,176 billion, including a 9.5% increase in lending to NFCs,[18] which totalled EUR 1,573 billion. Other regulatory ratios were also sound: the overall leverage ratio of France's six main banking groups was steady, inching down one basis point from 5.26% at end-2019 to 5.25% at end-March 2021 (thanks partly to the exemption for reserves held with central banks introduced in 2020 as part of the quick fix measures), while the aggregate liquidity coverage ratio (LCR) climbed by more than 25 percentage points from 131.8% to 157.4% at end-March 2021.

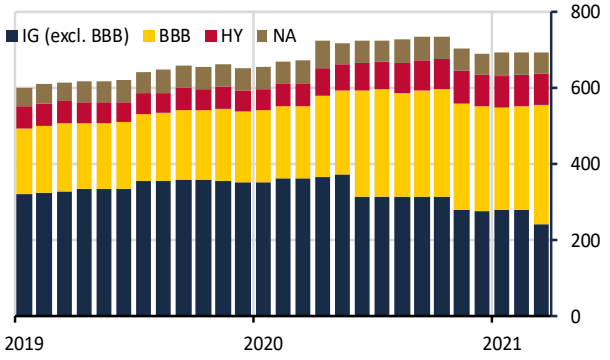
Risks linked to corporate financial positions look contained at this stage, but reveal a need for capital strengthening

After rising to record levels in late October 2020, partly reflecting precautionary concerns, business lending flows eased, as did use of market financing, which makes up about 36% of the stock of NFC debt financing (cf. Chart 1.4). The commercial paper market (short-term financing) did not come under further stress after March-April 2020.

However, the share of BBB rated securities in the investment grade category rose sharply (cf. Chart 1.8). Two factors may account for this increase: additional securities issuance by companies rated BBB before the crisis, together with downgrades for companies that were previously rated higher than BBB (cf. Chart 1.9). The BBB rating category is an important marker, as it is the final rating designation before securities are downgraded from investment grade to speculative (high-yield) grade, which many investment funds and other investors cannot access, thereby causing the investor base for these securities to shrink drastically.

Chart 1.8: Outstanding NFC market debt, by rating, France

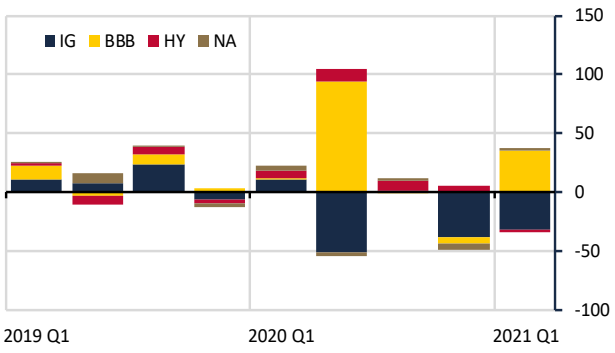
x: year / y: EUR billion



Note: IG = investment grade, BBB being the lowest rating designation before high yield (HY) grade. NA = unrated. Most recent value: March 2021.
Source: ECB (CSDB), Banque de France calculations

Chart 1.9: Change in outstanding corporate debt, by rating

x: year / y: EUR billion



Source: ECB (SHS, CSDB), Banque de France calculations

However, the deterioration in corporate credit ratings has slowed since summer 2020. Between January and March 2021, EUR 219 billion worth of euro area securities were downgraded, while EUR 199 billion got upgrades. Credit rating agencies lowered their projected default rate for HY European companies in 2021 and raised the expected frequency of rising stars (HY to IG upgrades) to reflect the anticipated economic upturn.[19]

Since the onset of the Covid-19 crisis, the highest-rated securities have seen their average ratings fall overall, but yields in this category have gone down at the same time (97% of outstanding IG securities yielding below 1% in April 2021, including 40% whose rates were in negative territory, cf. Chart 1.10). This decrease in yields on the

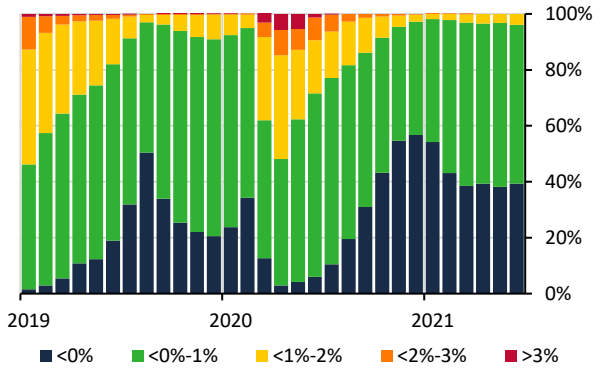
[18] Including French and foreign NFCs.
[19] Moody's, *Economic recovery increases prospects for some speculative-grade companies becoming investment grade in 2021*, 6 April 2021.

market debt of French NFCs was also in evidence in the HY category (cf. Chart 1.11). In a handful of cases, which remain the exception for the time being, some HY securities actually yielded below zero.

From the perspective of issuers, these are positive developments that are helping to maintain accommodative financial conditions. However, excessive divergence from fundamentals, coupled with a reversal in risk appetite, could weaken the refinancing capacity of these more vulnerable companies.

Chart 1.10: Breakdown by yield, debt of IG French NFCs

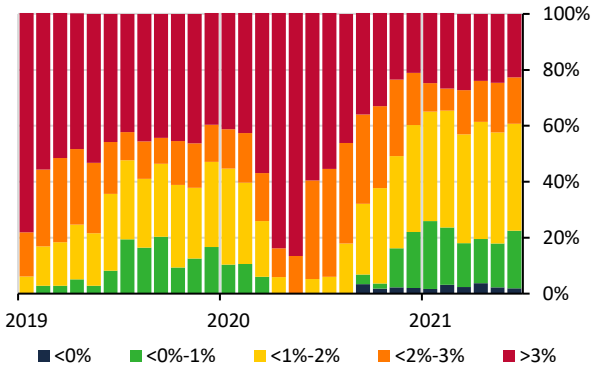
x: year / y: % of euro-denominated debt



Note: Eikon data are taken from a commercial database that provides a partial but relatively representative picture of the market. Most recent value: June 2021.
Source: Eikon, Banque de France calculations

Chart 1.11: Breakdown by yield, debt of HY French NFCs

x: year / y: % of euro-denominated debt



Note: Eikon data are taken from a commercial database that provides a partial but relatively representative picture of the market. Most recent value: June 2021.
Source: Eikon, Banque de France calculations

However, this assessment applies only to companies that make use of market financing. Through its scoring system, the Banque de France monitors a broader spectrum of French NFCs than that tracked by credit rating agencies, covering smaller companies reporting revenues of over EUR 750,000.[20] Analyses conducted in 2020 by the Banque de France on 2019 corporate balance sheets resulted in scoring downgrades. However, these were relatively moderate, at around 20%. This is within the range recorded since 2007 (17%-25%). The 2021 scoring exercise, based on 2020 balance sheets, has begun, and initial analytical trends suggest that there will not be a significant downgrade trend. Furthermore, banks continued to lend to companies, providing around EUR 8.9 billion over the first four months of 2021.[21]

Thanks to continued support and accommodative financing conditions, corporate failures remain contained so far at a level well below that seen in previous years (down 30% year-on-year in late May 2021 and down 2% between March 2021 and May 2021 compared with the three preceding months).[22] A catch-up is expected in the coming months, however, at least in certain sectors. This needs to be differentiated from a potential additional impact due to the crisis. This latter effect, whose structural impact is subject to considerable uncertainty, may however prove to be less pronounced than those seen during past crises owing to the unusual characteristics of the health crisis (activity shut down due to lockdown measures), as well as its shorter duration and contrasting impact across sectors.

Further out, once the restrictions on economic activity are lifted, two potential pitfalls will need to be avoided: withdrawing relief measures too abruptly could create problems for otherwise viable firms (so far, this risk looks to be largely dispelled in France); insufficiently targeted support would allow structurally unprofitable companies to stay in business, resulting in inefficient overall allocation of resources, a deterioration in the balance sheet

[20] https://entreprises.banque-france.fr/cotation. Each year, the Direction Générale des Finances Publiques (DGFIP — Directorate General of Public Finances) collects information from the parent company accounts of French companies in the tax returns filed along with their earnings reports. As part of its task of analysing the economy, the Banque de France gathers the same information from specific companies

[21] https://www.banque-france.fr/communique-de-presse/limpact-de-la-crise-du-covid-19-sur-la-situation-financiere-des-entreprises-et-des-menages-en-avril

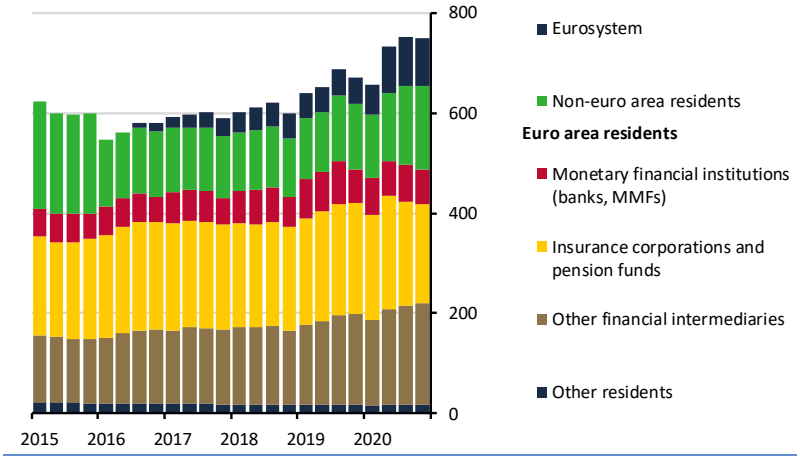
[22] Gross year-on-year data; seasonally and working-day adjusted quarter-on-quarter changes, www.banque-france.fr/statistiques/chiffres-cles-france-et-etranger/defaillances-dentreprises/suivi-mensuel-des-defaillances

quality of exposed financial institutions, and a slowdown in potential growth (see chapter entitled "Capital strengthening would help to consolidate corporate positions").

While liquidity measures were designed to support all companies whose business was disrupted or shut down by health restrictions, capital strengthening is needed to maintain the investment capacity of sound companies that have genuine growth prospects but are handicapped by high debt levels. For companies that were already weakened before the crisis or whose outlook has been lastingly damaged by the health crisis, the proper solution is swift and orderly restructuring of liabilities, while the most compromised firms should be liquidated, allowing all stakeholders to rebound.

Chart 1.12: Holders of French corporate debt

x: year / y: EUR billion



Note: The Eurosystem's holdings are proxied by considering only the Banque de France. Most recent value: final quarter of 2020. Detail for certain categories:
- Other financial intermediaries: financial participants other than monetary financial institutions, insurers and pension funds. These are chiefly non-money market CIS;
Other residents: in particular general government, NFCs and households.
Sources: ECB (SHS), Banque de France calculations

A debate has recently emerged over the question of cancelling a portion of the debt taken on by companies during the crisis. This debt is held by financial intermediaries, and via these intermediaries, by non-financial participants, including households and NFCs looking to invest their savings or cash. Cancellation would therefore harm the financial positions of these end investors. At end-2020, euro area insurers and pension funds held 27% of corporate debt (cf. Chart 1.12). Investment funds (excluding money market funds) hold an identical share. Setting aside specific cases, a blanket cancellation would also have the major drawback of creating moral hazard going forward by benefiting companies that took out excessive debt.

Increased sovereign debt represents the corollary to efforts to stem the risks linked to companies and households.

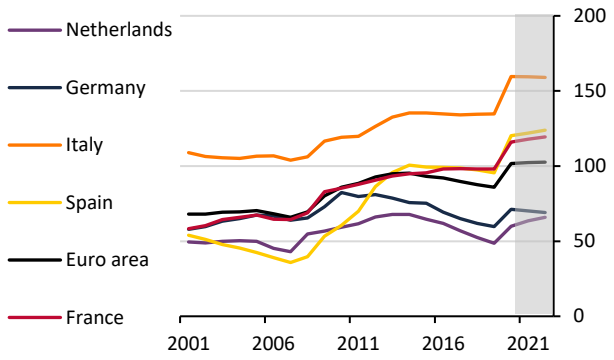
In 2020, the sharp slowdown in economic activity, combined with exceptional budgetary measures (amounting to over 5% of euro area GDP),[23] plus the effects of automatic stabilisers (also 5% of GDP), caused public finances to worsen by more than they did in the aftermath of the 2008 crisis. Thanks to larger automatic stabilisers, the overall budget stimulus in the euro area was almost as strong as that of the United States. The general government budget deficit reached 7.2% of euro area GDP at end-2020, compared with 0.6% in 2019, exceeding the record of 6.4% set in late 2009.[24] Euro area governments also provided sizeable loan guarantee envelopes (19% of GDP for the euro area as a whole in 2020), which represent contingent liabilities,[25] i.e. possible obligations that arise from events whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events.

In 2021, the continued health crisis and new business restrictions prompted France, like most other European countries, to extend the major budgetary support measures introduced in the previous year. The ECB estimates that the aggregate deficit of euro area Member States will narrow to 7.1% of GDP this year, reflecting lower interest payments and a more favourable cyclical component, which more than offset the additional stimulus measures not covered by Next Generation EU grants.[26]

[23] IMF, *Fiscal Monitor*, April 2021.
[24] https://ec.europa.eu/eurostat/documents/2995521/11563047/2-22042021-AP-FR.pdf/0535ffa2-36d4-45b3-f16b-fb2461d4faff?t=1619026307878
[25] European Central Bank, Economic Bulletin, March 2021.
[26] https://www.ecb.europa.eu/pub/projections/html/ecb.projections202106_eurosystemstaff~7000543a66.en.html

Chart 1.13: Ratio of government debt to GDP

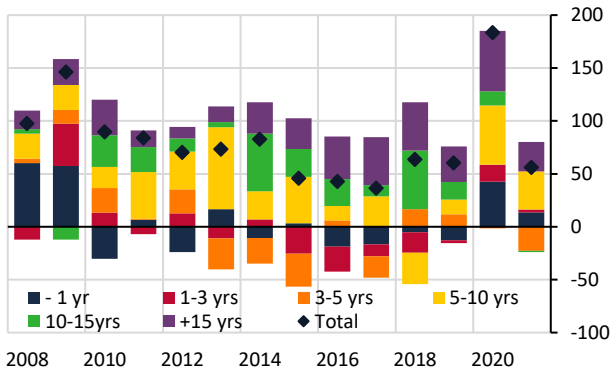
x: year / y: % of GDP



Note: Projections shown in greyed area
Sources: European Commission

Chart 1.14: Net government issuance in France

x: year / y: EUR billion



Note: issuance net of buybacks and maturities; the bar for 2021 shows issuance to end-May 2021
Source: Agence France Trésor.

Two factors need to be clearly identified in the growth of government debt (cf. Chart 1.13):

- the health crisis caused French sovereign debt to increase (17 points of GDP) at a rate that was relatively consistent with other euro area countries (14 points of GDP). This increase stemmed primarily from a denominator effect, since GDP fell sharply over 2020, but also reflected the exceptional measures that should enable economies to recover quickly once the health crisis is over;
- disparities resulting from a longer-term trend within the euro area since the 2008 financial crisis. In some countries, including France, government debt has either plateaued at high levels or continued to increase, while other countries have managed to get back to pre-financial crisis levels. Once the economic recovery is bedded in, deleveraging will be necessary from 2023 to limit the vulnerability of French debt to the risk of an interest rate shock or an exogenous cyclical shock.

France's government deficit stood at 9.2% of GDP in 2020, up from 3.1% in 2019.[27] According to Banque de France estimates,[28] extending the emergency measures and ramping up the stimulus plan will cause the deficit to remain high in 2021, at close to the level seen in 2020, before gradually shrinking to around 4.5% of GDP in 2023 as growth resumes and the exceptional measures are withdrawn. To cover the EUR 293 billion financing requirement set out in the initial Budget Act for 2021, Agence France Trésor issued close to EUR 130 billion in medium- and long-term debt between the start of the year and the end of May. This issuance played a part in pushing up outstanding negotiable government debt by EUR 50 billion, primarily in short-term and five- to ten-year maturities (cf. Chart 1.14).

These projections are subject to considerable uncertainty, particularly as regards future developments in the health crisis, the deployment of exceptional support measures and the speed with which Europe's Next Generation EU stimulus fund is rolled out. They are likewise dependent on how economic policies adjust to the future path of the pandemic. Despite the surge in debt, the macroeconomic benefits of these government expenditures justify maintaining them for as long as the effects of the Covid-19 crisis last.[29]

In terms of the debt/GDP ratio, the European Commission is projecting 117.5% for France at end-2021,[30] and 116.5% in 2022, higher than the projected ratios for the euro area of 102.4% in 2021 and 100.8% in 2022.[31] Banque

[27] INSEE, General government national accounts - first results - 2020, 26 March 2021.
[28] BMPE June forecast: https://publications.banque-france.fr/projections-macroeconomiques-juin-2021
[29] The IMF (WEO, April 2021) said that the world GDP contraction might have been three times larger had relief measures not been deployed, including automatic stabilisers, discretionary measures and measures targeting the financial sector.
[30] According to an INSEE study published on 25 June 2021, French government debt stood at 118.2% of GDP at the end of the first quarter of 2021.
[31] The ECB is projecting the ratio to peak at close to 100% of euro area GDP in 2021 before gradually easing to 95% in 2023 (ECB Economic Bulletin, Issue 4 / 2021)

de France projections put the ratio at over 115% of GDP in 2023. In its 2021-2027 stability programme, meanwhile, the French government said that it does not expect the government debt ratio to decrease until 2027.

Favourable financing conditions limit debt sustainability vulnerabilities for now.

First and foremost, the government debt profile will benefit from the economic recovery expected this year. The growth rate will influence both the primary deficit (through the level of tax revenues) and, automatically, the debt/GDP ratio. In 2020, almost half of the deterioration in the French debt/GDP ratio was due to the collapse in activity. Currently, ongoing favourable financing conditions represent another major resilience factor that is mitigating refinancing risks and the cost of debt service.

Sovereign debt continues to be refinanced at record low interest rates, even among the euro area's most heavily indebted countries. While taking advantage of negative short-term interest rates, euro area governments extended the average maturity of debts issued in order to lock in the favourable conditions over a longer period. The weighted average rate for French medium- and long-term debt issues in the first quarter of 2021 came to -0.08%, compared with -0.11% in 2020, 0.11% in 2019 and an average of 1.63% over 2009-2017.

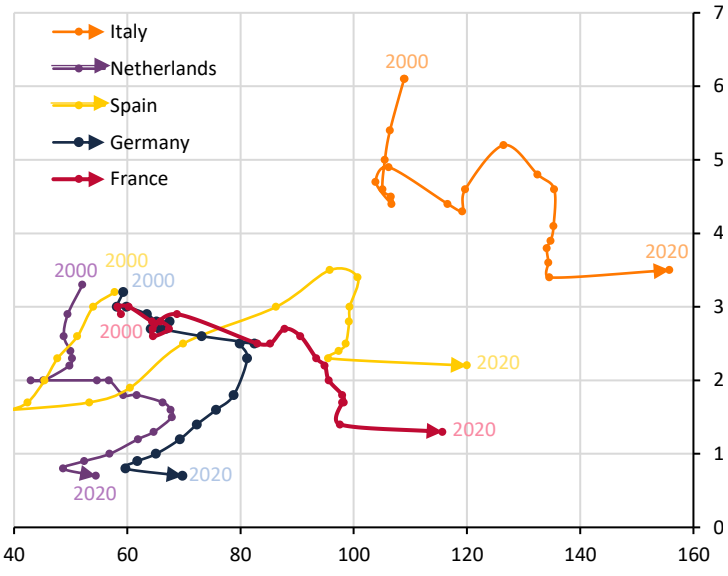
For example, on 19 January 2021, the French Treasury issued a EUR 7 billion 50-year syndicated OAT (government bond) at the lowest rate (0.59%) ever for this maturity by France. The average residual maturity of French medium- and long-term debt has increased by around six months since the start of the pandemic and now exceeds nine years,[32] helping to reduce exposure to higher short-term interest rates. Average daily trading volumes on the secondary market and French sovereign repos outstanding reported by primary dealers reached record levels in 2020, making French debt among the most liquid in the euro area.[33]

Lower yields caused average gross interest payments on French sovereign debt to go down, even though debt/GDP ratios are higher than in 2009 (cf. Chart 1.15).

As long as the interest rate on debt service stays below the nominal growth rate of GDP, France's public finances will continue to benefit from a positive effect on debt dynamics and avoid a "snowball effect" in which debt becomes self-sustaining. Even so, this favourable gap will not be enough to stabilise debt on a medium-term horizon, given the primary government balances expected between now and 2022 (a 3% deficit corresponds roughly to the threshold that would allow the French debt/GDP ratio to stabilise at pre-crisis levels).

Chart 1.15: Average gross interest payments between 2000 and 2020

x: ratio of government debt to GDP as a % / y: interest paid divided by GDP as a %



Source: Eurostat, Banque de France calculations

The current yield curve reflects investor expectations that interest rates will remain long for a protracted period, which will continue to automatically reduce the average rate on French debt over the coming years. But even if the stock and average maturity of France's debt mean that an interest rate shock would take time to be reflected in debt service, elevated debt makes the public finances more vulnerable to a fresh shock to economic activity.

[32] AFT Monthly Bulletins.

[33] Commission pour l'avenir des finances publiques (Commission on the future of public finances), Preparatory documents, *Trajectoires et soutenabilité de la dette*, March 2021.

In fact, in the first half of 2021, despite the increased stock of debt, in euro area sovereign bond yields edged up only slightly in response to higher US interest rates, firming economic prospects and risk appetite sentiment. The dispersion of yield spreads between countries remained stable. In addition, the budgetary support mechanisms adopted at European level, including the Recovery and Resilience Facility (RRF), are bolstering the area's overall fiscal strength. These new mechanisms offer a way to pool financing and improve solidarity between European countries. Chiefly, they allow all Member States to obtain more favourable financing terms. However, they also represent a new debt to be repaid by European economic participants.

In all, 17 EU Member States received around EUR 76 billion in back-to-back loans at favourable terms under the first six debt issues of the Support to mitigate Unemployment Risks in an Emergency (SURE) programme.[34] To finance the European stimulus plan, the European Commission plans to raise EUR 800 billion in debt between mid-2021 and the end of 2026, making the EU one of the largest debt issuers in Europe over the coming years, with a wide range of maturities and instruments, and repayments running through to 2058.

Interactions between sovereign debt, banking risks and the situation in the NFC sector also need to be taken into account. Currently, the various support measures provided by countries to businesses minimise the risk of contingent government liabilities arising. Although it is neither of the same type nor on the same potential scale as during the euro area crisis, the nexus through which deteriorations in the positions of one or more of these participants become self-sustaining and mutually reinforcing must not be overlooked (cf. Box 1.1).

In France, the risk that this nexus could be activated is tempered by the fact that the exposure of French banks to domestic sovereign debt has declined since 2014 relative to shareholders' equity and total assets, unlike in other euro area countries. Whatever happens, the economy's growth trajectory will be a decisive factor in preventing risks associated with this nexus from arising.

Box 1.1: How will the sovereign-bank-business nexus operate in 2021?

In theory, sovereigns, banks and businesses interact through two main channels:

- The possibility of an increase in failures could prompt a repricing of corporate credit risk. This would result in increased loan loss provisions for banks and a reduction in the financing provided by financial intermediaries to businesses, increasing the risks that other companies might fail. The profile of the public finances would be affected by the decrease in revenues and the activation of loan guarantees provided during the crisis.
- Fears about the sustainability of sovereign debt could cause market rates for government debt to surge and push up issuance costs for government debt. Lower confidence in the effectiveness of public support and an increase in government borrowing costs would raise financing costs for financial intermediaries and companies as well. Some financial participants might then seek to lower their exposure to sovereign debt in order to limit their overall risk envelope. This would have the effect of further increasing yields on government debt and exacerbate concerns about the viability of government debt.

However, these channels are unlikely to function in 2021 as they did during the euro area sovereign debt crisis in 2012, when bank ran into difficulties, forcing Member States to organise costly bail-outs. European banks today have never been so well capitalised and their risk management is better regulated. Furthermore, the Single Resolution Mechanism, established by the SRMR[35] and supplemented by an intergovernmental agreement,[36] forms the second pillar of the Banking Union and provides a framework for the recovery and resolution of credit institutions and investment firms. This framework is intended to enable orderly resolution

[34] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1467
[35] https://eur-lex.europa.eu/legal-content/fr/TXT/PDF/?uri=CELEX:32014R0806&from=EN
[36] https://data.consilium.europa.eu/doc/document/ST%208457%202014%20INIT/EN/pdf

of failing banks by minimising the costs for taxpayers and the real economy through a Single Resolution Board and a Single Resolution Fund financed by contributions from the banking sector.

1.4 The low interest rate environment continues to squeeze the margins of financial intermediaries

The low interest rate environment has caused a structural decrease in the net interest margin of French banks

Since their primary business is maturity transformation, commercial banks derive much of their income from net interest margin (NIM), which is the difference between interest income earned on assets and the interest expense paid out to lenders. NIM represents about 50% of French banks' net banking income, with the remainder being made up of fees and commissions and market income.

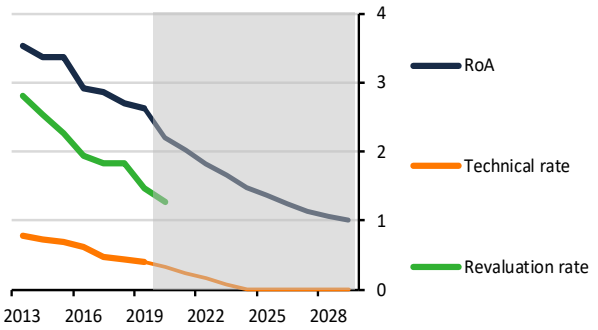
Changes over time in NIM can be decomposed into an interest income effect, an interest expense effect and a volume effect linked to changes in total assets. Persistently low rates have eroded interest income while the surplus cash held by banks with the central bank has been subject to negative interest rates since 2014. These effects are partially offset by the volume effect of new lending (a targeted effect of accommodative monetary policy), the tiering mechanism[37] and the extremely attractive pricing of TLTROs (now as low as -1%, i.e. below the deposit facility rate, which currently stands at -0.5%). Right now, TLTROs more than offset the annual expense resulting from the application of negative rates to the excess cash that banks hold with the central bank.

Declining financial income for life insurers

The persistent low interest rate environment is putting downside pressure on insurers' financial income. The average return on assets (RoA) fell from 3.5% to 2.6 % between 2013 and 2019. Making the assumption that maturing bonds are reinvested in zero-rate bonds, this decline in RoA could continue at a rate of approximately 15 basis points per year.[38] This expected decline in RoA is especially critical for firms that guarantee revaluation rates (cf. Chart 1.16).

Chart 1.16: Ten-year RoA projection, low interest rate scenario

x: year / y: %



Note: RoA = Return on Assets. The model provides projections for life and mixed insurers' investment assets other than unit-linked products. Two categories are considered: (1) parametrically modelled amortising assets with fixed coupons (65% of the total, projected line by line) and (2) other assets
Assumptions:
(1) French 10-year government bond yield to remain at 0% over the entire period from 2021
(2) zero net inflows over the entire period
(3) other assumptions are specific to each entity
Source: ACPR.

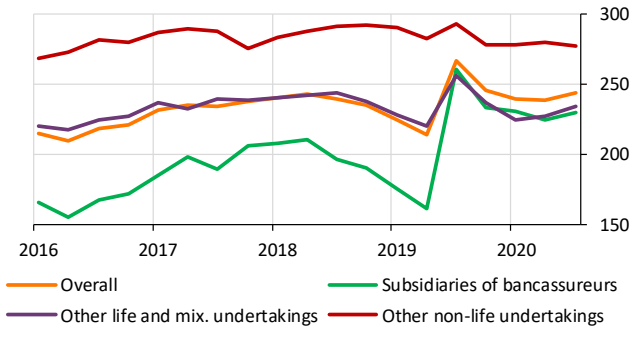
[37] Since 30 October 2019, the ECB has allowed a portion of the reserves held by European banks with the central bank to be exempt from being remunerated at the negative deposit facility rate currently in effect (-0.50%).
[38] In addition to interest rate scenarios, RoA projections also assume zero net inflows to euro-denominated instruments.

The prolonged low interest rate environment has also affected life insurers' coverage of capital requirements

In terms of solvency, underwriting profitability generated in the past has enabled institutions to build up reserves and strengthen their capital. As a result, institutions hold significant surplus capital to cover capital requirements, with an average solvency ratio of 244% at the end of 2020 (cf. Chart 1.17).

Chart 1.17: Insurers' solvency ratio

x: year / y: %



Most recent value: 31/12/2020.
Source: ACPR.

However, the decline in financial income may make it harder for institutions build up reserves, which could affect their solvency over the long run. The interest rate environment also adversely affects the coverage ratio via valuation of the prudential balance sheet. Liabilities are increasing owing to the discounting of expected cash flows at lower interest rates. This increase in insurance liabilities is only partly offset by the increase in the value of assets resulting from the duration gap between assets and liabilities. Between the third quarter of 2018 and the third quarter of 2019, the average market coverage ratio fell sharply, decreasing from 243% to 214% owing to the fall in interest rates.[39]

1.5 In a setting of high market valuations, recent incidents highlight the need to strengthen the non-bank regulatory framework

Stock market indices continue to make gains, displaying elevated valuations that partly reflect the low interest rate environment

Since the March 2020 shock, which caused stock market indices to plunge, equity markets have enjoyed a sustained rally. European indices recently headed past the levels reached in February 2020. US indices, meanwhile, have hit record highs. Since March 2021, they have been more than 20% above their February 2020 readings.

Equities have not risen at the same pace across sectors (cf. Chart 1.18) and regions, suggesting that investors engaged in switching between stocks and markets. Digital firms, for example, have outperformed other sectors. This is partly due to their business model, which was a particular beneficiary of lockdown measures, and also because, as growth stocks, they work to a longer dividend horizon (earnings are often reinvested to support the firm's growth), making them less sensitive to interest rate fluctuations.

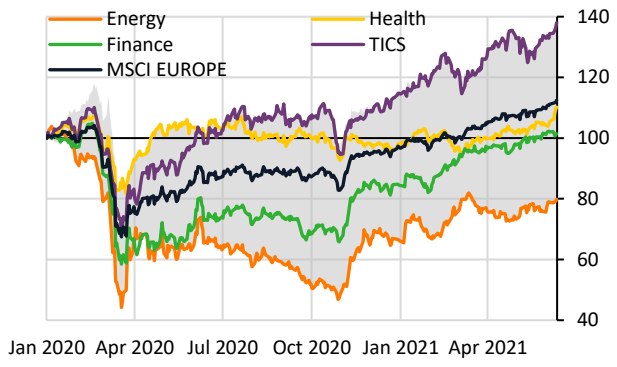
Future earnings are expected to show strong growth (cf. Chart 1.19). The low interest rate environment increases the present value of these future earnings, while an increase in interest rates would automatically cause this value to decrease through a higher discount rate.

This mechanism applies especially to tech stocks – and these have accordingly outperformed the indices – but also partially accounts for geographical differences, since digital companies are overrepresented in US indices compared with European indices, which comprise a larger proportion of industrial firms.

[39] The average capital requirement coverage ratio rose at the end of 2019 as a result of the combined effects of slightly higher rates, the authorisation granted in late 2019 to include a portion of profit-sharing reserves in capital, and measures taken by insurers (subordinated debt issues, recapitalisation by parent companies, restrictions on dividend payouts, rationalisation of investment policies through a focus on less capital-consuming assets).

Chart 1.18: Performance of MSCI Europe and sub-indices

x: time / y: index and sub-indices

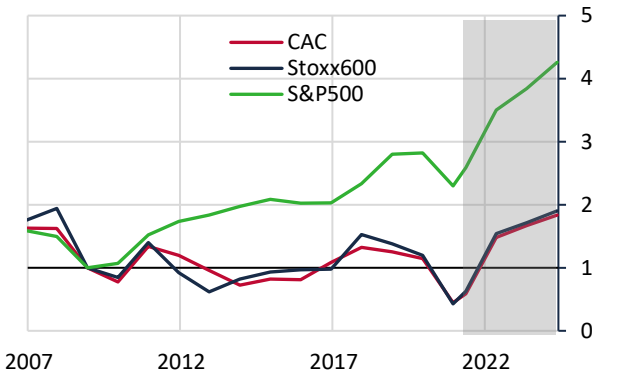


Notes: The chart plots the performance of the benchmark index (in black) and sector sub-indices. For the indices, 01/01/2020 = 100. MSCI is the Morgan Stanley Capital International equity index, while TICS stands for technology, information and communication services The greyed area shows the min-max spread for the sub-sectors. Most recent value: 11 June 2021

Source: Bloomberg. Banque de France calculations

Chart 1.19: Earnings per share and expectations

x: year / y: 2008 earnings = 1



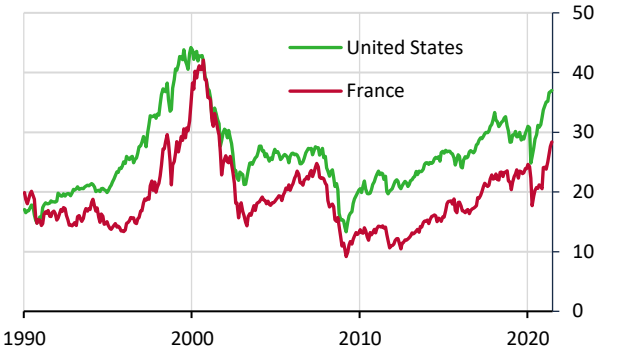
Note: 2021 goes up to end-May; following years are considered from May to May.

Source: Bloomberg.

The equity rally may seem at odds with today's macroeconomic conditions and uncertain outlook, raising fears of a sudden correction. And indeed, cyclically adjusted price/earnings (CAPE) ratios for France in June 2021 were slightly above their 2007 levels, while in the United States they are currently on a par with 1998 ratios, i.e. the levels recorded before the dot.com bubble burst (cf. Chart 1.20).

Chart 1.20: CAPE ratio

x: year / y: CAPE ratio

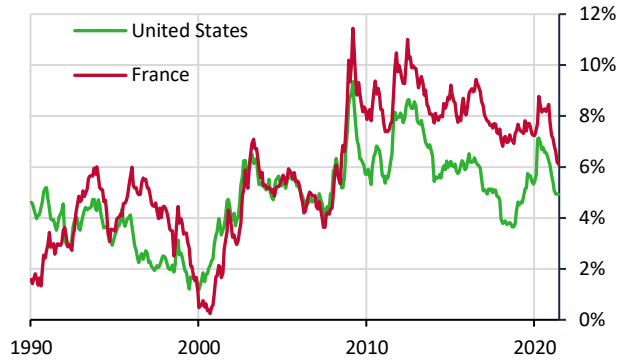


Note: CAPE = cyclically adjusted price earnings ratio. The indicator represents (real) index prices divided by (real) earnings smoothed over ten years. Most recent value: 1 June 2021

Sources: Datastream, Robert Shiller website. Banque de France calculations.

Chart 1.21: Risk premiums

x: year / y: %



Most recent value: 1 June 2021

Sources: Datastream, Robert Shiller website, IMF-WEO. Banque de France calculations.

Taking into account the effect of the low interest rate environment and expected growth in dividends, a decomposition of equity prices reveals a relatively high risk premium over the long run. This is reflected in the additional compensation required by investors for their risk-taking (i.e. the share of expected equity returns over the risk-free rate, cf. Chart 1.21). While these premiums are at their lowest level since February 2020, they are still higher than the record low premiums recorded at the end of the 1990s. An excessively small risk premium would reflect a type of irrational exuberance on the markets, similar to what occurred during the dot.com bubble. However, risk premiums currently look to be in line with historical distributions, and accordingly do not signal unusually low risk aversion on equity markets.

Financial markets are showing multiple signs of exuberance

Crypto-assets also hit new records. Bitcoin broke temporarily past USD 60,000 in March 2021, driven by fears of renewed inflation in the United States and a portion of the forced savings built up by households during the crisis, before surrendering almost half its value during a bout of extreme volatility. These assets are fundamentally speculative and exposed to potential market manipulation: 14% of Bitcoins in circulation are held by 95 addresses (or portfolios) out of a total of more than 36 million addresses, and the price is highly sensitive to the effects of news about possible use cases.

Given the financial and non-financial (fraud and laundering) risks associated with crypto-assets, strong and swift steps to regulate the sector are needed. The proposal for a European Markets in Crypto-Assets (MiCA) Regulation, which was published last September as part of a package of measures for digital finance and which is currently being discussed by the EU, represents an initial response.[40] In addition to harmonising the rules within the EU, the proposal seeks to introduce enhanced requirements that would apply to issuers of crypto-assets as well as to service providers operating on the market.

High stock market valuations increase the likelihood of idiosyncratic shocks, which, combined or associated with downbeat macroeconomic news or higher market interest rates, could trigger a major overall repricing of risks.

In the United States, initial public offerings (IPOs) are using new channels that need to be monitored (cf. Box 1.2).

Box 1.2: SPACs

The increase in the number of special-purpose acquisition companies (SPACs) observed in 2020 continued in 2021. These companies are set up with the sole purpose of raising capital on the stock market with a view to the future acquisition of an unlisted company. Following the 248 SPACs launched in the United States in 2020 (compared with 244 in the previous 12 years), a further 297 were launched in the first quarter 2021, with increasingly large amounts of funds being raised.

Although these companies allow new market participants to invest in previously unlisted firms, the valuation of these entities is based chiefly on the reputation of the sponsors (the prospectus published by the SPAC before its IPO supplies information on the sector of activity, sponsors and material conflicts of interest) prior to the announcement of potential acquisitions, meaning that investors must exercise great care. This is a relatively new phenomenon in Europe. In France, where several SPACs have been launched in recent years, access to the capital of such entities is restricted to professional investors.

Several market events during the first half of 2021 highlighted the vulnerabilities that could be created by such shocks, including the short squeeze[41] on GameStop shares, the collapse of reverse factoring specialist Greensill and the default by Archegos, a fund to which several international banks were exposed (see Box 1.3). These incidents showed that regulators need to identify transmission channels between participants, some of which remain unregulated, by looking at the adequacy of existing position disclosure practices for example, while banks need to strengthen governance and risk management arrangements for their dealings with non-banks.

Box 1.3: In early 2021, several market events occurred that were very different in character but that were all indicative of vulnerabilities.

- A short squeeze on US video game retailer GameStop in January 2021 propelled the company's shares to around 19x their price at the start of the year. Funds that had shorted the shares were forced to rush to buy them back, even as prices were going up on buying pressure from retail investors. The volatility seems

[40] The proposal, which does not include AML/CTF due diligence obligations, will form the basis for the future AMLD review.
[41] A short squeeze refers to a period in which investors who previously shorted shares are forced to buy the securities back to cover their positions. Shorting is a risky strategy because prices can increase greatly, potentially generating major losses for investors if their short bets do not come off.

to have been primarily the result of risk mismanagement, insofar as short-selling of GameStop stock exceeded the actual tradable volume of the company's shares. Spillover was limited to a few other companies that were also the subject of heavy short-selling volumes. Yet this bout of high volatility illustrates other financial system vulnerabilities, including the increase in the number of retail speculators with access to complex financial contracts via online platforms, as well as the procyclical effect of margin calls. Some platforms were forced to abruptly restrict the products that they were offering in order to avoid defaulting on margin calls.

- In early March 2021, Greensill Capital, a UK financial corporation specialising in reverse factoring,[42] was forced to file for insolvency when its insurers withdrew. Greensill provided a service whereby companies could offer suppliers swifter payment of invoices in return for a discount. Regulators had already identified risks associated with this activity due to its ability to mask real debt levels, since this type of financing is not recorded as debt for financial institutions. The risks taken on by Greensill were exacerbated by a highly unstable structure based on fund contributions by investors; the company is being investigated for fraud (missing invoices, loans to prospects against future invoices). This incident did not have a systemic impact, but is symptomatic of the risks to financial stability posed by new lightly regulated non-banks in the financial value chain.

- At end-March 2021, Archegos, a US family office, defaulted on its margin calls. The firm had taken heavily leveraged positions (notably through performance swaps) on tech and media stocks, and was unable to cover its losses when the market reversed. The banks involved as counterparties to these contracts lost more than USD 10 billion in total when they unwound their positions. While this event did not have systemic ramifications, it highlighted the major risks to which some banks are exposed through their links to hedge funds and more specifically through their fund-financing prime brokerage activities. An international initiative by the Basel Committee and IOSCO making it mandatory to report derivatives transactions and mitigate counterparty credit risk in uncleared derivatives should ultimately limit some of these risks (for example, the final phase in the mandatory exchange of initial margin will come into force in the EU in 2022 under EMIR). Note that this incident did not have a direct material impact on euro area banks, including French banks.[43] However, this default should spur all market participants to strengthen risk management and governance arrangements for these activities.

These issues underscore more broadly the need to strengthen the regulatory framework for the non-bank sector.

Following a period during which risks abruptly subsided in March 2020, European bond funds were once again exposed to increased credit, duration and liquidity risk owing to net investments in euro area investment funds.[44] In particular, European funds increased their exposure to instruments with longer maturities and to the debt of lower-rated firms,[45] while the cash holdings of bond funds fell below pre-crisis levels. These shifts expose bond funds, but also equity funds, to major outflows in the event of fresh turmoil. This could fuel significant spillovers, making it all the more necessary to deal with the sector's structural vulnerabilities.

More specifically, the acute market crisis period in March 2020 revealed that European money market funds (MMFs) remain vulnerable to liquidity shocks. Several factors of vulnerability were identified, including liquidity risk management at MMFs and open-ended funds and the sharp increase in liquidity needs linked to increased margin calls.

[42] Factoring is a service through which a firm delegates management of client invoices to a financial intermediary (upstream management). Conversely, reverse factoring is a service whereby a firm delegates management of supplier payments (downstream management).
[43] https://www.bankingsupervision.europa.eu/press/interviews/date/2021/html/ssm.in210506~ec5fa1bcac.en.html
[44] ECB Financial Stability Review, May 2021
[45] This observation concerning exposure to lower-rated debt does not apply to French funds (cf. page 47)

Because of the interconnectedness of participants on the short-term financing market, i.e. NFCs, banks and MMFs, and also because of the hold that MMFs have on these markets, the stress in March 2020 spread via MMFs, in spite of the specific microprudential requirements applicable to them. Central banks were forced to intervene to relieve the pressure, especially on short-term financing markets.

The Banque de France is participating in work by European bodies (European Systemic Risk Board and the ECB's Financial Stability Committee) and international bodies (Financial Stability Board) to analyse the vulnerabilities linked to non-bank financing and its role in liquidity management within the financial system. This work may lead to adjustments to the rules governing non-bank financing (especially for MMFs). Enhancing the regulatory framework for MMF activities to include a systemic, i.e. macroprudential, approach would help to improve the stability of the sector, notably in terms of its role in financing the real economy. Furthermore, additional measures to help commercial paper markets to function more effectively in all circumstances could underpin the structure and development of this market, improve the liquidity of securities held by MMFs and promote better stability on this market.

Beyond efforts to analyse individual risk factors and markets that may have contributed to amplifying the March 2020 shock, work to understand the systemic risks associated with non-bank intermediation as a whole is under way with a view to potentially providing a regulatory response, notably through the HCSF.

1.6 Vulnerabilities linked to structural changes, such as the digital transition and climate change, could have a major impact on the financial sector.

Financial system participants must ensure that their business models integrate the ability to absorb shocks that may seem improbable before they occur. The health crisis is an example of just such a shock. It exposed gaps in the collective preparedness of global health systems, which had major financial impacts. Although the global financial system was able to deal with this shock, the G20 noted the lack of preparation and called during a joint meeting of finance and health ministers for efforts to work together to lay the foundations for targeted actions to cope with future pandemics.[46] This should help to improve the system's resilience should a similar shock happen again. With this in mind, health was added to the items on the G20 finance track agenda.

While it is hard to draw up an exhaustive list of these extreme events, two in particular deserve attention given their systemic dimensions and non-negligeable likelihood of occurring. Common features of these two risks include the lack of data to quantify them precisely and gauge their systemic dimension, as well as their essentially forward-looking nature.

First of all, given the reliance on information systems, a loss of access to these systems, even on a temporary or localised basis, affecting financial or non-financial participants, could have major consequences for the financial system. This set of vulnerabilities and potential shocks that could arise in the short term and that concern digital infrastructures are classified as cyber-risk. Compounding these IT security issues, the rise of digital financial services is also prompting current participants to make changes to their business models.

Climate change, meanwhile, presents economies, and especially financial systems, with an unprecedented challenge through a variety of transmission channels. Work by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), for which the Banque de France acts as the secretariat, has identified climate risks as a source of financial risks and stressed that the mandate given to central banks and supervisors requires them to ensure that the financial system has the resilience to withstand these new risks.

[46] https://solidarites-sante.gouv.fr/IMG/pdf/g20_joint_finance_health_ministers_meeting_statement_-17_sep_2020_engli.pdf

A need to adapt the banking sector to new digital uses

For some years, the digital transition has been a major structural issue for financial institutions. In a setting where customer demand is shifting towards more digital services and personalised solutions, new participants are emerging and increasing competition on some customer relation segments of the banking sector.

These changes are taking place on the supply and demand sides alike, forcing traditional firms to invest massively to adapt and innovate, potentially by acquiring start-ups specialised in finance, otherwise known as fintechs.[47] However, digitalisation is also providing them with opportunities to make their internal processes and information systems more efficient, with a view to lowering costs.

Lockdown measures introduced in response to the health crisis played a role in galvanising and accelerating some aspects of digitalisation, spurring a massive increase in home working by employees (internal digitalisation) and widespread adoption of non-face-to-face banking transactions by individuals and businesses alike (external digitalisation).

While the digital transition is enabling financial intermediaries to make their internal processes and information systems more efficient, with a view to lowering costs, it also increases sensitivity to cyber-attacks.

The multiple transmission channels of cyber-risk contribute to its potentially systemic dimension

Since the health crisis, the financial sector's significant exposure to cyber-risk has been accentuated by the need to switch financial activities massively and rapidly to working from home arrangements and non-face-to-face service delivery. The Bank for International Settlements highlighted a strong link between the prevalence of working from home arrangements and the incidence of cyber-attacks between February and June 2020, with the financial sector ranking high on both accounts.[48] Even so this transition has taken place within a broadly controlled framework, with no incident having a systemic impact so far.

Given the high level of interconnectedness within the financial system and through technology, some cyber-incidents could however affect financial stability going forward, after being triggered by isolated events or a simultaneous impact on several components of the financial system (see Box 1.4).

Besides the speed with which they spread, cyber-attacks are different from more conventional financial shocks in the sense that they may be targeted at a specific time with malicious intent, which may also cause them to magnify pre-existing tensions. Moreover, while most attacks are financially motivated, geopolitical tensions also increase the risk of incidents aimed specifically at sabotage or destabilisation.

Box 1.4: The multiple transmission channels of cyber-risk

Several types of incidents have the capacity to trigger cascade effects, including:

(i) A major disruption to critical economic infrastructures or functions, such as central counterparties or payment systems. In a real-time gross settlement system, for example, several banks may depend on the payments of a single major participant. If that participant is incapacitated, intraday liquidity may come under strain. According to Fed estimates, a cyber-attack on the wholesale payment network of one of the five largest participants in the US payment system would affect, on average, 38% of the network.

[47] Large tech companies, or bigtechs, could also be a source of competition for the banking sector https://www.fsb.org/2019/12/bigtech-in-finance-market-developments-and-potential-financial-stability-implications/

[48] BIS Bulletin No. 37, *Covid-19 and cyber risk in the financial sector*, 14 January 2021.

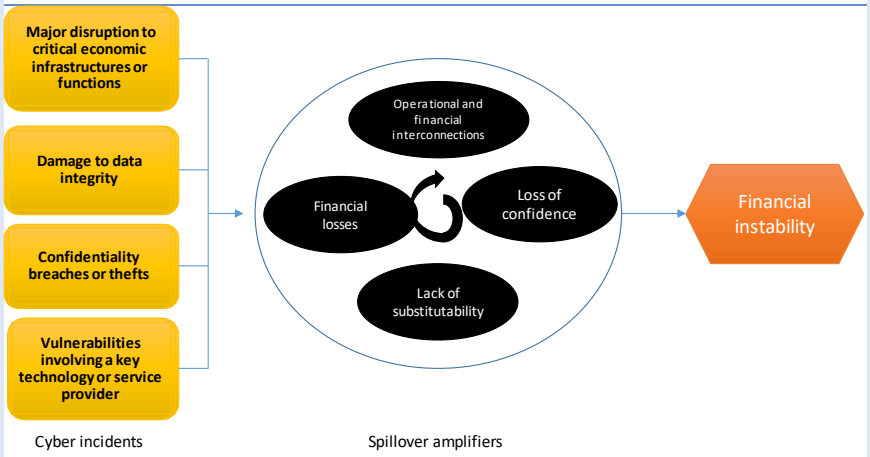
(ii) Damage to the integrity of the data needed for orderly market operation (account balances, securities holdings, etc.). In August 2020, disruptions on the New Zealand stock exchange caused by a series of cyber-attacks led trading to be halted due to market integrity concerns.

(iii) Confidentiality breaches or thefts that undermine confidence. Numerous cyber-incidents targeting commercial banks (including Cosmos Bank, Capital One and Banco de Chile), central banks (access to the SWIFT payment system of the Bangladesh Central Bank in 2016) and other types of institutions (Equifax, a credit bureau, or Travelex, a foreign exchange company) have resulted in financial losses or data theft.

(iv) Vulnerabilities involving a key technology or service provider. Although not specifically targeting financial institutions, recent attacks on the system built by software publisher SolarWinds and used by thousands of companies and government agencies, as well as on Microsoft Exchange, a professional email service, illustrate the vulnerabilities connected with supply chains and third-party service providers. The European Banking Authority was hit by the Microsoft Exchange hack, but the confidentiality of its systems and data was not compromised. This type of risk underlines the need for financial institutions of all sizes to ensure that their dealings with service providers are subject to adequate oversight and management.

Disruptions to a provider of electricity or telecommunications services, for example, could also indirectly cause major problems for the financial sector.

Chart 1.22: Cyber-incidents and risks to financial stability



Source: Banque de France.

These types of incidents have the potential to bring significant disruption (news of which may be swiftly amplified, notably by social media), which could cause financial losses and sap confidence among customers and market participants. In turn, this could activate channels of financial contagion and feed extreme negative feedback loop scenarios (liquidity and financing problems, more volatile prices for financial instruments, fire sales, bank runs, withdrawals from open-ended funds, insolvencies and so on). These effects could be further exacerbated by a lack of substitutability for the services or infrastructures in question.

Ensuring that high-quality data are available on the consequences of cyber-attacks is one of the ways to more effectively recognise the risks linked to these transmission channels, even if backward-looking data have weak predictive power owing to the fast-changing nature of the risk, especially in the case of extreme incidents. The completion of projects covering, for example, the harmonisation of incident taxonomies[49] or the systematic notification of serious incidents to authorities will help to address some difficulties in quantifying cyber-risk, while promoting information-sharing and crisis management at an international level.

Looking beyond individual cyber-risk management capacities, steps are needed to strengthen the collective ability to manage systemic cyber-incidents. With this in mind, numerous international initiatives are being carried out to improve national cyber-security frameworks and promote greater consistency between them. These include work

[49] A proposed common categorisation of IT incidents, prepared by the ACPR and other G7 authorities, was published in April 2021. Work is continuing on this subject within the FSB. Europe's draft DORA regulation also contains measures to harmonise the notification of major incidents.

on factors that mitigate the impact of major cyber-incidents, notably via information-sharing, coordination and existing macroprudential tools.[50]

Several recent testing exercises, including the Eurosystem's TITUS and UNITAS exercises and the G7 cross-border coordination exercise organised in June 2019 by the Banque de France, have also helped to strengthen the operational capacity of financial authorities and the main participants to deal with a large-scale cyber-incident. Within Europe the draft Digital Operational Resilience Act (DORA) regulation proposed by the European Commission will provide the entire sector with a binding framework to ensure digital operational resilience. The framework will cover, among other things, incident reporting, security testing and management of third-party risk, particularly through direct supervision of the most significant IT service providers.

Broader collection of data on climate change exposures is needed to estimate the associated risk more effectively

Since 2014 and the introduction of Directive 2014/95/EU, also known as the Non-Financial Reporting Directive (NFRD), 11,700 large European companies (with more than 500 employees) have had to disclose information about their treatment of social and environmental challenges. These data are essential because they allow investors, consumers and non-government organisations to assess the non-financial performances of companies and encourage firms to adopt a responsible approach.

These obligations now look inadequate in terms of their geographical and thematic coverage. Many institutions, both public and private, have launched initiatives to encourage firms to disclose more information. In fact, there were over 100 initiatives of this type around the world in May 2021. These initiatives are diverse in terms of their nature and goals, and seek to address variously broad sets of issues.

The fact that there are so many initiatives creates the threat of disorderly data collection at global level, with companies able to disclose different information depending on where they are based or their ties to a particular data provider. Without international coordination, the information available in one region will not necessarily be available in another, and even if it is, it may not be easily comparable if different methodologies are used.

Accordingly, public authorities are calling for international norms that could provide a set of standards for all global companies to follow and ensure data consistency. These standards represent a critical challenge. They will enable financial participants to steer their investments towards companies with the most sustainable business models and technologies. From a financial stability perspective, they will force banks, insurers and other financial institutions to manage their environmental, social and governance (ESG) risks by acquiring detailed knowledge about the content of their asset portfolios. These standards will also facilitate the transition to climate neutrality and promote compliance with commitments made at the Conference of Parties (COP).

The IFRS Foundation is organising itself to draw up international accounting standards and has the backing of most of the international community regarding the principle of building a common set of interoperable standards. However, ambitions vary in terms of the scope of these standards.

The European Union has set the boldest goals, owing to its experience in this area and the major investments made by the main European and domestic institutions to promote the development of climate risk assessment tools. For example, the ACPR recently published the results of a pilot climate exercise (see box on the findings in the chapter covering the challenges involved in the transition to a carbon-neutral economy).

On 21 April 2021, the European Commission published its draft Corporate Sustainability Reporting Directive (CSRD), which sets out Europe's ambitions in this area. The draft legislation proposes to extend data disclosure obligations to all large companies with over 250 employees, compared with 500 previously, to add more detailed disclosure requirements covering the entire ESG spectrum, and to make this information available through a single point of access. Among other things, the directive proposes to require companies to follow the double materiality

[50] Within the European Systemic Risk Board.

principle in their reporting, by disclosing not only the risks to which they are subject because of their environment (currently the main focus internationally), but also the risks that they pose to their environment (these are largely overlooked at international level and under the IFRS approach).

These efforts reflect Europe's determination to lift the ambitions of the international community and to provide the IFRS Foundation with effective tools that can be transposed to the global level. The Banque de France is taking part in Europe's bold strategy and fully supports initiatives that will promote more sustainable economic development.

2. Resilience of banks and insurers to interest rate risk

The economic role of financial markets and intermediaries is to promote the efficient allocation of capital, namely available cash and savings, to economic agents with financing needs. Within this setting, variations in interest rates on financial markets and their effects on financial asset returns may create or renew vulnerabilities for the stability of the financial system.

These market movements may also have significant consequences for economic activity through their impact on financing conditions for households and businesses. Such effects are potentially made more problematic by the fact that interest rates have been relatively low for a number of years while the growth rate of debt has recently gone up, fuelling fears of a surge in credit risk, even as low interest rates squeeze financial firms' margins. However, the exposure of French banks and insurance companies to interest rate risk remains under control, while an interest rate shock would have a limited impact on existing loans to households and NFCs since the vast majority of loans are at fixed rates.

2.1 Mechanisms through which an interest rate shock may be transmitted to the financial system

Much of the business of financial intermediaries consists in balance sheet management, i.e. in managing uses of funds (assets) and sources of funds (liabilities). On a bank's balance sheet, for example, uses of funds chiefly comprise loans to households and businesses, while customer deposits make up the sources. In the case of a life insurer, uses of funds consist primarily of financial assets, while money from policyholders is the main source of funds. To generate positive earnings, intermediaries aim to be in a position where their uses of funds earn a higher average return than their sources of funds overall. An analysis of interest rate risk thus seeks to identify to what extent changes in interest rates observed on the market may affect a financial participant's balance sheet and potentially drive significant variations in the entity's profit & loss account.

Risk-free rate and risk premium

In macroeconomic terms, nominal interest rates may be understood as reflecting a "real" interest rate resulting from the overall equilibrium between savings, investment and trend growth, plus a premium corresponding to expected inflation.[51] Alternatively, for an investor, a bond yield may be broken down into a theoretically "risk-free" benchmark rate plus an additional return, or risk premium. Various factors may influence this premium, including the term premium, the borrower's credit risk, and the liquidity risk determined by the ability to sell the instrument without loss of value. The greater the risks perceived by creditors in relation to an issuer's repayment capacity, the harder it will be to sell that issuer's bonds on the secondary market and the higher the yield will need to be to remunerate the risk taken on by creditors. Meanwhile, a bond that is considered to be extremely safe (because the country that issued it is in a sound and solvent financial position) and highly liquid (because it is widely accepted and sought after on the market) will have a lower yield.

Bonds are priced by comparing the risk/reward tradeoff against that of a bond of the same maturity that is considered in practice to be "risk-free" (typically sovereign debt of the highest possible credit quality). In the case of sovereign bonds, and notwithstanding the sharp increase in debt levels, most market analyses use US Treasuries as the benchmark for USD issues and German sovereign bonds (whose credit quality is based on a controlled debt trajectory and a track record of strict management of the public finances) for EUR issues, which also have the shared feature of being extremely liquid. As a result, movements in the yields of these benchmark bonds dictate movements on other fixed income markets, whether these be sovereign or private debt markets, or financial asset prices more broadly. But these structural factors are not the only ones with an influence on the transmission of interest rate shocks, and other factors come into play via other transmission channels.

[51] According to the Fisher equation: $i \approx r + \pi$ where *i* is the nominal rate; *r* the real rate and π the rate of inflation. If the real rate does not change, a movement in inflation expectations will cause a shock to nominal interest rates.

Interest rate risk transmission channels

A movement in benchmark bond yields, for example in anticipation of improved growth prospects or higher inflation, may be transmitted to other segments of the bond market (and other financial assets more generally) through various channels. The overall level of interest rates may affect investors' risk-taking behaviour. When rates are low, for instance, investors are readier to move away from benchmarks to search for yield in other asset classes. Moreover, when they hold marked-to-market portfolios, institutional investors and banks may record losses on bond portfolios when yields rise (prices fall), prompting them to modify the composition of their assets in order to adjust their earnings profile. These switches may involve instruments denominated in the same currency or instruments denominated in different currencies.

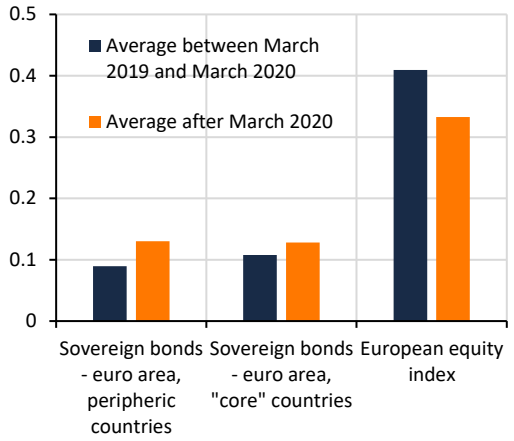
Box 2.1: Risk of spillover to Europe from higher US yields

Because financial markets and advanced economies are closely interconnected, negative and positive shocks affecting a set of assets can spread between them. Accordingly, in the past, increases in US interest rates may have affected those in Europe. These effects are especially important to monitor because they can cause financial conditions to tighten in ways that are not intended by domestic monetary authorities.

A proposed quantification of spillover effects is provided in Chart 2.1 using estimates from a Diebold-Yilmaz (DY) model of spillover affecting European sovereign bond yields. Two main factors are discernible: i) no matter what period is under consideration, European equities seem to be more sensitive to US spillovers than European sovereign bonds, even if transmission has decreased since March 2020; ii) movements in US sovereign yields have a significant but relatively smaller impact on European sovereign yields, even if spillover increased with the rise in US yields since July 2020.

Chart 2.1: DY indicators of spillover from US shocks to European markets

x: asset class / y: %



Note: The different columns show the scale of the spillover to European asset classes caused by a change in US interest rates. Euro area peripheral countries are those that were hit particularly hard during the 2010-2012 sovereign debt crisis, such as Spain, Italy and Portugal. Core countries include France and Germany, among others. The indices are calculated with the help of a Diebold-Yilmaz indicator (described in Boeckelmann and Stalla-Bourdillon (2021)) and are estimated for seven international financial series, including the Euro Stoxx 50 as the variable reflecting European equity indices. Most recent value: 30 April 2021.
Sources: Bloomberg, ICE. Banque de France calculations.

Yet in the past, increases in US yields pushed European yields up to varying degrees, including during the 2013 taper tantrum when the Fed scaled back its programme of securities purchases, during the period surrounding the election of Donald Trump, and during the normalisation of US monetary policy in 2017/2018. More recently, starting in August 2020, the prospects of a sustained economic recovery in the United States helped to push US interest rates higher. This increase became more pronounced in January 2021 as markets looked ahead to the effects of the Biden stimulus plan. This had a knock-on effect on European sovereign yields, with German 10Y yields climbing by 28 bps and French 10Y yields rising by 32 bps in response to the 81 bps increase for US 10Y yields between 1 January and 18 March 2021, the date of the meeting of the

Federal Open Market Committee (FOMC), which halted the rise in USD yields.[52] These types of interest rate shocks may disrupt and trigger stress on markets.[53]

Both the weak spillover indicator (cf. Chart 2.1) and correlations during periods of rising US yields (cf. Chart 2.2) underline the decoupling of economic developments and especially of monetary policies. The decrease in correlations during the last three phases of rising US yields highlights the dominant effect of euro area monetary policy on European sovereign yields. The ECB has confirmed the accommodative stance of its monetary policy and has said that it will keep policy rates at present levels until it sees the inflation and core inflation outlook converge robustly towards a level close to the target. Accordingly, the market is not expecting a sharp increase in euro area yields.

Chart 2.2: Correlation between US and German sovereign yields

x: month / y: Correlation coefficient

Guide: The blue areas show phases when US sovereign yields were rising: 26/04/2013 – 05/07/2013, 04/11/2016 – 31/12/2016, 08/09/2017 – 26/03/2018, 01/01/2021 – 16/03/2021

Note: The correlation coefficient is calculated based on daily changes in yields over a rolling three-month period. Most recent value: 11 June 2021. US = United States, DE = Germany

Source: Bloomberg. Banque de France calculations.

Interest rate shocks impact the valuations of assets held by financial firms

Markets continue to price in an accommodative monetary policy and persistently low interest rates in the euro area

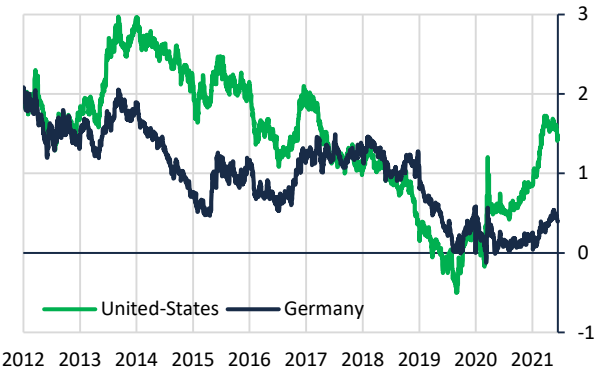
The recent increase in US sovereign yields was accompanied by significant yield curve steeping (cf. Chart 2.3), which contributed, to a lesser degree, to an increase in European sovereign yields (cf. Box 2.1). A scenario of higher euro area sovereign yields, similar to developments in the United States, is not expected by the market, underlining the timing differences between US and European monetary policy. In the euro area, market rates are expected to stay low for a prolonged period (cf. Chart 2.4), notably because monetary policy is set to remain accommodative until inflation and core inflation converge robustly towards the target level. In addition, central bank securities purchases are playing a part in moderating government bond yields and may modify the structure of expectations reflected in forward rates.

[52] The Fed held a monetary policy meeting on 16-17 March 2021. US sovereign yields stopped going up on 18 March 2021, after rising since the start of 2021.

[53] For example, on 25 February 2021, a US 7Y sovereign bond issue encountered weaker demand than expected, leading to lower prices and hence higher yields, which caused unforeseen market disruption: as a result of the rise in yields, the market's liquidity and especially its depth were badly affected and took several weeks to return to “normal” levels.

Chart 2.3: 3M – 10Y yield curve slope

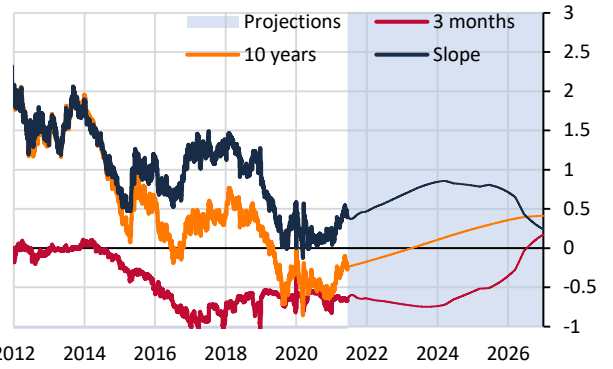
x: time / y: basis points



Note: The slope of the yield curve is calculated as the difference between 10Y and 3M sovereign yields. Most recent value: 11 June 2021.
Source: Bloomberg, Banque de France calculations.

Chart 2.4: Projections for 3M and 10Y yields and slope of the German yield curve

x: year / y: %



Note: The blue area shows projected yields and the 10Y-3M yield curve slope. Projections show the forward rates expected by the market. Most recent value: 11 June 2021.
Source: Bloomberg, Banque de France calculations.

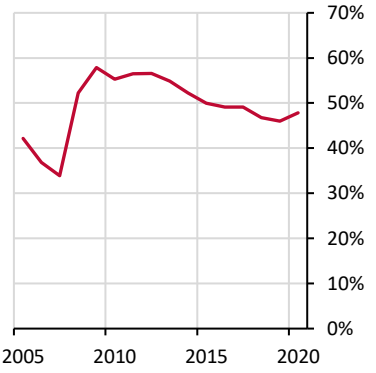
Financial regulation covers the risks linked to interest rate developments

Interest rate risk in the banking system is regulated through Basel Committee reforms

Because of their business, financial firms are sensitive to changes in asset prices. Credit institutions borrow funds in the short and medium term (overnight and term deposits, issues of debt securities booked as liabilities) and lend in the medium and long term to economic agents (customer loans and debt securities booked as assets, mainly in the form of home loans to households, consumer loans, business loans and purchases of corporate or sovereign debt securities). They therefore need to manage the maturity transformation risk between their sources and uses of funds. This risk has two components: a liquidity component and an interest rate component. Interest rate risk management is especially important to banks, given that interest income accounts for around 50% of their net banking income (see Chart 2.5). Net interest income comprises a price effect, which is based on the net interest rate, i.e. the difference between the average rate on interest-bearing assets and the cost of liabilities, and a volume effect.

Chart 2.5: Share of net interest margin (NIM) in the net banking income of French banks

x: time / y: %



Source: Banque de France.

From a regulatory perspective, interest rate risk in the banking book of a credit institution refers to "current or prospective risk to the bank's capital and earnings arising from adverse movements in interest rates that affect the bank's banking book positions".[54] Interest rate shocks that cause the net present value (NPV) of financial assets to change therefore influence bank balance sheets (on the asset and liability sides) as well as off-balance sheet items such as derivatives, ultimately affecting the economic value of banks. This could have the effect of encouraging banks to modify the composition of their assets (securities and loan portfolios) but also of their capital in order to control their interest rate risk (IRRBB)[55] and avoid being weakened. To measure and control these risks, the Basel framework[56] set up after the 2008 crisis adjusts banks' capital requirements according to the level of interest rate risk borne. Banks are therefore required to model the extreme losses that could arise in various

[54] As defined by the Basel Committee in April 2016 (https://www.bis.org/bcbs/publ/d368.pdf) and supplemented by the European Banking Authority in 2018 https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2282655/169993e1-ad7a-4d78-8a27-1975b4860da0/Guidelines%20on%20the%20management%20of%20interest%20rate%20risk%20arising%20from%20non-trading%20activities%20%28EBA-GL-2018-02%29.pdf?retry=1

[55] Interest rate risk in the banking book.

[56] The IRRBB standard published by the BCBS in 2016 provides information to measure and manage this risk in order to adjust banks' capital requirements. https://www.bis.org/bcbs/publ/d368.pdf

interest rate scenarios and to adjust their capital in order to have enough to cover these potential losses at all times.

In 2017, the European Central Bank, in partnership with national authorities, studied the effects of these variations on the risk profile of banks under its supervision and found that interest rate risk was well managed by most European banks, including French ones.[57] These stress testing exercises used six interest rate scenarios, including one featuring a parallel increase in rates and one featuring a parallel decrease in rates to show banks' sensitivity to a simultaneous movement in short and long rates.

European rules for insurers also regulate interest rate risk

Since 2016, the Solvency 2 framework applicable to the insurance sector has been based on market valuation and an assessment of the risks taken on by insurers. Insurer solvency is thus assessed on the basis of:

- Capital requirements: the Solvency Capital Requirement (SCR), whose calculation under the standard formula is composed of various risk sub-modules, which are combined using regulatory correlation matrixes that seek to capture diversification effects between these risks. For each sub-module, capital requirements correspond to the capital loss resulting from a sudden and adverse event, such as a collapse in real estate prices or an increase in life insurance surrenders. The Minimum Capital Requirement (MCR) provides a capital floor below which the entity is not authorised to operate;

- A prudential balance sheet measured at market value, in which own funds eligible to cover the SCR are calculated as the excess amount between the market value of assets and liabilities. Since insurers' liabilities cannot be measured at market value, they are calculated using a best estimate corresponding to a probability-weighted estimate of average future cash flows that takes account of the time value of money (risk-free yield curve). To obtain the technical provisions, a risk margin corresponding to the cost of holding the capital required to settle all insurance obligations is added to the best estimate.

A change in interest rates impacts both the prudential balance sheet and the SCR. For example, if interest rates go down:

- The value of French insurers' assets, which mainly comprise bonds and interest rate products, will increase. The impact of lower rates on the value of equity holdings is more complex, but the effects are similar.
- The increased asset value is offset by increased liability value, via the mechanism used to discount expected future cash flows linked to insurance obligations (premiums, surrenders, profits).

In practice, since liabilities have greater duration than assets on average, a decline in interest rates leads liabilities to increase by more than financial assets, causing own funds to decline. Generally, lower interest rates also lead to increased capital requirements for some sub-modules in the standard formula, especially the interest rate risk, equity risk and underwriting risk (life, health, non-life) sub-modules. In a low interest rate environment, the increase in the SCR, coupled with a decline in own funds, leads to a deterioration in coverage ratios.

2.2 Assessing the sensitivity of French financial firms to an interest rate shock

The low interest rate environment is impacting the profitability of credit institutions

Empirical analyses covering the impact of yield curve movements on the valuation of bank balance sheets and profitability reveal a number of trends. When rates go down, bank interest margins become thinner, reflecting the fact that it is hard for banks to offset a lower return on assets by reducing the returns offered on deposits. This is due to the inelastic nature of the remuneration paid on deposits, which does not decline in the same proportion

[57] See Banque de France's Risk Assessment, December 2017.

as the rate of return on assets, notably because in France the return on retail deposits is subject to a 0% floor. RoA, meanwhile, is decreasing as loans are gradually renegotiated to obtain lower rates and as variable-rate loans are automatically adjusted.

Beyond the structural changes, such as consolidation and digitalisation, being made to offset the effects of negative rates, the framework used to implement the Eurosystem's monetary policy has also evolved to adjust for the costs linked to low interest rates. In 2019, a tiering system was introduced for the remuneration paid on excess liquidity, while pricing TLTRO III operations is now extremely favourable. Tiering and ultra-low rates (currently 50 bps below the deposit facility rate) for Eurosystem TLTRO III refinancing operations more than offset the annual expense linked to the application of negative rates to the surplus cash held by banks with the central bank.

Meanwhile, a broader view of the impact of interest rates on bank profitability reveals that lower rates also have positive aspects: via the appreciation of bond portfolios held by banks and the decreased cost of funds, but above all via the macroeconomic effects of accommodative monetary policy, which stimulates credit demand and ultimately lowers the cost of risk.

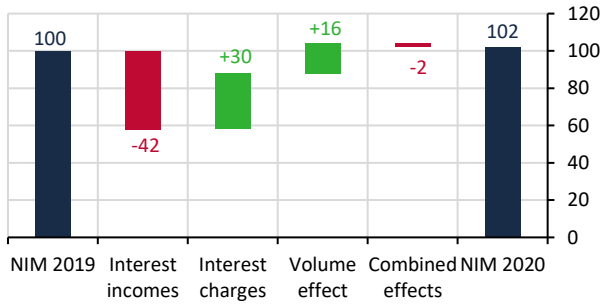
The health crisis has amplified the effects of the prolonged low interest rate environment on bank profitability

Interest rates have been trending downwards in advanced economies for over a decade. In the euro area, the ECB's deposit facility rate entered negative territory in June 2014. In such an environment, the future movement of yield curves is a matter of considerable importance to banking.

The economic effects of the pandemic caused the aggregate interest income of French banks to shrink, although an analysis of individual bank statistics shows that some institutions reported an increase in this type of income[58] (cf. Chart 2.6). The overall decline was due in particular to the lack of payments on loans subject to moratoria as well as to the lower risk premium on state-guaranteed loans. However, the increase in loans arising from demand for financing from economic agents to cope with the Covid-19 crisis coupled with the decline in interest expense on liabilities made up for the fall in income. This volume effect made it possible for aggregate net interest margin to increase (cf. Chart 2.7).

Chart 2.6: Net interest margin (NIM)

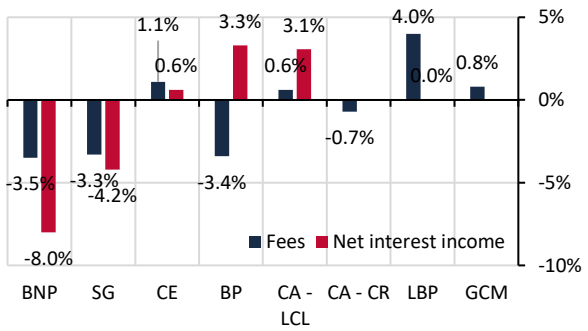
x: factor / y: NIM at end-December 2019 = 100



Note: scope comprises France's six largest banks (BNP Paribas, Crédit Agricole Group, Société Générale, Crédit Mutuel Group, Banque Populaire – Caisse d'Épargne, La Banque Postale)
Sources: Financial reporting, ACPR.

Chart 2.7: Interest income and net fees and commissions

x: bank / y: %



Note: CA = Crédit Agricole, CE = Caisse d'Épargne, BP = Banques Populaires, LBP = La Banque Postale, GCM = Crédit Mutuel Group
Sources: Financial reporting, ACPR.

[58] Crédit Agricole regional banks, La Banque Postale and Crédit Mutuel do not publish information on NIM changes.

Changes in the interest income of French banks in response to interest rate movements

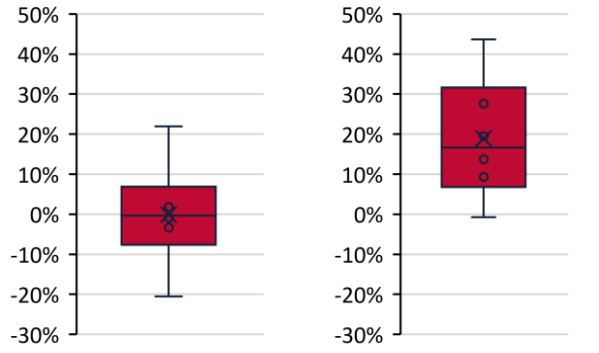
The effects of higher interest rates on bank earnings are mixed. The income earned on variable-rate assets or on new loans benefits from higher interest rates, supporting increased NIM (cf. Chart 2.8).

But if rates were to go up, the value of fixed-rate assets would go down and credit institutions might be affected by a deterioration in the quality of adjustable-rate assets in the event of an increase in the associated solvency risk.

The principles governing the supervision of interest rate risk established by the Basel Committee have been adapted for the euro area by the European Banking Authority (EBA/GL/2018/02), which requires banks, among other things, to file quarterly reports containing a sensitivity analysis similar to that carried out during the 2017 stress test. A review of these reports provides an idea of the exposure of the main French banks[59] to interest rate risk and stresses that an adverse shock scenario would improve banks' NIM (cf. Chart 2.8, right side).

Chart 2.8: Change in net interest income compared with the baseline in the event of a parallel 200 bps decrease / increase in rates

x: scenario (left: decrease; right: increase) / y: %



Guide: The charts plot the minimum, 15th centile, median, average, 85th centile and maximum values. In the case of a 2% decrease in interest rates, the median value for the six main French banks is zero, i.e. this scenario has no impact on interest income compared with the baseline scenario. In the event of a 2% increase in interest rates (right-hand chart), the median shows that interest income would improve by approximately 15% compared with the baseline.
Source: Banks' regulatory reports.

A parallel rate decrease results in a slight increase in income for half of the banks in the sample and a decrease for the other half. Conversely, if rates go up, most banks record a substantial increase in their income.

The insurance sector is highly sensitive to large-scale interest rate shocks

The prolonged low interest rate environment complicates asset/liability management for insurers

Persistently low interest rates have prompted life and mixed insurers to adjust their models to offset the decrease in financial income by expanding their offerings of unit-linked products in order to offer investors higher returns in return for a transfer of market risk. The decline in income on assets (especially bonds) directly linked to low interest rates has eroded the return on insurers' assets.

These factors partly explain the decline in revaluation rates observed in recent years as well as the increase in profit-sharing reserves. In this unsupportive interest rate setting, insurers are adjusting some of their practices to unlock sources of income, but they still favour low-risk, liquid investments to ensure that they remain financially sound.

A sudden interest rate shock would have a negative impact on insurers' RoA

If interest rates were to rise suddenly, insurers would be affected due to the inertia of their obligations. They could thus be faced with the risk of massive surrenders and competition from new market entrants offering higher-earnings products.

[59] BNP Paribas, Société Générale, Crédit Mutuel, Crédit Agricole, La Banque Postale and BPCE.

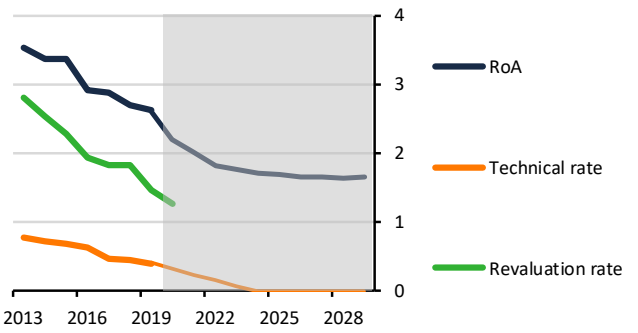
Furthermore, a significant interest rate shock would have a major impact on the market valuation of life insurers' assets, especially since their portfolios are chiefly invested in bond securities and asset duration is high.

However, this impact is mitigated by the fact that life insurers hold securities to maturity,[60] which makes them less sensitive to interest rate shocks (cf. Chart 2.9), except in cases where the assets are sold.[61]

In addition, an increase in interest rates would contribute to lowering the value of liabilities and limit asset/liability mismatches. Finally, to cope with these surrender and impairment risks, insurers hold several years' worth of reserves, which limits the impact on their liquidity and solvency.

Chart 2.9: Ten-year RoA projection, interest rate shock scenario

x: time / y: %



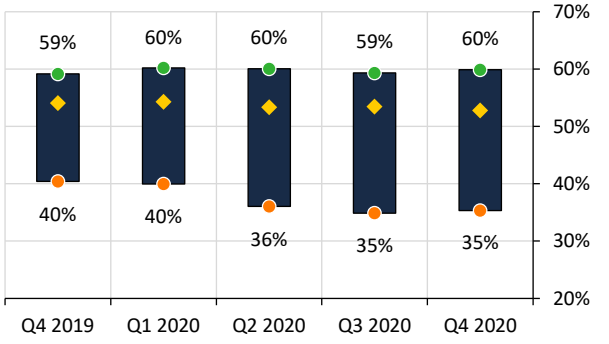
Note: RoA = Return on Assets. The model provides projections for life and mixed insurers' investment assets other than unit-linked products. Two categories are considered: (1) parametrically modelled amortising assets with fixed coupons (65% of the total, projected line by line) and (2) other assets Assumptions: (1) French 10-year government bond yield to rise to 2% from 2022 (2) zero net inflows over the entire period (3) other assumptions are specific to each entity
Source: ACPR.

Most of the securities held by insurers can be quickly and easily converted into cash

The risk of massive surrenders associated with an increase in interest rates could theoretically create liquidity requirements for insurers, insofar as they might have to sell assets quickly to honour their obligations to policyholders. As a result, most of the assets held by insurers are highly rated and extremely liquid. The liquidity ratio of assets held by life insurers stands at over 50%[62] (cf. Chart 2.10). Assets can therefore be accessed easily in the event of massive surrenders. The liquid assets of non-life insurers, meanwhile, are equivalent to around 30 months' worth of claims (cf. Chart 2.11).

Chart 2.10: Liquidity ratio of assets held by life insurers

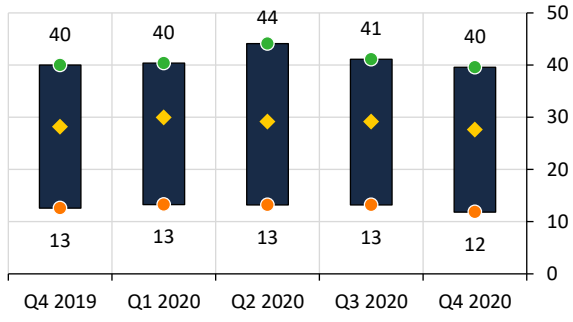
x: time / y: %



Note: first quartile in orange, weighted average in yellow, third quartile in green.
Sources: ACPR.

Chart 2.11: Months of claims covered by liquid assets held by non-life insurers

x: time / y: number of months



Note: first quartile in orange, weighted average in yellow, third quartile in green.
Source: ACPR.

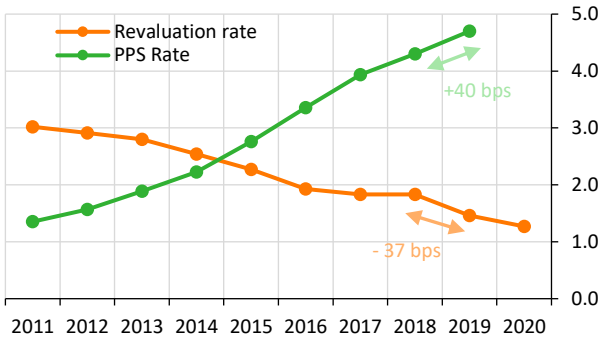
[60] This type of investment consists in purchasing a debt security and holding it to maturity. In this case, in accounting terms the value of the asset is measured at amortised cost, which supports stable earnings (in contrast with the fair value method, which causes more volatility).
[61] If the asset is kept in the portfolio until it matures, market variations over the life of the asset have no impact on the realised gain. Conversely, in the event of a surrender, the sale of assets that have suffered adverse shocks may lead the life insurer to realise an unrealised loss.
[62] The calculation method for this ratio is inspired by the standards developed by the Basel Committee under the Basel III framework, which introduced a liquidity coverage ratio (LCR) whose purpose is to promote banks' short-term resilience to liquidity risk. This ratio, which is used for example by the European Insurance and Occupational Pensions Authority (EIOPA), represents the share of unencumbered high quality liquid assets (HQLA) that may converted into cash quickly and easily in private markets in the event of a liquidity crisis lasting three calendar days, relative to all investments.

Over three full years of revaluation in reserves

Life insurers are adjusting their models in response to the steady decline in RoA. In the first place, they are reducing the revaluation rates applied each year to policyholders' euro-denominated products. According to initial estimates, rates were cut by around 20 bps on average in 2020, bringing returns to 1.27% compared with 1.46% in 2019. To smooth over time the impact of cyclical conditions on the revaluation of insurance contracts, this trend decrease has been accompanied by an increase in the profit-sharing reserves (PSRs) that life insurers use to lessen the negative impact of cyclical conditions by increasing investor returns in order to limit exits not just during prolonged periods of falling interest rates but also when rates jump suddenly. Total reserves stand at 4.7% of outstanding amounts held by policyholders, i.e. the equivalent of more than three full years of revaluation under current conditions (cf. Chart 2.12).

Chart 2.12: Revaluation rate and ratio of allocations to profit-sharing reserves

x: year / y: %



Source: ACPR.

The rise of unit-linked products

In addition to building up reserves for euro-denominated products, insurers are also promoting investments in unit-linked products, whose market risk is borne essentially by retail investors (unlike with euro-denominated funds, whose invested capital is guaranteed by the insurer, unit-linked funds offer no capital guarantees and their value varies according to market developments). In 2020, successive lockdowns were accompanied by a sharp increase in savings by French households, with a pronounced preference for the most liquid products, including bank passbooks. Although most of them can be surrendered at any time, euro-denominated life insurance products saw net outflows of EUR 31 billion[63] resulting exclusively from a steep decrease in premiums paid and not from increased surrenders. In contrast, unit-linked products continued to see positive net inflows, which totalled EUR 24 billion. This trend remained in place overall during the first five months of 2021, with life insurance recording net inflows of EUR 6.4 billion across all redeemable products, comprising net outflows for euro funds (EUR 7 billion) and net inflows to unit-linked products (EUR 13 billion).

[63] Net inflow/outflow statistics after recognising net switching between products.

3. Capital strengthening would help to consolidate corporate positions

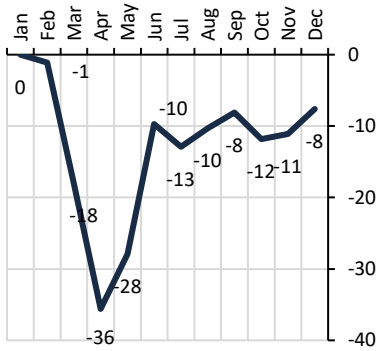
3.1 An unprecedented shock with contrasting effects

The Covid-19 crisis has had unprecedented economic consequences. France's GDP collapsed by 8.0% in 2020. Thanks to government support, partial unemployment schemes (EUR 29 billion in 2020), exemptions from social security contributions (EUR 18 billion) and solidarity funds (EUR 17 billion),[64] companies saw their gross operating surplus contract by just EUR 53 billion overall.[65]

The shock had contrasting effects from the outset (cf. Chart 3.1): in April 2020, activity contracted by 36% overall, but falls in turnover ranged across sectors from 11% for farming, forestry and fishing to 82% for hotels and restaurants, with sharp variations between companies in the same sector.[66] Thereafter, companies followed different trajectories: some swiftly returned to normal activity levels, while others continued to operate at lower or virtually zero levels of business (cf. Chart 3.2).

Chart 3.1: Aggregate shock per month in 2020 compared with a simulated counterfactual where no crisis occurred

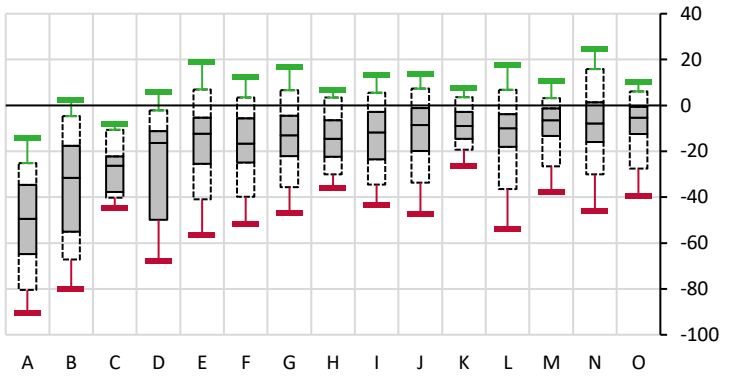
x: date / y: turnover shock as a %



Source: Monthly VAT data reports, INSEE and Banque de France calculations.

Chart 3.2: Distribution of turnover shocks in 2020 by sector compared with a simulated counterfactual where no crisis occurred

x: sector / y: %



Note: From lowest to highest, the lines on the charts indicate the 5th centile, the 1st decile, the 1st quartile, the median, the 3rd quartile, the 9th decile and the 95th centile. Shocks are weighted by company headcount.
From left to right (followed by corresponding sector codes): A: accommodation and food services (IZ); B: other services (RU); C: transport equipment manufacturing (C4); D: transportation (HZ); E: real estate (LZ); F: scientific & technical (MN); G: construction (FZ); H: electronic manufacturing (C3); I: other products (C5); J: trade (GZ); K: energy & extractive industries (DE); L: information & communication technologies (JZ); M: health (OQ); N: agriculture & fishing (AZ); O: industrial food manufacturing (C1).
Source: Monthly VAT data reports, INSEE and Banque de France calculations.

3.2 Support measures helped companies to survive, but some 6-7% of NFCs have been left financially weakened by the crisis.

To cope with the shock to activity linked to the crisis and its consequences for cash and earnings, companies raised external funds, chiefly by taking out loans from the financial sector (cf. Chart 3.3).[67] Gross corporate debt grew by 12% (EUR 220 billion) between end-2019 and end-April 2021, with bank loans rising by 12% (EUR 150 billion) and securities financing by 10% (EUR 70 billion). At the same time, overall corporate cash holdings increased by 30% (EUR 214 billion).

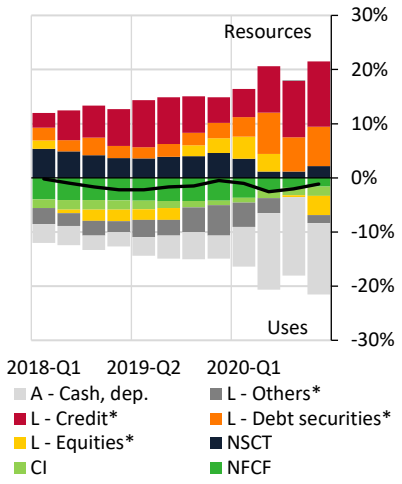
[64] These support schemes were supplemented by EUR 38 billion in tax and social security payment deferrals and EUR 217 billion in loans from the financial sector, EUR 130 billion of which was facilitated through the state-guaranteed loan scheme.
[65] Gross operating surplus contracted by 12.5% between 2019 and 2020.
[66] See also: https://blocnotesdeleco.banque-france.fr/billet-de-blog/crise-sanitaire-une-approche-complementaire-sur-lactivite-des-entreprises
[67] Total corporate debt also increased following tax and social security payment deferrals.

The increase in gross debt was driven by companies of all sizes, but growth rates differed. Outstanding SME debt continued to increase at a sustained rate, while that of mid-tier firms (MTFs) and large companies (LCs) slowed (cf. Chart 3.4).

Unsurprisingly, the composition of the additional debt reflects the nature of the shock. In 2020, cash loans saw the fastest growth (37.7%), while investment loans remained at their pre-crisis pace (6.1% in 2020 compared with 6.3% in 2019).[68] This situation is reflected in the distribution of outstanding corporate loans by maturity: the share of loans with a maturity of between six months and two years doubled from 7% to 14% of total outstandings in the second quarter of 2020, at the expense of longer maturities (cf. Chart 3.5). However, the distribution of outstanding loans is linked to the classification of state-guaranteed loans as one-year loans; in fact, borrowers can choose to spread loans beyond one year and up to five years, which would change the distribution of Chart 3.5.

Chart 3.3: Decomposition of French NFCs' net lending[69]

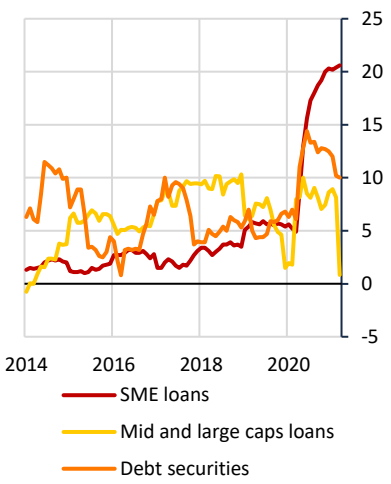
x: quarter / y: % of gross value added smoothed over four quarters



Note: L= liabilities, A = assets, CI = change in inventories, NSCT= net saving and capital transfers, NFCF= net fixed capital formation, dep. = deposits, Debt sec. = debt securities
** consumption*
Source: Banque de France (quarterly financial accounts)

Chart 3.4: Year-on-year growth rate of debt, by company size

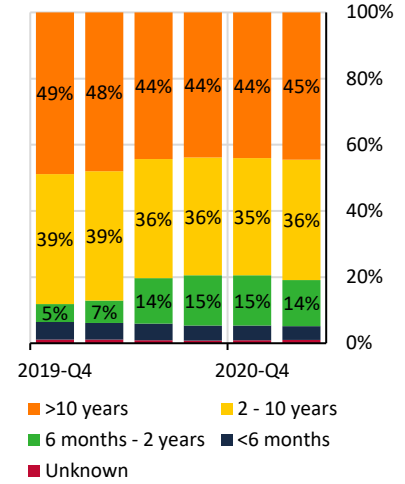
x: year / y: %



Note: SMEs = small and mid-sized enterprises, LCs = large companies, MTFs = mid-tier firms
Source: Banque de France (company statistics and monetary statistics)

Chart 3.5: Distribution of outstanding loans to French companies, by maturity

x: quarter / y: %



Source: ECB (AnaCredit).

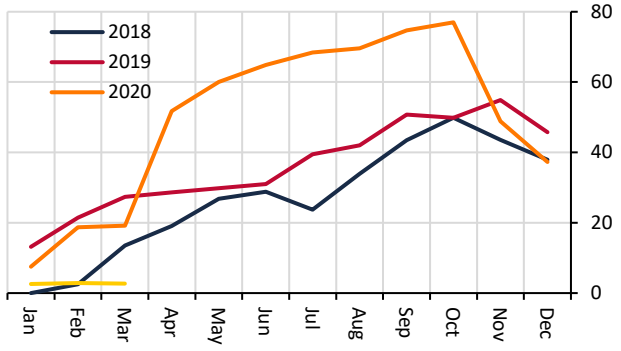
The increase in loans was extensively supported by the deployment of state-guaranteed loans, which accounted for 63% of new loans granted in 2020, or EUR 129 billion out of EUR 205 billion. These loans allowed companies to obtain relatively favourable borrowing terms while securing their medium-term financing (just 16% of companies plan to repay their state-guaranteed loans in full in 2021). However, 66% of companies say that they have made little or no use so far of the amounts borrowed under this scheme.[70]

On the securities market, net issuance continued to be brisk after the primary market briefly shut down in March 2020 (cf. Chart 3.6). Outstanding market debt increased by EUR 75 billion between January and September 2020, a 50% increase compared with 2018 and 2019 at the same date, with relatively uniform growth across sectors. Since the final quarter of 2020, the outstanding bond debt of NFCs has fallen by EUR 35 billion (5% reduction in total outstandings), in a sign that corporate financing requirements are normalising. In the end, the increase in securities debt in 2020 was on a par with that of previous years in value terms. Companies rated BBB represented

[68] https://www.banque-france.fr/statistiques/credit/credit/credits-aux-societes-non-financieres
[69] The positive blocks show sources of funds, while the negative blocks indicate uses of funds. The black line designates cash generation, i.e. the difference between gross saving and capital transfers, and gross fixed capital formation, inventory changes and asset acquisitions less disposals.
[70] See: http://www.rexecode.fr/public/content/download/40877/418873/version/2/file/Barometre-PME-Bpifrance-Rexecode-2021-05.pdf

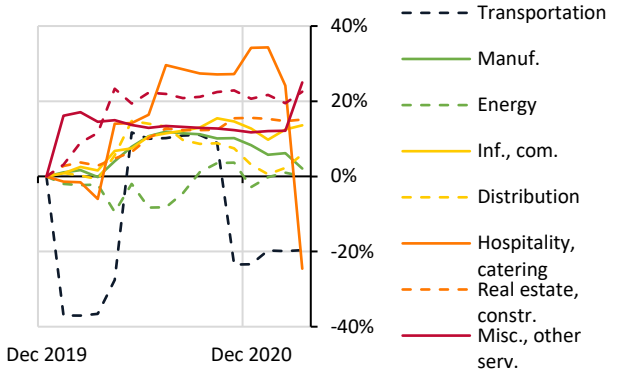
the lion's share of net issuance in 2020, partly owing to downgrades within the investment grade category (cf. Charts 1.9 and 3.7).

Chart 3.6: Growth in outstanding bond debt of French NFCs, by year
x: month / y: EUR billion



Note: Cumulative change in outstanding bond debt by year (EUR billion, including issues and maturing securities). Most recent value: 31 March 2021.
Source: ECB (CSDB), Banque de France calculations

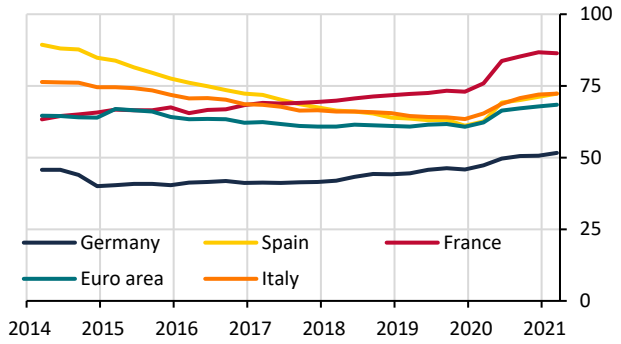
Chart 3.7: Growth in outstanding bond debt of French NFCs, by sector
x: month / y: % of sector outstandings at end-2019



Note: Change in outstanding bond debt by sector since December 2019 (EUR billion, including issues and maturing securities). Most recent value: 31 March 2021. Some sectors issue fewer securities than others, which may cause selection effects.
Source: ECB (CSDB), Banque de France calculations

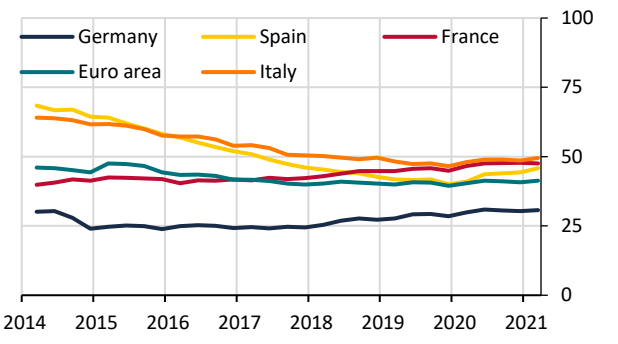
Taking an international perspective, the increase in gross debt as a percentage of GDP was particularly pronounced in France, at 13.3% between end-2019 and end-March 2021, compared with 7.7% in the euro area over the same period. From a macroeconomic point of view, this shift was offset by a larger build-up of cash (cf. Chart 3.8). French net financial debt rose by just 1.8 percentage points between end-2019 and end-March 2021, a similar increase to that observed in the euro area overall (2.6 pp increase, cf. Chart 3.9).

Chart 3.8: Consolidated corporate debt ratios, gross
x: quarter / y: % of GDP



Note: the first quarter of 2021 is based on an initial Banque de France estimate
Source: National accounts; most recent value: December 2020.

Chart 3.9: Consolidated corporate debt ratios, net of cash
x: quarter / y: % of GDP



Note: the first quarter of 2021 is based on an initial Banque de France estimate
Source: National accounts; most recent value: December 2020.

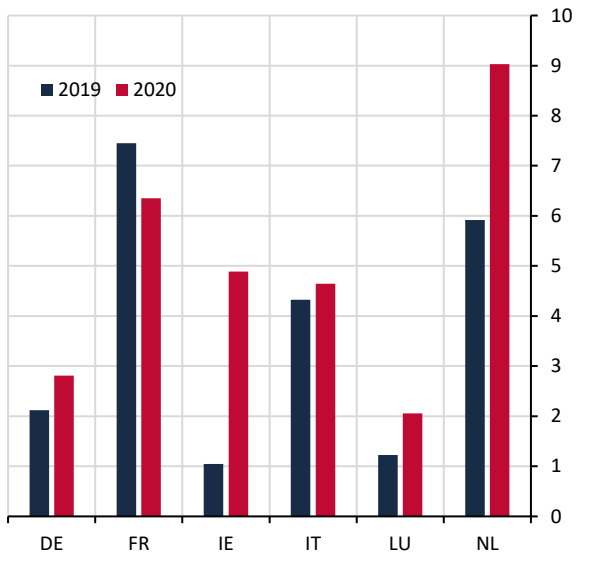
Conversely, initial public offerings and capital increases by listed companies were muted in 2020 (cf. Chart 3.10) before picking up in early 2021. Cumulative issues came to just EUR 6.3 billion in 2020, compared with EUR 7.5 billion in 2019. French companies thus relied less heavily on own funds in 2020, unlike other euro area listed NFCs.

Overall, despite an unprecedented shock to activity, the short-term cash impact was overcome and the earnings impact was largely absorbed by government support schemes (partial unemployment, solidarity funds, etc.). The

relatively benign aggregate developments, however, mask significant disparities. While most companies were able to get through the crisis without suffering major damage, an analysis of accounting balance sheets already available and closed between the end of June 2020 and early 2021 reveals that a minority of companies were financially weakened by the crisis: 61% of companies saw an increase in their gross debt ratio, while 14% also reported a decrease in cash (cf. Chart 3.11). Setting aside the companies with the highest scores before the crisis (between 3++ and 4+), which are well enough positioned to cope with the shock, as well as companies with the lowest scores (6 to P), which were already badly weakened even before the crisis, it is estimated that around 6% to 7% of listed companies need to be monitored closely.[71] Disparities are noted at sector level and between companies in the same sector.

Chart 3.10: IPOs or capital increases by listed companies in the euro area

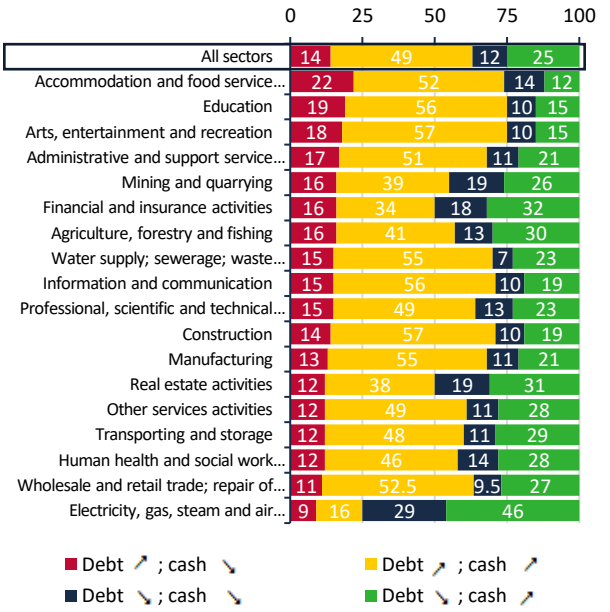
x: year-country / y: amounts in EUR billion



Source: Bloomberg, Banque de France calculations.

Chart 3.11: Changes in the balance sheets of French companies in 2020

x: % / y: sectors



Note: Analysis of the first 205,392 balance sheets closed between end-June 2020 and early 2021 and received at end-May 2021. This chart shows all companies, making no distinction between scores. If firms with average scores (4/5+/5) are targeted, the percentage of companies that saw their debt go up and their cash go down falls from 14% to between 6% and 7%.
Source: Banque de France.

3.3 Risks concentrated in the medium term

Support for companies during the crisis exit phase must consider two main risks: one macroeconomic, the other financial.

Massive public support limited losses but also put the usual turnover of poorly performing companies on hold: there were 40% fewer failures in 2020 than in normal times (cf. Chart 3.12) although failures of MTFs and large companies, of which there are usually just a handful, rose by 62% to reach a total of 52 between March 2020 and March 2021. A return to normal or potentially a catch-up effect is therefore to be expected. However, given the way that the support schemes have been designed and unless cyclical conditions worsen markedly, a major wave of failures looks unlikely.

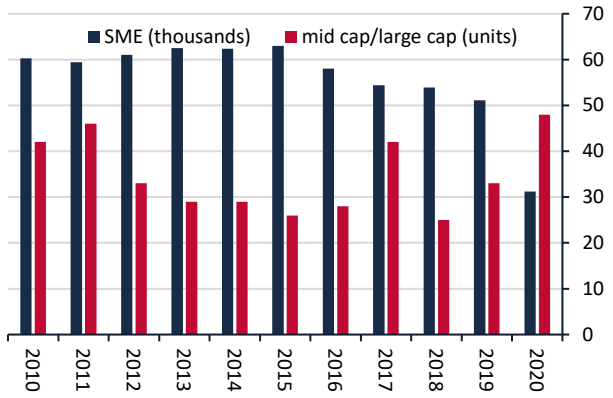
At the same time, many new businesses were created despite the health crisis, with the total number hitting a new record of 848,200 companies in 2020, 4% more than in 2019 (cf. Chart 3.13).[72] Much of the increase was driven by registrations of sole proprietorships under the micro-entrepreneur regime and by transportation and

[71] https://blocnotesdeleco.banque-france.fr/billet-de-blog/limpact-differencie-de-la-crise-sur-la-situation-financiere-des-entreprises
[72] https://www.insee.fr/fr/statistiques/5016913

storage activities, in response to the rise in home deliveries. The number of new corporations was stable in 2020, while the number of firms employing workers as soon as they were established increased slightly.

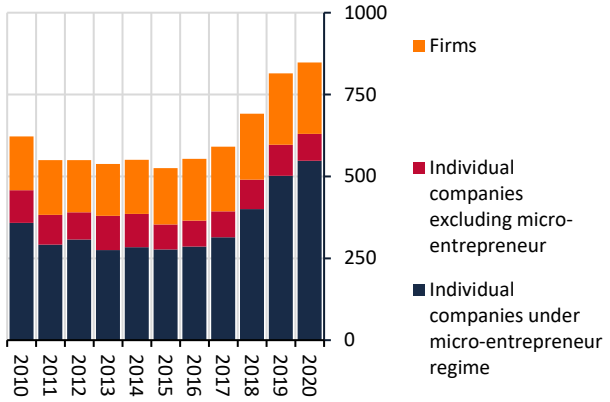
The scale of government support schemes has also had the effect of keeping non-viable companies alive artificially. Their continued survival will interfere with the growth of the younger firms that would normally replace them. This has slowed the natural renewal process within France's industrial fabric.

Chart 3.12: Number of failures, 2010 to 2020
x: year / y: number by company size category



Note: Data corrected for seasonal and working-day variations.
Source: Banque de France.

Chart 3.13: Number of business creations, 2010 to 2020
x: year / y: number, in thousands



Source: INSEE

The second risk is linked to an increase in debt, which might prove lasting for some companies. These firms could be highly sensitive to tighter financial conditions (37% of NFC debt is subject to variable rates or equivalent)[73] and would be more vulnerable to a new shock.[74] In the medium term, insofar as they may experience difficulties in finding new financing owing to their already high debt levels, these companies might delay or scale back growth projects and investments, inhibiting the recovery (debt overhang problem).[75] This issue was a major cause of flat investment in the aftermath of the sovereign debt crisis.[76]

To cope with these challenges, steps could be taken to strengthen the capital of solvent companies dealing with high debt levels following the crisis. Under the 2020-2022 stimulus plan, a state-backed equity loan and bond scheme is planned that should generate between EUR 10 billion and EUR 20 billion in quasi-equity for French companies' investment projects, enabling firms to invest, hire and grow their business.

The loans must be paid back over eight years, with a four-year grace period allowed before repayment begins. To reduce the risk to the banks and management companies that distribute these products, the state will guarantee up to 30% of capital losses, or EUR 6 billion out of a total amount of EUR 20 billion. The products will be deeply subordinated, with only equity interests being more subordinated in the ranking of claims.[77] The aim is to encourage providers of private equity, such as private equity funds, to get involved (cf. Box 3.1).

Box 3.1: The role of private equity in financing the recovery: a useful form of financing for SMEs/MTFs that was already booming before the health crisis

A critical means of funding for innovation and job-creating firms, private equity financing provided by asset management companies specialised in this area – known as general partners, while investors are referred to as limited partners – may aim to support companies with major growth potential (innovation capital), to finance companies with a relatively well-established growth trajectory (development capital), to finance

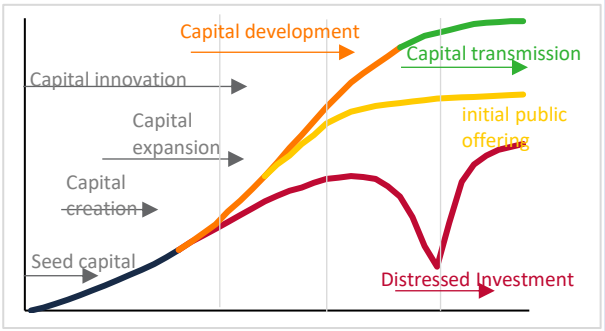
[73] Debts treated as equivalent to variable-rate debt include debts with an initial maturity of less than one year, as well as loans with a residual maturity of less than one year.
[74] Couaillier & Scalone (2020) show for example that shocks may have a non-linear impact on an economy depending on its debt ratio.
[75] At a highly leveraged company, creditors capture a major share of the profits from value-creating investments, which may discourage shareholders from making optimal choices. This phenomenon was originally theorised by Myers (1977).
[76] Kalemli-Özcan et al (2019)
[77] https://entreprises.banque-france.fr/sites/default/files/fiche_411-15003.pdf

companies in financial distress, backing their future recovery (turnaround capital), or simply to acquire or transfer ownership of a firm (buyout strategies,[78] cf. Chart 3.14). These segments make up a highly interdependent ecosystem in which different participants take turns providing backing as the financed firms expand.

The private equity industry has grown considerably since the 2000s, with total assets under management swelling to EUR 6,050 billion worldwide at the end of 2020, a third of which in the buyout segment.[79]

Chart 3.14: Private equity business financing cycles

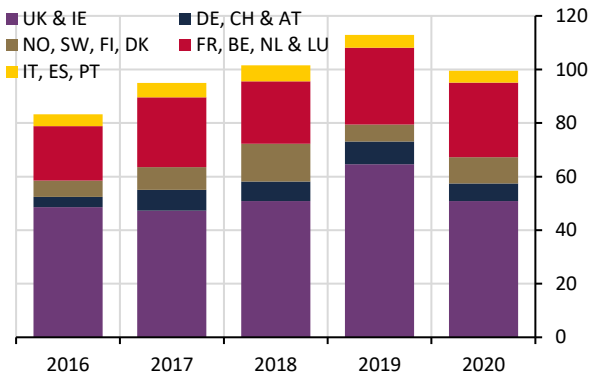
x: time / y: demand



Source: France Invest.

Chart 3.15: Funds raised through private equity funds in Europe

x: year / y: EUR billion



Note: UK for United Kingdom, IE for Ireland, DE for Germany, CH for Switzerland, AT for Austria, NO for Norway, SW for Sweden, FI for Finland, DK for Denmark, FR for France, BE for Belgium, NL for Netherlands, LU for Luxembourg, IT for Italy, ES for Spain, PT for Portugal.

Sources: Invest Europe / EDC.

Alongside the rise of private equity per se, private debt activities have also expanded in the last decade in Europe, although they have a longer track-record in the United States. This activity is fairly similar to private equity and often complements the latter, both for financed firms and for investors.

Across all segments, the amount of dry powder, i.e. capital that funds have available to invest, was five times greater in 2020 than in 2000, at EUR 1,050 billion worldwide. Despite a downturn in deals in 2020 – there were 24% fewer compared with 2019, and fund-raising fell by 12%, cf. Chart 3.15 – valuations of acquired companies rose by 8%. This points to plentiful capital on the market as well as continued appetite among economic participants for higher-yielding and hence riskier investments. It also reflects a split in the private equity investment universe, with significant discrimination in favour of companies that showed resilience or even expanded strongly during the pandemic, in contrast with other firms operating in more compromised sectors, which are currently not attracting interest no matter what the prospective valuations.

These valuations are analogous to those observed on listed equity markets. More generally, beyond deal valuations, private equity funds often value their portfolios on a quarterly basis, typically relying on comparisons with valuations of comparable listed companies, particularly during upswings. This trend has become more pronounced recently with the rise of special-purpose acquisition companies (SPACs, cf. chapter on the cross-cutting analysis of risks for more details), which, by making it possible to acquire unlisted firms through public fund-raising, are bringing valuations in the listed and unlisted universes closer together.

[78] Leveraged buyouts (LBOs) form the largest private equity financing segment. An LBO is a transaction in which a private equity fund or external investors use leverage to acquire a company in order to obtain total control and increase the value of the company with a view to selling it later at a profit.

[79] Source: Bloomberg combined with information from the Global Private Equity Report 2021 (Bain & Company) and the ECB's FSR (May 2020).

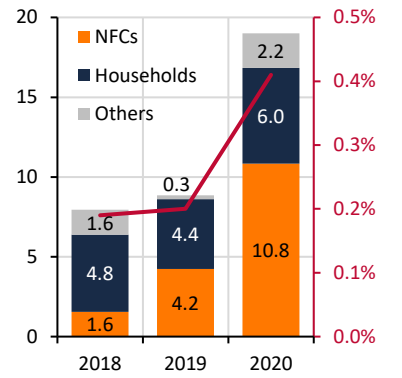
3.4 Risks borne by the financial sector remain under control

Banks have increased their provisions significantly while non-performing loan ratios remain moderate

Working in tandem with budgetary support measures targeting companies, decisions by the competent authorities with responsibility for monetary policy, financial stability and banking and market regulation gave the financial sector the time needed to adapt to the situation, as shown by positive movements in solvency ratios, the distance to combined requirements taking capital buffers into account, and outstanding loans.[80]

Chart 3.16: Annual cost of risk, by counterparty type

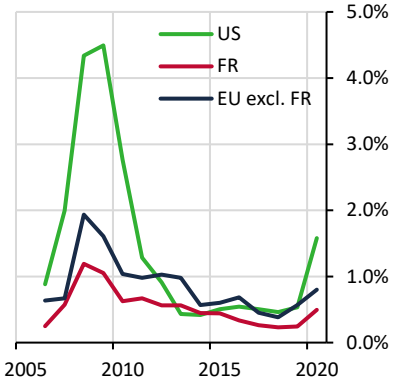
x: year / y left: EUR billion; y right: %



Note: The red curve indicates the annual cost of risk, shown as a ratio to debt instruments at amortised cost and at fair value through other comprehensive income.
Sources: FINREP data, ACPR calculations.

Chart 3.17: Cost of risk, comparison by jurisdiction

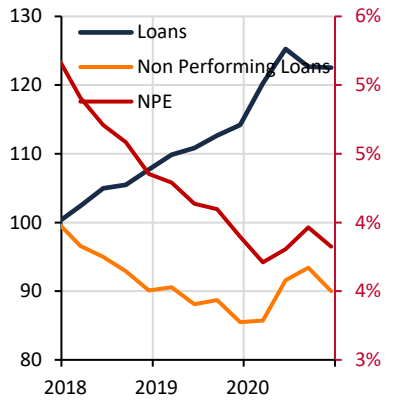
x: quarter / y: EUR billion



Source: Financial reporting, BankFocus, ACPR calculations.

Chart 3.18: Non-performing loan ratio, NFCs

x: year / y left: Dec 2017 = 100 / y right: %



Note: NPE for non-performing exposure, i.e. exposure to non-performing securities or loans
Sources: FINREP data, ACPR calculations.

IFRS 9 on the measurement of financial assets came into effect in the banking sector in 2018. As a result, provisions must be set aside for all loans to reflect expected credit losses. In 2020, French banks migrated EUR 72.1 billion in NFC exposures from Stage 1 to Stage 2 (meaning increased probability of credit risk), i.e. six times more than in 2019, which accounted for the bulk of the increase in the expected cost of risk, as provisions for Stage 3 (impaired) assets were stable. Accordingly, in 2020, the cost of NFC risk was 2.6 times higher at EUR 10.8 billion, while the overall cost of risk doubled to EUR 19 billion (cf. Chart 3.16).

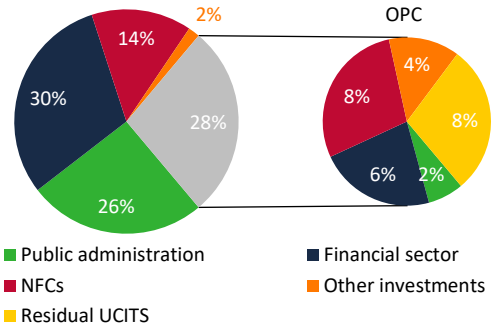
The provisioning gap between European banks and their US peers can be attributed in part to factors inherent in the different accounting frameworks used (IFRS 9 versus US GAAP), banking intermediation models (maturity of loans held on bank balance sheets) and the intrinsic credit risk of bank portfolios (cf. Chart 3.17).

Over the same period, NFC non-performing exposures edged up by EUR 3.1 billion, but the NPE ratio (cf. Chart 3.16), fell from 3.90% at end-2019 to 3.82% at end-2020 owing to a base effect linked to the EUR 110.7 billion increase in outstanding loans. At this stage, the gradual lifting of loan moratoria has not led to a sharp increase in loss experience in connection with the gradual recovery scenario, although situations continue to vary across different sectors of the economy. Overall, there are currently no signs that French banks are underprovisioning credit risk.

[80] https://acpr.banque-france.fr/la-situation-des-grands-groupes-bancaires-francais-fin-2019.

Insurers are primarily exposed to relatively highly-rated large companies; investment funds also have exposure to riskier segments

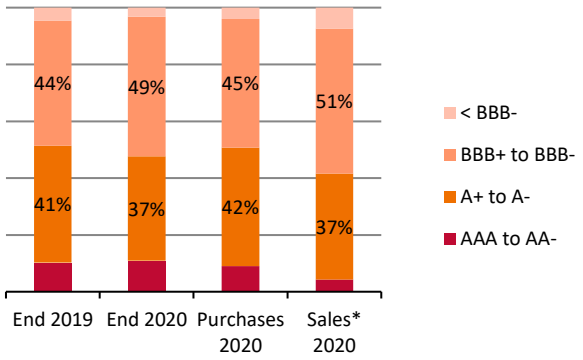
Chart 3.19: Decomposition of insurers' assets



Note: Before and after applying the look-through approach to collective investment schemes.
Sources: ACPR and Banque de France.

Chart 3.20: Breakdown of NFC bond securities, by rating

x: time / y: % of rated securities, before applying the look-through approach to collective investment schemes



Note: Sales include sales and maturing securities.
Source: ACPR.

Besides bank exposures, 35% of French corporate debt is made up of debt securities held by investors. Non-resident investors own 55% of these securities. Their share has remained steady over time, reflecting the relative attractiveness of French corporate securities.[81] Among resident investors, French insurers have EUR 131 billion in exposure before application of the look-through approach (17% of securities issued), while investment funds (excluding MMFs) have EUR 49 billion (7%).

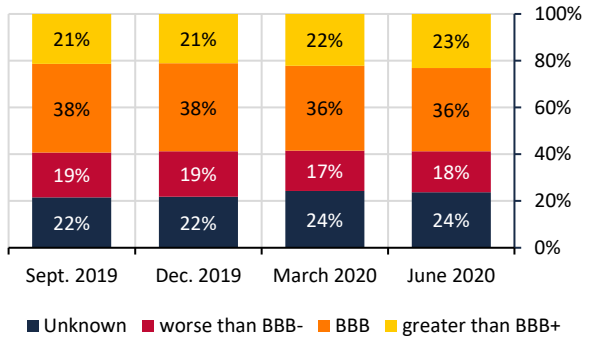
Insurers' investments in bond securities issued by NFCs make up 14% of their directly held portfolios, in third place behind their investments in the financial sector (30%) and general government (26%). After applying the look-through approach to the shares and units of French collective investment schemes, NFCs account for 22% of investments. The financial sector continues to account for the largest share (36%), while general government's share is more or less unchanged at 28% (cf. Chart 3.19). Insurers are mainly exposed to highly-rated large companies. Corporate securities with a rating of below BBB- account for less than 5% of the rated corporate bond securities held by insurers. However, sales of securities rated BBB- to BBB+ and purchases of securities rated A- to AAA observed in 2020 had barely any impact on the average portfolio rating, owing to downgrades to securities remaining in the portfolio (cf. Chart 3.20).

Investment funds are also exposed to companies via their holdings of debt issues. Total exposure to corporate debt securities stood at 5.4% of the total assets of French funds in mid-2020. In June 2020, almost one-quarter of securities were rated above BBB+, around one-fifth were rated below BBB-, while one-third were between these two bounds (see Chart 3.21).

These proportions did not change much over the period, although the share of the best rated assets inched up 2 pp over the period.

Chart 3.21: Ratings of corporate debt held in the assets of French funds

x: date / y: %



Note: Ratings are averages of Moody's, DBRS, SNP and Fitch ratings. The rating used is the security's rating if available, otherwise the issuer's rating is used. In the data presented, approximately half of the ratings are security ratings and the other half are issuer ratings.
Source: OPC titres.

[81] https://publications.banque-france.fr/sites/default/files/medias/documents/820356_bdf233-4_titres_publics_et_prives_vf.pdf

4. Challenges associated with the transition to a net-zero economy

The build-up of greenhouse gases (GHGs) in the earth's atmosphere is already leading to changes in global balances between the atmosphere, oceans and the biosphere. These changes are often discussed in terms of an increase in average temperatures around the world, but the effects are actually far more diverse and include rising sea levels as well as increased frequency and severity of extreme weather events such as droughts and floods. Temperatures are set to continue rising in the coming decades as GHG concentrations in the atmosphere keep on increasing. The climate shift will therefore continue for as long as GHG emissions exceed the absorption capacity of carbon sinks such as forests, soils and oceans.

To limit climate change, we need to transform our economies so that, collectively, we achieve carbon neutrality, or net zero emissions. This transformation represents an unprecedented challenge for our economies and for the financial system. The quantity of GHGs emitted between now and when the global economy reaches net zero will determine the scale of the climate change still to come.

The Paris Agreement adopted in 2015 seeks to limit global warming to well below 2°C, and ideally 1.5°C, compared with pre-industrial levels. To hold global warming to 1.5°C with a probability of 66%, global GHG emissions must be reduced by approximately 45% in 2030 compared with 2010, and net zero needs to be achieved by around 2050.[82]

In recent months, in line with the commitment written in the Paris Agreement to raise their goals, many countries have announced net zero targets or pledged to achieve net zero (usually by 2050): together, these countries account for close to two-thirds of current GHG emissions. Some, including the European Union[83] and the United States, have also said that they will seek to meet ambitious intermediate targets (mostly by 2030).[84] For countries to meet their commitments, they will have to implement a broad set of public policies, notably to promote a reallocation of capital towards low-carbon assets, for example via a carbon tax, public investment, regulations and standard-setting.[85]

4.1 The transition to net zero: an unprecedented challenge

Responsibilities at the heart of the financial stability mandate

The prospect of moving to net zero entails a reassessment of the financial risks associated with climate change, whether these be physical risks or transition risks (see Box 4.2). To identify these new risks and seize the related opportunities, we need to look ahead several years or even decades. This cannot be done by considering past trends, insofar as the transformations accompanying climate change and the transition are unprecedented and involve uncertain consequences. However, scenarios may be used to provide an overall framework for analysing these risks and to simulate possible interactions between climate, energy and economic variables. The NGFS has identified four categories of possible scenarios, which describe different levels of physical and transition risks (cf. Chart 4.1).[86]

[82] IPCC (2018). *Global warming of 1.5°C – Summary for policy makers*.
https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

[83] The European Union has committed to cutting its GHG emissions by at least 55% relative to 1990 by 2030.

[84] Private sector participants, including a number of financial institutions, have also adopted net zero targets. However, these commitments can mean very different things in practice. A net zero pledge is consistent with the concept of economy-wide carbon neutrality if it involves a radical reduction in the emissions associated with the company's activities (including those of its suppliers or sub-contractors) and in the emissions associated with using the products or services offered by the company, along with transformative changes and investments that are commensurate with current emissions. But if it is based primarily on carbon offsetting mechanisms, i.e. small emissions reductions coupled with purchases of carbon credits designed to increase the capacity of carbon sinks or reduce emissions in other sectors, a net zero commitment will contribute marginally if at all to achieving economy-wide carbon neutrality.

[85] A recent report by the International Energy Agency on getting to net zero by 2050 sets out the major changes needed for the global economy to make the transition from fossil fuels to renewables. Source: IEA (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*, May 2021. https://iea.blob.core.windows.net/assets/4482cac7-edd6-4c03-b6a2-8e79792d16d9/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf

[86] NGFS (2019). *First comprehensive report: A call for action*, April 2019.
https://www.ngfs.net/sites/default/files/medias/documents/ngfs_first_comprehensive_report_-_17042019_0.pdf

Box 4.1: Update for NGFS climate scenarios

The NGFS recently published[87] updated climate scenarios. The new scenarios incorporate countries' most recent climate commitments and are based on updated data (the previous version was based on the analysis prepared for the special report on getting to 1.5°C (2018)).

They also expand the set of available variables by adding new macroeconomic variables taken from the NiGEM model integrated in the suite of models used by the NGFS, and offer disaggregated information for over 130 countries. In terms of physical risks, the database has been expanded to cover exposures to extreme climate events and supplies impact assessments covering labour productivity and losses.

Net zero scenarios

The transition to a net zero economy is not in itself a source of financial risk. But a disorderly or delayed transition could be a source of economic shocks with financial stability implications. Three types of net zero scenarios may be identified.[88]

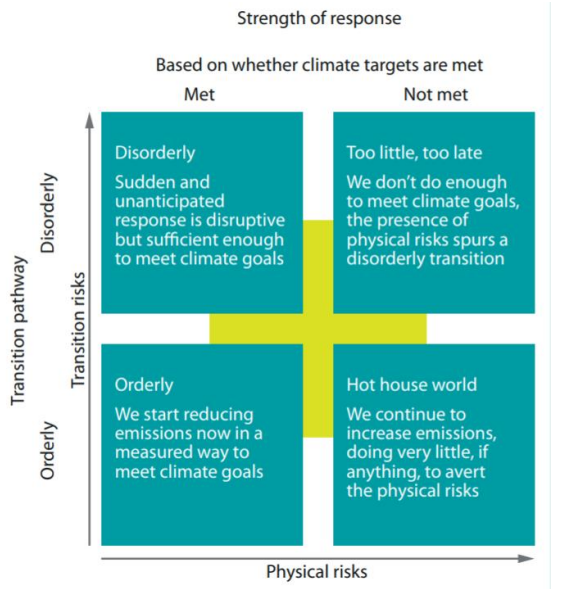
First, the transition may take place in an orderly fashion, with an immediate and progressive reduction in GHG emissions (cf. Chart 4.2), making it possible to comply with climate commitments (notably in the net zero 2050 scenario).

Early and consistent implementation of climate policies results in a steady and measured increase in the price of emissions (cf. Chart 4.3). This orderly transition leads to limited physical and transition risks.

The transition may also be disorderly, by being delayed or by arriving suddenly and/or unexpectedly. It would still be possible to meet the Paris Agreement goals under this scenario.

Chart 4.1: NGFS financial risk matrix

x: Climate goals met or not met / y: orderly or disorderly transition



Source: NGFS (2019)

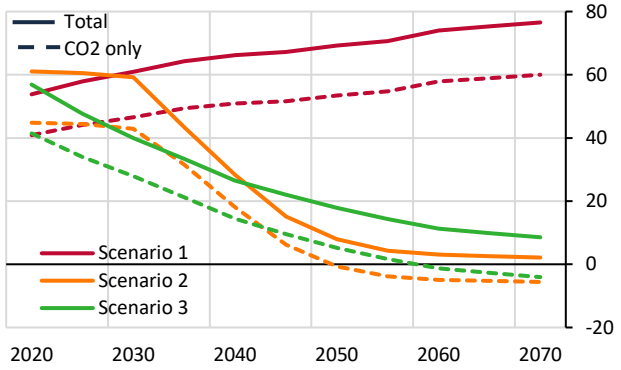
But the transition risks are increased, for example because some sectors are unable to adapt in a short space of time, causing their revenues and solvency to come under pressure. Delayed implementation of climate policies would also result in a more pronounced increase in emissions prices, pushing up the transition risks. In the event of a disorderly transition, the impact on global GDP due to transition risks would be greater.

[87] https://www.ngfs.net/en/communique-de-presse/ngfs-publishes-second-vintage-climate-scenarios-forward-looking-climate-risks-assessment

[88] A fourth group of "hot house world" scenarios comprise scenarios considering the possibility of limited climate action that leads to significant global warming and hence to a high level of physical risks. These physical risks will arise over different time horizons and in different ways across regions, and will impact economies (for example through reduced agricultural and physical labour productivity, or the destruction of infrastructure), especially in developing countries. Physical risks will cause capital to be reallocated to reconstruction and adjustment.

Chart 4.2: GHG emissions, by scenario

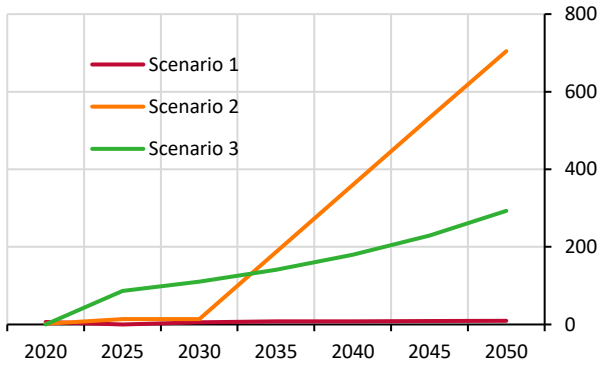
x: years / y: GHG emissions (Gt CO2 eq)



Note: Scenario 1 describes the hot house scenario
Scenario 2 describes the disorderly transition scenario
Scenario 3 describes the orderly transition scenario
Source: NGFS (2020)

Chart 4.3: Emissions price trajectories, by scenario

x: years / y: GHG emissions prices (USD/t CO2)



Note: Scenario 1 describes the hot house scenario
Scenario 2 describes the disorderly transition scenario
Scenario 3 describes the orderly transition scenario
Source: NGFS (2020)

Box 4.2: From risk factors to financial risks

Two broad categories of climate-related financial risks need to be distinguished: physical risks associated with the physical impacts of climate change, and transition risks linked to the transition of the economy to net zero.

Physical risks correspond to the financial losses attributable to an increase in the frequency and severity of extreme weather events, such as storms, floods and droughts, and to the chronic impacts of climate change, such as ocean acidification, rising sea levels or changing precipitation patterns. The main causes of transition risks include unforeseen changes in public policies, standards or technologies, and changes in consumer or investor preferences, with potential reputational impacts.

Even if the introduction of net zero transition measures should help to mitigate physical risks, a combination of these two risks is possible. A delayed or insufficient transition that prevents net zero goals from being achieved in a timely manner would result in the simultaneous occurrence of physical and transition risks.

Liability risks represent a third potential category of climate-related risks. If legal obligations are not met, a company or its directors could be held liable as individuals or entities take legal action and demand compensation for damages due to a failure to meet environmental obligations. A prime example in this regard is PG&E, owner of the largest distributor of electricity in California, which filed for bankruptcy in early 2019 following lawsuits by forest fire victims, who claimed that the firm had failed to adjust its network to reflect the risks posed by drier climate conditions.

This is a source of risk that may grow. KPMG says that close to 1,000 climate change-related class action lawsuits have been filed in 25 countries.[89] A Dutch court recently ordered Royal Dutch Shell to reduce its GHG emissions by 45% compared with 2019 by 2030. The obligations placed on countries and based on compliance with international conventions and respect for human rights could therefore be extended to private sector participants.

A third set of possible scenarios (too little, too late) consider a climate response that is insufficient and too delayed to keep climate change to the same level as in the first two cases. While net zero may be achieved in this scenario,

[89] https://home.kpmg/xx/en/home/insights/2019/03/combating-climate-risks-the-future-of-insurance-fs.html

it is reached in a disorderly manner and too late to achieve the objectives of limiting warming and minimising the physical consequences of climate change. This category includes high transition and physical risks.[90]

In stress testing, the baseline will thus comprise an orderly transition that minimises transition risks while ensuring that physical risks under control. Risks will then be analysed by comparing this scenario against others in which the transition is less gradual and/or more or overly delayed.

4.2 A necessary transition to control the physical risks

Getting to net zero is essential to stabilising GHG concentration levels in the atmosphere, but will not be enough to immediately halt the global warming process and the associated physical risks. Because of climate inertia, temperatures will rise by close to 1.5°C by the end of the century, at best and if all commitments are upheld. Thus, even if the transition to net zero is achieved, we will have to think about adapting our economies and companies to cope with more manageable climate risks.

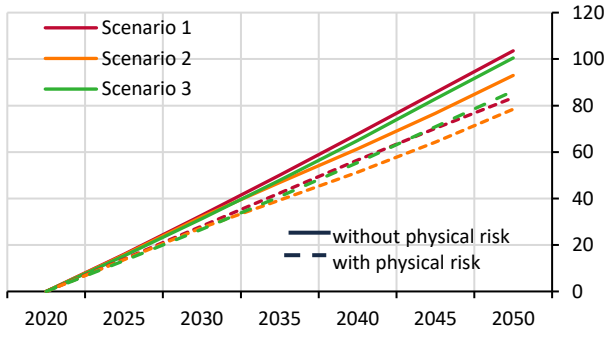
Net zero is essential to climate stability

The earlier the transition to a net zero economy is undertaken, the smaller the losses linked to physical risks will be. It is important however to note that most of the physical risks through to 2050 will be attributable to past emissions. The long lifespan of GHGs in the atmosphere means that a "stock" of emissions has built up, with the result that temperatures will continue to rise – and do damage – no matter what measures are taken today.

The IPCC (2018) estimates that only by drastically reducing our emissions today and reaching net zero within 20 years (making it possible to comply with a carbon budget of around 420 GtCO2 in 2018) will we be able to keep warming to below 1.5°C (66% probability) by the end of the century. This inertia explains why physical risks will not feel the benefits of transition measures until later.

Chart 4.4: GDP trajectories – World

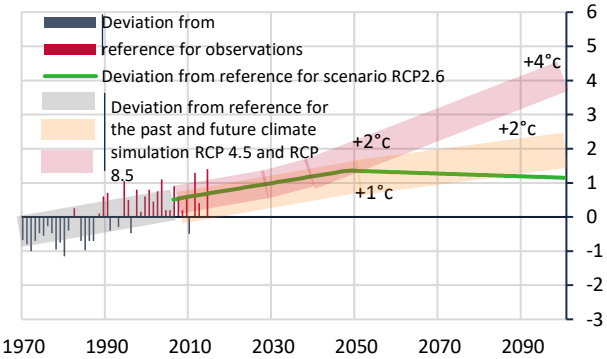
x: year / y: change in GDP index from 2020



Sources: NGFS (2020) and authors' calculations

Chart 4.5: Temperature trajectories – France

x: year / y: deviation from baseline (1976-2005)



Note: RCP = Representative Concentration Pathway
Sources: Caisse Centrale de Réassurance, Météo France

Using NGFS data, Chart 4.4 shows the global economic impacts of the physical risks associated with the two main net zero transition scenarios and provides a comparison with a scenario featuring no transition. Transition risks would have a cumulative impact on GDP of around 2% in 2050 in the event of an orderly transition (compared

[90] This category of scenarios may also include scenarios where insufficient climate action is more prevalent than delayed action. These scenarios do not guarantee carbon neutrality, even at a distant time horizon, such that climate change continues much as in the "hot house world" scenarios.

with a scenario featuring no transition) and 5% in the event of a disorderly transition (compared with a scenario featuring no transition).[91]

By 2050, in the worst case scenario, physical risks could cause up to 10% in additional lost GDP in the event of an orderly or disorderly transition, and over 12% in the case of a scenario featuring no transition. The impact differences across the scenarios are therefore not substantial at this horizon in terms of the physical risks.

They are sufficient however to prefer an orderly net zero transition by 2050, since the impacts of physical risks slightly exceed transition costs, resulting in GDP that is around 1.5% higher than in the case of a scenario featuring no transition. Physical risks will arise essentially after 2050 and could reduce GDP by up to a quarter by 2100 in a scenario featuring no transition (NGFS, 2020).[92] The benefits of the net zero transition are thus plain to see.

Real but controllable physical risk

Climate projections for France over the 2021-2050 period show average temperatures in mainland France rising by between 0.6°C and 1.3°C compared with the average observed between 1976 and 2005 for a scenario with transition. Chart 4.5 shows possible climate warming trajectories for France.

It reveals that differences in temperature trajectories - and hence in physical risks - between the scenarios are not significant through to 2050. The impacts of the transition in terms of the occurrence of physical risks over the next 30 years will therefore be marginal. Expected temperature increases will likely be concentrated in south-eastern France, with regional variations and extremes that could reach 1.5°C to 2°C. They will be accompanied by an increase in the number of heatwave days, especially in the south-east, and a decrease in the number of unusually cold winter days, particularly in the north-east.

4.3 Different net zero scenarios, different risk trajectories

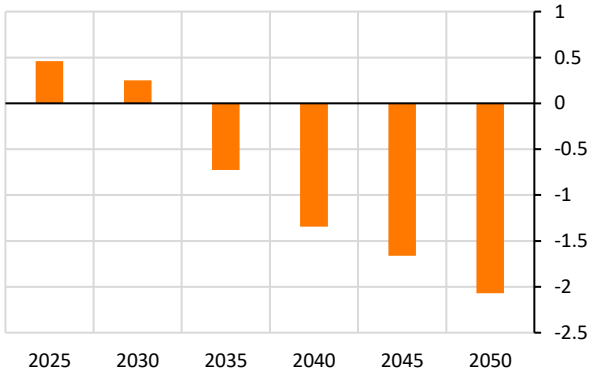
While physical risks are determined by the horizon at which net zero is achieved and are thus largely similar across the different transition trajectories through to 2050, transition risks are dependent on the transition trajectory followed.

Risks in the event of a disorderly transition

Initial Banque de France/ACPR estimates suggest that a disorderly net zero transition would reduce GDP in France in 2050 by 2.1% compared with an orderly transition scenario (cf. Chart 4.6).[93] Inflation and unemployment rates would worsen as a result over the period, rising by up to 0.4 and 0.6 pp respectively at the height of the shock. This transition could be made even more challenging if assumptions about technological advances associated with the transition, notably in terms of producing clean energy, are not realised. Expected productivity gains for the period would then have to be lowered, which could result in growth rates being revised

Chart 4.6: GDP in France under the disorderly transition scenario

x: time / *y:* % deviation from baseline



Source: Allen et al. (2020)

[91] NGFS estimates from the REMIND-MAgPie model are used in this chart.

[92] It is also important to keep in mind that climate modelling is probabilistic. Getting to net zero by 2050 increases our chances of avoiding unbearable climate change; it does not guarantee that we will not find ourselves in a new and more challenging situation.

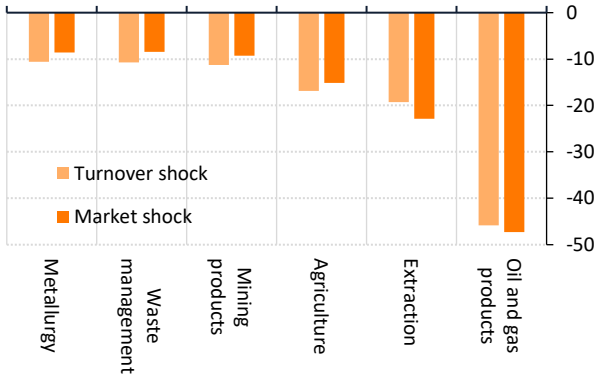
[93] Allen, T., Dees, S., Boissinot, J., Caicedo Graciano, M., Chouard, V., Clerc, L. and Vernet, L. (2020), "Climate-Related Scenarios for Financial Stability Assessment: An Application to France", Banque de France Working Paper series, No. 774, July. https://publications.banque-france.fr/sites/default/files/medias/documents/wp774.pdf

downwards by around 5.5% by 2050 relative to an orderly transition scenario. In addition, these simulated supply shocks have inflationary effects, requiring monetary policy to adjust interest rates accordingly.

Whatever the transition scenario, structural transformations pose risks

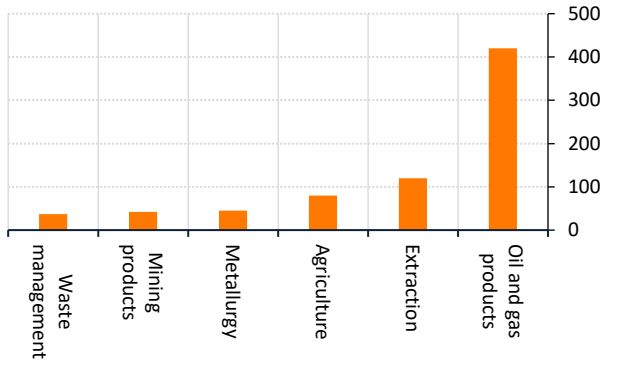
Behind these aggregate impacts lie major structural changes. Some sectors are set to be particularly affected, with cascade effects for the economy as a whole owing to interdependencies between activities and the central position occupied by the energy sector. Banque de France/ACPR estimates suggest that fossil fuel producers and major emitters - particularly those that are not in a position to adjust their production processes – could see their business shrink by more than half by the end of the period, depending on the transition assumptions (relative to an orderly transition scenario) (cf. Chart 4.7).

Chart 4.7: Turnover shocks (2050) and market shocks (2035) in France
Disorderly net zero transition scenario
x: main affected sectors / y: impacts on sector value added (as a deviation from the baseline)



Sources: Allen et al. (2020)

Chart 4.8: Deterioration in France of default probabilities in 2050
Disorderly net zero transition scenario
x: main affected sectors / y: impacts on sector default probabilities (as a deviation from the baseline)



Sources: Allen et al. (2020)

Turnover shocks could lead to sharp adjustments to asset values as market participants revise their growth expectations. These market corrections could come sooner than expected, in anticipation of shocks to the real economy, insofar as they are based on the returns expected by markets. Under a disorderly net zero transition scenario, for example, when new measures are announced and growth trajectories are updated, assets in the petroleum sector immediately suffer a 47% loss of value relative to an orderly transition scenario. Credit risks would also be likely to deteriorate for companies in the most affected sectors. Default probabilities are expected to increase fivefold in the petroleum sector in 2050 in the same scenario (cf. Chart 4.8).

However, a sector analysis is not enough to capture all the structural transformations, especially intra-sector changes, linked to the transition to a net zero economy in 2050. Substantial changes are expected within sectors themselves, for example in the electricity production and distribution sector and in transportation, with the emergence of new participants and profound changes to the business models of existing firms. These transformations will be sources of opportunities and risks and are expected to result in significant discrimination within sectors.

Box 4.3: Findings of the ACPR's pilot climate exercise

The ACPR's pilot climate exercise is an unprecedented undertaking. It marks the first time that a supervisor has organised such a complete assessment of the risks linked to climate change with the banking groups and insurance institutions under its responsibility.

Its uniqueness lies in the horizon of the assessment (30 years), the methodologies employed (analysis of scenarios by economic sector), the dynamic balance sheet assumption and the assessment of the impact of physical and transition risks. The exercise, which was conducted from July 2020 to April 2021, involved nine

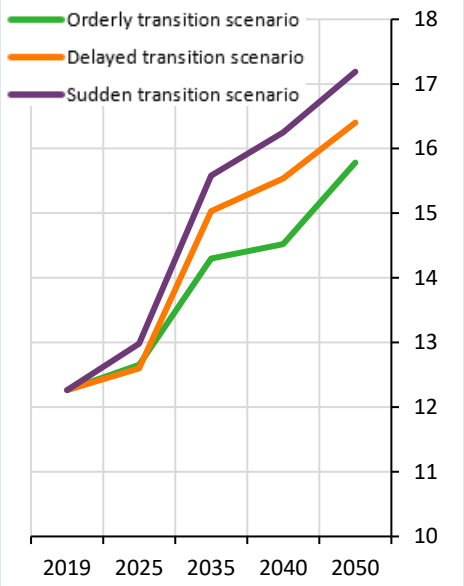
banking groups and 15 insurance groups covering 85% of total banking assets and 75% of total insurance assets respectively. It found that French banks and insurers have moderate overall exposure to climate risks. France, which accounts for approximately 50% of the exposures of French financial institutions, and Europe, which accounts for about 75%, are relatively less impacted than other geographical regions according to the NGFS scenarios underpinning the exercise. France also contributes less than 2% of global GHG emissions. Conversely, exposures to geographical regions such as the United States (around 9% of exposures) are more sensitive to transition risk.

However, this finding needs to be considered in the light of the uncertainties about the speed and impact of climate change. It is also contingent on the assumptions, scenarios analysed and methodological issues raised by the exercise. In addition, based on current balance sheet structures, major efforts still need to be made to reduce GHG emissions significantly and achieve net zero by 2050.

The exposure of French institutions to the sectors most affected by **transition risk**, as identified by this exercise (mining, coking and refining, petroleum, agriculture, etc.), is relatively low. However, these are the sectors in which the cost of risk and default probabilities increase by most. The cost of risk, for instance, is found to triple in these sensitive sectors. The contribution of these sectors to the increase in the cost of risk exceeds their share of bank assets (9.7% of banks' corporate portfolios). In addition, relative portfolio losses for banks and insurers are also concentrated in these sectors, although there is significant dispersion according to individual exposures. When interpreting these results, it is important to remember that none of the scenarios analysed

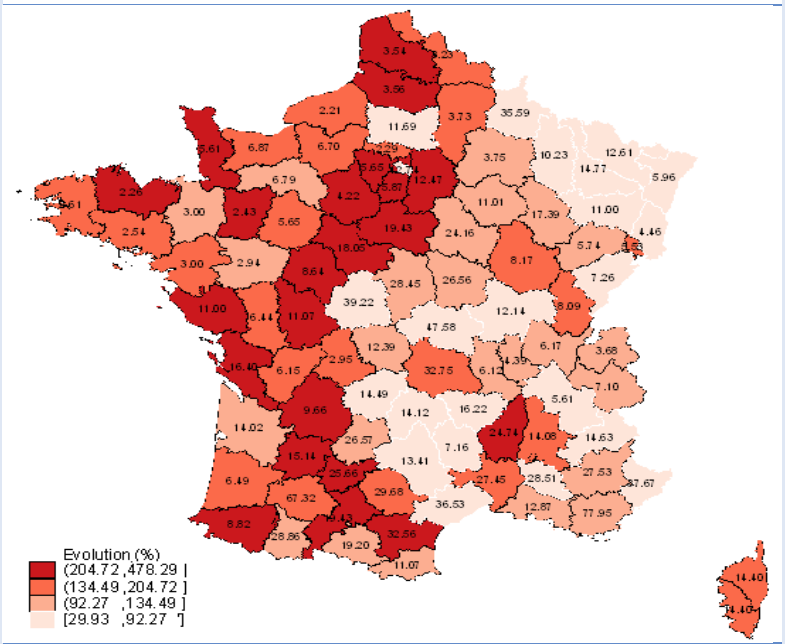
Chart 4.9: Annual cost of risk

x: selected years / y: Total flows of provisions / total exposures (bps) as a %



Note: data in basis points. The annual cost of credit risk is calculated by dividing annualised total flows of provisions for each interval of time by average exposures over the same time period. The statistics shown are the aggregate measures for the six main French banks taking part in the exercise and cover all geographical regions. In the accelerated transition scenario, the annual cost of credit risk is 17.2 bps in 2050 compared with 15.8 bps under the orderly transition scenario (8.9% higher). Two of the three scenarios in the pilot exercise are based on NGFS scenarios. Specifically, the orderly scenario is based on the orderly transition scenario and the delayed scenario is based on the disorderly transition scenario.
Source: ACPR

Chart 4.10: Exposure of insurers to natural catastrophes, by *département*



Guide: In the Gironde area, natural catastrophe claims stood at EUR 14.02 per resident in 2019. They are set to increase over the 2020-2050 period in a range of between 92% and 134%.
Source: ACPR

includes an economic recession by 2050, unlike under a standard stress-testing approach, but merely more muted growth in activity under adverse scenarios.

Even if France is relatively spared under the selected scenarios, the pilot exercise shows that the vulnerabilities associated with **physical risk** are far from insignificant. Based on information provided by insurers, the cost of claims could increase by between five and six times in some French *départements* between 2020 and 2050. The main risks contributing to the increase in loss experience are linked to the risks of drought and flooding as well as to the increased risk of cyclonic storms in overseas territories. The exercise revealed that banks have made little progress in terms of recognising physical risk relative to observations drawn up by the ACPR in 2019. This situation mainly reflects the difficulty for banks of having a precise consolidated view of the geographical locations of their exposures (real estate, companies).

The exercise also highlighted methodological limitations where progress needs to be made. It thus marks the starting point for new work to improve climate stress-testing methodology. The main areas identified by the ACPR for improvement include:

- assumptions used to draw up scenarios, which may lead the economic impacts of climate change to be underestimated;
- better recognition by institutions of physical risk;
- and improvements to the models used by banks and insurers and to data sources needed to ensure better recognition of risk.

Published by
Banque de France
39, rue Croix des Petits-Champs – 75001 Paris

Head of publication
Gilles Vaysset

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