



EUROPEAN CENTRAL BANK  
EUROSYSTEM

# Financial Stability Review

November 2021



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# Foreword



The recent economic recovery in the euro area has also brought a recovery in corporate activity that has reduced many of our worst fears about economic scarring and rising credit risk. Instead, risks of high rates of corporate defaults and bank losses are now significantly lower than six months ago. Across the euro area, reliance on policy support schemes has been shifting and a number of schemes have expired without creating disruption.

But risks stemming from the pandemic have not disappeared entirely, not least because vaccination progress has remained slow in many areas of the world, while global supply chain pressures and rising energy prices pose new challenges to the strength of the recovery and the outlook for inflation. Pandemic-related losses are likely to continue materialising for some time, amid a legacy of higher debt.

Meanwhile, a number of vulnerabilities have intensified. The markets for equity and risky assets have maintained their striking buoyancy, making them more susceptible to corrections. There have been examples of established market players exploring more novel and more exotic investments. In parallel, euro area housing markets have expanded rapidly, with little indication that lending standards are tightening in response.

Against this backdrop, the November 2021 Financial Stability Review (FSR) assesses financial stability vulnerabilities and their implications for financial market functioning, debt sustainability, bank profitability and the non-bank financial sector.

This issue of the FSR also includes three special features focused on addressing some long-standing challenges which affect the strength of euro area banks. They examine the usability of capital within the regulatory buffer framework, consider how mergers and acquisitions (M&As) could help the sector to return to more sustainable levels of profitability and explore approaches for managing non-performing loans, which can be a long-term drag on bank balance sheets.

This issue of the FSR has been prepared with the involvement of the ESCB Financial Stability Committee, which assists the decision-making bodies of the ECB in the fulfilment of their tasks. The FSR exists to promote awareness of systemic risks among policymakers, the financial industry and the public at large, with the ultimate goal of promoting financial stability.

Luis de Guindos  
Vice-President of the European Central Bank

# Overview

## Near-term pandemic risks lessen, but vulnerabilities ahead build up

Improved economic conditions have reduced near-term tail risks to financial stability, but supply disruptions and rising energy prices pose risks to inflation and the economic recovery.

Corporate default risk and bank losses are likely to be lower than feared earlier, while near-term debt sustainability concerns have been alleviated by favourable financing conditions.

Further ahead, vulnerabilities from growing stretch in property and financial markets, risk-taking by non-banks and elevated sovereign and corporate debt are building up.

Tighter macroprudential policies can address vulnerabilities ahead, notably for property markets in some countries. Strengthening the regulatory framework for banks and non-banks, and managing climate risks, will enhance the long-term resilience of the financial system.

### Near-term tail risks fall, but high debt and buoyant housing markets are of concern

- Solidifying economic recovery
- Rapid expansion in housing markets
- Solvency risks among vulnerable firms
- Elevated sovereign indebtedness

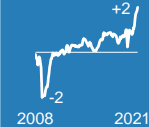
House price growth



### Stretched asset valuations at risk of disorderly correction

- Low real yields incentivise risk-taking
- Increased leverage
- Growing sensitivity to a rise in rates
- Stretched valuations in some markets

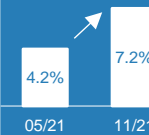
Return deviations of financial assets



### Improved bank profitability, but structural challenges remain

- Slower asset quality deterioration
- Muted corporate lending
- Rising share of negative deposit rates
- Slightly lower capital ratios

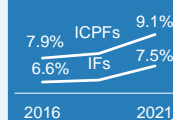
Analysts' 2021 ROE forecasts



### Non-banks vulnerable to renewed corporate stress, liquidity and duration risks

- Continued credit risk-taking
- Inflation concerns among fund investors
- Low liquid asset holdings in funds
- Improved financial conditions for insurers

Portfolio loss with 1% rise in rates



As the recovery progresses, policies shift focus from short-term support to mitigating risks from higher medium-term financial stability vulnerabilities, in particular emerging cyclical and real estate risks.

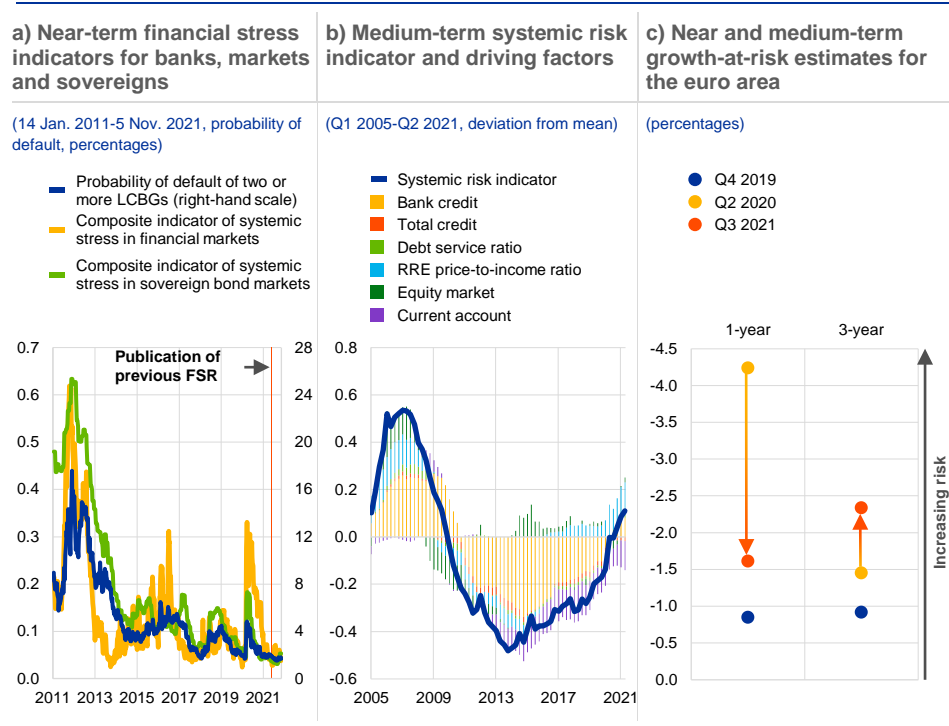
From the structural perspective, strengthening the regulatory framework for banks and the macroprudential approach for non-banks remains key.

## Near-term pandemic risks lessen, as vulnerabilities ahead build up

**Improved economic conditions have reduced near-term tail risks to financial stability.** Indicators of near-term financial stress have fallen to pre-pandemic lows since the previous FSR (see [Chart 1](#), panel a), in line with the recovery seen in euro area economic activity in the first half of 2021. While the recovery has broadened across euro area countries and sectors as lockdown measures have eased, some near-term risks remain, as corporate fragility remains high in certain sectors which were more heavily impacted by pandemic restrictions and had higher pre-existing indebtedness. There is also a risk that recent strains in global supply chains and the spike in energy prices could have longer-lasting effects on inflation than expected and weigh on the economic recovery.<sup>1</sup> Low vaccination rates in some parts of the world and growing vulnerabilities in major emerging market economies, notably the strains experienced by major property developers in China, also add to risks.

### Chart 1

Near-term risks have lessened in the financial sector and the real economy as pandemic-related uncertainty fades, but vulnerabilities further out are on the rise



Sources: ECB and ECB calculations.

Notes: Panel a: "Probability of default of two or more LCBGs" refers to the probability of simultaneous defaults in the sample of 15 large and complex banking groups (LCBGs) over a one-year horizon. On the composite indicator of systemic stress in financial markets, see Holló, D., Kremer, M. and Lo Duca, M., "CISS – a composite indicator of systemic stress in the financial system", *Working Paper Series*, No 1426, ECB, March 2012. On the composite indicator of systemic stress in euro area sovereign bond markets, see Garcia-de-Andoain, C. and Kremer, M., "Beyond spreads: measuring sovereign market stress in the euro area", *Working Paper Series*, No 2185, ECB, October 2018. Panel b: the systemic risk indicator has been adjusted to assume Q4 2019 GDP in the computation of the bank credit-to-GDP contribution. For more details on the systemic risk indicator, see Lang, J.H., Izzo, C., Fahr, S. and Ruzicka, J., "Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises", *Occasional Paper Series*, No 219, ECB, February 2019. Panel c: growth-at-risk is the 5th percentile prediction of the quantile regressions model estimated for a panel of euro area countries. Explanatory variables include a lag of GDP growth and indicators of cyclical systemic risk, financial stress and economic sentiment. RRE: residential real estate.

<sup>1</sup> For a recent discussion of the risks to euro area inflation, see the "Account of the monetary policy meeting of the Governing Council of the ECB held on 8-9 September".

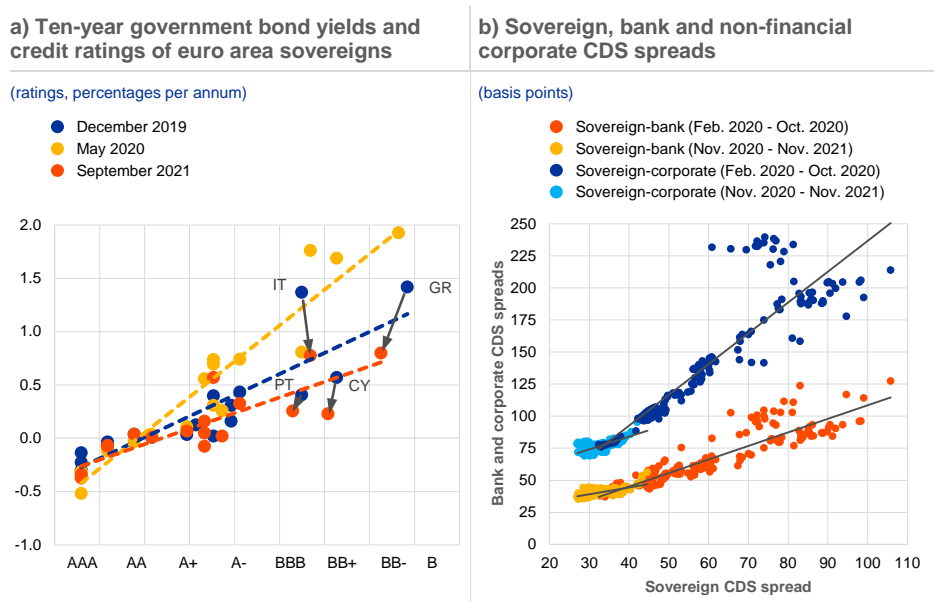
**Vulnerabilities further out have been building up.** Indicators of medium-term systemic risk have continued increasing in recent months (see [Chart 1](#), panel b), while rising medium-term growth-at-risk estimates also point to a changing time profile of risks (see [Chart 1](#), panel c). Concerns particularly relate to pockets of exuberance in credit, asset and housing markets as well as higher debt levels in the corporate and public sectors as a legacy of the pandemic.

## Generally improved outlook for sovereigns and firms

**Sovereign debt positions in the euro area, although historically high, have benefited from the ongoing recovery and continued favourable financing conditions.** Sovereign debt levels have risen sharply since 2019 to nearly 100% of GDP on aggregate for the euro area. While government action was instrumental in avoiding deeper pandemic-related scars on the euro area economy, it still adds to medium-term sovereign debt challenges, particularly for the more highly indebted countries. For the time being, current favourable financing conditions, driven in part by European initiatives such as the Next Generation EU instrument, have allowed governments to lock in long-term financing at historically low interest rates across the rating spectrum (see [Chart 2](#), panel a). The related increase in the residual maturity of outstanding government debt helps reduce rollover risks going forward.

### Chart 2

Stress in euro area sovereign bond markets is mitigated by favourable financing conditions, while the sovereign-bank-corporate nexus has loosened



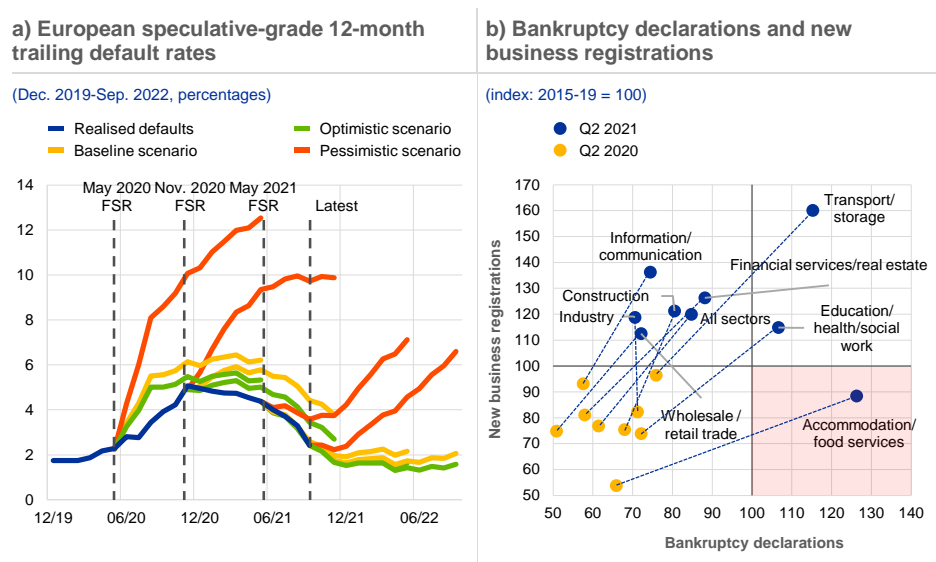
Sources: Bloomberg Finance L.P., S&P, Moody's, Fitch, IHS Markit, ECB and ECB calculations.  
 Notes: Panel a: the rating score represents the average rating by the three major rating agencies: Moody's, Standard & Poor's and Fitch. The bond yields indicate the long-term interest rate for convergence purposes (secondary market yields of government bonds with maturities of ten, or close to ten, years). Panel b: sovereign CDS spreads on five-year senior bonds are in relation to the average for five countries (France, Germany, Italy, the Netherlands and Spain). For corporate spreads, the iBoxx EUR Non-Financials option-adjusted spread is used. Bank CDS spreads are based on an average across five-year senior bonds of 12 listed euro area banks. CDS: credit default swap.



**The ongoing economic recovery has also helped debt-to-GDP ratios to stabilise.** The transition from blanket fiscal support to more targeted measures, coupled with the gradual exit from support schemes, has reduced strains on public finances. The positive role that fiscal (and monetary) policies have had in limiting lasting damage to corporates and banks has in turn limited negative feedback to governments via the sovereign-bank-corporate nexus (see [Chart 2](#), panel b). That said, if financing costs were to rise and economic growth were to fall short of expectations, this could put sovereign debt dynamics on an unfavourable trajectory, in particular in higher-debt countries (see [Box 1](#)), and contribute to some reassessment of sovereign risk by market participants going forward.

### Chart 3

Corporate solvency concerns have lessened, but some sectors continue to feel the impact of the pandemic more than others



Sources: Moody's Analytics, Eurostat and ECB calculations.  
Notes: Panel a: European speculative-grade default rates forecast by Moody's Analytics as at May 2020, November 2020, May 2021 and September 2021. In the baseline scenario, declining default rates among speculative-grade credits are assumed to be supported by increasing vaccination rates and continued low policy rates. The optimistic scenario builds on the favourable baseline, expecting markets to remain very supportive of speculative-grade issuers in 2021. By contrast, the pessimistic scenario acknowledges a particularly weak ratings mix among European speculative-grade issuers. For more details on the different scenarios, see [Moody's website](#). Panel b: "Bankruptcy declarations" refers to the number of legal units that had started bankruptcy proceedings at any time during the second quarter of 2020 and the second quarter of 2021 respectively. "New business registrations" captures the number of legal units entered in the company register.

**Near-term euro area corporate insolvency concerns have fallen, although some firms remain vulnerable, notably in pandemic-sensitive sectors.** Corporate profitability has shown a broad-based recovery in 2021 as economic activity has expanded. Corporate debt servicing capacity has also improved on account of low financing costs, improved revenues and continued public support measures. On average, corporate defaults have come in lower than the most optimistic expectations earlier in the pandemic (see [Chart 3](#), panel a), while insolvencies have remained around 15% below pre-pandemic levels. However, insolvencies in those sectors most affected by the pandemic did rise strongly and without being offset by a rise in new business registrations, suggesting a more pessimistic outlook for those sectors (see [Chart 3](#), panel b). Going forward, corporate insolvencies could still rise further, due to a backlog of unresolved bankruptcy cases and a gradual phasing-out of policy support



measures, although by less than feared in the initial phases of the pandemic. That said, more vulnerable and highly leveraged firms may be challenged by the scaling-back of support measures and, in the medium term, debt sustainability concerns may re-emerge given the sizeable debt accumulation during the pandemic.

## Euro area banks' structural problems resurface as pandemic-induced vulnerabilities dissipate

**Market sentiment towards euro area banks has remained favourable, as the near-term profitability outlook has improved.** Continuing the trend that started in July 2020, banks' equity price valuations have returned to pre-pandemic levels (see **Chart 4**, panel a). This was driven, among other things, by better than expected bank results on aggregate in the first half of the year, the lifting of the ECB Banking Supervision recommendation on limiting dividends as of October 2021<sup>2</sup> and a steeper yield curve. At the same time, the overall credit risk outlook for banks has improved in tandem with more benign conditions in the non-financial corporate sector (see **Chart 4**, panel b). Bank valuations were additionally bolstered by the confirmation of the resilience of the sector to adverse shocks in both the July 2021 stress test and the October 2021 macroprudential stress-test exercise (see **Box 6**). Taken together, these factors seem to indicate that investors consider the banking sector to have largely overcome the initial pandemic-induced challenges.

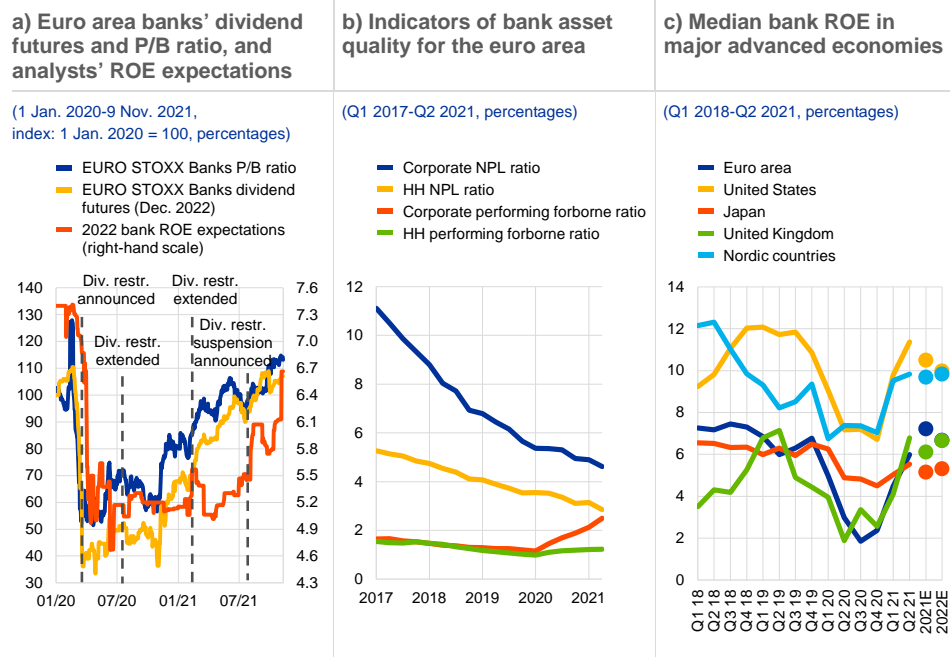
**Looking ahead, bank profitability remains hampered by euro area banks' structural challenges.** Bank profitability has improved overall since the start of 2021 on the back of lower loan loss provisions and stronger revenue streams from investment banking (see **Box 5**), but the profitability outlook continues to depend on the path of overall economic recovery and the pandemic. While the non-performing loan (NPL) ratio has dropped to levels last seen before the global financial crisis on account of further progress made in NPL sales, asset quality concerns may resurface as government support measures are gradually withdrawn, reinforcing the need for effective NPL solutions (see **Special Feature C**). Euro area bank profitability remains lower than in other jurisdictions (see **Chart 4**, panel c). Thus, even as pandemic-related challenges abate, pre-pandemic structural challenges, such as low cost-efficiency, limited revenue diversification, overcapacity and compressed margins in a low interest rate environment, remain. Consolidation via mergers and acquisitions could be one potential avenue for helping the sector to return to more sustainable levels of profitability (see **Special Feature B**). Looking ahead, euro area banks also face increasing urgency to meet digital transformation needs and to manage the implications of the transition to a greener economy.

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<sup>2</sup> See "ECB decides not to extend dividend recommendation beyond September 2021," press release, ECB Banking Supervision, 23 July 2021.

## Chart 4

Sentiment remains positive towards euro area banks as dividend payments resume and asset quality concerns fade, but structurally low profitability is still a concern



Sources: Bloomberg Finance L.P., ECB supervisory data and ECB calculations.

Notes: Panel a: 2022 bank ROE expectations indicate the median of a sample of 31 listed euro area banks. Panel b: based on a balanced sample of 92 significant institutions. Panel c: based on a sample of 31 listed euro area banks, 15 listed US banks, 4 listed UK banks, 11 listed Japanese banks and 7 listed Nordic banks. "Nordic countries" refers to Denmark, Finland and Sweden. The forecasts for 2021 and 2022 are as of 9 November 2021. E: estimated; HH: household; P/B: price-to-book; ROE: return on equity.

## Continued exuberance leaves parts of real estate and financial markets increasingly susceptible to corrections

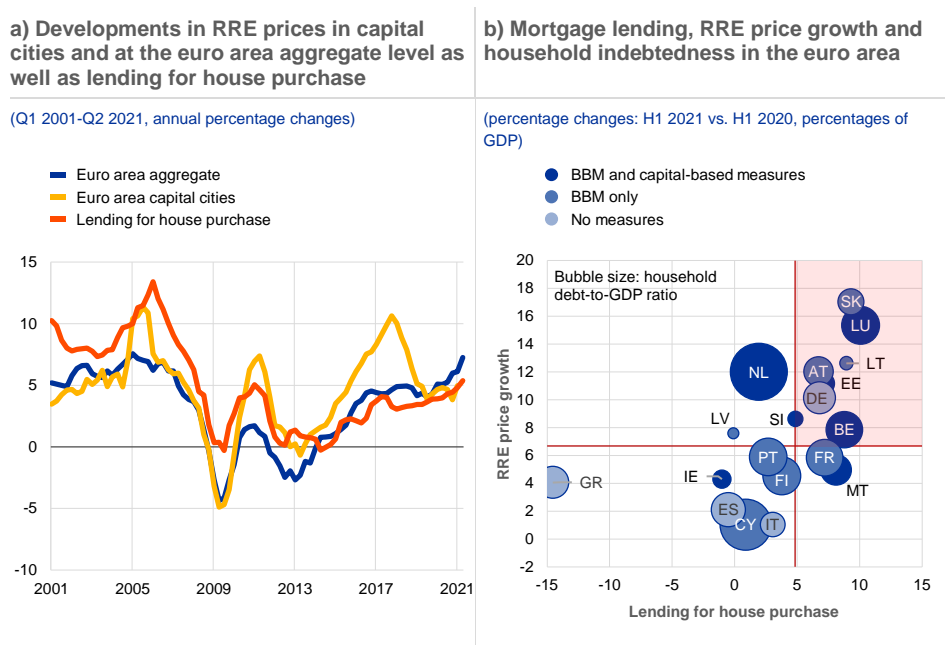
**Euro area house prices rose at their fastest pace since 2005 in the second quarter of 2021, amid signs of easing mortgage lending standards.** While the economic recovery has also supported near-term fundamentals for the housing market, continued strong house price growth of around 7% at the euro area aggregate level remains a cause for concern amid signs of more broad-based price increases across both urban and non-urban areas (see [Chart 5](#), panel a). Some of this rise could reflect an increase in demand for housing (including larger properties) during the pandemic. But growing signs of overvaluation for the euro area as a whole render residential real estate (RRE) markets more prone to a correction, in particular in countries with more elevated valuation levels (see [Section 1.5](#)). In some countries, the strength of RRE markets is coupled with buoyant mortgage lending, and there is evidence of a progressive deterioration in lending standards, as reflected by the increasing share of loans with high loan-to-value and loan-to-income ratios (see [Chapter 5](#)). High and rising levels of household indebtedness also contribute to heightened medium-term vulnerabilities in some countries (see [Chart 5](#), panel b). Taken together, these developments have strengthened the case for considering further activation of macroprudential policy measures, where appropriate.

**Commercial real estate (CRE) markets have benefited from the improving economic outlook, but parts of the market remain vulnerable to further price corrections.**

Investor sentiment has improved over recent quarters, but a substantial share of CRE investors still see the market in a downturn. The outlook seems particularly poor for lower quality CRE assets, with market intelligence flagging remote working, health concerns and the rush for greener property as channelling demand towards the prime segment. This intersects with elevated vulnerabilities among those sectors most affected by the pandemic, namely retail and office assets. Transaction data suggest substantial holdings of these most vulnerable assets across the euro area financial system, in particular for non-banks.

**Chart 5**

Vulnerabilities are on the rise in non-financial asset markets amid buoyant credit dynamics in some countries



Sources: ECB and ECB calculations.

Notes: Panel a: the composition of the sample underlying the time series on RRE price developments in capital cities changes over time and includes Austria, Belgium, Estonia (from 2003), Finland (from 2010), France, Germany, Ireland (from 2005), Italy, the Netherlands, Slovenia (from 2010) and Spain. The euro area series is a weighted average based on 2014 GDP weights. Panel b: the bubble size indicates the household debt-to-GDP ratio as at March 2021. Light blue bubbles refer to countries which have applied borrower-based macroprudential measures such as collateral or income-based limits. Dark blue bubbles refer to countries that have applied both capital-based (e.g. risk weights on RRE exposures) and borrower-based macroprudential measures. Grey bubbles indicate countries with no capital or borrower-based measures in place. The red horizontal and vertical lines indicate the euro area aggregate. BBM: borrower-based measures; RRE: residential real estate. In the Netherlands, the announced CRR measure (Article 458) foreseen for Q3 2020 (LTV-dependent risk weights floor for domestic IRB mortgage loan portfolios) was postponed in March 2020 in light of the COVID-19 pandemic. The measure should come into effect on 1 January 2022.

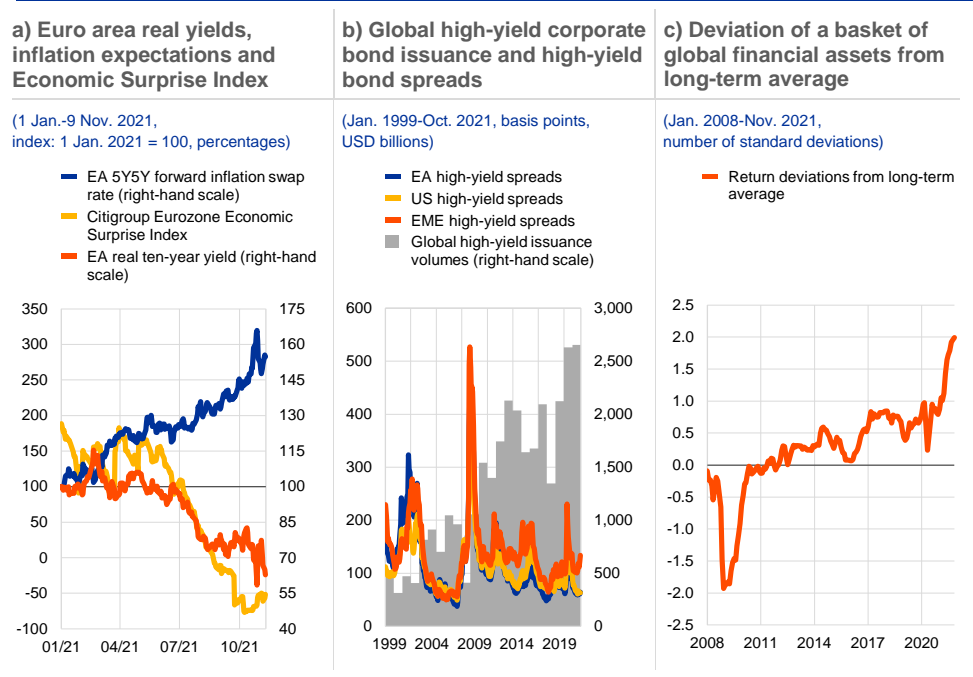
**Signs of exuberance are increasingly visible in some financial market segments as real yields fall and the search for yield continues.**

Real yields fell to all-time lows amid indications of a moderating pace of the economic recovery and increased inflationary pressures (see Chart 6, panel a), incentivising risk-taking in financial markets. Euro area and global equity markets have continued to advance since the publication of the previous FSR, also bolstered by a better than expected corporate earnings season and continued accommodative financial conditions. The stock prices of pandemic-sensitive firms have continued to underperform the market, indicating a continued concentration of risk in some sectors. Issuance activity in high-yield

corporate credit markets has reached new highs in 2021 (see [Chart 6](#), panel b). Despite large issuance volumes, spreads remain at record lows, pointing to strong investor appetite for risky assets.

### Chart 6

Exuberance in markets continued amid lower real yields, and high valuations render some financial markets vulnerable to repricing if global liquidity conditions change



Sources: Refinitiv, Dealogic, Bloomberg Finance L.P., ECB and ECB calculations.

Notes: Panel a: "EA 5Y5Y forward inflation swap rate" refers to the euro area five-year forward inflation-linked swap rate five years ahead. Panel b: government option-adjusted spreads are employed. Panel c: the basket of global financial assets used to compute the valuation metric includes: real yields on euro area, Japanese, UK and US ten-year government bonds; euro area and US investment-grade and high-yield bonds; euro area, Japanese, UK and US equity; US real estate investment trusts and mortgage-backed securities; and emerging market sovereigns and equity. EA: euro area.

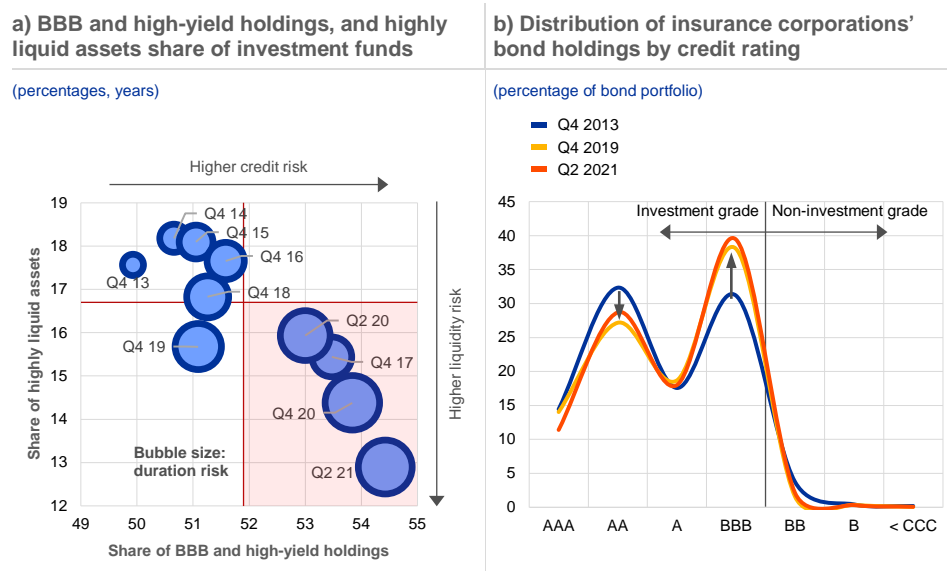
**Buoyant financial asset price developments raise overvaluation concerns in some markets, increasing the likelihood of market corrections.** The combination of historically low real yields and elevated valuations (see [Chart 6](#), panel c) leave sub-investment-grade bond and some equity markets vulnerable to adverse interest rate and growth shocks (see [Chapter 2](#)). The presence of a cohort of vulnerable firms could increase the sensitivity of corporate securities prices to risk-off shocks (see [Box 3](#)). A correction in markets could be triggered by a weaker than expected economic recovery, spillovers from adverse developments in emerging market economies, a re-intensification of stress in the non-financial corporate sector or abrupt adjustments in market expectations regarding the prospective path of monetary policy normalisation. In addition, more persistent inflationary pressures than currently anticipated could push nominal yields higher, which may put valuations under pressure. Beyond core markets, some more exotic market segments, such as crypto-asset markets, also remain subject to speculative bouts of volatility, with the growing popularity of stablecoins increasing interlinkages between crypto-asset and conventional financial markets (see [Box 4](#)).

**In parallel, the non-bank financial sector continues to face elevated credit risk.**

Non-banks continue to be an important source of financing for non-financial corporations (NFCs) as the economy recovers. However, in their search for yield, investment funds (IFs) have increased credit risk in their portfolios by purchasing around 70% of euro area-domiciled NFCs' newly issued BBB and high-yield bonds, leading to increased holdings of lower quality bonds in their portfolios (see [Chart 7](#), panel a). Similarly, insurance corporations and pension funds (ICPFs) have further expanded their lower-rated corporate debt holdings (see [Chart 7](#), panel b). While reduced corporate sector vulnerabilities alleviate related credit risks in the short run, non-banks remain exposed to the risk of substantial credit losses should conditions in the corporate sector deteriorate. For insurers, risks are partly mitigated by a more favourable operating environment, underpinned by the sector's robust capitalisation.

**Chart 7**

Non-banks continue to absorb the bulk of the record-high issuance of lower-rated instruments amid growing credit, liquidity and duration risks



Sources: ECB (securities holdings statistics and Centralised Securities Database) and ECB calculations.  
Notes: Panel a: the red horizontal and vertical lines indicate long-term sample averages between Q4 2013 and Q2 2021. The bubble size indicates the duration risk approximated by the weighted average residual maturity of the investment fund sector's bond holdings and scaled exponentially for visualisation purposes. The credit rating refers to debt securities' worst rating in the given period. Highly liquid assets are holdings with HQLA level 1. Panel b: holdings include globally issued long and short-term debt securities excluding non-rated assets. Credit rating refers to debt securities' worst rating in the given period. HQLA: high-quality liquid assets.

**For investment funds, growing credit risks are exacerbated by high liquidity risk as well as increasing duration risk exposure.** Low liquidity holdings leave the sector vulnerable in the event of large-scale outflows (see [Chart 7](#), panel a). At the same time, the average duration of exposures has increased during the pandemic. Were bond yields to rise, valuation losses could trigger outflows from investment funds which – when coupled with the low liquidity buffers – could force bond funds to liquidate assets to meet investor redemptions. Such procyclical selling behaviour could also amplify other financial market shocks. Overall, elevated levels of credit, liquidity and duration risks underscore the importance of strengthening the resilience of the non-bank financial sector, including from a macroprudential perspective.

## Climate change-related vulnerabilities call for policies to support an orderly transition

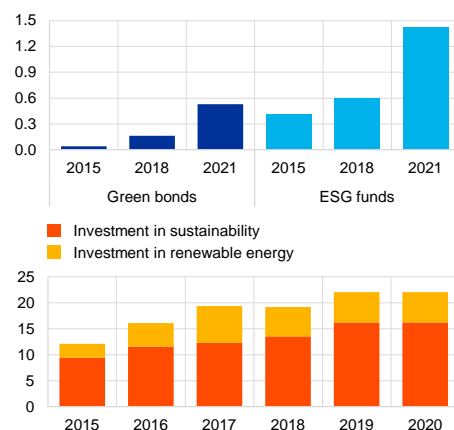
**A rapid deepening of green financial markets continues, but greenwashing risks warrant monitoring.** Investor interest in green finance has continued to grow rapidly over the course of 2021, alongside green investment more generally (see **Chart 8**, panel a), indicating increasing awareness of the need to transition to a low-carbon economy. While financial markets can play an important role in financing this transition, greenwashing concerns persist. These need to be tackled through better information, especially in relation to forward-looking commitments and plans, and enhanced standards, both to ensure that green finance effectively supports the transition and to foster efficient market mechanisms. Ongoing official sector initiatives in Europe and in global standard-setting bodies to shore up disclosures, standards and taxonomies should help in addressing some of these issues.

### Chart 8

Financial markets, non-banks and banks all face the challenge of achieving an orderly transition to a low-carbon economy

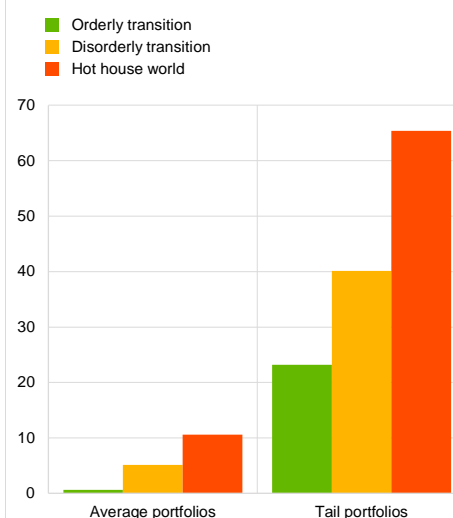
a) AuM of ESG funds, outstanding amount of green bonds, and investments in sustainability and renewable energy

(upper chart: € trillions; lower chart: € billions)



b) Projected increase in losses on banks' corporate loan books under various climate scenarios

(2020-50, percentage differences compared with 2020)



Sources: Bloomberg Finance L.P., ECB and ECB calculations based on NGFS scenarios (2020).

Notes: Panel a: "Investment in sustainability" includes investments in operational environmental and social compliance and other internal environmental and social initiatives (e.g. the amount invested in pollution prevention, recycling, employee training and environmental remediation). Panel b: the average percentage change in median loan portfolio PDs is presented relative to 2020 values for the top 10% of banks in terms of expected loss dispersion, and is compared with the same values for the median results across all banks in the sample. "Tail portfolios" are those banks within the 90th percentile of highest relative increase in expected losses between 2020 and 2050; "Average portfolios" refers to the total sample. For the specification of the scenarios, see Alogoskoufis, S., Dunz, N., Emambakhsh, T., Hennig, T., Kajiser, M., Kouratzoglou, C., Muñoz, M., Parisi, L. and Salleo, C., "ECB economy-wide climate stress test", Occasional Paper Series, No 281, ECB, September 2021, and "NGFS Climate Scenarios for central banks and supervisors", Network for Greening the Financial System, June 2020. AuM: assets under management; ESG: environmental, social and corporate governance; PD: probability of default.

**Timely, concerted action would ensure an orderly transition to a greener economy and the resilience of the financial system to climate-related risks.** The results of the ECB's recent top-down climate stress test highlight the benefits of a timely and orderly transition to mitigate climate-related vulnerabilities, in particular for

the tail of banks most exposed to climate risks (see [Chart 8](#), panel b). The floods and wildfires in Europe earlier this year illustrate financial impacts of climate-related hazards. This includes not only impacts on bank lending, but also on insurers directly exposed to losses from natural catastrophes. From a systemic perspective, insufficient and potentially diminishing insurability of climate-related risks and associated risk pooling could also significantly amplify future economic losses.

## As near-term risks fall, policy moves to address financial stability vulnerabilities further out

### **Recent months have seen attention shift from near-term financial stability risks associated with the pandemic to increasing medium-term vulnerabilities.**

Improved economic conditions have contributed to a decline in near-term vulnerabilities for sovereigns, corporates and banks, even if heterogeneity at the country and sector levels remains. Vulnerabilities from mispricing in some financial and tangible asset markets have increased, however, amid continued risk-taking by non-bank financial institutions. Moreover, the pandemic has left a legacy of significantly higher levels of indebtedness across sectors. These vulnerabilities could unravel in a disorderly manner through shocks such as: (i) an abrupt change in market expectations regarding the pace of monetary policy normalisation; (ii) a premature withdrawal of government support to non-financial sectors; or (iii) a re-intensification of the spread of the coronavirus. The potential for these vulnerabilities to materialise simultaneously and to possibly amplify each other further increases the medium-term risks to financial stability.

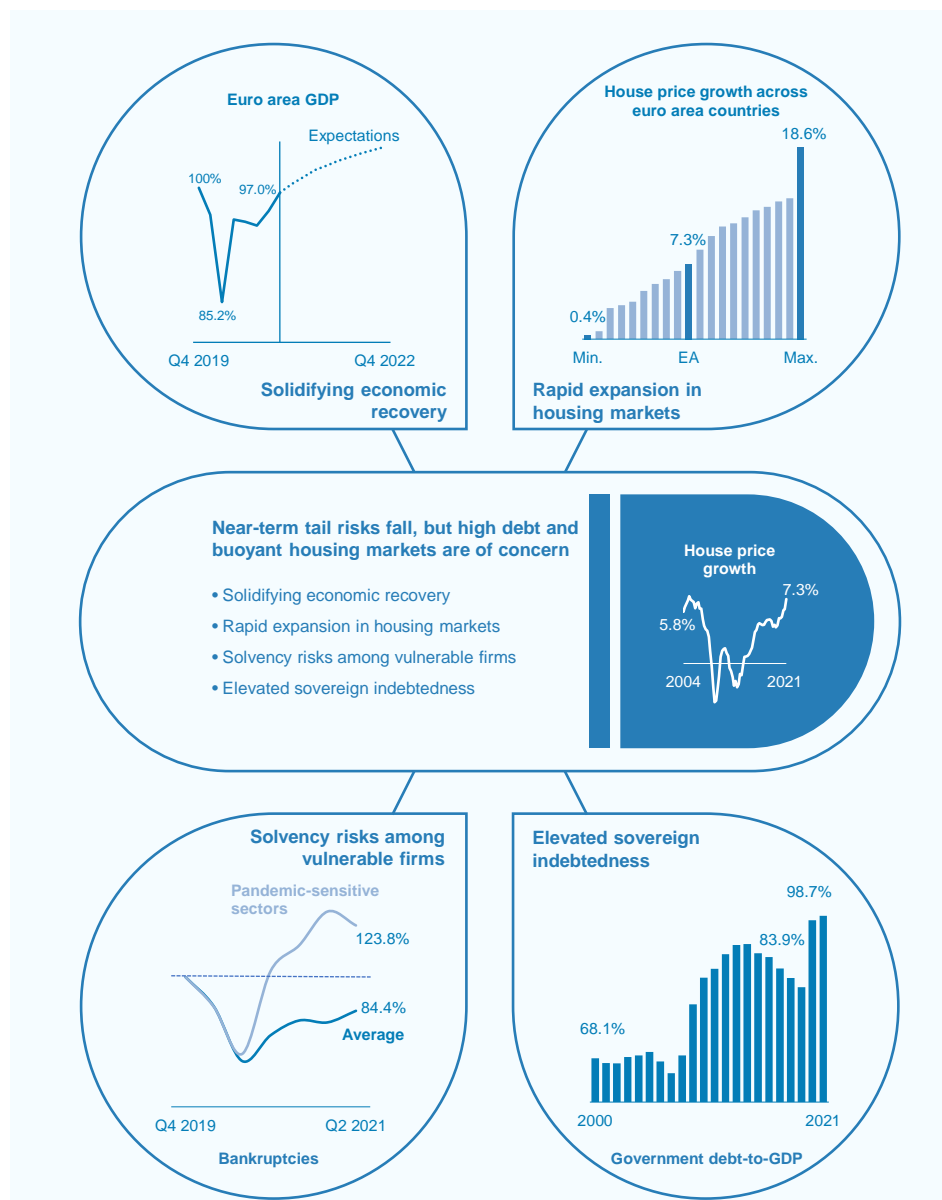
**Policies are also shifting from providing short-term support towards addressing financial stability vulnerabilities ahead.** Fiscal, supervisory and monetary policies have remained supportive, thereby avoiding strong adverse real-financial feedback loops. However, policies have started to shift from containing the immediate economic fallout from the pandemic and ensuring the near-term recovery to managing medium-term risks to financial stability. While the new ECB monetary policy strategy foresees a flexible approach to considering financial stability going forward (see [Box 8](#)), macroprudential policies remain the first line of defence against the build-up of systemic risk. A tightening of macroprudential policies may need to be considered in a number of countries as the economic recovery progresses and medium-term vulnerabilities rise, notably in property markets (see [Section 5.1](#)). At the same time, there is a need for structural policies to play a greater role in managing the transition to more resilient economic and financial structures that support sustainable economic growth.

**Strengthening the regulatory framework, in both the bank and non-bank financial sector, is crucial for the stability of the financial system.** From a broader regulatory perspective, strengthening the banking union and the timely, full and consistent implementation of the final leg of Basel III reforms are essential to address shortcomings in the existing framework. That said, the effectiveness of the framework could be improved, as some banks may be reluctant to use available capital buffers in periods of economic distress (see [Special Feature A](#)), while some



features of the current structural buffer regime could unintentionally create disincentives for cross-border mergers (see **Special Feature B**). Finally, from a system-wide perspective, further progress towards developing a macroprudential approach for non-banks is needed given their increasing role in funding the real economy and their close interlinkages with the wider financial system (see **Section 5.2**). In particular, the Financial Stability Board (FSB) has recently issued policy proposals to tackle vulnerabilities in money market funds, with a key aim being to ensure that they hold sufficient safe and liquid assets. It is now important for the FSB to move towards developing concrete policy proposals in relation to open-ended investment funds and margining practices.

# 1 Macro-financial and credit environment

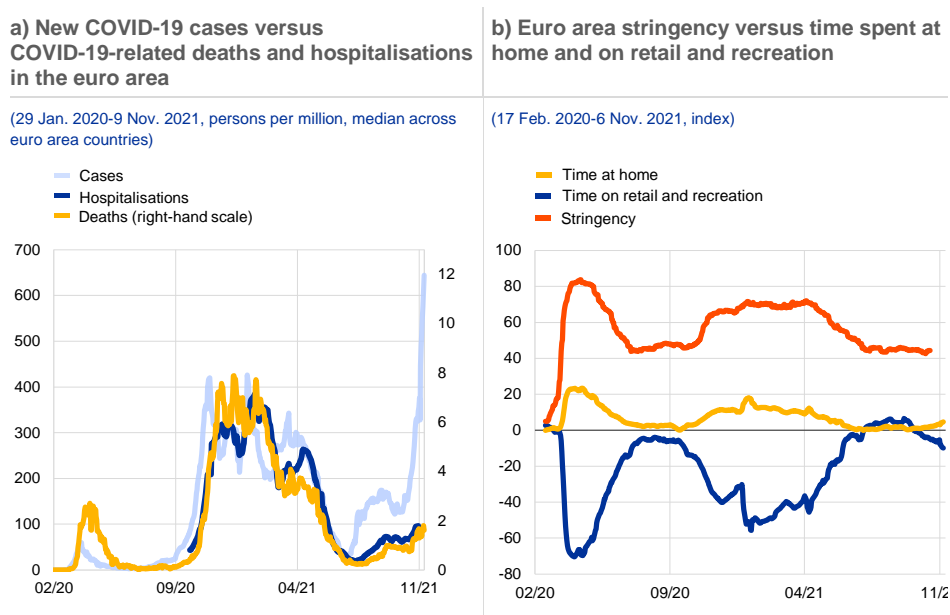


## 1.1 The economy reopens, but inflationary pressures pose downside risks to the recovery

**Economic growth surprised to the upside in the first two quarters of 2021, although growth momentum has slowed more recently.** Overall, real GDP in the third quarter of 2021 was about 0.5% below its level in the fourth quarter of 2019, as the euro area continued to recover. However, the momentum of the growth has moderated to some extent recently, with the rise in energy prices and supply chain bottlenecks posing downside risks to economic growth going forward. At the same

time rising coronavirus (COVID-19) incidence rates had a more limited impact so far on hospitalisations and deaths than in previous waves (see [Chart 1.1](#), panel a). Moreover, mobility data indicate that time spent at home as well as time spent on retail and recreational activities remain near pre-pandemic levels (see [Chart 1.1](#), panel b). Despite the slowdown in the recovery, it is still likely that real GDP will surpass its pre-pandemic levels in the fourth quarter of 2021, two quarters earlier than had been expected at the start of the year.

**Chart 1.1**  
**COVID-19 cases on the rise as society and economies have largely reopened**



Sources: Our World in Data, Hale et al., Eurostat, Google LLC “Google COVID-19 Community Mobility Reports” and ECB calculations. Notes: Panel a: hospitalisations exclude Germany and Greece. Panel b: the stringency index used is the [Oxford COVID-19 Government Response Tracker](#) from the Blavatnik School of Government, University of Oxford. It is based on 20 indicators, ranging from information on containment and closure policies (e.g. school closures and restrictions on movement) to economic policies (e.g. income support provided to citizens) and health system policies (e.g. COVID-19 testing regimes or emergency investments in healthcare). It reports the strictness of lockdown-style policies that primarily restrict people’s behaviour, on a scale of 0 to 100. See Hale, T. et al., “A global panel database of pandemic policies ([Oxford COVID-19 Government Response Tracker](#))”, *Nature Human Behaviour*, 2021. Changes relate to the number of visitors to places of retail, and recreation time spent in places of residence relative to a baseline day representing a normal value for that day of the week. The baseline day is the median value for the five-week period running from 3 January to 6 February 2020. The index is smoothed to the rolling seven-day average.

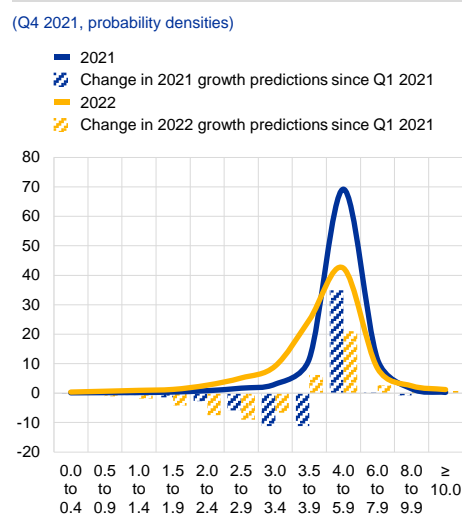
**While vaccination progress has helped to balance the risks to the economic recovery in the euro area, some downside risks remain.** Higher vaccination levels compared with the spring have reduced the level of downside risks for both this year and next (see [Overview](#) and [Chart 1.2](#), panel a). However, current economic expectations are still surrounded by uncertainty stemming from the possible need for new containment measures during the winter months. The virus is continuing to spread, possibly affecting vaccine-induced immunity or creating new mutations, which might translate into new constraints on economic activity. In addition, although economic activity has rebounded, the number of people in employment and total hours worked remain below pre-pandemic levels (see [Section 1.3](#)). Moreover, labour shortages, reflecting increasing job reallocation and labour mismatches, could affect the labour market for sectors that are facing a more permanent drop in demand. As such, the pandemic continues to be one of the main risks to economic growth going forward.

**Divergence in gross value added between sectors and countries narrowed, in part reflecting lockdown measures becoming more targeted.** The reopening of the euro area economy since the spring and increasingly targeted containment measures have reduced divergence in gross value added between sectors and countries (see [Chart 1.2](#), panel b). In addition, although they have softened since the summer, confidence indicators are signalling a recovery in economic activity in both services and manufacturing going forward. However, despite the economic recovery, the unequal impact of the pandemic on these countries continues to be reflected in economic projections. Although the euro area economy as a whole is expected to surpass pre-pandemic growth levels this year, private sector expectations show that for some of the countries hardest hit by the pandemic this is not likely to happen before the second half of next year. Moreover, activity in the most-affected sectors remains significantly below pre-pandemic levels (see [Chart 1.2](#), panel b). These sectors would also be subject to the greatest downside risk in the event of a new lockdown. As such, if the uncertain environment prevails, this could result in lower investment and subdued employment prospects, leading to scarring in those sectors that remain vulnerable to an intensification of the pandemic.

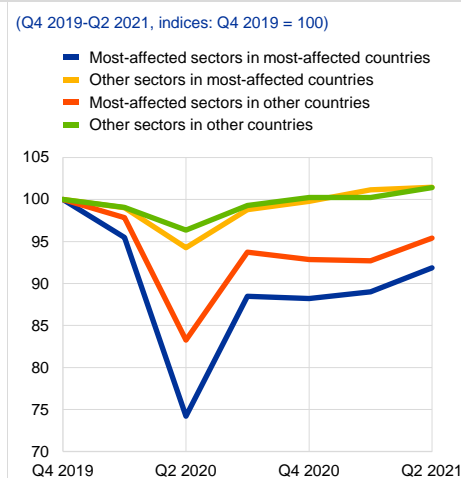
### Chart 1.2

Tail risks have fallen, but not all sectors have fully recovered from the pandemic

a) GDP growth distribution for 2021 and 2022 and growth revisions compared with May 2021



b) Country and sector dispersion in gross value added



Sources: ECB, ECB Survey of Professional Forecasters and Eurostat.

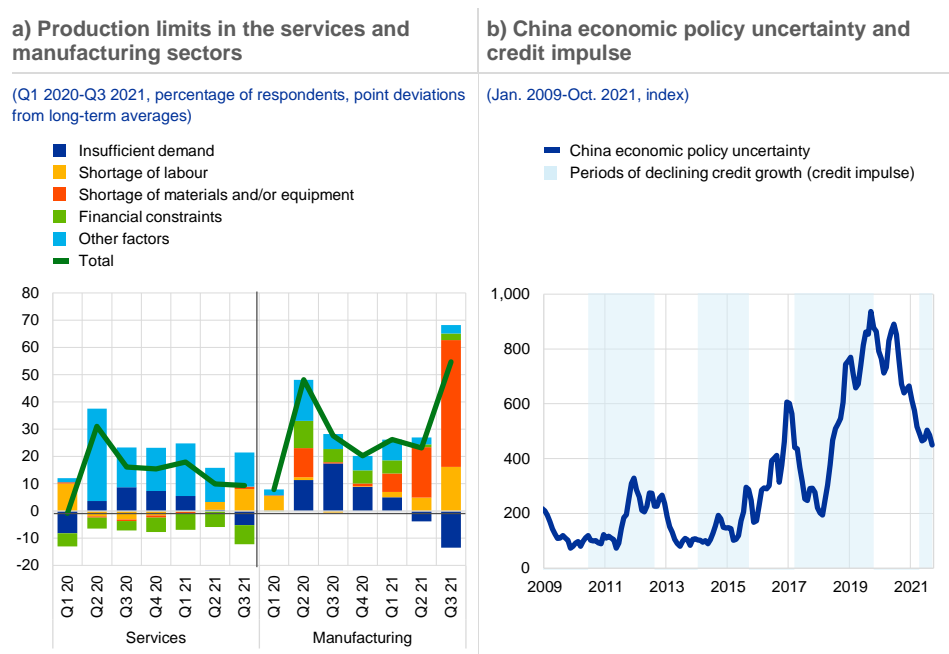
Notes: Panel a: x-axis labels reflect the year-on-year GDP growth for the euro area economy. Panel b: most-affected sectors include mining, construction, retail and wholesale trade, transport, accommodation and food services, professional and administrative services, arts and entertainment, and other services. Sensitivity to the pandemic is determined by the relative loss in gross value added in the second quarter of 2020. Most-affected countries include Greece, Spain, France, Italy and Portugal, while other countries include the remaining euro area countries.

**Supply chain disruptions and surging oil, gas and electricity prices have resulted in rising global inflationary pressures, which could be amplified by unequal vaccination levels.** In many advanced economies, inflation reported in 2021 so far has been higher than was projected last year. Although this widespread spike in headline inflation rates around the world largely reflects a sharp increase in energy prices, increases in input costs related to supply disruptions have also contributed to

upward pressure on inflation. Moreover, enterprises in both the manufacturing and the services sectors report that production is being hampered by a shortage of material (manufacturing) and labour (services, see [Chart 1.3](#), panel a). Going forward, supply chain disruptions could intensify if further virus outbreaks warrant new lockdowns, notably in emerging markets, where vaccination campaigns are less advanced than they are in developed markets. At the same time, if persistent bottlenecks feed through into higher than anticipated wage rises or the economy returns more quickly to full capacity, price pressures could become stronger. A more persistent high inflation scenario could translate into an untimely tightening of financial conditions, weighing on the economic recovery.

### Chart 1.3

Supply chain bottlenecks are increasingly constraining output, while China uncertainty represents a downside risk for the global economic outlook



Sources: European Commission, [policyuncertainty.com](http://policyuncertainty.com), Bloomberg Finance L.P. and ECB calculations.  
Notes: Panel a: reflects the answer to the European Commission's business and consumer survey question "What main factors are currently limiting your production?"; the category "total" excludes the answer "none". The long-term average covers 2003-19. Panel b: shaded area reflects a month-on-month decline in Bloomberg's China credit impulse index. The China economic policy uncertainty index is displayed as the three-month moving average.

**High uncertainty in relation to China, combined with evidence of weakening economic activity, has added to downside global economic risks.** While China recovered swiftly from the contraction induced by the pandemic in the first quarter of 2020, private sector forecasters have revised down their 2021 economic projections for the Chinese economy as credit impulse has declined and economic policy uncertainty remains elevated (see [Chart 1.3](#), panel b). The deceleration in economic activity has been compounded by the authorities' efforts to limit leverage among Chinese property developers. Tighter regulations are also aimed at reducing reliance on residential real estate sector growth, which is a key growth driver in China's economy. Following these developments, Evergrande – one of China's largest and most indebted property developers – prompted wider market concern in the autumn over the health of the Chinese property sector. So far, the impact on global growth

projections and financial markets has been limited, as foreign exposure seems relatively small. However, these developments add to the downside risks for global economic growth prospects<sup>3</sup>, given China's increasing role in global economic and trade developments.

## 1.2 Sovereign risks are contained in the near term, but elevated debt poses a medium-term vulnerability

**Although the pandemic continues to weigh on public finances, the need for further stimulus is gradually declining as the recovery solidifies.** With the euro area economy recovering faster than anticipated, governments are expected to run smaller deficits in 2021 and 2022 than projected at the beginning of 2021 (see **Chart 1.4**, panel a). Moreover, support measures have become more targeted on those sectors of the economy that are still affected by restrictions, thereby reducing their fiscal impact compared with the early days of the pandemic. According to the September 2021 ECB staff macroeconomic projections, the contribution of discretionary stimulus related to the pandemic is expected to decline from 4.6% of GDP in 2021 to 1.5% and 1.2% in 2022 and 2023 respectively. Meanwhile, additional fiscal stimulus measures for 2022 have been adopted by most governments in the context of their draft budgetary plans. These include an expansion of some pandemic-related spending, additional measures to alleviate the adverse impact of the increase in energy prices and other fiscal loosening measures in several countries.

**Scaling back pandemic-related stimulus implies a tightening of the fiscal stance in 2022.** Current projections for the euro area indicate that, as the economy recovers and government support measures unwind, the fiscal stance will tighten in 2022 (see **Chart 1.4**, panel a). Although the projected economic outlook allows for such tightening, pandemic-related downside risks surrounding economic projections could make it necessary to introduce new stimulus measures (see **Section 1.1**).

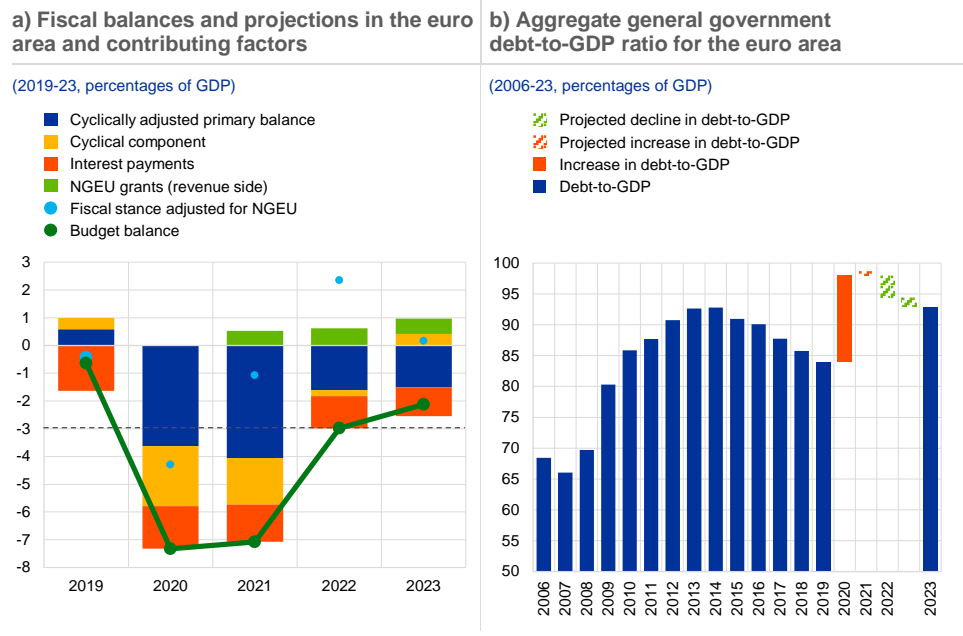
**Despite governments running sizeable budget deficits, the increase in debt-to-GDP levels this year is projected to remain limited.** While deficits will be at similar levels to 2020, the increase in debt ratios is expected to be far less pronounced this year, mainly reflecting robust economic growth (see **Chart 1.4**, panel b). Moreover, the gradual scaling back of fiscal support measures will serve to improve public finances and will contribute to a further decline in debt levels going forward. In 2020, approximately 35% of the increase in the euro area debt-to-GDP ratio was driven by the fall in GDP, but as the economy recovers this denominator effect will subside. Despite these favourable developments, however, government debt is expected to remain significantly above pre-pandemic levels, increasing the vulnerability of the economy to a deterioration in financial conditions and negatively affecting its resilience to future economic shocks (see **Box 1**).

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<sup>3</sup> See Box 1 entitled “Emerging markets’ vulnerability to a reassessment of risk”, *Financial Stability Review*, ECB, May 2021.

### Chart 1.4

Pandemic-related expenses have caused budget deficits to remain large in 2021, but general government indebtedness has stabilised this year



Sources: ECB, September 2021 ECB staff macroeconomic projections and ECB staff calculations.

Notes: Panel a: the dotted line depicts the 3% of GDP budget deficit threshold set in the Maastricht Treaty to delineate excessive government deficits. The data refer to the aggregate general government sector of euro area countries, adjusted for the impact of NGEU grants on the revenue side. The cyclical component refers to the impact of the economic cycle as well as temporary measures taken by governments, such as one-off revenues or one-off capital transfers. NGEU: Next Generation EU.

### Governments have continued to benefit from low debt servicing costs and reduced rollover risk by increasingly issuing long maturity debt.

Moreover, sovereign stress has fallen to its lowest level since 2001, as monetary support measures have continued to support financing costs (see [Chart 1.5](#), panel a, and [Chapter 2](#)). As a result, governments have increasingly made use of easy financial conditions to issue longer-term debt (see [Chart 1.5](#), panel b). The issuance of such debt fits with the ongoing trend of lengthening the maturity of the government debt portfolio, as the average maturity increased from 6.7 years in December 2010 to 7.9 years in September 2021 for the euro area on aggregate. In terms of debt servicing needs over a period of two years, this increased residual maturity translates into a 15% reduction in principal repayments compared with running the same amount of debt against the maturity profile in 2010.<sup>4</sup> However, debt servicing needs remain elevated, with some euro area countries facing refinancing and interest expenditure in excess of 40% of GDP over the next two years.<sup>5</sup> As such, a future deterioration in financial conditions could weigh on public finances in higher indebted euro area countries, hampering the recovery.

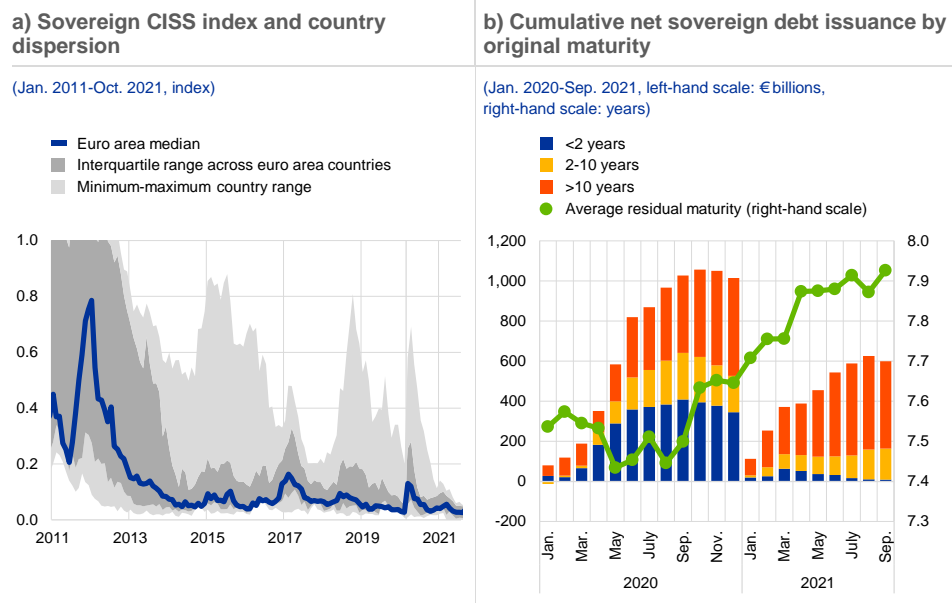
<sup>4</sup> Calculated as the change in principal payments divided by the change in total debt outstanding over the period from January 2010 to August 2021.

<sup>5</sup> Although remaining sizeable, debt service needs are also cushioned by sizable deposits with the Eurosystem and the reinvestments that follow from the pandemic emergency purchase programme (PEPP) and the asset purchasing program (APP).



**Chart 1.5**

Euro area sovereign risk dispersion declined to near all-time lows, while governments made use of easy financial conditions to issue long-term debt



Sources: ECB and ECB government finance statistics.

Notes: Panel a: the sovereign CISS is computed for the euro area as a whole. It includes 15 raw, mainly market-based, financial stress measures that are split equally into five categories, namely the financial intermediaries sector, money markets, equity markets, bond markets and foreign exchange markets. For further details, see Holló, D., Kremer, M. and Lo Duca, M., “CISS - A composite indicator of systemic stress in the financial system”, *Working Paper Series*, No 1426, ECB, March 2012. Panel b: cumulative net issuance refers to the cumulative issuance of government debt securities between January 2020 and January 2021, net of redemptions.

**Projected negative interest rate-growth differentials should facilitate a decline in debt levels over time, though their trajectory is surrounded by uncertainty.**

The economic recovery and the low interest rate environment will result in a negative interest rate-growth differential in the coming years (see **Chart 1.6**, panel a). As a result, debt levels are expected to decline gradually from their present level.<sup>6</sup> Moreover, current expectations only show marginally higher interest rate-growth differentials for higher debt countries than for lower debt countries. Historically, the relationship between a country’s debt level and its interest rate-growth differential grows stronger in times of elevated stress levels. This illustrates how the higher debt levels resulting from the pandemic could be more detrimental for government finances going forward if left unchecked (see **Box 1**).

**The EU recovery package could improve long-term economic prospects and, therefore, sovereign debt sustainability.**

Moreover, positive spillovers of investments under the NGEU between euro area countries could further boost economic growth<sup>7</sup> and could help to sustain the recovery without national budgets being directly negatively affected<sup>8</sup>. Currently, most euro area governments have submitted their recovery and resilience plans for the €750 billion NGEU funding

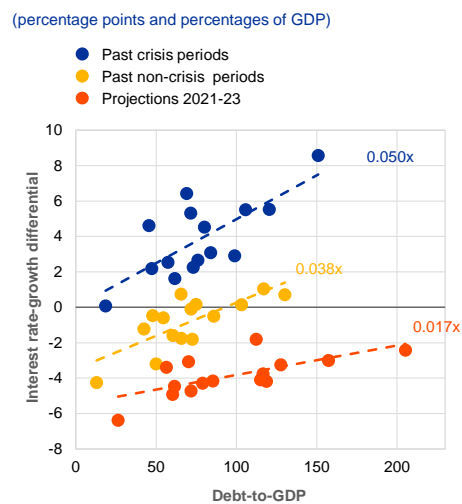
<sup>6</sup> These expectations reflect the continuing normalisation of primary deficit ratios as fiscal support is withdrawn.  
<sup>7</sup> For more details, see Pfeiffer, P., Varga, J. and in ‘t Veld, J., “Quantifying Spillovers of Next Generation EU investment”, *Discussion Papers*, No 144, European Commission, July 2021.  
<sup>8</sup> Ultimately, EU debt will be funded by European taxpayers as it is backed by Member States’ contributions to the EU budget and the EU’s own resources.

envelope: the plans are composed of grants and loans (see [Chart 1.6](#), panel b). Countries have until August 2023 to apply for loans: not all euro area countries have requested a full allocation so far, possibly reflecting the fact that most countries currently enjoy very favourable financing conditions. In the plans submitted to date, the largest share of the funds is allocated to public administration, construction, transport and energy. This may be because governments are looking to finance projects that will promote growth, in line with the digitalisation, green transition and social objectives of the NGEU package, rather than just focusing on the sectors hardest hit by the pandemic. But as only a few countries have set out a timeline for planned spending, uncertainty surrounding actual absorption rates, and hence the effectiveness of the NGEU package, remains high.

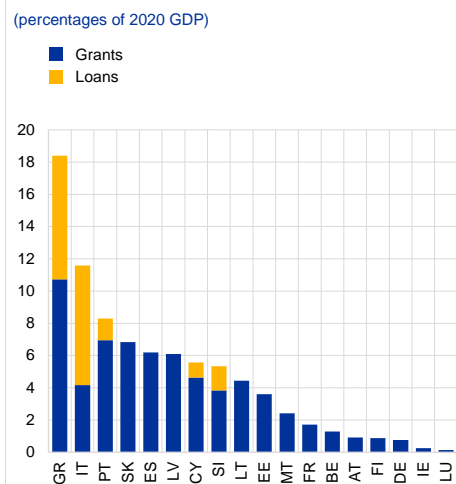
### Chart 1.6

Favourable financing conditions and the economic recovery are expected to contribute to sovereign debt sustainability

a) Interest rate-growth differentials and general government debt-to-GDP ratios



b) Submitted recovery and resilience fund plans and estimated grant and loan allocation



Sources: European Commission, Eurostat and ECB staff calculations.

Notes: Panel a: the interest rate-growth differential (i-g) is computed as the difference between the average nominal interest rate that governments pay on their debt (ratio of government interest payments in year t to the debt stock in t-1) and the nominal GDP growth rate. "Crisis periods" reflects the (i-g) and the debt-to-GDP ratio in 2008-09, 2011-14 and 2020; non-crisis periods are the remaining years between 2002 and 2021. Projections over the period 2021-23 are based on the September 2021 ECB macroeconomic projections. Outliers LT, LV and EE are excluded.

**While favourable financing conditions mitigate short-term risks, higher debt leaves euro area sovereigns more vulnerable in the medium term.** Although financing conditions have limited the impact of increased sovereign debt levels on budgets and debt servicing costs, the increased debt burden resulting from the pandemic could potentially represent a longer-lasting drag on the economy. Moreover, the sizeable increase in contingent liabilities since the start of the pandemic might weigh on government debt levels should economic growth slow. At the current juncture, the increase in sovereign indebtedness is not expected to reverse for at least another decade, and a return to less favourable financial conditions could imply less benign debt dynamics (see [Box 1](#)).

## Box 1

### Sensitivity of sovereign debt in the euro area to an interest rate-growth differential shock

Prepared by Othman Bouabdallah, Cristina Checherita-Westphal, Nander de Vette and Sándor Gardó

**Euro area sovereigns have issued significant amounts of new debt in response to the pandemic.** As a result of this and the sizeable GDP drop, the euro area debt-to-GDP ratio increased to about 100% of GDP in 2020, above the peak of 95% reached in the aftermath of the euro area sovereign debt crisis. While the related fiscal support was crucial to limit economic scarring and aid the recovery, it has also triggered concerns about medium to longer-term debt sustainability. Sustainability risks hinge on a multitude of factors, including fiscal and economic prospects, financial market conditions, the structure of debt and institutional features.<sup>9</sup> A key factor among these is the interest rate-growth differential ( $i-g$ ), also known as the “snowball effect”. If  $i > g$  a primary surplus is needed to stop the debt ratio from rising and an ever-larger surplus being needed to reduce it. Conversely, a persistently negative differential ( $i < g$ ) would imply that debt ratios could be reduced even in the presence of primary budget deficits, as long as such deficits have a lower impact on the debt ratio than ( $i-g$ ). This implies that projected budget balances play a key role as well: large and persistent primary deficits could prevent debt ratios from stabilising. The differential is surrounded by uncertainty related to the medium-term growth outlook and the long-term path of sovereign interest rates. Against this backdrop, this box assesses the impact of a rising ( $i-g$ ) differential on sovereign debt ratios in the euro area.

**The current favourable financing conditions and the expected economic recovery are helping to contain the short-term impact of the pandemic on sovereign debt sustainability.** Indeed, sovereign interest payments have continued to decline as a share of both debt and GDP, despite higher overall debt levels (see **Chart A**, panel a). In addition, governments are (re)financing debt at increasingly long maturities, contributing to lower rollover risks. Finally, to the extent that higher debt levels help economic growth to recover more quickly, some of the increase in sovereign debt-to-GDP ratios will reverse as the economy recovers. As a result, even elevated debt levels can be considered sustainable in the short-to-medium term provided that primary deficits do not outweigh the favourable contribution from projected negative ( $i-g$ ).

**Empirical evidence from past crises suggests that reversals in interest rate-growth differentials are not uncommon, notably for higher-debt countries.** From a historical perspective, while periods of negative ( $i-g$ ) have not been uncommon, most of the literature assumes that ( $i-g$ ) should be positive over the longer run, at least in advanced economies that are closer to their steady state.<sup>10</sup> For the mature euro area economies (as well as for most other advanced economies), differentials have been mostly positive on average since the early 1980s and over the EMU period. For the euro area aggregate debt, ( $i-g$ ) was 0.8 percentage points on average between 1999 and 2019 (0.6 percentage points for the period before 2008). Higher-debt countries tended to have higher differentials (see **Chart A**, panel b), among other things, as they paid higher risk premia in times of economic stress and have historically experienced a larger decline in economic activity.

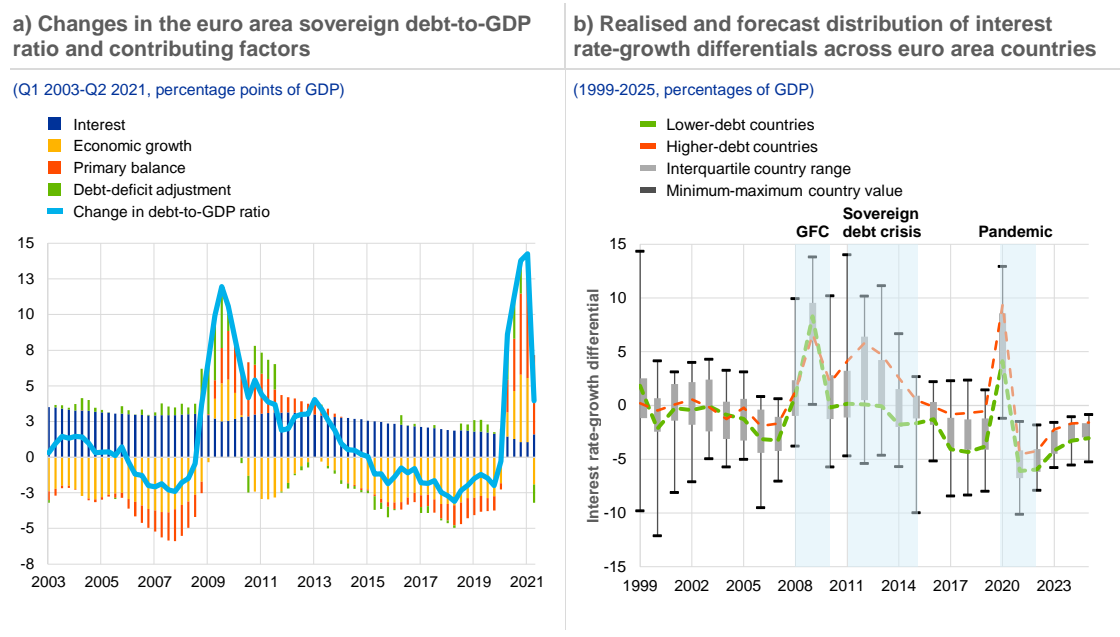
<sup>9</sup> For more details, see Bouabdallah, O., Checherita-Westphal, C., Warmedinger, T., de Stefani, R., Drudi, F., Setzer, R. and Westphal, A., “Debt sustainability analysis for euro area sovereigns: a methodological framework”, *Occasional Paper Series*, No 185, ECB, April 2017.

<sup>10</sup> See Box 11 in Work stream on monetary-fiscal policy interactions, “Monetary-fiscal policy interactions in the euro area”, *Occasional Paper Series*, No 273, ECB, September 2021 for an overview. A debate on the role of fiscal policy with a persistently negative ( $i-g$ ) was revived by Olivier Blanchard in his 2019 American Economic Association presidential address. Other authors (e.g. Charles Wyplosz) conclude that ( $i-g$ )  $< 0$  is not the norm for advanced economies (and has not been since at least the 1960s) or, even if extended periods of negative ( $i-g$ ) exist, they are not necessarily conducive to lower debt ratios and sovereign stress.

The pandemic brought a surge in the differentials for 2020 as GDP growth dipped, with record – albeit temporary – differentials for all countries.

### Chart A

Large positive interest rate-growth differentials are not uncommon during episodes of stress, particularly affecting countries with higher debt levels



Sources: ECB and ECB calculations.

Notes: Panel a: the debt-deficit adjustment (DDA) captures the effects of the accumulation or sale of financial assets, changes in the value of foreign debt owing to exchange rate changes and remaining statistical adjustments, as well as other residuals. While relevant for debt dynamics, especially in crises times, DDA is assumed to be broadly neutral over the longer term, and thus abstracted from the discussions in this box (paragraph 1). The change in the government debt-to-GDP ratio can be decomposed as follows:  $\Delta b_t = -pb_t + \left(\frac{i_t - g_t}{1 + g_t}\right) b_{t-1} + dda_t$  where  $t$  is a time subscript,  $b$  is general government gross debt as a percentage of GDP,  $pb$  is the primary balance as a percentage of GDP,  $i$  is the average (implicit) nominal interest rate on government debt,  $g$  is the nominal GDP growth rate and  $dda$  is the debt-deficit adjustment. Panel b: Estonia, Latvia and Lithuania are excluded for the period preceding 2011 on account of extreme  $(i-g)$  values and very high volatility. Ireland is excluded for 2015 due to a revision in GDP methodology. The aggregate of higher-debt countries includes euro area countries with a 2019 debt-to-GDP ratio above 90%. The lower-debt aggregate includes the remaining euro area countries. Averages in this chart are unweighted. The interest rate-growth differential is computed as the difference between the average nominal interest rate that governments pay on their debt (ratio of government interest payments in year  $t$  to the debt stock in  $t-1$ ) and the nominal GDP growth rate. Projections over 2021-25 are based on an ESCB debt sustainability tool using September 2021 ECB macroeconomic and fiscal projections for 2021-23 (benchmark scenario). GFC: global financial crisis.

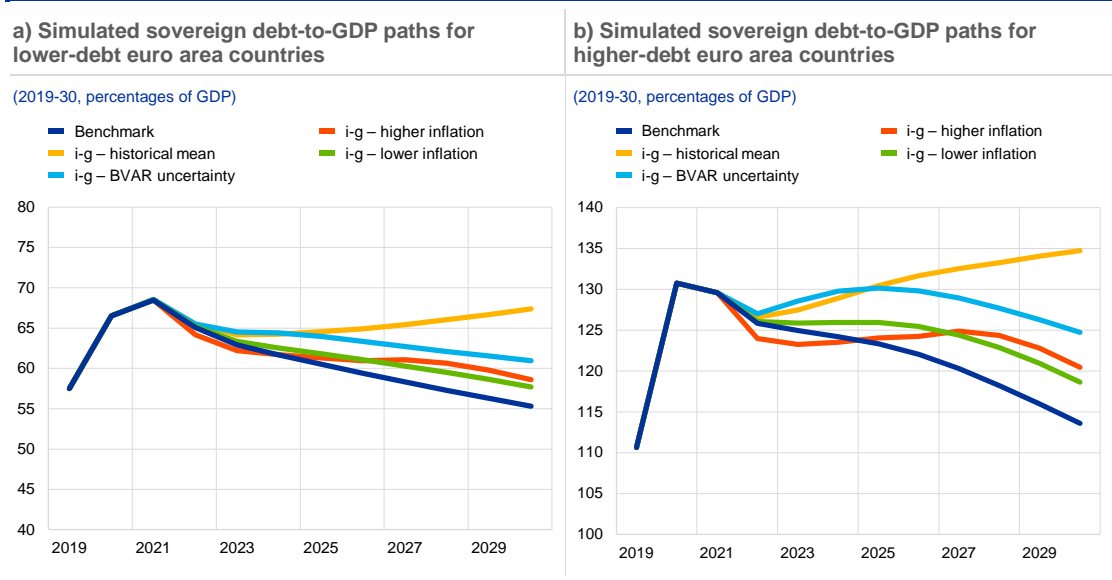
**A benchmark scenario consistent with a continued economic recovery suggests a declining debt path, but at levels still higher than before the crisis for the higher-debt countries.** Under a benchmark debt sustainability scenario (which assumes a continued economic recovery in line with ECB projections and further convergence to potential output growth, a fiscal path of improving structural balances, inflation converging to the ECB’s target and sovereign interest rates in line with market expectations),  $(i-g)$  is expected to decline below zero for all euro area countries as of 2021 and for the foreseeable period thereafter. Despite rising over the scenario period,  $(i-g)$  still remains negative over the medium-to-longer run and well below its long-term average. As such, understanding the implications of possible higher  $(i-g)$  differentials is key to gauging the resilience of sovereign debt sustainability and the higher debt levels induced by the pandemic.

**Sensitivity analysis indicates that an  $(i-g)$  shock would be more detrimental for higher-debt countries.** Indicative simulations capturing (only) adverse risks to the  $(i-g)$  differential under four alternative scenarios, which consider historical patterns in the distribution of  $(i-g)$  or calibrated forward-looking shocks, suggest more debt pressure in all cases, notably for higher-debt countries (see **Chart B**). The “historical mean” scenario, in which countries’ differentials return to their 1999-2019 average over ten years, shows an upward debt path even for lower-debt countries. In the

“BVAR uncertainty” scenario, the shock calibrated based on the (usually reported) 68th upper percentile of the ( $i-g$ ) distribution from a Bayesian vector autoregression (BVAR) model with relevant macroeconomic, financial and fiscal variables sees a milder impact but still with a substantial rise in the debt burden, especially for higher-debt countries. In the “( $i-g$ ) high inflation” scenario<sup>11</sup>, higher than currently projected inflation, accompanied by monetary policy tightening, also heightens debt sustainability risks for higher-debt countries. The aggregate debt ratios decline in the first year after the shock, owing to the favourable denominator effect, but then start rising again for several years, even though the interest rate-growth differential remains negative. In the “( $i-g$ ) low inflation” scenario, where the inflation rate is assumed to follow a path below the ECB’s target, with no further central bank reaction (interest rates assumed already at the effective lower bound), the debt ratios would also remain on a higher path than in the benchmark but would stabilise.

## Chart B

An adverse ( $i-g$ ) shock would have negative implications, in particular for higher-debt countries



Sources: ECB and ECB calculations.

Notes: The benchmark refers to the main scenario of the debt sustainability analysis simulations based on the September 2021 Macroeconomic Projection Exercise for the period 2021-23 and assumes broad minimum compliance of the fiscal path thereafter with the Stability and Growth Pact (gradual convergence to countries’ specific medium-term fiscal objectives, with current debt rule requirements not included in the simulations). For more details, see Bouabdallah et al., op. cit. The (GDP-weighted) aggregate of higher-debt countries includes euro area countries with a 2019 debt-to-GDP ratio above 90%: BE, GR, ES, FR, IT, CY, PT. The lower-debt aggregate includes the remaining euro area countries. The alternative scenarios show risks stemming from less favourable ( $i-g$ ) dynamics as of 2022. In the ( $i-g$ ) historical mean scenario, the interest rate-growth differential is assumed to converge over ten years to its 1999-2019 average, or at least 0.5 percentage points. The BVAR scenario reflects the impact on benchmark debt of ( $i-g$ ) following the 68th percentile path of its distribution based on a BVAR model (for more details, see Checherita-Westphal, C. and Domingues Semeano, J., “Interest rate-growth differentials on government debt: an empirical investigation for the euro area”, *Working Paper Series*, No 2486, ECB, November 2020). The ( $i-g$ ) high inflation scenario assumes the standard reaction of monetary policy to an inflationary shock (3% for four years) according to an estimated Taylor rule. In the ( $i-g$ ) low inflation scenario, the inflation rate is assumed to follow a path below the ECB’s target, in line with indicators of market expectations. For individual countries, specific conditions apply; Greece is one example, where a very large share of the stock of debt is fixed-rate and governed by official financing conditions, and therefore consistently excluded from the calculation of the historical average as well as from the simulated path of  $i-g$  differential.

**All in all, the risks arising from the pandemic-induced increase in sovereign debt levels appear manageable in the shorter run, but sovereign risks could intensify in the event of a sustained rise in ( $i-g$ ) levels.** The ongoing economic recovery is expected to deflate some of the recent increase in sovereign debt-to-GDP ratios, while favourable financing conditions, if supported by fiscal prudence and growth-friendly policies, are expected to keep rollover risks in check. However, shocks to currently projected ( $i-g$ ) levels could prove detrimental to debt dynamics in both higher and

<sup>11</sup> For more details on the calibration of the latter two scenarios, see also Box 18 in Work stream on monetary-fiscal policy interactions, “Monetary-fiscal policy interactions in the euro area”, *Occasional Paper Series*, No 273, ECB, September 2021.

lower-debt countries. For higher-debt countries, any adverse deviation from the benchmark ( $i-g$ ) scenario would further increase the debt burden and potentially heighten overall vulnerabilities. This, in turn, could trigger a reassessment of sovereign risk by market participants and reignite pressures on more vulnerable sovereigns. While these events, especially the return to ( $i-g$ ) historical averages, do not have a high probability, risk monitoring should continue.

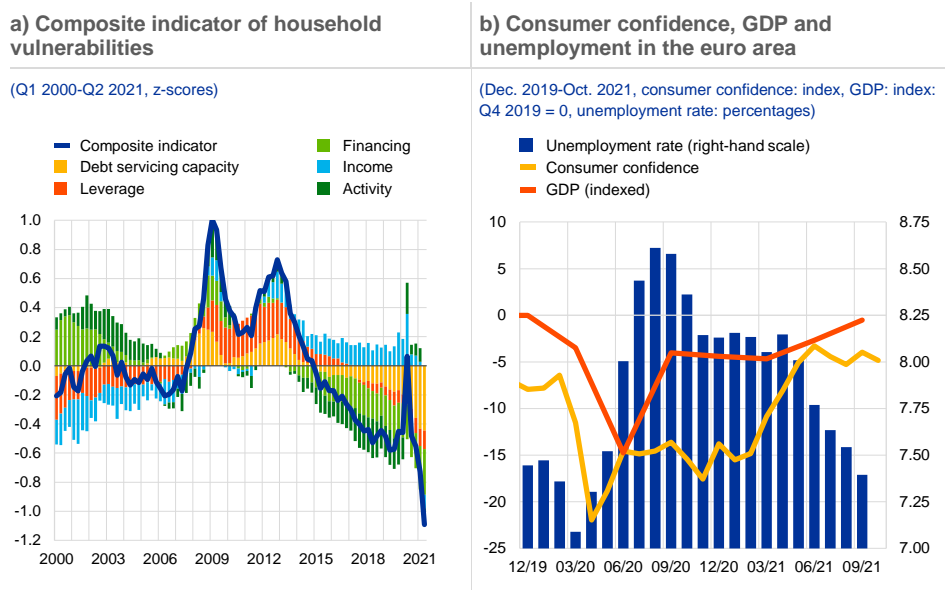
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### 1.3 Households remain resilient, but pockets of vulnerabilities may emerge

**Euro area households' aggregate balance sheets have remained robust, although some uncertainty persists.** The financial situation of euro area households has improved further on aggregate, with indicators of financial health signalling vulnerabilities below long-term averages (see [Chart 1.7](#), panel a). The largest uplift comes from households' debt servicing capacity being bolstered by lower interest payments and a high savings rate as household income was shielded by government support throughout the pandemic and containment measures limited spending opportunities. In addition, financing conditions and credit provision have remained favourable. Consumers gained confidence as vaccination campaigns accelerated and economies reopened over the summer, which has supported GDP growth (see [Chart 1.7](#), panel b). Households further benefited from a decline in unemployment throughout the second and third quarters of 2021, with the unemployment rate of 7.4% in September back to pre-pandemic levels. With several sectors reporting labour shortages, the general outlook for employment remains positive. That said, global supply chain bottlenecks could weigh on the economic recovery, and jobs created in the hospitality and leisure sectors could be vulnerable to a renewed deterioration in the pandemic situation.

### Chart 1.7

Households are benefiting from easy financial conditions, while sentiment is robust and unemployment has fallen



Sources: Eurostat, ECB and ECB calculations.

Notes: Panel a: the composite measure is based on a broad set of indicators along five dimensions: debt servicing capacity (measured by gross interest payments-to-income ratio, savings ratio and expectation of the financial situation); leverage (gross debt to income and gross debt-to-total assets ratios); financing (bank lending rate, short-term debt-to-long-term debt ratio, quick ratio (defined as current financial assets/current liabilities) and credit impulse (defined as the change in new credit issued as a percentage of GDP)); income (income growth and income-to-GDP ratio); and activity (labour participation rate and unemployment expectations). The indicators are standardised by transforming them into z-scores, i.e. they are converted into a common scale with a mean of zero and a standard deviation of one. Composite sub-indicators are computed for each of the five dimensions by taking the simple arithmetic average of the respective underlying z-scores of the individual indicators. Finally, the overall composite indicator is obtained by equally weighting the composite z-scores of the five sub-categories. Positive values indicate higher vulnerability, negative values lower vulnerability. Panel b: the latest observation is the third quarter 2021 for GDP growth and September 2021 for the unemployment rate.

### Record savings have enhanced households' resilience but are unevenly distributed, which may limit any additional boost to consumption.

Households continued to accumulate excess savings as containment measures limited spending. Substantial parts of these are held in deposits and cash, but an increasing share is invested in less liquid financial assets like equity and investment fund shares (see [Chart 1.8](#), panel a). Households may hold these savings for precautionary reasons, to pay down debt or in anticipation of possible price or tax rises as survey data suggest that they do not intend to increase their spending on durables beyond pre-pandemic levels, thus limiting hopes that pent-up demand would translate into higher consumption.<sup>12</sup> In addition, higher-income households, which tend to have a lower marginal propensity to consume, account for the highest savings. While the importance of government support schemes is receding overall, they still play a significant role in stabilising income, consumption and debt servicing capacity, especially for lower-income households that will be left vulnerable to cliff effects if support schemes are withdrawn prematurely (see [Chart 1.8](#), panel b). Together with robust house price and stock market valuation gains, households' net worth surged to 772% of disposable income in the second quarter of 2021 (see [Section 1.5](#)).

<sup>12</sup> See also the boxes entitled "COVID-19 and the increase in household savings: precautionary or forced?", *Economic Bulletin*, Issue 6, ECB, 2020, and "COVID-19 and the increase in household savings: an update", *Economic Bulletin*, Issue 5, ECB, 2021.

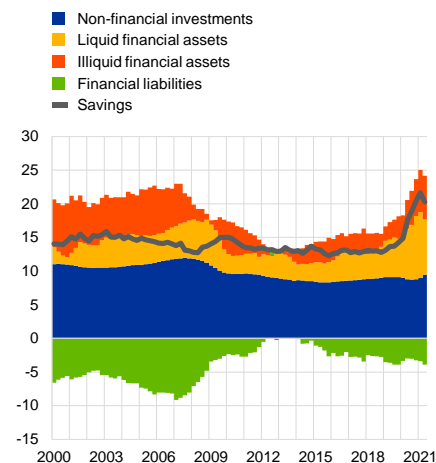


### Chart 1.8

Excess savings are increasingly invested in illiquid assets, while lower-income households still depend on government support

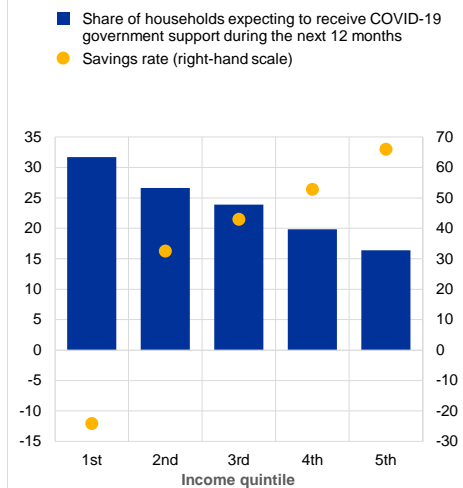
a) Household savings rate and allocation

(Q1 2000-Q2 2021, percentages)



b) Households expecting to receive government support and savings rate by income quintile

(Jul. 2021 and Aug. 2021, percentages)



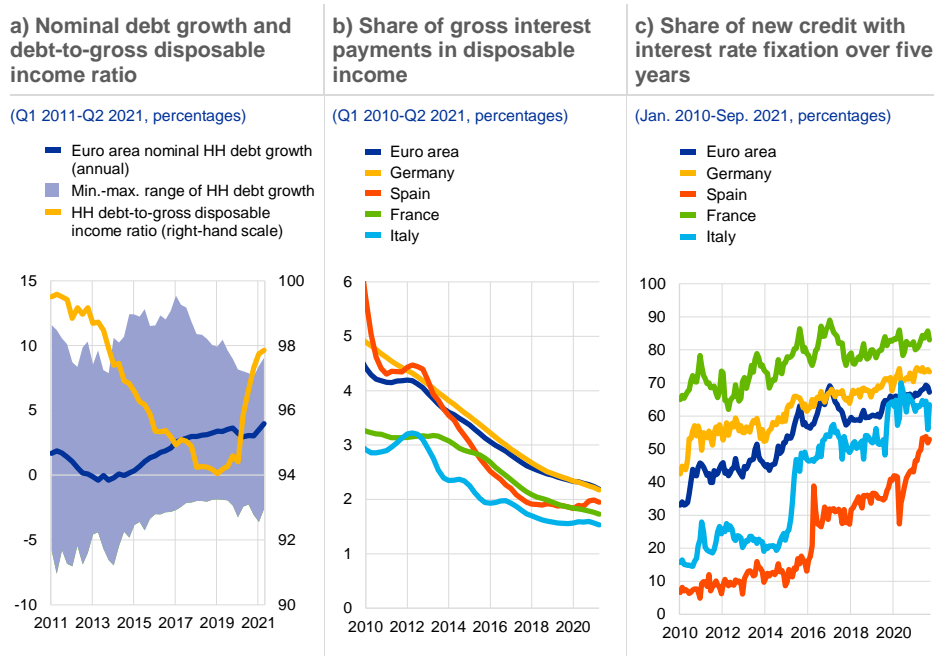
Sources: Eurostat, ECB Consumer Expectations Survey (CES) and ECB calculations.

Notes: Panel a: figures shown are four-quarter trailing sums of transactions expressed as percentages of income. Panel b: expectations of government support are taken from the August 2021 CES wave, the savings rate is inferred from the July 2021 CES wave. Data cover surveys from Belgium, Germany, Spain, France, Italy and the Netherlands. The savings rate is calculated as the difference between monthly income and reported expenses on consumption divided by the monthly income, where income is inferred from income buckets. Accordingly, the data should be interpreted with caution, and mainly as an illustration of differences across different income classes.

**Household debt continues to grow amid record low debt servicing costs.** While the situation differs across countries, aggregate household debt grew at the highest rate in a decade – almost 4% in annual terms in the second quarter of 2021 (see [Chart 1.9](#), panel a), mainly on the back of robust mortgage lending (see [Section 1.5](#)). Household income, on the other hand, has grown at a slower rate, increasing the debt-to-disposable income ratio to 97.9%. Record low interest rates support households' debt servicing capacity as only around 2.2% of disposable income needs to be spent on interest payments (see [Chart 1.9](#), panel b). In addition, the increasing share of fixed-rate loans in new credit flows makes the household sector less vulnerable to interest rate shocks going forward (see [Chart 1.9](#), panel c). Nevertheless, should debt continue to grow faster than income, vulnerabilities could build up in the household sector.

### Chart 1.9

While household indebtedness is rising, low interest rates and longer periods of interest fixation support households' debt servicing capacity



Sources: Eurostat, ECB and ECB calculations.

Notes: Panel a: annual euro area nominal HH debt growth is calculated as the four-quarter moving sum of household loan flows divided by the previous quarter's loan stock. Panel b: interest payments are measured before allocation of financial intermediation services indirectly measured (FISIM). Panel c: share of new credit flows with initial interest rate fixation over five years of new lending to households for house purchase, consumption and other purposes, including renegotiations. HH: household.

**Overall, financial stability risks stemming from the household sector remain contained, but some medium-term vulnerabilities are rising.** With excess savings, robust net wealth and record low debt servicing costs, households retain their capacity to weather economic headwinds. However, lower-income households are disproportionately reliant on government support and have likely benefited less from higher financial wealth, leaving them in a potentially vulnerable position when policy support is scaled back. In addition, should higher inflation persist and households' spending on essential goods increase, both their ability to support the broader economic recovery and their debt servicing capacity could be hurt. Concerns over household debt sustainability could rise, especially in those countries where the take-up of policy support is substantial, residential properties are overvalued and debt levels are elevated.

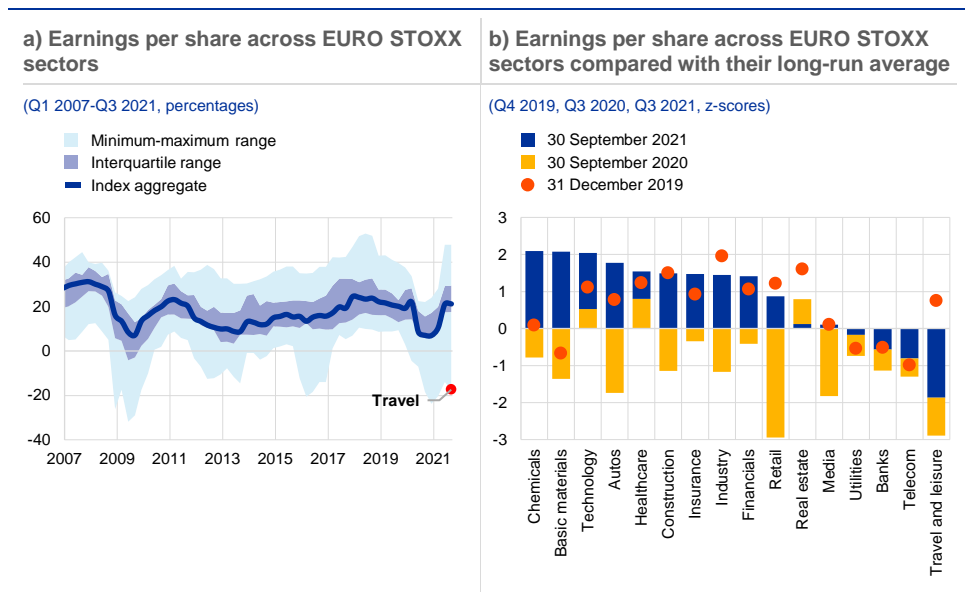
## 1.4 Corporate outlook improves, reducing near-term risks

**Near-term corporate sector vulnerabilities declined as economic activity picked up.** Corporate earnings showed a large, broad-based improvement in the second quarter of 2021, returning to pre-pandemic levels for listed firms, thereby alleviating solvency concerns (see [Chart 1.10](#), panel a). Despite this marked improvement, corporates face challenges stemming from the swift pick-up in economic activity as energy prices soar, supply chain bottlenecks limit production among manufacturers

and labour shortages start to weigh on the services sector, potentially slowing its recovery going forward (see [Section 1.1](#)). Moreover, profitability has lagged behind in those sectors where activity continues to be suppressed by pandemic restrictions and which have experienced only a marginal improvement on their pandemic lows, such as the travel industry (see [Chart 1.10](#), panel b). In addition, corporates will probably need a prolonged period of growth to make up for lost earnings, as backward-looking cumulative earnings are still 6.5% below pre-pandemic levels.

**Chart 1.10**

Earnings rebounded from pandemic lows for most sectors, but not all



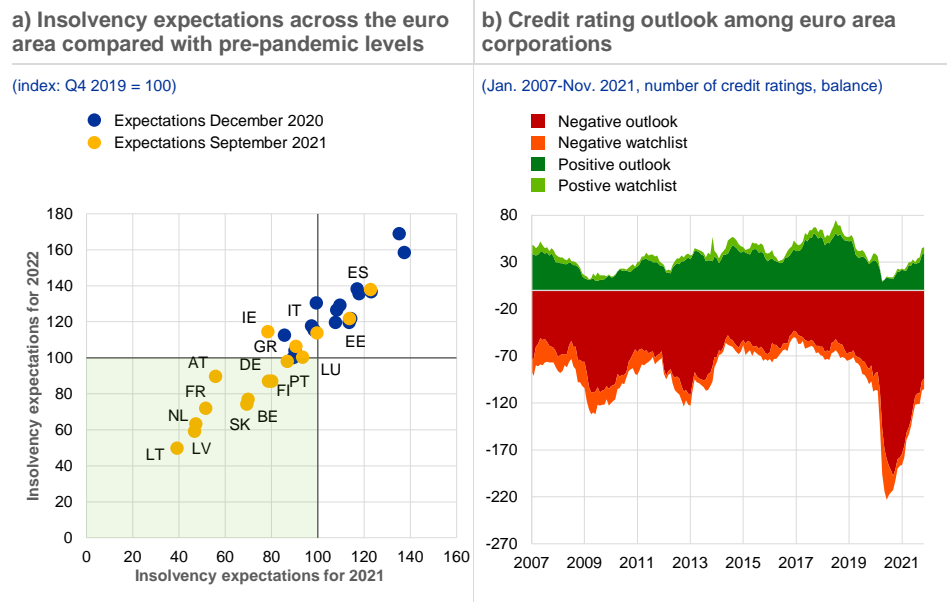
Sources: Bloomberg Finance L.P., ECB and ECB calculations.

Notes: Panel a: sample consists of the EURO STOXX sectors chemicals, basic materials, technology, autos, healthcare, construction, insurance, industry, financials, retail, real estate, media, utilities, banks, telecom, and travel and leisure. Panel b: Bloomberg best earnings estimates. z-score calculated over the reference period Q1 2007-Q3 2021.

**Insolvencies remain strikingly subdued, although they have materialised in some of the sectors most affected by the pandemic.** On aggregate, the level of insolvencies in the euro area remained 15% below pre-pandemic levels in the second quarter of 2021. However, more granular data show that insolvencies have risen in those sectors hardest hit by the pandemic (e.g. in the accommodation and education sectors). At the same time, the swift economic recovery makes it unlikely that insolvency numbers will rise to match earlier private sector projections (see [Chart 1.11](#), panel a). Policy support measures as well as the suspension of the obligation to file for insolvency have likely prevented the large-scale materialisation of additional bankruptcies. However, assessing corporate viability remains challenging in the light of the post-pandemic prospects for different business models. This is also signalled by the balance of positive and negative rating outlooks for companies with a credit rating, as many firms are still at risk of a credit rating downgrade (see [Chart 1.11](#), panel b). As such, insolvencies and bond defaults could still pick up if less favourable economic outcomes were to materialise.

**Chart 1.11**

Insolvencies remain subdued in most countries, although the outlook remains challenging for many corporations



Sources: Euler Hermes (Allianz Research), ECB calculations and Moody's Analytics.

Notes: Panel a: insolvency statistics and projections are taken from "Insolvencies: we'll be back", Euler Hermes (Allianz Research), 6 October 2021 for September 2021 expectations and "Vaccine Economics", Euler Hermes (Allianz Research), 18 December 2020 for December 2020 expectations. Panel b: the number of negative outlook and negative watchlist ratings is inverted.

**Corporate credit growth increased moderately, reflecting large liquidity buffers and improving economic activity.**

Demand for bank loans increased in the third quarter of 2021 on account of slightly higher fixed investment, debt refinancing needs and financing needs for inventories and working capital (see [Chart 1.12](#), panel a). However, non-financial firms built up significant liquidity buffers, with gross debt remaining elevated, while net debt declined to below pre-pandemic levels, contributing negatively to the demand for new loans. This largely reflects the position of large listed corporates, whereas SMEs were more heavily affected by the pandemic and are less likely to have access to market-based funding, resulting in lower cash buffers. Finally, large firms also partially replaced borrowing from banks with market-based debt to benefit from favourable market conditions. Going forward, banks expect a small net increase in demand for loans to firms (see [Chart 1.12](#), panel a).

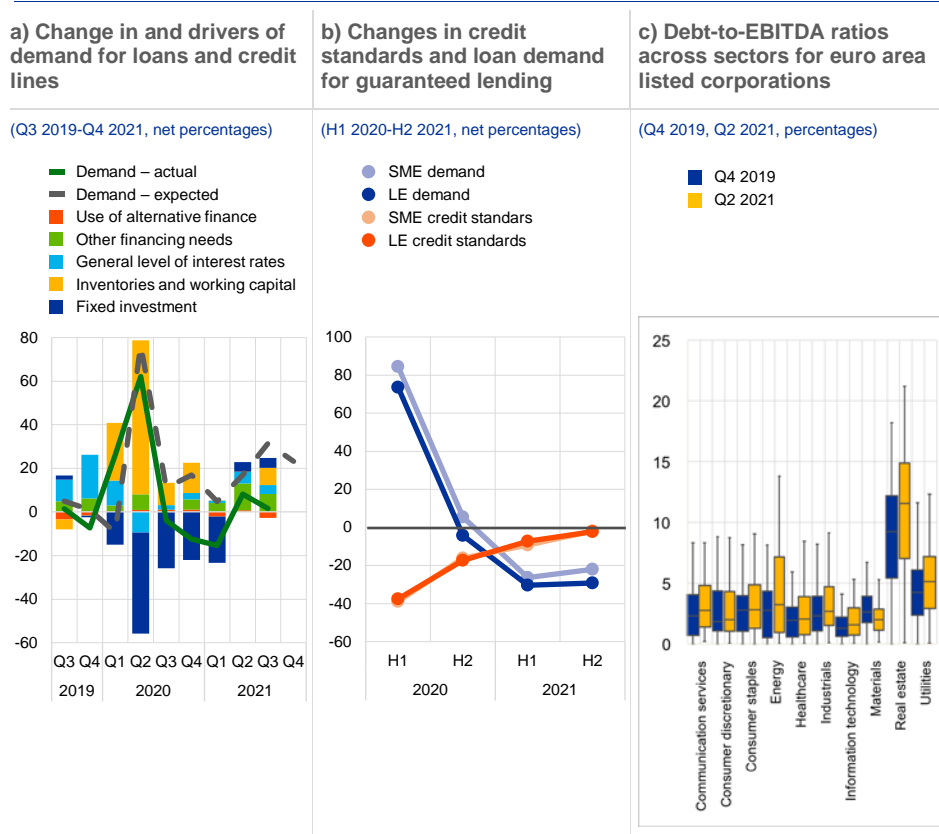
**Although demand for liquidity declined, guaranteed loans still account for a non-negligible share of new loan origination in some countries.**

Guaranteed loans still make up between 5% and 10% of new loan origination in Italy and Spain. Public guarantee schemes play a less material role in other euro area countries. Moreover, the results of the ECB's bank lending survey indicate that demand for guaranteed lending has started to decline among large and small and medium sized enterprises, reflecting lower demand amid broadly unchanged lending standards (see [Chart 1.12](#), panel b). Unless it is decided to prolong them further, national guarantee programmes are generally expected to wind down at the end of 2021. As they still attract sizeable demand in some countries, there is a risk that their termination could lead to an unwarranted tightening of lending conditions and lower credit volumes,

which could weigh on the economic recovery in those countries where the share of guaranteed lending remains significant.

**Chart 1.12**

Corporate loan demand increased moderately as debt accumulated in some sectors



Sources: Eurostat, ECB, ECB bank lending survey and S&P Capital IQ.  
Notes: Panel a: "actual" values are changes that have occurred, while "expected" values are changes anticipated by banks. Net percentages for the questions on demand for loans are defined as the difference between the sum of the percentages of banks that responded "increased considerably" and "increased somewhat" and the sum of the percentages of banks that responded "decreased somewhat" and "decreased considerably". Panel b: the net percentage refers to the difference between the sum of the percentages for "tightened considerably" and "tightened somewhat" and the sum of the percentages for "eased somewhat" and "eased considerably". Data for H2 2021 reflect six-month forward expectations as indicated by banks in the Q2 2021 round of the bank lending survey. SME: small and medium sized enterprises, LE: large enterprises. Panel c: a fixed sample of 1,057 euro area non-financial corporations with total assets larger than €50 million as at Q3 2019; data available for Q2 2021 are used. Whiskers reflect the 10th and 90th percentile of the distribution across corporations.

**Longer-term corporate sector vulnerabilities remain elevated, despite the improvement in economic prospects compared with the spring.**

On aggregate, corporate debt levels declined to 115% of GDP in the second quarter of 2021 from 119% of GDP in the first quarter of 2021 as the economy recovered.<sup>13</sup> However, pockets of highly indebted companies have so far not succeeded in bringing their debt levels down (see **Chart 1.12**, panel c). These firms are more likely to encounter permanent scarring and remain vulnerable to a further scaling back of support measures. Moreover, highly indebted firms are also likely to run at lower levels of investment and employment,<sup>14</sup> which could represent a longer-term drag on the euro area economy. Adding further to these vulnerabilities, highly-indebted firms applied for

<sup>13</sup> Measured as the unconsolidated debt excluding trade credit of non-financial corporations as a ratio of GDP.  
<sup>14</sup> See also Kalemi-Özcan, S., Laeven, L. and Moreno, D., "Debt overhang, rollover risk, and corporate investment: evidence from the European crisis", *Working Paper Series*, No 2241, ECB, February 2019.

guaranteed loans and moratoria in greater numbers than did companies with a lower level of indebtedness (see [Chapter 3](#)). While this mitigated the short-term impact of the pandemic, the sizeable uptake in guaranteed lending in some countries could weigh on sovereign debt sustainability if the economic recovery is weaker than anticipated or if financial conditions deteriorate.

## 1.5 Vulnerabilities are growing in euro area property markets

**Euro area residential real estate (RRE) prices showed robust growth throughout the first half of 2021.** Nominal house prices grew at 7.3% at the euro area aggregate level in the second quarter of 2021 – the fastest rate observed since 2005 (see [Chart 1.13](#), panel a). Policy measures have helped to maintain household incomes during the pandemic, while favourable financing conditions have allowed households to obtain financing for house purchase at record low interest rates (see [Chart 1.13](#), panel a). Together with a possible preference for more living space as people worked from home, this fuelled demand for housing during the pandemic. Despite the recovery in residential construction, labour shortages, global supply chain bottlenecks and input price increases are weighing on the construction sector’s ability to expand housing supply, which is putting upward pressure on house prices.<sup>15</sup> Rents have not followed the strong increases in house prices in most countries, which may partly reflect regulations in many rental markets.

**Medium-term vulnerabilities in euro area residential property markets have continued to build up.** While short-term risks have declined markedly since the height of the pandemic as financial conditions have eased, risks of price corrections over the medium term have increased substantially (see [Chart 1.13](#), panel b) amid rising estimates of house price overvaluations. As price and lending dynamics are outpacing household income growth, household indebtedness and RRE overvaluation are increasing (see [Chart 1.14](#), panel a), adding to the build-up of medium-term vulnerabilities and concerns over a debt-fuelled housing bubble. In particular, households with variable rate mortgages or shorter fixed-rate periods on their mortgages are exposed to an unexpected rise in interest rates, which could adversely affect their ability to service their debt (see [Section 1.3](#)).

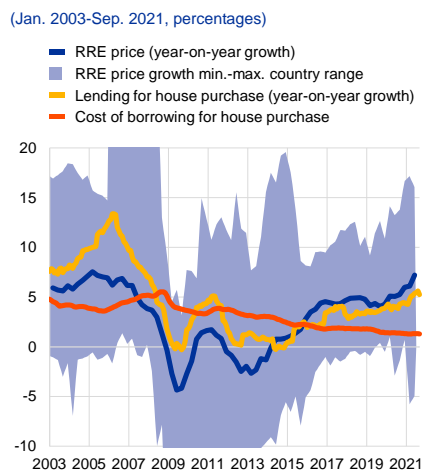
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<sup>15</sup> For a detailed analysis of house price developments during the pandemic, see the article entitled “[The euro area housing market during the COVID-19 pandemic](#)”, *Economic Bulletin*, Issue 7, ECB, 2021.

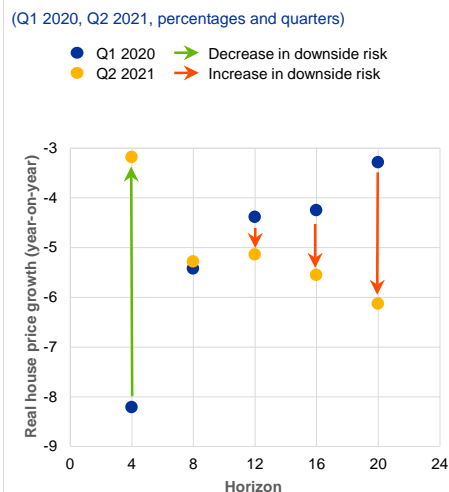
**Chart 1.13**

**Euro area residential property prices continue rising, increasing medium-term risks**

**a) RRE price developments, lending growth and cost of borrowing for house purchase**



**b) 10th percentile of house prices at risk over different horizons**



Sources: ECB and ECB calculations.

Notes: Panel a: the latest observation for RRE price growth is for the second quarter of 2021. The y-axis is truncated to make the main series more readable. Panel b: results from a house price-at-risk model based on a panel quantile regression on a sample of 19 euro area countries over the period from the first quarter of 1999 to the first quarter of 2021. Explanatory variables: lag of real house price growth, overvaluation (average of deviation of house price-to-income ratio from long-term average and econometric model), systemic risk indicator, consumer confidence indicator, financial market conditions indicator capturing stock price growth and volatility, government bond spread, slope of yield curve, euro area non-financial corporate bond spread, and an interaction of overvaluation and a financial conditions index.

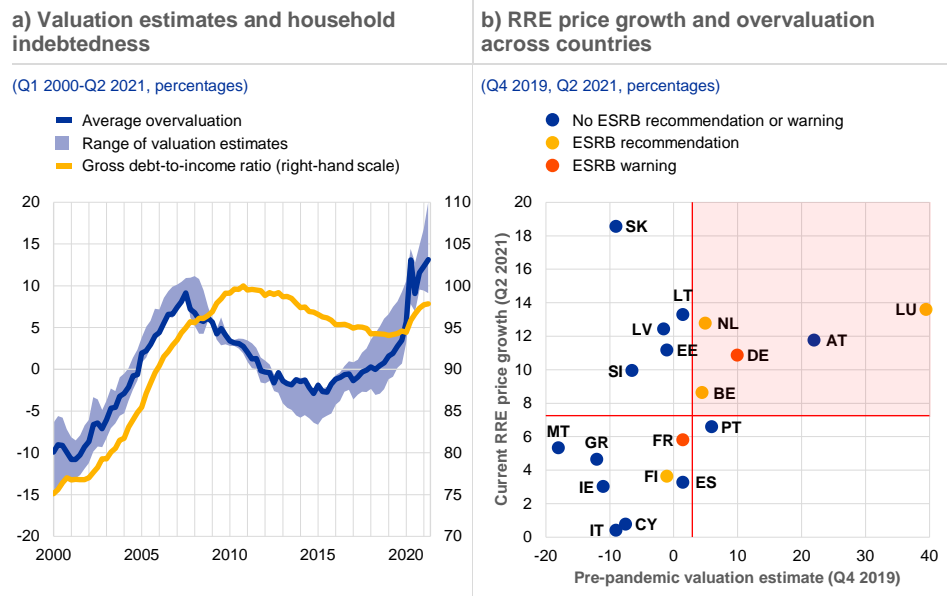
**House price and lending dynamics have been much stronger in many of the countries with pre-existing vulnerabilities.** House prices have generally risen more in countries which had stretched valuations prior to the pandemic (see [Chart 1.14](#), panel b), resulting in further increases in estimated overvaluation. Coupled with higher mortgage lending growth in some countries where households face higher debt levels (see [Chart 5](#), panel b, in the [Overview](#)), the risks of a price correction and the build-up of vulnerabilities appear unevenly spread across euro area countries. Particularly notable are developments in countries that had already received a warning or recommendation from the European Systemic Risk Board (ESRB). This has strengthened the case for considering activating further macroprudential policy measures (see [Chapter 5](#)). Lending standards like loan-to-income and loan-to-value ratios had eased prior to the pandemic and there is some indication that they have eased further, adding to concerns about household and bank resilience going forward (see [Chart 5.1](#) in [Chapter 5](#)).<sup>16</sup>

<sup>16</sup> See the special feature entitled “Trends in residential real estate lending standards and implications for financial stability”, *Financial Stability Review*, ECB, May 2020.



**Chart 1.14**

Estimates of house price overvaluation have been rising alongside prices, particularly for some countries



Sources: ECB and ECB calculations.

Notes: Both panels: the average valuation estimate is the simple average of the price-to-income ratio and an estimated Bayesian vector autoregression (BVAR) model. For details of the methodology, see Box 3 in *Financial Stability Review*, ECB, June 2011, and Box 3 in *Financial Stability Review*, ECB, November 2015. Overall, estimates from the valuation models are subject to considerable uncertainty and should be interpreted with caution. Alternative valuation measures can point to lower/higher estimates of overvaluation. Panel a: the range of valuation estimates is based on four different valuation methods: the price-to-rent ratio, the price-to-income ratio, an asset pricing approach and an estimated BVAR model. Panel b: red and yellow dots indicate countries that received an ESRB warning or recommendation respectively in September 2019. The red horizontal and vertical lines indicate the euro area aggregate. Given that Q2 2021 RRE price growth is not yet available, Q1 2021 data are shown for Ireland and Finland and Q4 2020 data for Cyprus.

**Commercial real estate (CRE) markets started to recover following marked declines during the pandemic, but the outlook for the non-prime segment remains poor.**

While overall market sentiment has improved in tandem with the wider economy, an elevated share of investors still sees the market in a downturn (see **Chart 1.15**, panel a). Recent market intelligence suggests that this downturn is particularly pronounced for the lower-quality end of CRE markets. Pandemic-related experience with remote working, health concerns and stronger demand for more environmentally friendly buildings may move demand towards modern, high-quality office spaces over the medium term. The shift towards e-commerce may also have an outsized impact on lower-quality retail space. This division is clearly visible in survey data which show that investors expect rents for non-prime office and retail properties to decrease strongly over the next 12 months (see **Chart 1.15**, panel b). Should these trends prove to be lasting structural changes, non-prime segments could face risks of pronounced market corrections.

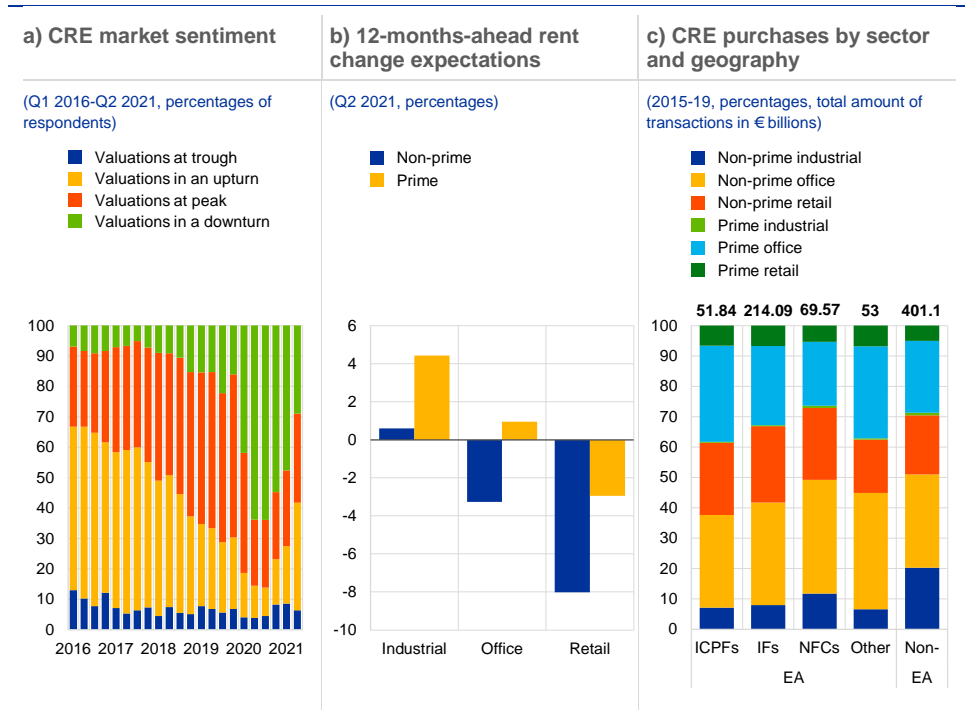
**A sustained decline in CRE markets could feed through the wider financial system and negatively affect the real economy.**

The financial system is exposed to a deterioration in CRE prices via increased credit risk, decreased collateral values and losses on direct holdings. Transaction data show that over the five year period preceding the pandemic, euro area insurance corporations and pension funds, investment funds and non-financial corporations (NFCs) predominantly purchased non-prime retail and office properties (see **Chart 1.15**, panel c), suggesting that

exposures to the most vulnerable CRE asset types could be substantial. In addition, banks in some countries have high exposures to CRE via loan purposes and collateral. A significant drop in CRE prices and the associated reduction of collateral values could hamper NFCs' access to finance and thus result in lower scope for investment and economic activity. Other market participants, such as investment funds faced with redemption pressure, could behave procyclically and amplify the price decline, thereby exacerbating negative feedback loops.

**Chart 1.15**

Conditions in CRE markets have improved somewhat, in tandem with the wider real economy, but the outlook for lower-quality buildings remains poor



Sources: RICS, Real Capital Analysis and ECB calculations.  
Notes: Panel a: chart shows percentage shares of survey respondents perceiving the current phase of the property cycle to be at a trough, in an upturn, at a peak or in a downturn respectively. Panel c: numbers reported at the top of the chart are aggregated transaction values in billions of euro. ICPFs: insurance corporations and pension funds, IFs: investment funds, NFCs: non-financial corporations, EA: euro area.

**Risks to financial stability stemming from real estate markets remain elevated and have increased for the medium-term horizon.** A sharper than expected decline, particularly in lower-quality CRE valuations, might set off negative economic feedback loops. In residential property markets, while credit dynamics and household balance sheet vulnerabilities look less concerning than in the run up to the global financial crisis, buoyant expansion of RRE prices and a sense of deteriorating lending standards may warrant monitoring going forward (see **Box 2**). Against this background, the financial sector may be exposed to the risk of real estate market corrections, especially in those countries where debt levels are elevated, exposures are high and properties are overvalued.

## Box 2

### Assessing the strength of the recent residential real estate expansion

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Prepared by Marco Lo Duca, Jan Hannes Lang, Barbara Jarmulska, Marek Rusnák and Emil Bandoni

#### **Credit-fuelled residential real estate booms can pose major risks to financial stability.**

Residential real estate (RRE) booms and busts have frequently been associated with deep recessions and financial crises, especially when the RRE boom is fuelled by debt.<sup>17</sup> The real estate bubble in the United States ahead of the global financial crisis (GFC) is possibly the most prominent recent example. In a boom, a feedback loop of rising prices and rising credit growth can result in a later correction of overvalued RRE prices affecting the economy and financial system through several channels. A collapse in RRE prices can weigh on household expenditure via wealth effects and/or confidence. High household indebtedness can further contribute to a reduction in consumption and can lead to defaults on loans if debts prove unsustainable. Investment and corporate loans can be impaired if the RRE price boom has been accompanied by a twin construction boom. Finally, the bursting of a real estate bubble can severely affect the credit supply and amplify the downturn as the value of available collateral shrinks and losses impair banks' intermediation capacity.<sup>18</sup>

**Euro area RRE markets have seen a continued expansion throughout the pandemic, but how concerning are these developments compared with the past?** This box compares recent RRE developments at the euro area level with the period ahead of the GFC, compiling indicators into risk ratings across three dimensions: (i) price pressures, (ii) lending dynamics, and (iii) household balance sheet strength.<sup>19</sup> The analysis is complemented by an assessment of lending standards.

**First, house price dynamics and overvaluation are already at levels similar to those observed at the height of the pre-GFC cycle in 2007.** The average risk rating across price indicators, which covers four indicators related to real RRE price dynamics and overvaluation estimates, stands close to the pre-GFC levels of 2007 and well above the levels of 2005 (see **Chart A**, panel a). The recent increase in the average risk rating reflects changes in the overvaluation estimates, which are currently above the levels observed in 2007 for the euro area aggregate.

**Second, vulnerabilities stemming from mortgage lending developments are currently below pre-GFC levels, but they are slowly increasing and are heterogeneous across countries.** The average risk rating across lending indicators, which summarise information from three measures of mortgage loan dynamics and mortgage loan spreads, indicates low risk overall (see **Chart A**, panel b). This is in stark contrast to the pre-GFC period in 2005 and 2007 when the risk rating stood at higher levels. While the analysis of aggregate credit dynamics is reassuring from a financial stability perspective, there are several euro area countries where annual household mortgage credit growth is already above 7% and accelerating.

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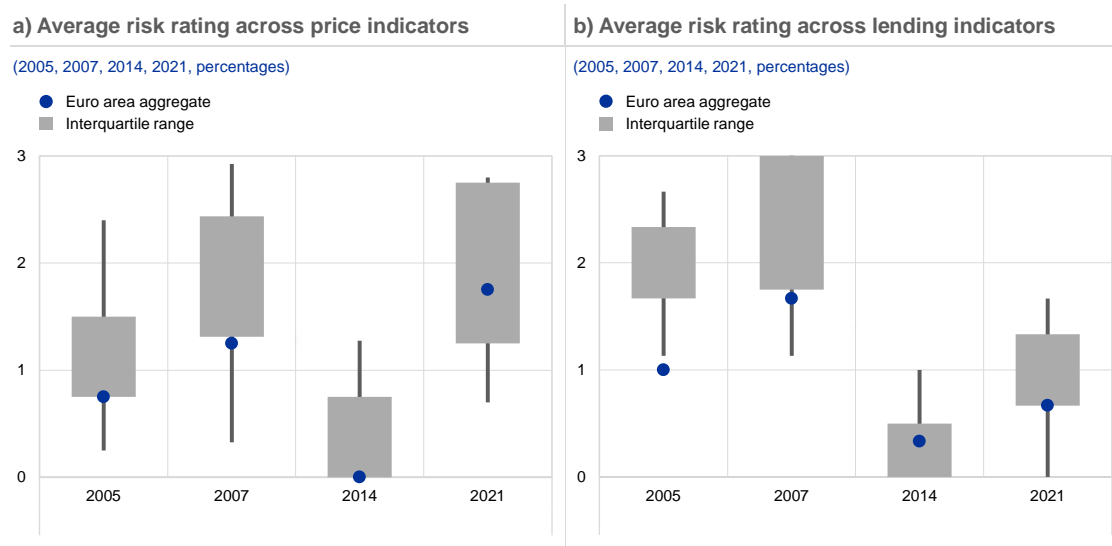
<sup>17</sup> See Jordà, O., Schularick, M. and Taylor, A., "[Leveraged bubbles](#)", *Journal of Monetary Economics*, Vol. 76, 2015.

<sup>18</sup> Falling house prices result in a lower value of available collateral, which in turn means lower credit supply – the "collateral channel of the wealth effect". The strength of this channel differs across countries due to specificities of residential real estate markets and housing loan contracts.

<sup>19</sup> Each composite risk indicator is constructed as a simple average of various underlying indicators, which are first transformed into a discrete risk rating ranging from 0 to 3 depending on whether the indicator breaches certain risk thresholds (the rating scale is: 0 = no risk, 1 = low risk, 2 = medium risk, 3 = high risk). These thresholds are guided by evidence from early warning models and the historical distribution of the indicators. See Working Group on Real Estate Methodologies, "[Methodologies for the assessment of real estate vulnerabilities and macroprudential policies: residential real estate](#)", ESRB, 2019.

## Chart A

Price developments are at levels similar to those observed at the height of the pre-GFC cycle in 2007, but lending developments paint a more benign picture



Sources: ECB, Eurostat and ECB calculations.

Notes: The lower and upper hinges correspond to the 25th and 75th percentiles. The upper/lower whisker extends from the hinge to the 90th/10th percentile. 2021 data are from the first quarter. Panel a: the average risk rating across price indicators covers the average three-year real growth of house prices, residential price index relative to trend, the house price-to-income ratio, and overvaluation estimates based on an econometric model (inverted demand equation). In 2014 all 19 euro area countries are covered; in 2021, 2007 and 2005 some countries are missing due to data unavailability (Cyprus in 2021; Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia in 2007; Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia in 2005). Panel b: the average risk rating across lending indicators covers the average three-year real growth of loans to households for house purchase, deviation of the loans to households for house purchase from the trend, and household loan spread. In 2021 all 19 euro area countries are covered, in earlier years some countries are missing due to data unavailability (Cyprus, Estonia, Latvia, Lithuania, Malta and Slovakia in 2007; Cyprus, Estonia, Latvia, Lithuania, Malta, Slovenia and Slovakia in 2005). The data unavailability inevitably results in an unbalanced sample, which might potentially affect the distribution at different points in time.

### Third, household balance sheet vulnerabilities appear to be lower than in the pre-GFC period.

Collectively, household debt levels and debt service burdens currently signal similar risk to 2005 and lower risk on average than in 2007 (see **Chart B**, panel a). In addition, although during the pre-GFC period a quarter of countries had a high-risk signal, hardly any countries currently have a risk signal above medium, which is reassuring from a financial stability perspective. However, this more benign picture also reflects households' low borrowing costs, which points to risks stemming from possible tighter financing conditions in the future.<sup>20</sup>

**Fourth, the risk profile of new loans for house purchase seems to be at similar levels to the pre-GFC period, according to some parameters.**<sup>21</sup> Strong price and lending increases are particularly concerning if they are coupled with a deterioration of the risk profile of loans as measured,

<sup>20</sup> This is especially relevant for households borrowing at variable rates, with interest rate fixation periods shorter than the maturity of the loan; or for households that will need to refinance loans at maturity.

<sup>21</sup> Against the backdrop of the scarcity of data on lending standards this box uses data from residential mortgage loans that have been securitised. See [European Datawarehouse GmbH](#). The analysis in the box assumes that the observed trends in lending standards in securitised mortgages are mirrored in the loans remaining in the bank balance sheets. The literature on the credit quality of securitised loans is not conclusive. Some studies show that securitised loans could be of lower quality than loans retained in banks' balance sheet (see Keys, B., Mukherjee, T., Seru, A. and Vig, V., "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans", *The Quarterly Journal of Economics*, Vol. 125, Issue 1, 2010, pp. 307-362). Other studies find the opposite (see Albertazzi, U., Eramo, G., Gambacorta, L. and Salleo, C., "Asymmetric information in securitization: An empirical assessment", *Journal of Monetary Economics*, Vol. 71, 2015, pp. 33-49). An analysis of default frequencies of the loans considered in this study does not reveal substantial differences from historical default frequencies on a larger pool of mortgage loans.

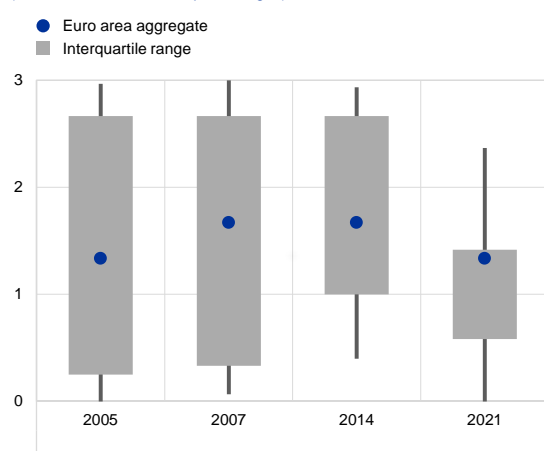
for example, by the loan-to-value (LTV) and the loan-to-income (LTI) ratios.<sup>22</sup> The share of loans with LTV ratios above 90% in newly originated loans currently appears to be higher than in the pre-GFC boom (see **Chart B**, panel b). Shares of loans with LTI ratios above 6, meaning with households borrowing over six times their annual disposable income, are currently at roughly the same level as in 2007. However, as a lower borrowing cost implies increased housing affordability, for a given maturity of new loans, their debt service burdens may currently be lower than pre-GFC.

### Chart B

Household balance sheet vulnerabilities are at slightly lower levels than pre-GFC, but current lending standards seem to be at similar levels

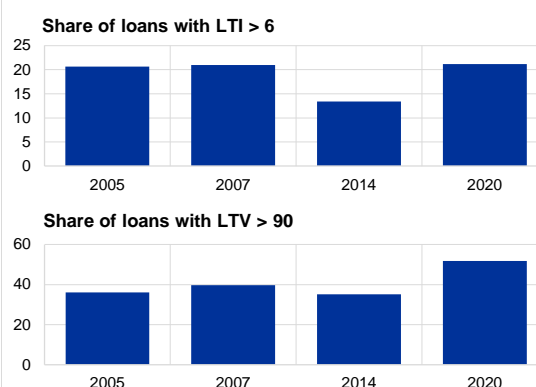
#### a) Average rating across households' balance sheet indicators

(2005, 2007, 2014, 2021, percentages)



#### b) Shares of risky loans in new securitised lending

(2005, 2007, 2014, 2020, percentages)



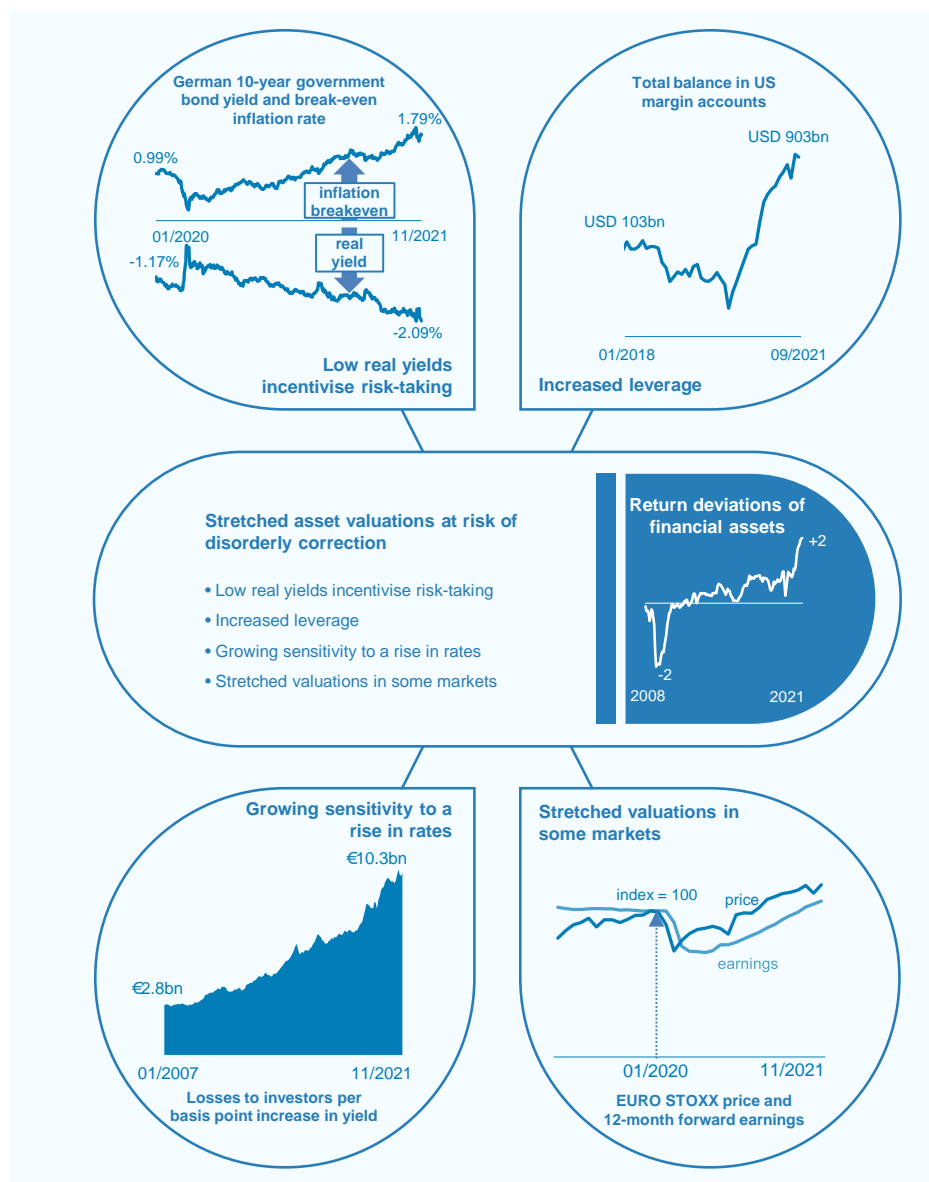
Sources: Panel a: ECB, Eurostat and ECB calculations. Panel b: European Datawarehouse GmbH (EDW) and ECB calculations.

Notes: Panel a: the average risk rating across household balance sheet indicators covers household debt in relation to disposable income, household financial assets in relation to debt and the aggregate debt-service-ratio of households. The lower and upper hinges correspond to the 25th and 75th percentiles. The upper/lower whisker extends from the hinge to the 90th/10th percentile. 2021 data are from the first quarter. In 2021 all 19 euro area countries are covered; in earlier years some countries are missing due to data unavailability (Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta and Slovakia in 2007 and 2014; Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia in 2005). The data unavailability inevitably results in an unbalanced sample, which might potentially affect the distribution at different points in time. Panel b: data available for Belgium, Germany, Spain, France, Italy, the Netherlands and Portugal, total weighted by GDP. Chart uses information on securitised mortgage loans only (potentially resulting in selection bias) which may not accurately represent national mortgage markets.

**Overall, vulnerabilities in euro area RRE markets appear more benign than during the pre-GFC period, but build-ups of medium-term vulnerabilities warrant close monitoring and potentially policy consideration.** On aggregate, mortgage lending is less exuberant and households' balance sheets seem more resilient currently than in the pre-GFC period. In addition, despite the pandemic, the euro area banking system is more resilient compared with the pre-GFC period, reflecting improved quality of supervision, stronger capital positions and, in some countries, measures that already address real estate risks. Nevertheless, the continued build-up of vulnerabilities in residential real estate markets calls for close monitoring and possible macroprudential measures.

<sup>22</sup> High LTVs expose banks to higher loss-given-default and entail a higher risk of negative equity which can incentivise strategic defaults by borrowers. A loan is in negative equity when the value of the outstanding amount of the loan is higher than the value of the purchased real estate asset. High LTI loans measure the size of the loan in relation to the income of the borrower and correlate with default risk.

## 2 Financial markets



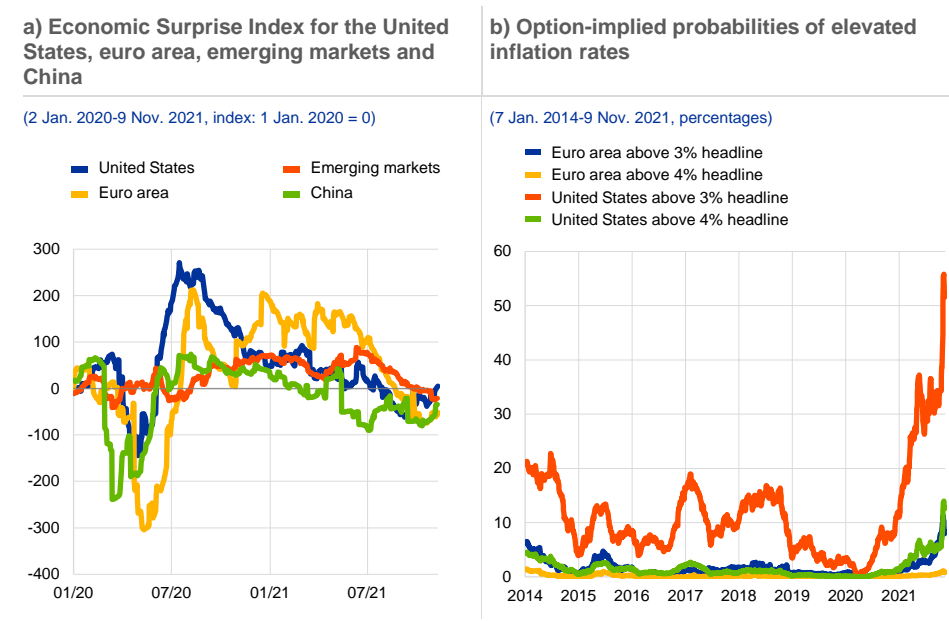
### 2.1 Real yields fall due to risks of higher inflation and slower global recovery

**Financial market pricing has adjusted in recent months for a continued but slower global recovery amid increasing supply-side constraints and surging energy prices.** During the first half of 2021, markets were dominated by positive risk sentiment following the November 2020 news on the development of COVID-19 vaccines. As the recovery unfolded and economic data surprised on the upside (see **Chart 2.1**, panel a), markets started to focus on emerging global inflationary

pressures and the implications of increasing yields. Over the course of the summer, however, disappointing economic data and concerns about the Delta variant of the coronavirus started to adversely affect market sentiment. The global economic recovery has continued, but momentum has slowed and risks are skewed to the downside.<sup>23</sup> Despite the slowdown in global growth dynamics, inflationary pressures have persisted, driven in part by supply-side constraints and surging energy prices (see [Chart 2.3](#), panel a). Although inflationary pressures in the euro area are expected to decline in the course of next year, recent inflation surprises, notably in the US, have led a growing number of market participants to see risks that higher inflation rates last for a more extended period. The market-implied probability for “high inflation scenarios” remains relatively subdued for the euro area, but has risen sharply for the United States (see [Chart 2.1](#), panel b). At the same time, market prices now imply a very low probability for scenarios of very low inflation (below 1%) or deflation.

### Chart 2.1

#### Economic data start to disappoint as we enter a new phase of the recovery



Sources: Citigroup, ECB Statistical Data Warehouse and Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a: negative values of the Citigroup Economic Surprise Index point to disappointing economic data as performance was lower than expected. Panel b: probabilities implied by five-year zero-coupon inflation options, averaged over five business days. Risk-neutral probabilities may differ significantly from true probabilities. “Headline” refers to headline inflation.

**Inflationary pressures and risks to the strength of the economic recovery drove real yields to all-time lows, incentivising risk-taking.** Between the publication of the May 2021 FSR and August of this year, nominal yields declined and global yield curves flattened, reflecting the perception that growth momentum had reached its peak (see [Chart 2.2](#), panel a). Real yields fell to all-time lows (see [Chart 2.2](#), panel b) and remained low even after nominal yields rebounded in August. Lower real yields have incentivised risk-taking in financial markets, despite growing risks. In September, equity indices reached record highs in the United States and various euro area

<sup>23</sup> See, for example, “[World Economic Outlook Update: Fault Lines Widen in the Global Recovery](#)”, International Monetary Fund, July 2021, and “[OECD Economic Outlook, Interim Report September 2021: Keeping the Recovery on Track](#)”, Organisation for Economic Co-operation and Development, September 2021.



countries. Increased risk-taking does not necessarily imply that growing risks do not lead to any downward adjustment of market pricing; equity markets declined over the course of September in response to concerns about rising inflationary pressures, supply bottlenecks and problems at the large Chinese property developer Evergrande. Markets rebounded relatively quickly; this reflects the continued strong risk appetite. In an inflationary environment, equities may also be more attractive than fixed income products, as the coupon payments on nominal bonds do not offer protection against inflation.

**Nominal yields rebounded in August, driven by the inflation component, and may be sensitive to market participants’ expectations around policy normalisation going forward.**

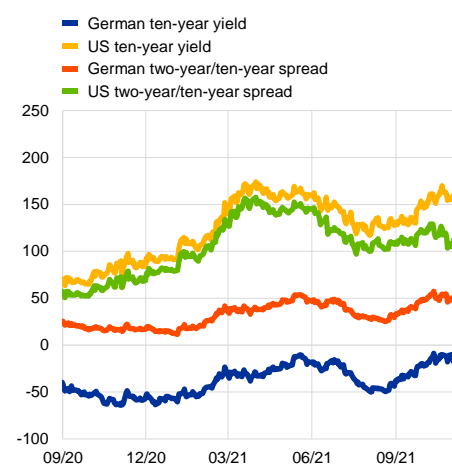
Potential drivers of bond yield dynamics include the evolution of inflation dynamics, the strength of the recovery and market participants’ anticipation of policy normalisation.<sup>24</sup> Recent nominal yield increases happened in the context of a perceived slowdown in the global recovery and were driven by the inflation component as supply-side constraints intensified and energy prices surged. Market participants also focus on central banks’ reaction functions to these inflationary pressures. Adjustments of market participants’ expectations can lead to volatility in bond markets, whereby cross border spillovers can also affect euro area bond markets.

**Chart 2.2**

Real yields fell to all-time lows as inflation premia continued to rise

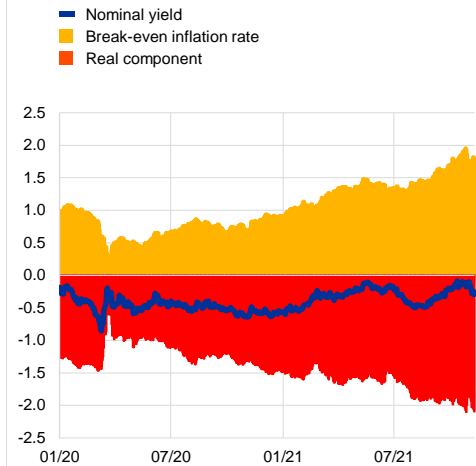
a) German and US government bond yields

(1 Sep. 2020-9 Nov. 2021, basis points)



b) German ten-year government bond nominal and real yields and break-even inflation rate

(1 Jan. 2020-9 Nov. 2021, percentages)



Sources: Bloomberg Finance L.P. and ECB calculations.

**The sharp increase in energy commodity prices contributes to inflationary pressures and poses wider risks to the recovery and to markets.** The second half

<sup>24</sup> US Treasury prices may have temporarily benefited from the drawdown of the Treasury General Account, which declined by around USD 1.7 trillion between 29 July 2020 and 13 October 2021 and is now close to normal pre-pandemic levels. As issuance is expected to pick up, especially also in connection with the US infrastructure bill, US Treasury yields may increasingly face upward pressures.

of 2021 has seen sharp increases in energy commodity prices due to insufficient supply in combination with low reserves, especially in Europe (see [Chart 2.3](#), panel a). Surging prices affect industries that rely heavily on these commodities, can have a negative impact on growth and can weigh on market confidence. Corporate defaults may be triggered in the event of unhedged exposures. Carbon prices have increased in tandem with the demand for energy commodities.

**Financial markets also reflect a growing divergence between emerging and developed economies.** Emerging market equities started to underperform global equities over the course of 2021 (see [Chart 2.3](#), panel b). To some extent, this may be attributed to relatively low vaccination rates in some emerging markets.<sup>25</sup> The impact of the emerging market slowdown on developed economies is twofold: first, adverse developments in emerging markets can lead to spillovers through a decline in global demand; and second, emerging markets play a key role in global supply chains, and disruptions may further fuel inflationary pressures in developed economies.

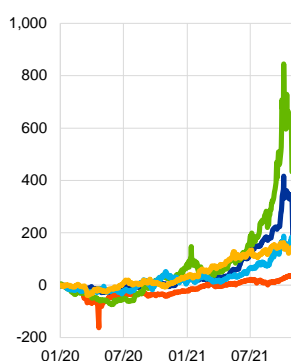
### Chart 2.3

#### Energy commodity prices surge, while emerging and developed markets diverge

a) Commodity futures price changes since January 2020

(1 Jan. 2020-9 Nov. 2021, percentage change since January 2020)

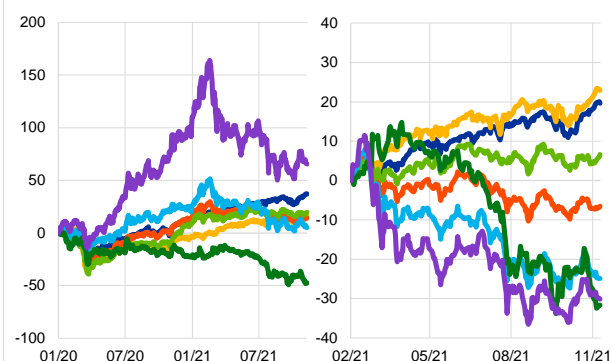
- Europe coal
- Carbon
- Oil
- Europe natural gas
- US natural gas



b) Equity index performance

(left chart: 1 Jan. 2020-9 Nov. 2021, percentage change since January 2020; right chart: 1 Feb.-9 Nov. 2021, percentage change since Feb. 2021)

- World
- Euro area
- Emerging markets
- Emerging markets excluding China
- China
- China real estate
- China technology



Sources: Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a: percentage price change of first futures contract since January 2020. "Europe coal" refers to Rotterdam Coal Futures. "Europe natural gas" refers to UK Natural Gas Futures. "United States natural gas" refers to futures with delivery at the Henry Hub in Louisiana.

**Emerging market underperformance has, in part, been driven by developments in China.** The relative underperformance of emerging markets cannot entirely be attributed to the impact of the vaccine roll-out and the Delta variant. Actions by Chinese authorities are having a profound impact on China's technology, education and real estate sectors (see [Chart 2.3](#), panel b, and [Section 1.1](#)). To date, bouts of

<sup>25</sup> See, for example, "[Asian Development Outlook \(ADO\) 2021 Update: Transforming Agriculture in Asia](#)", Asian Development Bank, September 2021, which revises down its forecasts for South Asia, South-East Asia and the Pacific, citing differences in vaccination progress and control of COVID-19 outbreaks as drivers.

volatility in Chinese high-yield credit markets following problems with the property developer Evergrande have not led to significant spillovers to global markets, as direct exposures are limited. An economic downturn in China may, however, adversely affect developed markets via global demand. So far, tensions were largely contained to the (“off-shore”) market for Chinese dollar-denominated high-yield bonds. Some Chinese firms with a speculative grade rating may struggle to refinance their dollar-denominated debt, while a number of investment grade firms might be vulnerable to rating downgrades to high yield.

## 2.2 The pandemic scars of debt and duration form long-lasting vulnerabilities in markets

### **Increased debt leaves the financial system more vulnerable to credit risk.**

Government, corporate and household debt have increased over the course of the pandemic (see [Chart 2.4](#), panel a, and [Section 1.4](#)). Borrowers’ ability to service this debt is contingent on low financing costs and also depends on the strength of the economy (see [Chapter 1](#)). These dependencies not only increase the economy’s vulnerability to a deterioration in financial conditions, but can in turn also cause financial market conditions to respond more strongly to unforeseen adverse shocks.

### **Increased duration leaves markets and financial intermediaries more exposed to upward shocks to interest rates.**<sup>26</sup>

Over the past decade, the duration of euro area fixed income securities has increased, most notably for bonds issued by sovereigns and sub-sovereigns (see [Chart 2.4](#), panel b). The duration of a bond increases mechanically when yields decline,<sup>27</sup> but issuers have also increased the maturity of newly issued securities in the context of lower rates and flatter curves.<sup>28</sup> As a consequence of the increase in duration and overall debt, losses associated with a given increase in underlying yields have now reached historically high levels (see [Chart 2.4](#), panel c). Increased sensitivity to rates could be destabilising in the event of a material interest rate shock.<sup>29</sup> Open-ended bond funds may also exacerbate such a shock, as redemptions could trigger forced sales (see [Chapter 4](#)).

### **Equity markets also appear to have become more sensitive to interest rates.**

Price-to-dividend ratios for the EURO STOXX index have increased by almost 60% between 2017 and 2021 (see [Chart 2.4](#), panel b). Shares with a higher price-to-dividend ratio are generally more sensitive to interest rate changes.<sup>30</sup> Corporate leverage provides a second channel through which equities have become

<sup>26</sup> The duration of an asset is a measure of the sensitivity of its value to an increase in underlying yields.

<sup>27</sup> Straight bonds (i.e. bonds without embedded options) have a positive convexity, which implies that the duration increases when rates decline.

<sup>28</sup> See Plessen-Mátyás, K., Kaufmann, C. and von Landesberger, J., “[Funding behaviour of debt management offices and the ECB’s Public Sector Purchase Programme](#),” *Working Paper Series*, No 2552, ECB, May 2021.

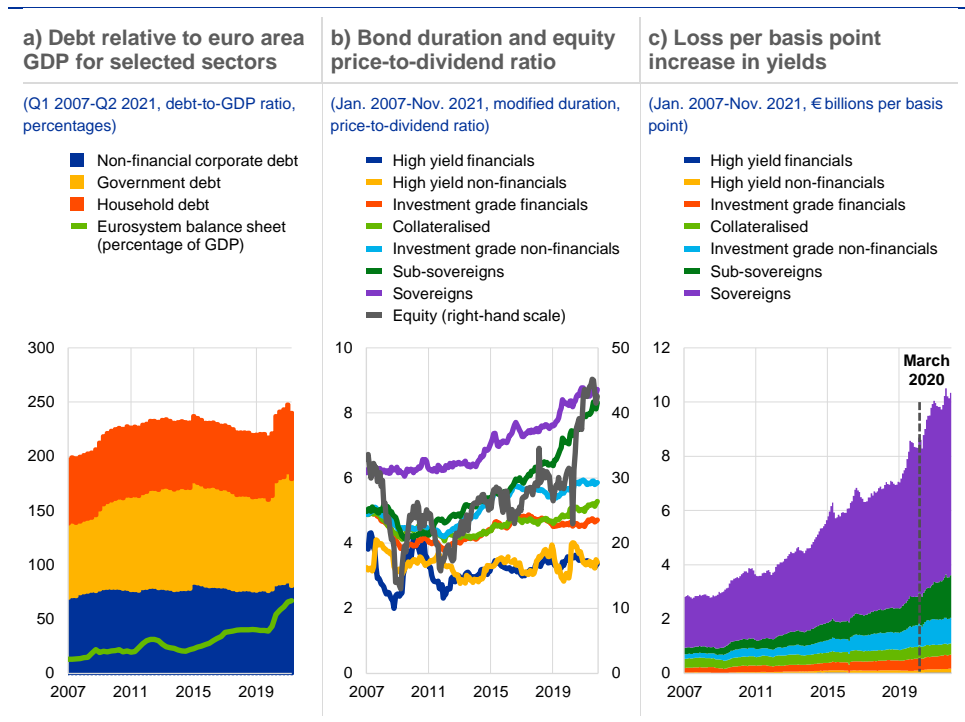
<sup>29</sup> The 2013 “taper tantrum” in the United States provides an example of a case where rates increased sharply, as the ten-year Treasury yield increased by 137 basis points in around four months.

<sup>30</sup> Intuitively, the relationship between interest rate sensitivity and price-to-dividend ratios may be understood from the perspective of a dividend discount model. When prices are relatively high compared with current dividends, this must be justified by higher expected cash flows in the future. The present value of more distant cash flows is more sensitive to changes in interest discount rates.

more sensitive to interest rates, as higher debt levels per unit of earnings leave the latter more sensitive to the cost of debt. Corporate leverage measured as debt/EBITDA<sup>31</sup> has risen during the pandemic (see [Chart 2.6](#), panel a), and the firms in the upper tail still show elevated leverage above pre-pandemic levels. Leverage also increased during the global financial crisis and remained elevated even after earnings recovered. The long-term impact of the pandemic on corporate balance sheets remains to be seen (see [Chapter 1](#)). The sensitivity of equity valuations to interest rates through the inflation component is somewhat ambiguous, as some firms may be able to increase earnings by raising the prices of their products.

### Chart 2.4

The pandemic has inflicted lasting scars on debt and duration



Sources: ECB Statistical Data Warehouse, IHS Markit, Refinitiv and ECB calculations.

Notes: Panel a: non-financial corporate and government debt are on a consolidated basis. Household debt is unconsolidated. The increase in the debt-to-GDP ratio is partially – but not completely – driven by the fall in GDP. Panel b: equity duration is proxied by the price-to-dividend ratio. In a single-stage Gordon Growth Model, the duration of equities would be identical to the price-to-dividend ratio.

### Financing costs have remained low despite large debt issuance, but may come under pressure.

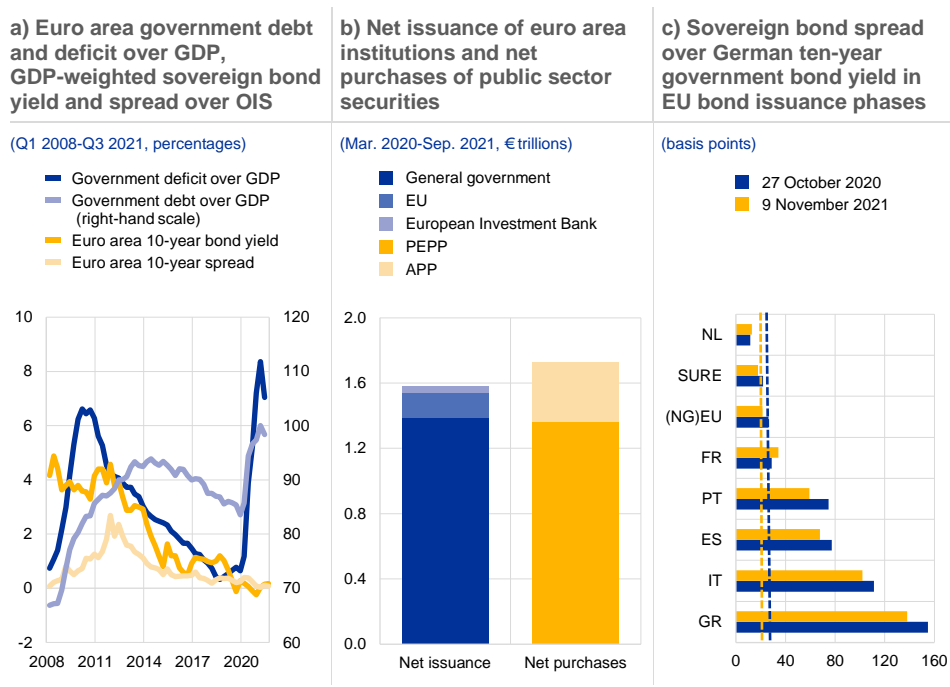
The Eurosystem has expanded its balance sheet by around €3.7 trillion since the start of the pandemic (see [Chart 2.4](#), panel a), helping to safeguard favourable financing conditions despite newly issued “pandemic debt”. Between March 2020 and September 2021, net purchases of public sector securities under the asset purchase programme (APP) and the pandemic emergency purchase programme (PEPP) surpassed the net issuance by euro area governments and European institutions (see [Chart 2.5](#), panel b). Together with fiscal support, this has helped economies to overcome the pandemic-related crisis, but also poses challenges as the recovery takes hold and policy support is scaled back.

<sup>31</sup> EBITDA stands for earnings before interest, tax, depreciation and amortisation.

**Successful issuances of Next Generation EU (NGEU) bonds and bills have contributed to governments' ability to support the recovery.** Investor demand for newly issued NGEU and SURE (Support to mitigate Unemployment Risks in an Emergency) bonds has been strong, and spreads relative to German government bonds have narrowed since the first SURE issuance in October 2020 (see [Chart 2.5](#), panel c). EU spreads stand well below those of the bonds issued by some of the Member States with a considerable take-up of NGEU funds (see [Chapter 1](#)).

**Chart 2.5**

Government debt has grown, but SURE issuance has been a success



Sources: ECB Statistical Data Warehouse, Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a: spreads are with respect to the ten-year overnight index swap (OIS) rate. Panel b: the general government category is as defined in the European System of Accounts 2010. Certain agencies eligible for Eurosystem purchases do not fall under this category.

**Corporate vulnerabilities may resurface as policy support is reduced and could be a source of instability in financial markets.** Default rates for speculative-grade firms have remained well below even the most optimistic forecasts made in March 2020 (see [Chart 3](#), panel a, in the [Overview](#)), likely in part owing to the strong fiscal and monetary policy responses to the pandemic. While the median firm may look healthy, some evidence points to the existence of a tail of vulnerable corporates, which could lead to “catch-up defaults”.<sup>32</sup> A market correction might also be more severe in the presence of corporate vulnerabilities (see [Box 3](#)).

**The increased reliance on market-based debt has enabled firms to benefit from a more diverse array of funding sources, but has rendered the financial system and the real economy more vulnerable to market corrections.** A market correction does not automatically give rise to financial stability concerns. However, such concerns may arise when a sell-off turns disorderly, when it spills over to the wider

<sup>32</sup> See Special Feature A entitled “[Corporate zombification: post-pandemic risks in the euro area](#)”, *Financial Stability Review*, ECB, May 2021.

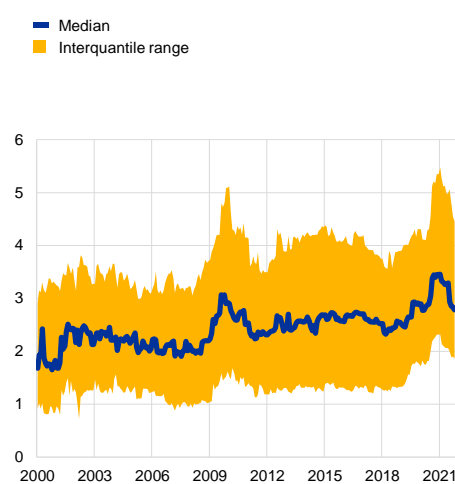
market, or when it starts to affect the availability and cost of corporate financing. The increased importance of corporate bond markets (see [Chart 2.6](#), panel b) leaves firms more exposed to such risks. It also increases the amount of risky, tradable debt in the system. High-yield debt is, to a large extent, being absorbed by investment funds (see [Chapter 4](#)). Open-ended investment funds are subject to redemption risk, and a liquidation of assets may amplify a sell-off.

### Chart 2.6

The increased importance of market-based debt leaves both financial markets and the real economy more vulnerable to market corrections

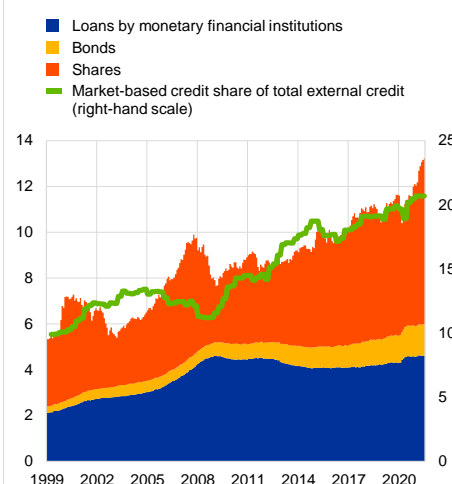
a) Debt-to-EBITDA ratio of EURO STOXX constituents

(Jan. 2000-Oct. 2021, percentages)



b) Amounts outstanding of market-based debt and listed shares issued by non-financial corporations

(Jan. 1999-Jul. 2021, left-hand scale: € trillions; right-hand scale: percentages)



Sources: ECB Statistical Data Warehouse, Bloomberg Finance L.P., S&P Global Market Intelligence and ECB calculations.  
Notes: Panel a: EURO STOXX firms. Panel b: "Market-based credit share of total external credit" shows market-based credit as a share of total external credit. Specifically, the numerator includes debt securities and non-retained securitised loans, while the denominator is composed of debt securities and all loans except for intra-group loans.

### Box 3

The sensitivity of asset prices to risk shocks when corporate vulnerabilities are high

Prepared by Livia Chițu, Magdalena Grothe and Martina Jancoková

**Fragilities created by the interaction of stretched valuations and corporate balance sheet vulnerabilities may represent a risk to financial stability.** Corporate asset prices have soared at the same time as the pandemic shock has prompted an increase in the vulnerability and indebtedness of many corporates. Corporate asset valuations look high relative to the fundamentals and rest to some degree on strong risk appetite, which could make them vulnerable to shifts in global risk sentiment.<sup>33</sup> In the current environment, where balance sheet fragilities depend on policy support and uncertainty about the recovery is still elevated, corporate vulnerabilities could re-emerge and stock and bond market prices may be more sensitive to reversals in global risk appetite. An interaction of such vulnerabilities may have an impact on financial conditions and pose risks to financial stability. This box examines the increased sensitivity of US corporate markets to risk-off

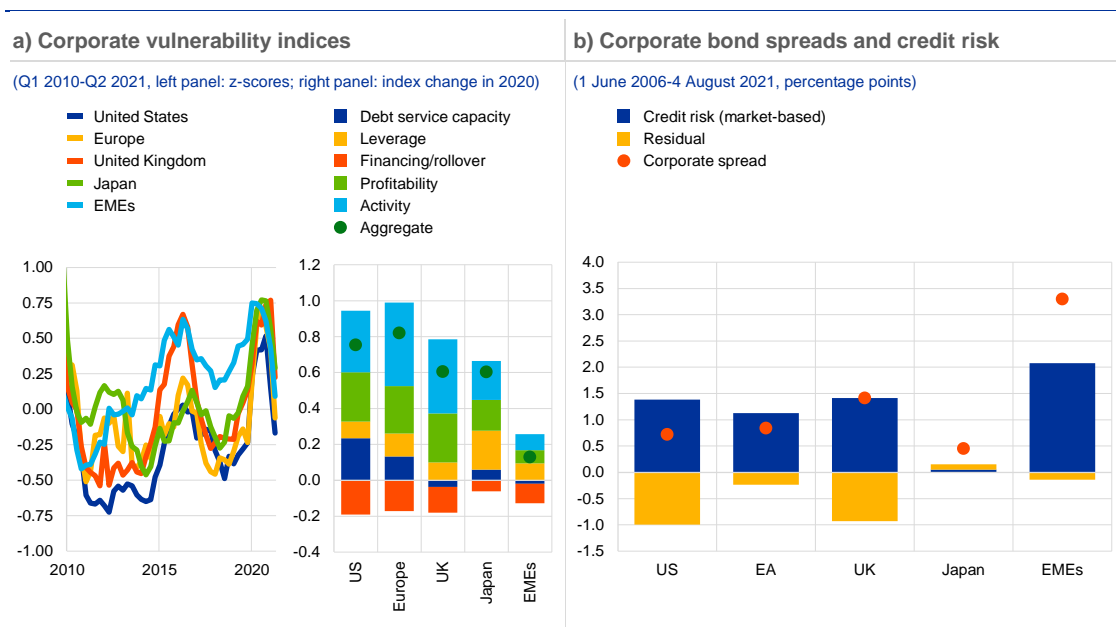
<sup>33</sup> See, for example, recent assessments in "Global Financial Stability Report", International Monetary Fund, October 2021, and "BIS Quarterly Review", Bank for International Settlements, September 2021.

shocks when corporate vulnerabilities are high, and considers the implications from a euro area perspective.

**Global corporate vulnerabilities rose to elevated levels at the onset of the pandemic, mostly subsiding thereafter on the back of strong policy support and recovering earnings.** An overview of corporate vulnerability indices, comprising information from a large set of corporate balance sheet indicators, suggests that fragilities across firms increased globally in 2020 (see **Chart A**, panel a). The increases were related to weaker activity, earnings losses, higher leverage as well as tighter debt service capacity, and were partly offset by accommodative financing conditions. Since then, global corporate vulnerabilities have eased on the back of a strong economic recovery and fiscal stimulus. Yet the resilience of the corporate sector is highly dependent on the pace of the economic recovery across countries, continued fiscal measures and monetary accommodation. It is also subject to challenging debt service capacity for highly leveraged firms.

### Chart A

#### Global corporate vulnerabilities and financial market risk appetite



Sources: Moody's Analytics, Bloomberg Finance L.P., Refinitiv and ECB calculations.

Notes: Panel a: the corporate vulnerability index is an aggregate measure of corporate risk, computed for US, European, UK, Japanese and emerging market economy (EME) firms included in the corresponding equity indices: S&P 500 (United States), STOXX Europe 600 (Europe), FTSE 350 (United Kingdom), TOPIX (Japan) and MSCI EME Index (EMEs). The index broadly follows the methodology in Box 1 entitled "Assessing corporate vulnerabilities in the euro area", *Financial Stability Review*, ECB, November 2020. The index includes five components computed as average z-scores of balance sheet indicators since Q2 2002, due to data availability. The components include: activity (one-year moving average of year-on-year sales growth, turnover ratio), profitability (return on assets, profit margin), leverage (ratios of gross and net debt to EBITDA (earnings before interest, taxes, depreciation and amortisation), ratio of debt to book value of equity), debt service capacity (retained earnings, ratio of EBITDA to short-term liabilities, revenue generation) and financing (short-to-long-term liabilities, quick ratio, return on equity, corporate spread). Panel b: the chart shows the model-based contribution of credit risk to BBB-rated corporate spreads, following the approach in Gilchrist, S. and Zakrajšek, E., "Credit spreads and business cycle fluctuations", *American Economic Review*, Vol. 102(4), 2012, pp. 1692-1720. Credit risk is measured by Moody's KMV expected default frequencies (EDFs), and corporate spreads are measured at the country index level for bonds with a BBB rating and a three to five-year maturity. For EMEs, the EMBIG blended spread is used and credit risk is proxied by the simple average of EDFs for 14 major EMEs. The model is estimated using daily data since June 2006. The constant term is not depicted in the chart, which is why the credit risk component and the residual depicted in the chart do not tally with corporate spreads. For a broader review of euro area valuations, see, for example, Altavilla, C., Lemke, W., Linzert, T., Tapking, J. and von Landesberger, J., "Assessing the efficacy, efficiency and the potential side effects of the ECB's monetary policy instruments since 2014", *Occasional Paper Series*, No 278, ECB, September 2021. EA: euro area. The latest observations are for Q2 2021 (panel a) and 4 August 2021 (panel b).

**Financial markets appear relatively sanguine about credit risks and reliant on strong risk appetite, which makes them potentially sensitive to shifts in investor sentiment.** Increases in valuations across asset classes have fuelled concerns about a potential disconnect between financial markets and the real economy. Corporate credit markets point towards risk appetite having a significant influence on prices, with bond yields and spreads trading close to historic lows.



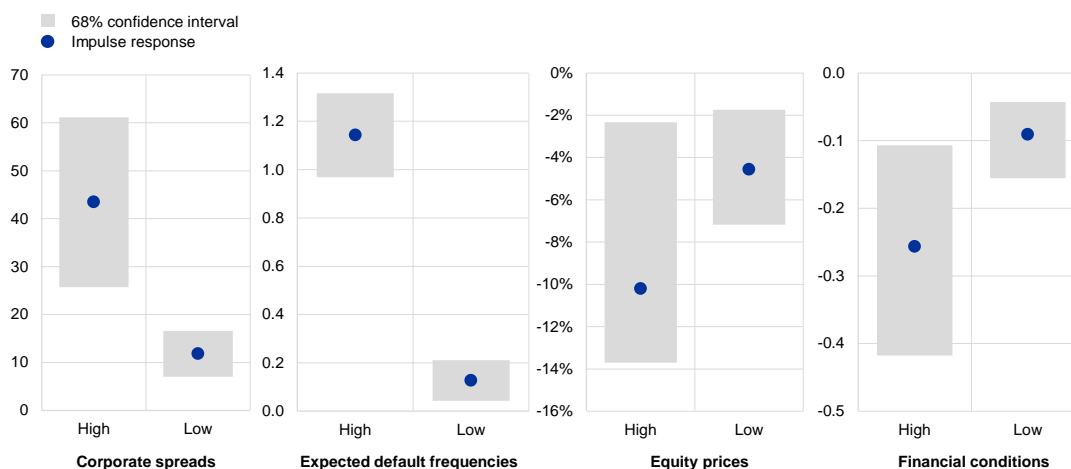
Model-based analysis suggests that global corporate bond valuations, in particular for the lower-rated segments, may be stretched relative to their average historical levels and fundamentals. In particular, a market assessment of credit risk only partly explains corporate bond spreads, and the “excess bond premium” – captured by the model’s residual – is negative across several markets (see **Chart A**, panel b).

## Chart B

### Increased sensitivity to risk-off shocks in states of elevated corporate fragility

#### Financial market reactions to global risk shocks when corporate vulnerabilities are high

7 January 2000-30 July 2021, corporate spreads: basis points; expected default frequencies: percentages; equity prices: percentage changes; financial conditions: index changes)



Sources: Bloomberg Finance L.P., Refinitiv and ECB calculations.

Notes: The dots represent the mean estimate of the response of US corporate spreads, expected default frequencies, equity prices and financial conditions (measured by a financial conditions index) following a global risk shock. Corporate spreads refer to a BBB-rated US corporate index for three to five-year maturities over the Treasury curve. The global risk shock captures flight-to-safety dynamics and is estimated in a daily Bayesian vector autoregression (BVAR) model using a combination of sign, relative magnitude and narrative restrictions along the lines of Brandt, L., Saint Guilhem, A., Schröder, M. and Van Robays, I., “What drives euro area financial market developments? The role of US spillovers and global risk”, *Working Paper Series*, No 2560, ECB, May 2021. Impulse responses are shown at impact and are estimated by local projections allowing for state dependence (for example, similar to the approach in Ramey, V. and Zubairy, S., “Government spending multipliers in good times and in bad: evidence from US historical data”, *Journal of Political Economy*, Vol. 126(2), 2018, pp. 850-901). “High/Low” refers to a state of relatively elevated (benign) corporate vulnerabilities, with probabilities derived from a logistic transformation of the corporate vulnerability index, similar to equation 4 in Auerbach, A. and Gorodnichenko, Y., “Measuring the output responses to fiscal policy”, *American Economic Journal: Economic Policy*, Vol. 4(2), 2012, pp. 1-27. The gamma parameter is assumed to be 2. The estimation is conducted based on weekly data over the period 2000-21, controlling for economic activity, interest rates and market uncertainty (measured by the Citigroup Economic Surprise Index, the two-year US Treasury rate and the VIX respectively), and includes crisis dummies for the weeks of the peak of the global financial crisis and the COVID-19 crisis. The estimates are shown at the 68% confidence interval in line with, for example, Jordà, O., “Estimation and inference of impulse responses by local projections”, *American Economic Review*, Vol. 95(1), 2005, pp. 161-182 and Box 3 in *Financial Stability Review*, ECB, May 2021. The latest observations are for 30 July 2021 (weekly).

**Corporate asset prices may be particularly sensitive to risk-off shocks when corporate vulnerabilities are high.** Risk-off shocks related to sudden changes in investor sentiment often have a significant impact on financial markets, causing investors to shed risky assets. Empirical analysis conducted for the US market shows that corporate market reactions to global risk shocks are stronger when corporate vulnerabilities are high relative to the historical average (see **Chart B**).<sup>34</sup> The impact of identified global risk shocks on corporate bond spreads, expected default frequencies, stock returns and financial conditions is estimated through threshold local projections which differentiate between states of high and low vulnerabilities in the corporate sector. Corporate bond spreads reprice by around 40 basis points when firms’ balance sheets are fragile, as compared with an average reaction of about 10 basis points in low-vulnerability regimes. Similarly, expected default frequencies

<sup>34</sup> The global risk shock captures flight-to-safety dynamics, assuming that heightened global risk aversion triggers a flow out of equity into safe long-term US bonds while also causing the US dollar to appreciate.

increase far more strongly in times of corporate weakness. The different impact on equity prices and overall financial conditions is also visible, although less significant.

**Weakening investor risk sentiment could translate into corrections in US corporate markets, posing risks to macro-financial stability in the euro area.** Larger corrections in US corporate markets could have a substantial impact on euro area financial markets and lead to a tightening of financial conditions. In fact, past US equity market corrections have also been associated with declines in euro area equity markets, as well as increases in euro area corporate bond spreads for both the investment-grade and non-investment-grade sectors.<sup>35</sup> Given the still elevated uncertainty about the recovery and the reliance of asset valuations on investor risk sentiment, a strong sensitivity to risk-off shocks when corporate balance sheets are fragile may translate into risks to macro-financial stability.

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## 2.3 Optimistic earnings expectations and low real yields further stretch some valuations despite growing risks

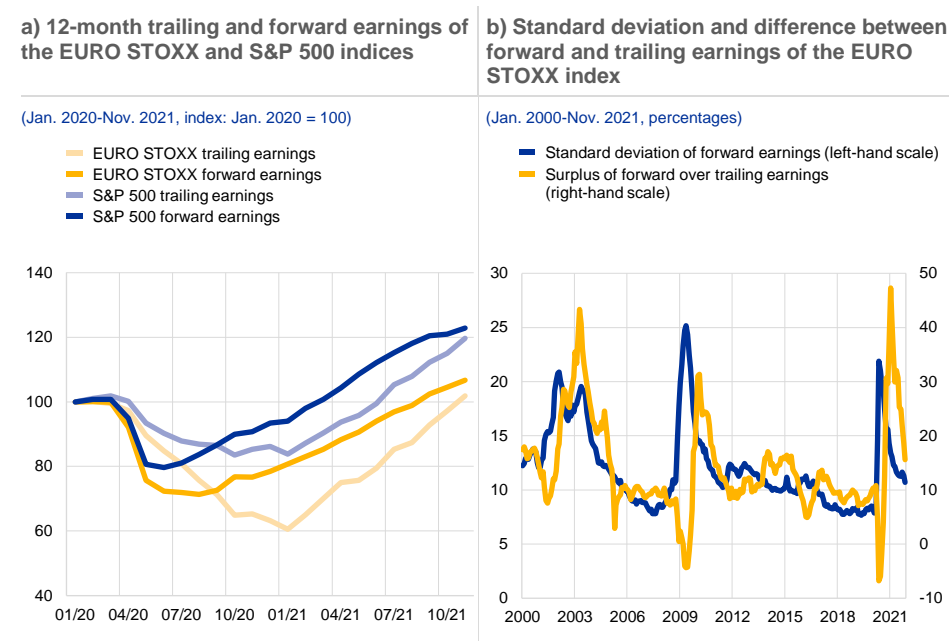
**Valuations of certain asset classes are vulnerable if high earnings expectations fail to materialise.** During the third quarter of 2021, equity markets reached record highs in both the euro area and the United States, as earnings expectations were increasingly revised upwards. Forward and trailing earnings recovered to just above pre-pandemic levels (see [Chart 2.7](#), panel a), while equity prices advanced considerably more over the same period of time (see [Chart 2.3](#), panel b). Despite the positive outlook for corporate earnings in the euro area, the uncertainty surrounding the outlook remains elevated, and the gap between trailing (realised) and forward earnings indicates risks to the realisation of the optimistic expectations (see [Chart 2.7](#), panel b).

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<sup>35</sup> See, for example, Box 3 entitled “[Risk of spillovers from US equity market corrections to euro area markets and financial conditions](#)”, *Financial Stability Review*, ECB, May 2021.

**Chart 2.7**

Strong earnings have boosted equity markets, but uncertainty remains high



Sources: Refinitiv and ECB calculations.

Note: Panel b: standard deviation is expressed as a percentage of forward earnings; surplus of forward over trailing earnings is expressed as a percentage of trailing earnings.

**Some markets are showing signs of stretched valuations, especially given current uncertainties.** The cyclically adjusted earnings yield in excess of the risk-free rate (excess CAPE yield) is hovering around post-global financial crisis lows, suggesting that equity valuations are stretched, particularly in the United States (see [Chart 2.8](#), panel a). The post-vaccine rally in equity markets may also partly have been driven by the use of leverage, which could precipitate large concentrated losses if volatility increases. For example, in the United States debit balances in customers' securities margin accounts, a measure of investor leverage, stand close to all-time highs.<sup>36</sup>

**Structural developments in markets also point to a degree of complacency.**

Since the global financial crisis, markets have tended to move more homogeneously. In equity markets, this is reflected by the increasingly narrow distribution of individual stock returns, as well as by the increasing extent to which equity returns can be explained by common factors (see [Chart 2.8](#), panel b). The increased importance of common factors mechanically implies a diminished role for the non-common components of typically more fundamental, firm-specific factors. This may hamper the price discovery mechanism and could mean that risks are no longer priced in a way that appropriately differentiates between assets with different characteristics.<sup>37</sup> These developments may be linked to the growing importance of passive investment

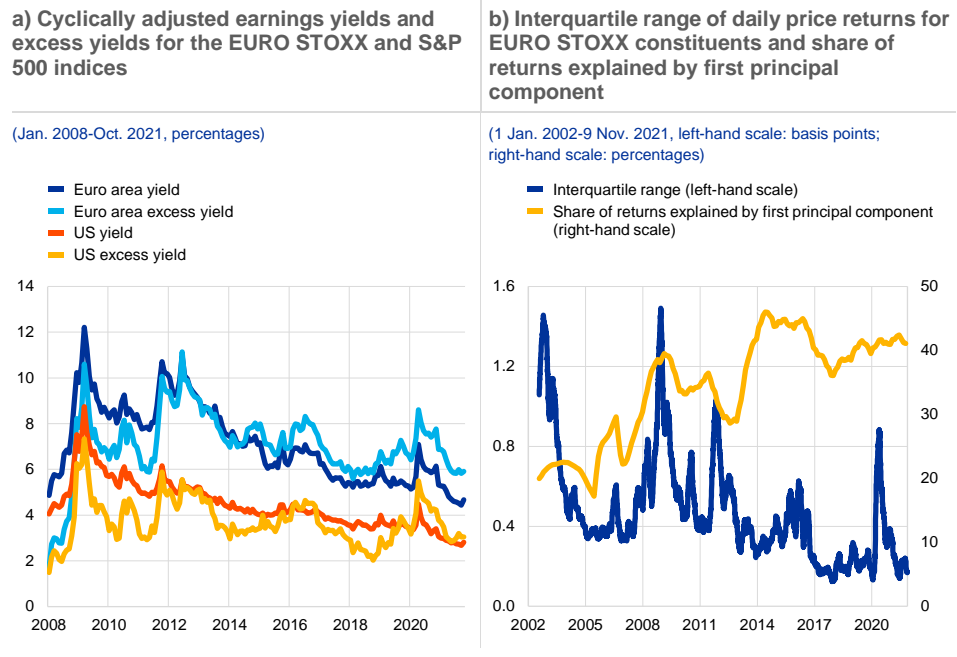
<sup>36</sup> The Financial Industry Regulatory Authority (FINRA) publishes the [combined margin debt of member firms' customers](#). In September 2021, the FINRA margin debt stood at USD 903.1 billion.

<sup>37</sup> In credit markets, for example, there seems to be less differentiation between assets with a variety of credit characteristics. This was described in Special Feature A entitled "[Corporate zombification: post-pandemic risks in the euro area](#)", *Financial Stability Review*, ECB, May 2021.

strategies. Some market participants also point to the impact of central bank liquidity injections, which may affect asset prices in a relatively uniform manner.

### Chart 2.8

Some valuations appear stretched and markets show some signs of complacency



Sources: Refinitiv and ECB calculations.

Notes: Panel a: cyclically adjusted earnings are defined as the average of ten years of earnings, adjusted for inflation. The earnings yield is computed as the ratio of (cyclically adjusted) earnings per share divided by the share price. Excess yield refers to the difference between the earnings yield and the real yield on the relevant ten-year government bond yield. Panel b: share of variance of daily EURO STOXX equity returns explained by the first principal component. Principal components are determined over a two-year moving window. Results have been averaged over a moving 12-month window.

**Changing cross-asset correlations are limiting market participants’ ability to diversify risks.** The vaccine-driven “everything rally” seen in the first half of 2021 led to changes in a number of cross-asset relationships. Notably, in the United States the correlation between bond and stock returns turned positive. Together with the growing importance of common factors, as described above, such increased cross-asset correlations hamper market participants’ ability to diversify risks.

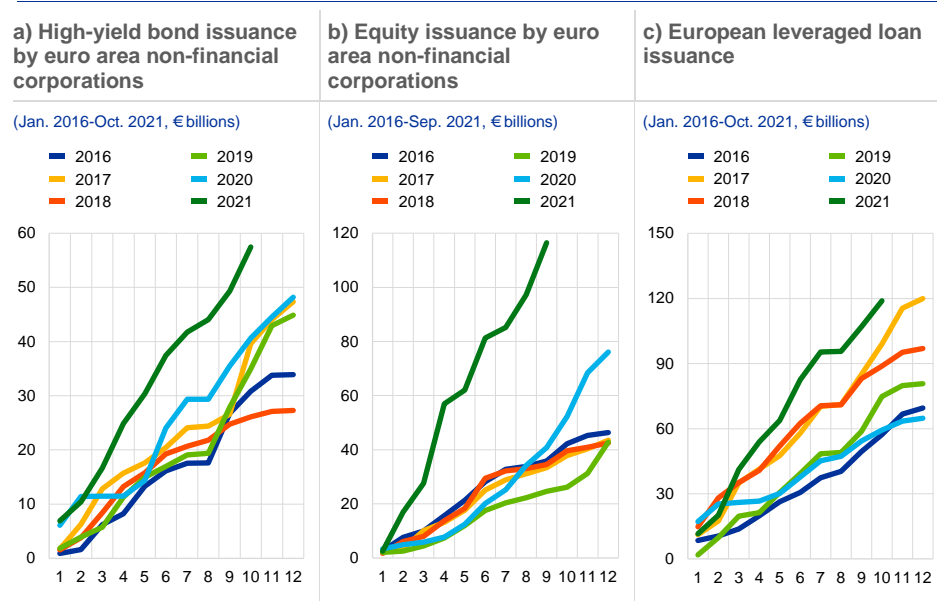
**Speculative-grade debt and equity issuance have reached record highs in 2021, with investors exhibiting a continued strong appetite for risky assets.**

Immediately after the March 2020 market turmoil, investment-grade corporate bond issuance surged as firms hoarded cash. Speculative-grade issuance initially stalled in 2020, but restarted during the second half of the year and has reached record highs in 2021 (see [Chart 2.9](#)). Equity and leveraged loan issuance have also surged. Markets have soaked up the newly issued debt without signs of credit spread widening. High-yield bonds have been absorbed largely by investment funds (see [Chapter 4](#)). In the United States, the start of 2021 also saw sizeable issuance volumes from special-purpose acquisition companies (SPACs), but activity has been subdued since then. SPAC issuance in the euro area also rose, but remains insignificant from a financial stability perspective. Investors also made increasing use of the right to redeem their shares, instead of participating in the acquisition of a target company.

This suggests that the appetite to obtain equity exposures through SPACs has moderated.

### Chart 2.9

#### Issuance of risky assets surged in 2021



Sources: Dealogic, ECB Statistical Data Warehouse and S&P Global Market Intelligence and ECB calculations.  
Note: Panel a: gross issuance of euro-denominated high-yield bonds by non-financial corporations located in the euro area. Panel b: gross issuance of euro-denominated listed shares. Panel c: European leveraged loan issuance also covers non-euro area issuers in Europe.

**Crypto-asset markets have grown in importance and complexity, and their market capitalisation is subject to bouts of speculation.** The growing popularity of stablecoins has strengthened links between crypto-asset and conventional financial markets (see **Box 4**). In addition, the development of a crypto-based market infrastructure under the name of “decentralised finance” (DeFi) has increased the complexity of crypto-asset markets. DeFi typically involves the use of smart contracts covering financial services such as lending, insurance, exchanging crypto-assets, derivatives platforms and staking.<sup>38</sup> Finally, some crypto-asset investors use leverage, which increases the potential relevance of the segment for financial stability as such practices can lead to large, concentrated losses.<sup>39</sup>

### Box 4

#### The expanding functions and uses of stablecoins

Prepared by Mitsutoshi Adachi, Alexandra Born, Isabella Gschossmann and Anton van der Kraaij

**The market capitalisation of stablecoins has risen from USD 5 billion to USD 120 billion since 2020 and they are serving increasingly different functions in the crypto-asset ecosystem (see Chart A, panel a).** Stablecoins are digital units of value that use blockchain cryptography. They rely on tools to maintain a stable value relative to one or several currencies or other assets (including

<sup>38</sup> Staking is a practice which pools tokens to form a larger “stake”. For blockchains that operate under the “proof of stake” principle, larger stakes can lead to certain rewards. See also “[What is staking?](#)”, Coinbase.com.

<sup>39</sup> See “[3rd Annual Global Crypto Hedge Fund Report 2021](#)”, PricewaterhouseCoopers.

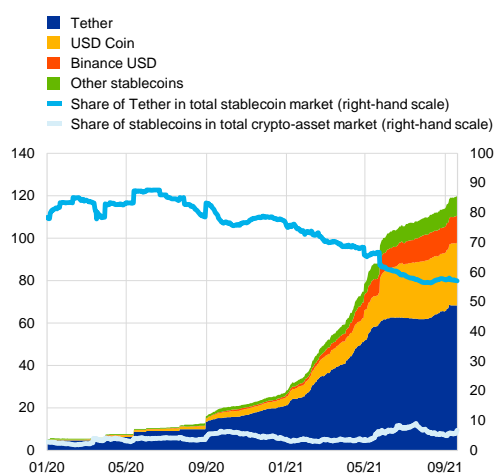
crypto-assets), or make use of algorithms to maintain a stable value.<sup>40</sup> For those stablecoins referring to currencies or assets, these tools include holding reserve assets against which stablecoin holdings can be redeemed. Despite their recent growth, stablecoins still only account for around 6% of the estimated USD 2 trillion total market capitalisation of crypto-assets, though interlinkages between stablecoins and crypto-assets imply a correlation of risks between these market segments. At the same time, the functions served by stablecoins within the ecosystem have multiplied. In addition to acting as a relatively safe “parking space” for crypto volatility, stablecoins serve as a bridge between fiat currencies and crypto-assets. They are used for trading: in September 2021 around 75% of all trading on crypto trading platforms involved a stablecoin.<sup>41</sup> Due to their relatively low price volatility, they are also used as collateral in crypto-asset derivative transactions or in decentralised finance (“DeFi”). In the light of stablecoins’ direct links to the traditional financial system and their interlinkages with the wider crypto-asset market, this box analyses the risks associated with the evolving functions of stablecoins and the financial stability implications of such risks.

### Chart A

The use of stablecoins has expanded rapidly over the past two years, despite high transaction fees on some blockchains such as Ethereum, which should in principle constrain their use as a form of payment

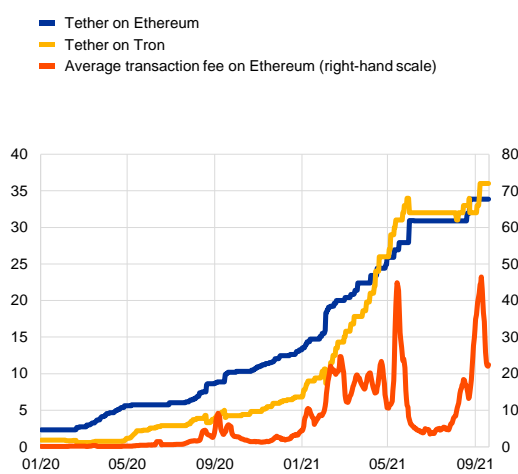
a) Market capitalisation of largest stablecoins

(1 Jan. 2020-19 Sep. 2021, left-hand scale: USD billions; right-hand scale: percentages)



b) Tether market capitalisation by blockchain and average transaction fees on Ethereum

(1 Jan. 2020-19 Sep. 2021, left-hand scale: USD billions; right-hand scale: USD)



Sources: CryptoCompare, ECB calculations and Coinmetrics.io.  
Note: Panel a: “Other stablecoins” includes Multi-Collateral DAI, Pax Dollar, TrueUSD and GeminiUSD.

**The current high transaction fees on certain blockchains curb the use of stablecoins as a form of payment and may push the largest existing one towards a cheaper blockchain.** Like other crypto-assets, stablecoins are issued on a blockchain which maintains a record of transactions made. For users to consider making payments with stablecoins, issuers need a blockchain with stable and low transaction fees. However, the fees on the Ethereum blockchain, where most stablecoins are

<sup>40</sup> See ECB Crypto-Assets Task Force, “[Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area](#)”, *Occasional Paper Series*, No 247, ECB, September 2020; and Bullmann, D., Klemm, J. and Pinna, A., “[In search for stability in crypto-assets: are stablecoins the solution?](#)”, *Occasional Paper Series*, No 230, ECB, August 2019.

<sup>41</sup> See “[Share of Trade Volume by Pair Denomination](#)”, The Block.

currently issued, are considered too high and too volatile for payment use (see **Chart A**, panel b).<sup>42</sup> This situation may change if Ethereum's transaction fees decrease or stablecoin usage moves to low or no-fee blockchains. In fact, the supply of Tether on Tron – which offers users a daily number of free transactions and generally low transaction fees – has now surpassed that on Ethereum (see **Chart A**, panel b).

**Stablecoin holders can earn revenue from their holdings by providing liquidity, although they run the risk of incurring significant losses if they do so.** The use of stablecoins in the DeFi ecosystem of financial applications that enable trading or lending is becoming increasingly popular. These DeFi activities are facilitated by liquidity pools consisting of crypto-assets and stablecoins governed by software protocols known as “smart contracts”. For example, trades between stablecoins and crypto-assets are enabled by liquidity pools, and liquidity providers earn income from the transaction fees paid for the trades they facilitate. Taking the example of an Ether/Tether pool, returns from providing liquidity in this way can reach around 18%.<sup>43</sup> However, stablecoin liquidity providers run the risk of incurring significant losses, even if the stablecoin itself remains stable.<sup>44</sup> The smart contract governing a liquidity pool requires the asset pair in that pool to maintain a constant total value. As a result, a price decrease for Ether creates arbitrage opportunities that increase the supply of Ether in the Ether/Tether pool but reduces the supply of Tether. In turn, the liquidity providers suffer a reduction in the total value of the liquidity pool in fiat currency, which could drop to zero if the Ether price falls to zero.

**Stablecoins are exposed to similar vulnerabilities as money market funds (MMFs), and there is currently a lack of transparency regarding stablecoins' reserve assets.** Stablecoins, like MMFs, need to be backed by liquid reserve assets if users are to see the conversion back to a fiat currency as credible. Losses on reserves could trigger a loss of user confidence and prompt large-scale redemption requests, while the liquidation of underlying – usually traditional – assets to cover redemptions could have negative fire-sale contagion effects on the financial system. The market impact will depend on the size of the stablecoins, some of which have already reached asset values comparable to those of large prime MMFs domiciled in Europe (see **Chart B**, panel a). However, too few details on the reserve asset composition of major stablecoins have been disclosed for the risks within these reserves to be fully understood. For example, although Tether's published reserve breakdown shows that half of the reserve assets were invested in commercial paper and 21% in cash and bank deposits, the lack of more granular information on its commercial paper investment makes it difficult to form a clear view of the liquidity of its holding (see **Chart B**, panel b).<sup>45</sup>

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<sup>42</sup> See “[The Ethereum Gas Report](#)”, CoinMetrics, 22 March 2021 and [Ethereum.org](#) for an explanation of transaction fees on Ethereum and recent changes; Schär, F., “[Decentralized Finance: On Blockchain and Smart Contract-Based Financial Markets](#)”, *Economic Research*, Vol. 103, No 2, Federal Reserve Bank of St. Louis, 2021; and “[Tether Use on Tron Passes Ethereum as Low Fees Attract Small Transactions](#)”, CoinDesk.

<sup>43</sup> See “[SushiSwap, Ethereum/USD Tether pair](#)”, intotheblock. The return reflects the average Ether-Tether pool return on investment over a three-month period from 30 June to 30 September 2021 on the decentralised SushiSwap exchange.

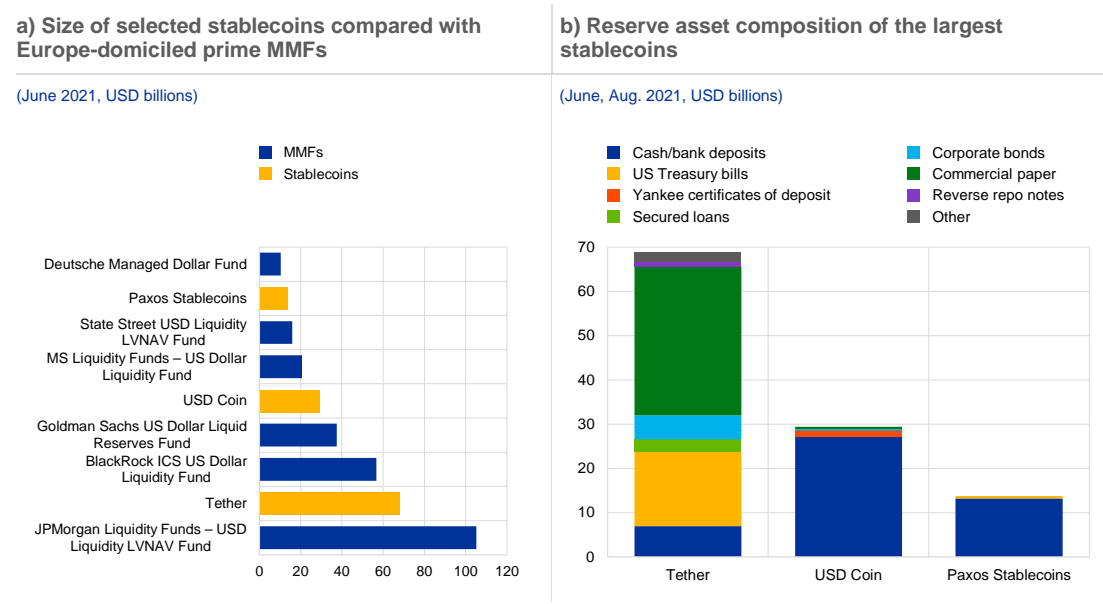
<sup>44</sup> See “[UniSwap: A Good Deal for Liquidity Providers?](#)”, Pintail, 12 January 2019.

<sup>45</sup> In October 2021, the Commodity Futures Trading Commission issued a fine against Tether for misleading statements from at least June 2016 to February 2019 to the effect that Tether had sufficient dollar reserves to back each of its stablecoins in circulation; see “[CFTC Orders Tether and Bitfinex to Pay Fines Totaling \\$42.5 Million](#)”, Release Number 8450-21, 15 October 2021.



## Chart B

The size of the reserve assets underlying stablecoin arrangements rivals that of large prime MMFs domiciled in Europe, but their composition raises concerns regarding their liquidity



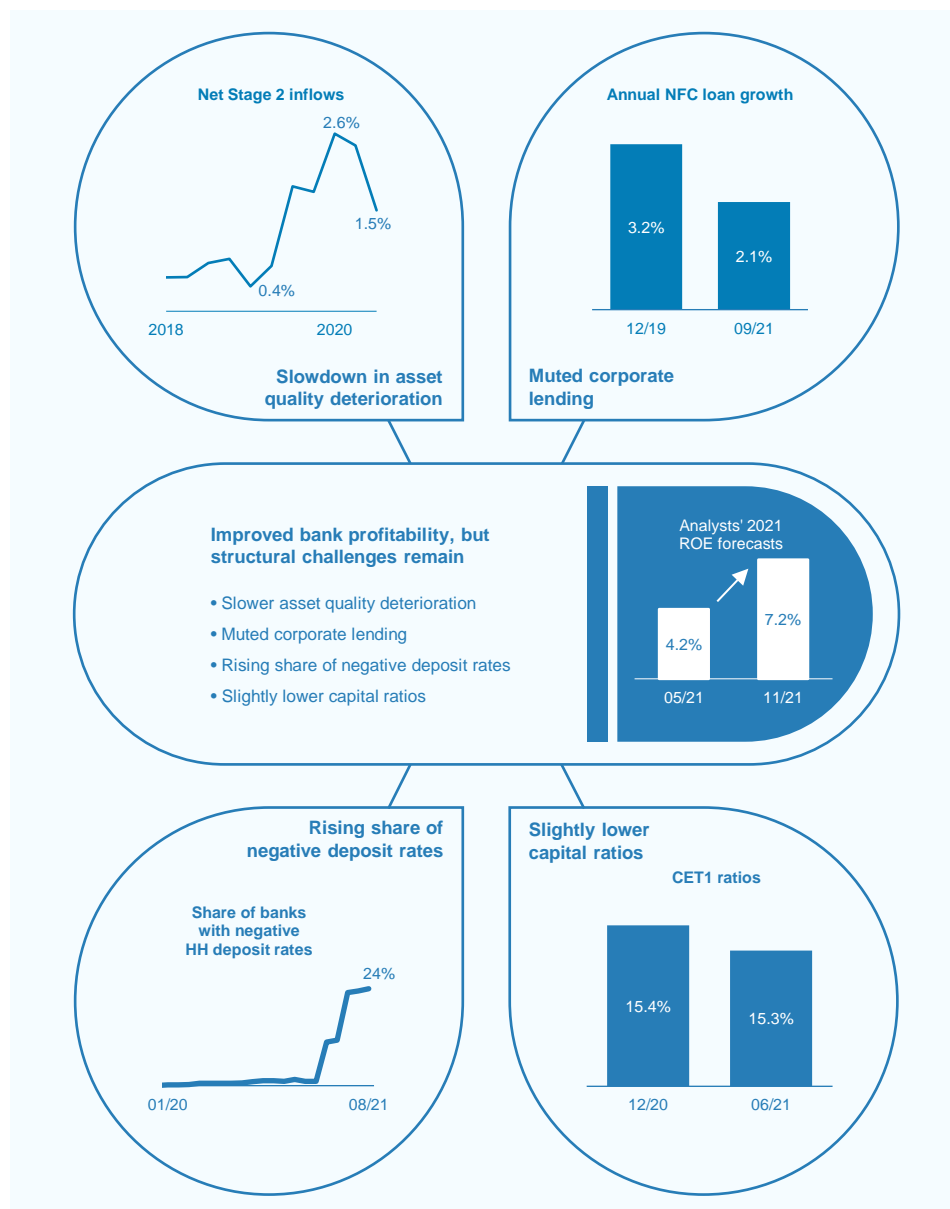
Sources: Fitch European Money Market Fund Compare (June 2021) and company disclosures.  
 Notes: Panel a: Fitch's Money Market Fund Compare covers all Europe-domiciled MMFs publicly rated by Fitch under its Global Money Market Fund Rating Criteria. All data are based on fund surveillance reports from the fund administrators and managers. The MMFs displayed are the largest prime dollar-denominated Europe-domiciled funds by asset size in June 2021. Panel b: reserve data are as at 30 June 2021 for Tether and Paxos Stablecoins (Binance USD, Pax Dollar) and 31 August 2021 for USD Coin. Total assets equal outstanding issuance as at 19 September 2021. Corporate bond holdings of Tether include funds and precious metals. Commercial paper holdings of Tether include certificates of deposit. Binance USD is issued along with Pax Dollar, so official reserve disclosures are consolidated under "Paxos Stablecoins".

**Stablecoins currently pose limited financial stability risks in the euro area, but their growing size, usage and interconnections call for urgent implementation of regulatory, supervisory and oversight frameworks.** There are still few connections with the traditional financial system. However, the stablecoin landscape is evolving rapidly, with the growing participation of retail and institutional investors and a potentially larger role for banks. For example, it is currently planned that the Diem stablecoin (previously known as Libra) will be issued by a commercial bank which will also manage the underlying reserve assets.<sup>46</sup> In addition, the use of stablecoins may accelerate if large technology companies (big techs) start offering their own stablecoins or integrate existing stablecoins into their wallets. For example, Facebook recently launched a pilot of its Novi wallet in the United States and Guatemala using the stablecoin Pax Dollar.<sup>47</sup> Appropriate regulatory, supervisory and oversight frameworks must be put in place urgently before stablecoins pose greater risks to financial stability. The European Commission's recent proposal for the Regulation on Markets in Crypto-assets (MiCA) is a significant step forward. The global reach of this market also underscores the need for global standard-setting bodies to further assess the extent to which existing standards are appropriate for, and applicable to, stablecoins, and close any gaps as necessary.

<sup>46</sup> See "Diem Announces Partnership with Silvergate and Strategic Shift to the United States", Diem press release, 12 May 2021.

<sup>47</sup> See "Pilot Version of Novi Now Available", Novi News, 19 October 2021.

## 3 Euro area banking sector



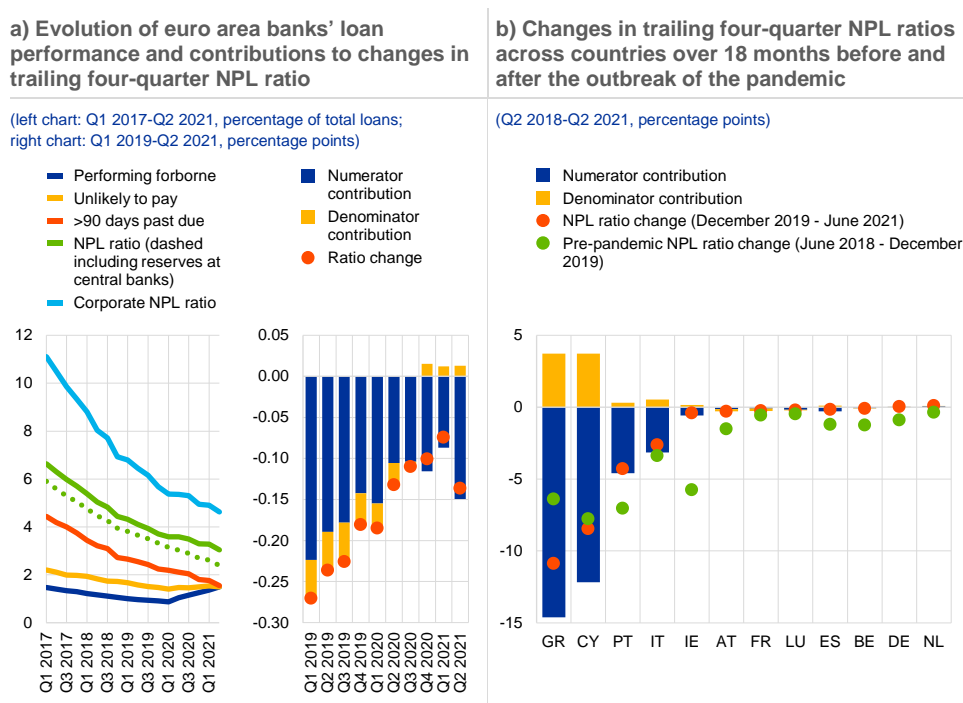
### 3.1 Asset quality performing better than anticipated so far

**The aggregate non-performing loan (NPL) ratio of euro area banks declined further during the first half of 2021, mainly due to the disposal of legacy NPLs.** The aggregate NPL ratio stood at 2.4% at the end of the second quarter of 2021, down 31 basis points compared with the end of the previous year, confirming the downward trend observed since 2014. When excluding central bank reserves from the

denominator,<sup>48</sup> the aggregate NPL ratio came out at 3.0%, falling at a slower pace than during the pre-pandemic period. The second quarter of 2021 still registered the highest decrease in the NPL ratio since the outbreak of the pandemic, mainly on the back of decreasing NPL stocks (see **Chart 3.1**, panel a). Banks in Greece and Cyprus reduced their NPL ratios by more than 8 percentage points after the outbreak of the pandemic, while in all other euro area countries changes in NPL ratios were still far from pre-pandemic levels (see **Special Feature C** and **Chart 3.1**, panel b). At the sector level, NPL ratios remain highest in the corporate portfolio, at 4.6% in the second quarter of 2021, mainly driven by loans to small and medium-sized enterprises.

### Chart 3.1

Euro area aggregate NPL ratio declined during the first half of 2021, mainly reflecting the disposal of legacy NPLs concentrated in a few countries



Sources: ECB supervisory data and ECB calculations.

Notes: Based on a balanced sample of 92 significant institutions. NPL ratios are computed in terms of gross carrying amount. Cash balances at central banks and other demand deposits are excluded from the denominator of the NPL ratio unless explicitly mentioned (i.e. the dashed line). Panel b: where the number of significant institutions in a country is less than three, the country is not shown for confidentiality reasons. NPL: non-performing loan.

### Forward-looking credit risk metrics indicate a slowdown in asset quality deterioration during the first half of 2021, although heterogeneous across sectors.

Following the surge registered at the outbreak of the pandemic, the increase in latent credit risk, as measured by net loan inflows to the “underperforming” Stage 2 asset class, was more contained in the second quarter of 2021 (see **Chart 3.2**, panel a).<sup>49</sup> The increase was driven both by reduced inflows (almost halved

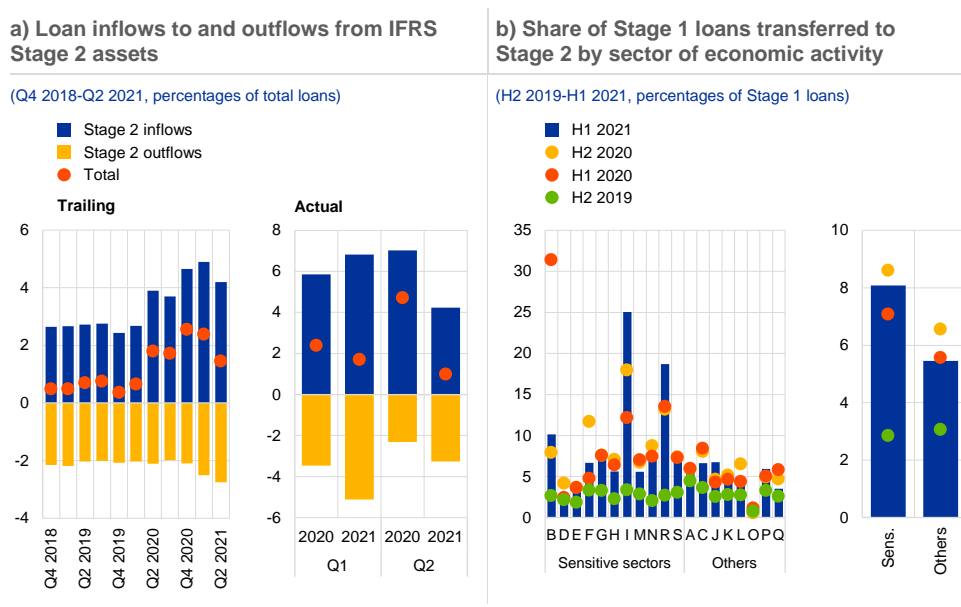
<sup>48</sup> Cash balances at central banks and other demand deposits in the ECB supervisory statistics data collection were reported together with loans until the second quarter of 2020. It was therefore not possible to disentangle their contribution. The aggregate figure for cash balances at central banks and other demand deposits for a balanced sample of 92 significant institutions in the euro area increased from €1.6 trillion in the fourth quarter of 2019 to €3.7 trillion in the second quarter of 2021.

<sup>49</sup> Stage 2 loans are still performing but are assessed by banks to have experienced a significant increase in credit risk after origination.

compared with the same quarter of 2020) and by record-high outflows, mostly back to Stage 1. That said, inflows are still more than double pre-pandemic levels; and in the first half of 2021 the share of loans migrating from “performing” Stage 1 to Stage 2 over a period of six months decreased by only 0.5 percentage points in pandemic-sensitive sectors versus 1.1 percentage points in other sectors relative to the second half of 2020 (see [Chart 3.2](#), panel b). Within pandemic-sensitive sectors, declines in Stage 2 inflows were only seen in some (e.g. F – construction, H – transport, M – professional and N – administrative services), while inflows continued to increase in others (e.g. I – accommodation and R – arts and entertainment).

### Chart 3.2

Measures of latent credit risk increased at their slowest pace since the outbreak of the pandemic and point to more limited asset quality deterioration for less affected sectors



Sources: ECB supervisory data, ECB AnaCredit, ECB Register of Institutions and Affiliates Data (RIAD) and ECB calculations. Notes: Based on a balanced sample of 92 significant institutions. Panel a, left chart: the total refers to the difference between actual inflows and outflows as observed in the trailing four quarters and is expressed as a share of total loans. Panel a, right chart: inflows and outflows as observed in the respective quarter and expressed as a share of total loans. Panel b: the loans transferred from Stage 1 to Stage 2 are scaled by all loans classified as Stage 1 at the beginning of the period and still on the balance sheet at the end of the period. This implies that the denominator includes only IFRS exposures. Capital letters refer to NACE codes as follows: A – Agriculture; B – Mining; C – Manufacturing; D – Electricity; E – Water supply; F – Construction; G – Trade; H – Transport; I – Accommodation; J – Communication; K – Financials; L – Real estate; M – Professional services; N – Administrative services; O – Public sector; P – Education; Q – Health services; R – Arts and entertainment; and S – Other services. Pandemic-sensitive sectors include mining, electricity, water supply, construction, retail and wholesale trade, transport, accommodation and food, professional, administrative, arts and entertainment, and other services. IFRS: International Financial Reporting Standards; NACE: Nomenclature statistique des activités économiques dans la Communauté Européenne (Statistical classification of economic activities in the European Community).

**Loans reclassified to the “underperforming” Stage 2 category tended to have pre-existing vulnerabilities or be in banks closer to key capital thresholds.** Firms whose loans were reclassified to Stages 2 and 3 during 2020 entered the crisis with higher debt-to-assets ratios, a lower return on assets and lower liquidity ratios, compared with firms whose loans remained in Stage 1 (see [Chart 3.3](#), panel a). Loans to firms in sectors most affected by the lockdowns, notably services, were more likely to be reclassified to higher stages, although the noisiness of the relationship between turnover shocks and loan migrations suggests that other factors were significant too. Indeed, regression analysis suggests that banks with low capital buffers reclassified a larger share of loans to Stage 2 and Stage 3, holding borrower characteristics constant. However, reclassification of loans by banks with low capital

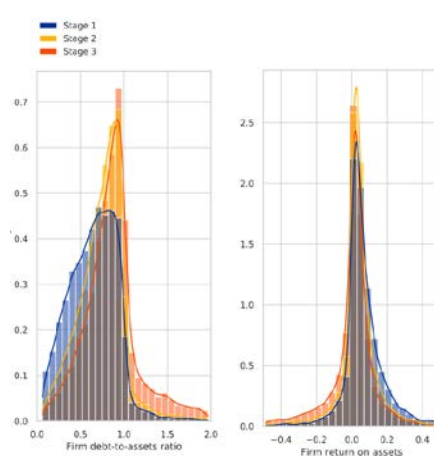
buffers appeared less sensitive to corporate borrowers' pre-pandemic vulnerabilities, especially their liquidity ratio, than reclassification by better capitalised banks (see [Chart 3.3](#), panel b, dark blue and yellow lines). In line with the literature on zombie banks and zombie firms, this may hint at forbearance being granted to weaker borrowers.<sup>50</sup>

### Chart 3.3

Loans to more leveraged and less profitable firms were more likely to be reclassified to IFRS Stages 2 and 3 in 2020 and banks' distance to MDA influenced the classification

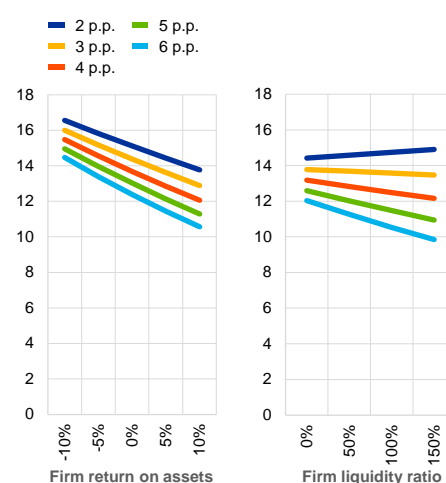
a) Distribution of pre-pandemic borrowers' leverage ratio and ROA by IFRS loan stage classification at end-2020

(Dec. 2020, density function)



b) Model-based probability of loan migration to Stage 2 by borrower characteristics and bank distance to MDA

(Dec. 2019-Dec. 2020, percentage of Stage 1 loans)



Sources: ECB supervisory data, ECB AnaCredit, Bureau van Dijk's Orbis database and ECB calculations.

Notes: Sample of 850,000 firms with an active lending relationship classified as Stage 1 at end-2019 that remained active at end-2020. Panel b: a multinomial logit model is used to assess the role of firm-level, bank-level and macro factors in driving the deterioration of corporate credit quality. The dependent variable is defined as the stage in which the firm was classified at end-2020. Three groups of explanatory variables are considered: firm-level financial variables, representing the pre-pandemic fundamentals of the borrower, macro variables representing the country and sector-specific impact of the pandemic, and bank-specific factors. The results presented here are obtained from a specification including country fixed effects and interactions between bank distance to MDA and firm variables. Variables other than distance to MDA and borrower characteristic under assessment are set to the sample medians. A flat line in the chart indicates that the respective borrower characteristic was not correlated with the probability of loan migration to Stage 2. IFRS: International Financial Reporting Standards; MDA: maximum distributable amount; p.p.: percentage point; ROA: return on assets.

### Nearly all euro area loan moratorium schemes have now expired with a limited immediate impact on banks' asset quality, but risks of losses from loans still under moratoria have increased.

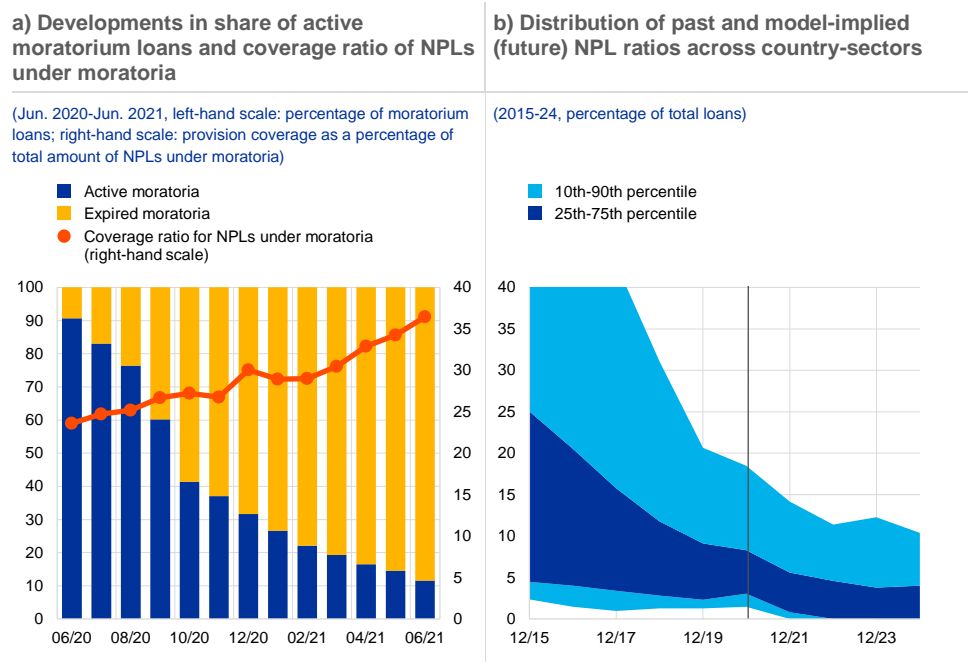
Around 88% of moratoria granted to loans had expired as at June 2021 (see [Chart 3.4](#), panel a) and the active moratoria still represent a material share (i.e. at least 5%) of total corporate loans only for banks in two euro area countries. While the expiry of moratoria has not immediately translated into a deterioration of banks' asset quality, the coverage ratio of NPLs under moratoria increased from 24% in June 2020 to 36% in June 2021, signalling a higher concentration of risks in this portfolio. This development is observed in most euro area countries and suggests that, while stronger borrowers have gradually resumed payments, weaker borrowers – which usually require higher provisioning – are still

<sup>50</sup> Storz et al. demonstrate that weak banks are more likely to roll over loans to weak firms, thus postponing recognition of borrowers' problems and perpetuating the existence of zombie firms. A similar mechanism may be at work with respect to loan classification. See Storz, M., Koetter, M., Setzer, R. and Westphal, A., "Do we want these two to tango? On zombie firms and stressed banks in Europe", *Working Paper Series*, No 2104, ECB, October 2017.

taking advantage of this measure. At the same time, the share of loans taken up under government guarantee schemes reached its steady state at the beginning of 2021 and represents 3.4% of total loans to the non-financial private sector.

### Chart 3.4

While moratoria on loans have almost completely expired, developments in corporate fundamentals do not predict an increase in NPL ratios until 2023



Sources: ECB supervisory data, Bureau van Dijk's Orbis database, Capital IQ, Eurostat and ECB calculations.  
 Note: Panel a: Based on a balanced sample of 92 significant institutions. Panel b: distribution of median NPL ratios across country-sector groups of firms, considering nine economic sectors. For each country-sector group, the model-implied NPLs for 2020 to 2024 are based on past corporate fundamentals (median ROA, liquidity ratio and debt-to-asset ratio registered by firms inside each group) and forecast turnover mapped with relationships from a panel model consistent with that in Box 3 entitled "Do corporate fundamentals explain differences in sectoral NPLs?", Financial Stability Review, ECB, May 2019. The results hold after controlling for country and sector fixed effects, and considering interactions between corporate financial variables and economic sectors. The nine economic sectors considered in this analysis account for around 60% of total loan exposures.

**Despite the positive signs, the full impact of the pandemic on bank asset quality could take another two years to become visible.** The future level of NPLs depends on the strength and continuation of the economic recovery, as well as the effectiveness of policy measures in preventing corporate defaults. An analysis of loan performance in all euro area countries for nine economic sectors from 2014 to 2020 finds that NPL ratios rise around four years after aggregate corporate profitability and liquidity ratios worsen, and two years after an increase in the debt-to-assets ratio.<sup>51</sup> Combining these historical relationships with the observed country-sector-level data and turnover paths consistent with the September 2021 ECB macroeconomic projections<sup>52</sup> suggests that the corporate NPL ratio could continue its gentle

<sup>51</sup> The results are consistent with those obtained for corporate profit margins in Box 3 entitled "Do corporate fundamentals explain differences in sectoral NPLs?", Financial Stability Review, ECB, May 2019, based on a panel model covering twelve euro area countries and spanning a longer time period, but not capturing information on economic sectors.

<sup>52</sup> Since the model is estimated over a period of pronounced reduction in NPLs, the results should be generally more reliable for country-sector groups that are not characterised by pronounced NPL disposals during the calibration period (i.e. 2014-20). At the same time, measures put in place to support corporates during the COVID-19 pandemic may have hidden more structural issues and lengthened the duration of the pass-through from firms' financial health to NPLs.

downward trend in most country-sector groups over the next few years (see [Chart 3.4](#), panel b). At the same time, this approach implies that NPL ratios for the weakest country-sectors (i.e. the 90th percentile of the distribution of NPL ratios) will rise in 2023 and decrease again in 2024.

**Overall, the outlook for euro area banks' asset quality has gradually improved over the last year, in line with the economic recovery.** Standard indicators of asset quality do not yet signal a material deterioration in credit quality, most likely influenced by two factors. First, policy measures seem to have provided adequate support to euro area firms; and second, the latest ECB macroeconomic projections expect real GDP to grow by 5.0% in 2021 and 4.6% in 2022 (compared with 3.9% and 4.2% respectively, predicted in December 2020) despite continued uncertainty related to the future development of the COVID-19 pandemic. In this context of uncertainty, supervisors have also identified several deficiencies in banks' credit risk management frameworks, which will have to be addressed and may have potentially negative impacts on asset quality indicators.<sup>53</sup>

## 3.2 Profitability recovering towards pre-pandemic levels

**Euro area banks' profitability improved in the first half of 2021 on the back of lower loan loss provisions and higher revenues.** After a substantial decline in 2020 due to pandemic-induced impairments, especially during the second and fourth quarters, the aggregate return on equity (ROE) of euro area significant institutions rose from 1.3% at the end of 2020 to 5.2% in the second quarter of 2021.<sup>54</sup> For euro area banks on aggregate, the largest part of the profitability improvement can be attributed to lower impairment costs reflecting reduced downside risks to growth after the vaccine approval and the gradual reduction in containment measures. However, differences across banks remain pronounced. For better performing banks, the profitability improvement was mainly driven by higher operating profit, while worse performing banks saw a decline in their operating profit which was compensated for by lower impairments and positive contributions from one-off other profit and loss items (see [Chart 3.5](#), panel a). The third quarter earnings releases of listed banks reveal that the profitability of euro area banks improved slightly compared with the previous quarter on the back of higher operating profits. This was mainly driven by improved NII and NFCI.

**Trading as well as fee and commission income supported profitability, while interest income declined.** Significant institutions' aggregate operating profit rose in the first six months of 2021 amid higher net trading income (NTI) as well as net fee and commission income (NFCI), which compensated for the decline in net interest income (NII). As this outcome for the euro area aggregate was mainly driven by the strong contribution of trading income, it benefited institutions with a larger role of investment

<sup>53</sup> See also "[Credit risk: Acting now paves the way for sound resilience later](#)", a blog post by Elizabeth McCaul, Member of the Supervisory Board of the ECB.

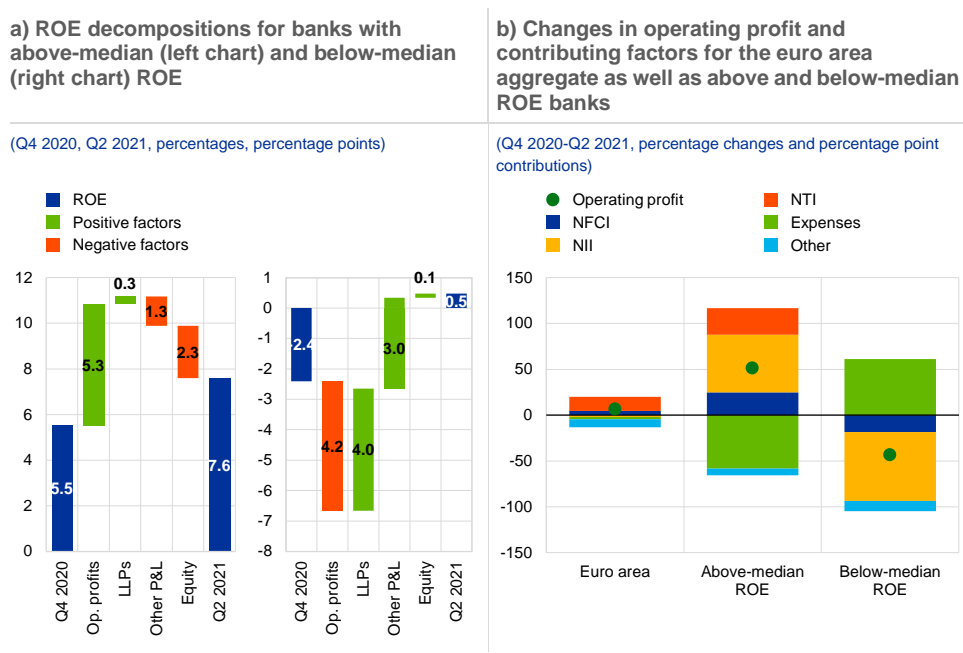
<sup>54</sup> In the FSR, the four-quarter average of total equity is used in the denominator, while net income is annualised using trailing four-quarter sums. ECB Banking Supervision annualises quarterly data by multiplying them by four, resulting in a different headline profitability number.



banking (see **Box 5**). The heterogeneity across banks is also visible in the changes in operating profit. More profitable banks exhibited higher operating profit on the back of rising NII in particular but also due to higher NFCI and NTI. For less profitable banks, operating profit fell as cost-cutting could not compensate for the decline in NFCI and, especially, in NII (see **Chart 3.5**, panel b).

### Chart 3.5

Bank profitability remained heterogeneous across individual institutions, as core revenues improved for more profitable banks and declined for less profitable banks



Sources: ECB supervisory data and ECB calculations.

Notes: Based on a balanced sample of 92 significant institutions. The split of the sample into two groups is based on trailing four-quarter ROE levels in the second quarter of 2021. LLPs: loan loss provisions; NFCI: net fee and commission income; NII: net interest income; NTI: net trading income; P&L: profit and loss; ROE: return on equity.

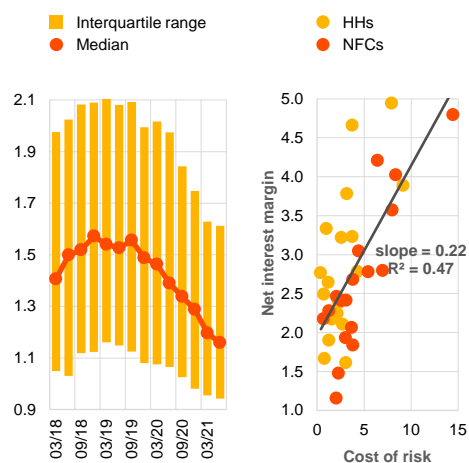
**Net interest income remains subdued, but its decline has slowed recently.** While net interest income accounts for almost 60% of the aggregate net income of euro area significant institutions, it has declined by 6% since the fourth quarter of 2015 owing to margin compression in a low interest rate environment. An open question in the light of declining margins is whether the interest earned on new lending is commensurate with the credit risk (see **Chart 3.6**, panel a). Starting from around 2018, banks tried to counter the margin decline by increasing loan volumes. When the pandemic hit, state guarantees helped banks to limit their credit risk while supporting the lending flow to the real economy, but the resulting decline in risk premia also intensified margin compression. With the gradual reopening of economies and the expiry of state support measures, the decline in net interest income has slowed recently (see **Chart 3.6**, panel b).

### Chart 3.6

The decline in net interest income slowed, but it remains uncertain whether the interest earned compensates sufficiently for the credit risk to which banks are exposed

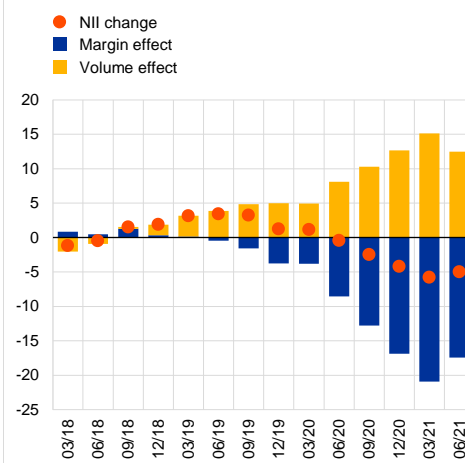
a) Net interest margin for euro area banks on aggregate, as well as net interest margin and cost of risk across countries and sectors

(left chart: Q1 2018-Q2 2021, percentages of interest-earning assets; right chart: Q2 2021, percentages)



b) Annual changes in net interest income of euro area banks on aggregate and contributing factors

(Q1 2018-Q2 2021, percentage changes and percentage point contributions to NII growth)



Sources: ECB supervisory data and ECB calculations.

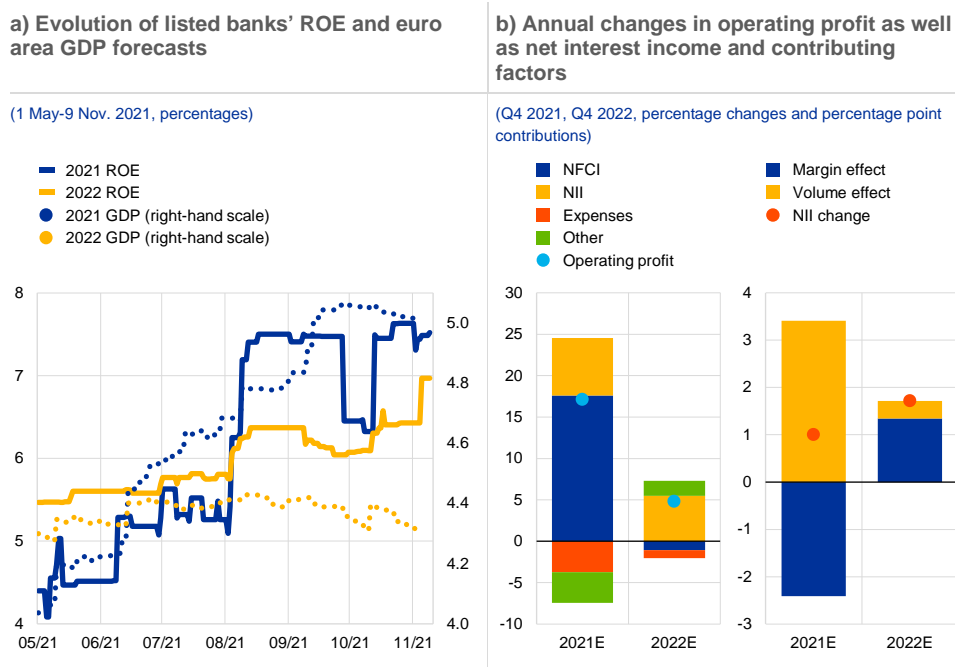
Notes: Based on a balanced sample of 92 significant institutions. Figures are on a trailing four-quarter basis. Panel a: cost of risk is defined as impairments on loans divided by loans. The net interest margin at the country-sector level is computed as net interest income on loans as a share of performing loans. HHs: households; NFCs: non-financial corporations; NII: net interest income.

### The profitability of euro area banks is expected to normalise further in 2022, but at a slower pace than this year.

Due to the reopening of economies, the euro area macro outlook for 2021 and 2022 has improved since June (see [Chapter 1](#)). In tandem, market analysts have revised upwards their estimates of banks' return on equity in 2021 to 7.2%, from 4.2% at the end of May (see [Chart 3.7](#), panel a). As the GDP projection for 2022 has only improved slightly over the same period, the expected rise in bank profitability for 2022 is also more modest. The bulk of the increase in future bank profitability is due to lower loan loss provisions. With regard to the expected improvements in operating profit and net interest income, model estimates suggest that they are mainly driven by higher fee income and lending volumes respectively (see [Chart 3.7](#), panel b). Even if downside risks from a potential resurgence of the coronavirus do not materialise, bank profitability is set to remain under pressure from the low interest rate environment. According to forward rates, the yield curve slope – an indicator of the potential for maturity transformation – is expected to increase in the coming years, but less than it was a few months ago. Bank consolidation through mergers and acquisitions can also help to address these structural challenges and act as a catalyst for improving efficiency and ultimately profitability (see [Special Feature B](#)).

### Chart 3.7

Alongside an improving macro outlook, bank profitability is expected to continue recovering due to lower impairments as well as higher fees and lending volumes



Sources: Bloomberg Finance L.P., Consensus Economics, Fitch Ratings, Refinitiv and ECB calculations.  
Notes: Panel a: the ROE forecasts are computed as a median based on a sample of 31 listed euro area banks. Panel b: the projections for 2021 and 2022 are ECB staff time-series VAR estimations as at end-September. The sample of banks in the time-series VAR models is 41 banks for which analysts' expectations are available. E: estimate; NFCI: net fee and commission income; NII: net interest income; ROE: return on equity; VAR: vector autoregression.

### Recent lending volumes have exceeded pre-pandemic levels on the back of markedly higher mortgage lending, while corporate loan growth is still expected to pick up.

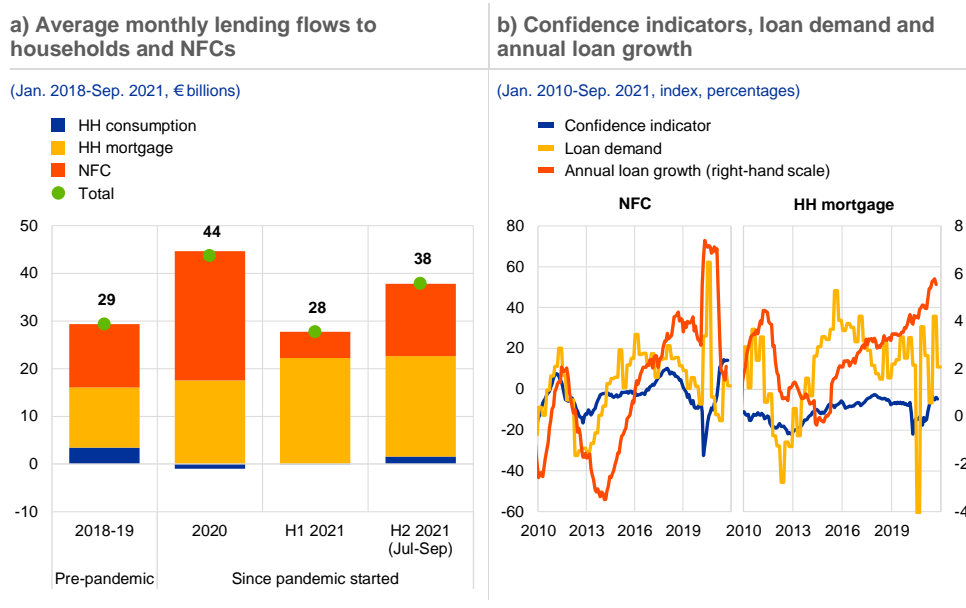
During 2018 and 2019, lending flows of euro area banks were broadly balanced between corporate lending and lending for house purchases. At the onset of the pandemic, corporate lending increased to meet firms' liquidity needs, but has since become more muted, and banks' new lending volumes have become dominated by mortgage lending (see [Chapter 1](#) and [Box 2](#)). In the second half of 2021<sup>55</sup>, average monthly lending to the private non-financial sector exceeded the pre-pandemic levels seen during 2018-19 for the first time. But while lending for house purchases is 68% above the levels observed prior to the pandemic, lending to households for consumption is still 55% lower and lending to non-financial corporations (NFCs) only picked up recently. Between July and September it was, on average, 14% above pre-pandemic levels (see [Chart 3.8](#), panel a). Owing to the reopening of euro area economies, indicators of consumer and industrial confidence have improved substantially and results from the euro area bank lending survey point to rising corporate loan demand. As both confidence indicators and loan demand typically lead lending growth, a pick-up in NFC loan growth can be expected going forward. At 5.5%, mortgage loan growth is at the highest level observed since the global financial crisis and is trending upwards (see [Chart 3.8](#), panel b). To the extent that banks rely on higher loan volumes to compensate for the margin decline, intense

<sup>55</sup> The second half of 2021 refers to all data available at the time of FSR publication.

competition might lead to a deterioration in underwriting standards, which might affect banks' credit risk in the future. And as mortgages have been granted increasingly at fixed rates with longer maturities, interest rate risk has shifted from borrowers to banks.

### Chart 3.8

Corporate lending was muted but started to improve recently, while mortgage lending growth is at its highest level since the global financial crisis

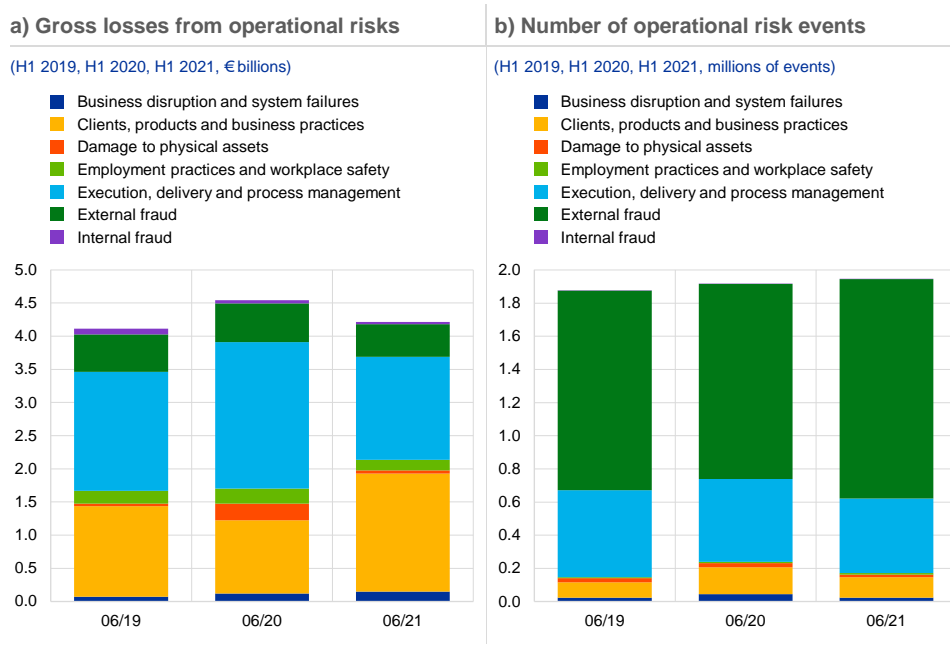


Sources: ECB MFI balance sheet statistics, European Commission, ECB euro area bank lending survey and ECB calculations.  
Notes: Panel a: HH consumption: loans to euro area households for consumption; HH mortgage: loans to euro area households for house purchases; NFC: loans to euro area non-financial corporations.

**Losses from operational risk events have declined compared with the previous year.** The gross losses from operational risk events which occurred during the first six months of 2021 have declined by 7% to €4.2 billion (corresponding to around 0.3% of total equity) compared with the same period last year, but are 2% above the levels seen in 2019. The share of losses related to execution, delivery and process management, which had increased after the start of the pandemic and accounted for almost half of the total losses, decreased and fell below pre-pandemic levels (see [Chart 3.9](#), panel a). In terms of the number of operational risk events in the first half of 2021, external fraud represents, at 68%, the most common event type and its share is trending upwards, but it accounts for only 11% of the total losses (see [Chart 3.9](#), panel b).

**Chart 3.9**

The number of operational risk events is gradually increasing, but losses have declined compared with last year



Sources: ECB supervisory data and ECB calculations.  
Note: Based on a balanced sample of 92 significant institutions.

**Cyber incidents reported by euro area banks have remained broadly unchanged in 2021.**

While cyber incidents reported by euro area banks have increased during the pandemic, there was no major change in the overall number and structure of reported incidents during the first half of 2021. Distributed denial-of-service attacks represent the most frequent type of incident, but institutions have not been severely impacted so far. In addition, ransomware attacks, which have been increasing in other industries, have also been observed in the financial industry, mostly via banks' third-party service providers. These attempts did not, however, lead to substantial damage to banks.

**Box 5**

**Sustainability of recent euro area investment banking strength and debt capital market intermediation**

Prepared by Nander de Vette, Dejan Krusec, Petya Radulova and Tamarah Shakir

**Investment banking revenues have contributed markedly to the recent increase in euro area banks' non-interest income growth and the rebound in bank profitability (see Chart A, panel a, upper chart).**<sup>56</sup> Internationally, in the last three years equity capital market (ECM) revenue has doubled, while debt capital market (DCM) and merger and acquisition (M&A) revenues have increased by around 50%, with only syndicated lending remaining more subdued. In the euro area, however, the most significant volume increase has come from debt instruments, which have long

<sup>56</sup> Investment banking is defined as financial intermediation consisting of financial advisory, primary market and secondary market activities, as well as proprietary trading. See "The Role of Investment Banking for the German Economy", Zentrum für Europäische Wirtschaftsforschung, October 2011.

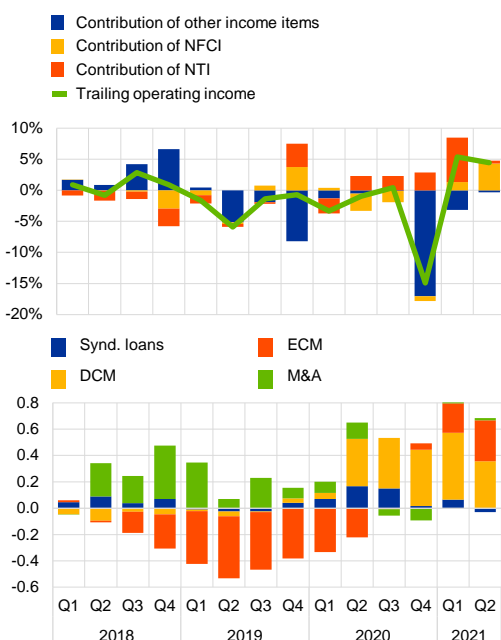
been the preferred source of corporate funding in the euro area, dominating over equity (see **Chart A**, panel a, lower chart). Despite the international growth in capital market volumes, market commentary before the pandemic suggested that investment banking was a weak aspect of European banking,<sup>57,58</sup> with many large banks retreating from various market segments as they faced the fallout from the global financial crisis. Against this background, this box considers the recent developments in investment banking of euro area banks in relation to some of the prior trends and considers how sustainable the recent strength might be.

## Chart A

Investment banking has been a major driver of higher non-interest operating income since the pandemic, with euro area banks increasing their shares in debt and syndicated loan markets

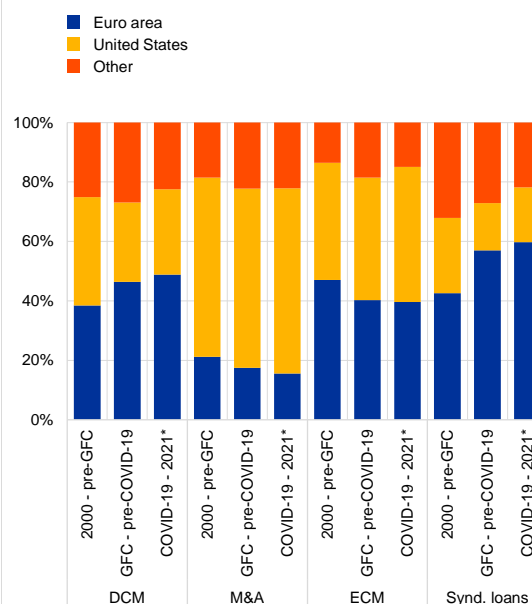
**a) Factors contributing to euro area banks' operating profit (upper chart) and investment banking growth for euro area non-financial firms (lower chart)**

(upper chart: quarterly growth rates, lower chart: growth rates indexed to Q4 2017; percentages)



**b) Market shares of euro area, US and global banks across euro area non-financial M&A, debt, equity and syndicated loan markets**

(percentage of total)



Sources: Dealogic, Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a, upper chart: trailing quarterly operating profit. Panel a, lower chart: seasonally adjusted by taking the four-quarter moving average. Change compared with Q4 2017. Panel b: figures for the latest period include annualised projections for 2021. \* - data up to October. DCM: debt capital markets; ECM: equity capital markets; GFC: global financial crisis; M&A: mergers and acquisitions; NFCI: net fee and commission income; NTI: net trading income.

**Since the pandemic, euro area banks have increased their market shares in the two segments dominating the European investment banking landscape – debt and syndicated loans.** At the same time, despite the recent increase in activity in the equity and M&A markets, euro area banks do not seem to have expanded their market presence. The economic and policy response to the pandemic has enhanced a well-documented increase in debt securities issuance during the past two years, spurred by the need for additional liquidity. Growth in corporate debt issuance in particular has increased the number of opportunities for investment banking arms to earn fees from bookrunning and intermediating related financing, hedging and market-making activities. While corporate debt

<sup>57</sup> See, for example, the [analyst's report](#) on Société Générale's earnings for the second quarter of 2021.

<sup>58</sup> See, for example, "[European Investment Banks Face A Continued Fight To Remain Competitive](#)", S&P Global, September 2020.

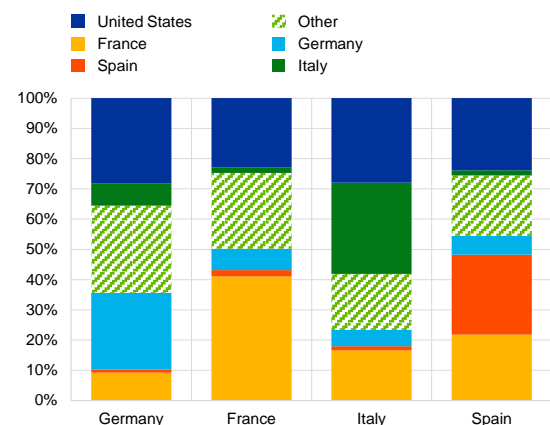
issuance may slow in the years ahead as economic activity returns to pre-pandemic levels, a higher DCM share may suggest more sustained positive news for euro area banks, especially since other market segments continue to be dominated by non-euro area banks (see **Chart A**, panel b).

## Chart B

Persistent home bias across the largest euro area countries, lower fees per deal and an increase in the number of bookrunners per deal have shaped the debt capital markets over the last decade

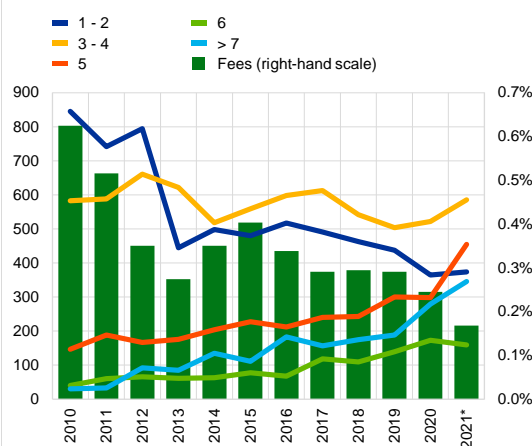
**a) Market share for non-financial bond issuance by country of issuance and domicile of bookrunning bank**

(Q1 2020-Q3 2021, share in total country issuance by bank domicile, percentages)



**b) Bookrunner fees and number of bookrunners by volume of newly issued debt in the euro area non-financial bond market**

(left-hand scale: issuance volume in €billions; right-hand scale: fee as a share of deal volume)



Sources: Dealogic and ECB calculations.

Notes: Panel a: bank domicile based on ultimate parent entity, market share based on apportioned deal value in euro, share in non-financial debt capital markets. Panel b: average fee as a share of deal volume, euro area non-financial debt capital markets; \* refers to a projection based on deals placed in 2021.

**In particular, lower-ranked investment banks have gained market share, perhaps benefiting from home bias in the debt capital markets, the increasing number of bookrunners per deal and broader trends.**<sup>59,60</sup> The debt market share of the top ten banks declined since the early 2000s from nearly 70% in 2001 to 57% currently, and the number of banks active in the debt capital markets has risen. This could reflect many factors. First, as corporate debt issuance has grown, so has the demand for investment banking, while home bias combined with bookrunning trends may have benefited local operators acting as junior partners.<sup>61,62</sup> For instance, Italian and Spanish banks hold almost 30% of their own debt markets, while their market presence in other euro area countries is much less pronounced. By contrast, US investment banks seem to have achieved a stable presence of between 20% and 30% (see **Chart B**, panel a). Second, the last decade has also seen a doubling in the share of deals involving five or more bookrunners (see **Chart B**, panel b). By using multiple bookrunners, debt issuers widen the range of potential investors, which is especially useful as the average tranche size and the number of tranches in deals have increased significantly in recent

<sup>59</sup> "Can investment banking successfully embrace digitalisation?", *International Banker*, March 2021.

<sup>60</sup> Lower-ranked investment banks are those outside the top ten largest investment banks in the euro area.

<sup>61</sup> "Too many banks spoil the bond issue", *Nasdaq*, March 2021.

<sup>62</sup> "Arranger, bookrunner, MLA and other roles in financing transactions", *BBVA*, June 2018.



years. More recently, during the pandemic, banks providing companies with additional liquidity may also have been rewarded for doing so by gaining a place in bond syndicates.<sup>63</sup>

**Overall, although euro area investment banking has benefited from the recent boom in debt issuance, margins are under pressure, with few signs of growth in the more profitable equity and M&A activities.** Euro area banks have relied heavily on expanding volumes for investment banking revenue growth, as the European debt capital markets generate less fee income per unit of debt issued compared with other capital market segments, reflecting the high share of investment-grade bond issuance in the euro area. Furthermore, while the dispersion of euro area DCM activity across a larger number of bookrunners may be positive for market competition and resilience, it has also weighed on fee income per deal (see **Chart B**, panel b). Meanwhile, the more profitable – albeit riskier – segments of the euro area capital markets (equity with a 1.6% fee, high-yield bonds with a 1.2% fee and to some extent also M&A activity with a 0.8% fee and leveraged loans with a 0.6% fee<sup>64</sup>) are relatively underdeveloped, and euro area banks operate at higher costs and with less geographical breadth than their global peers. This suggests that there is scope for euro area investment banks to strengthen their revenue base and make the recent upswing momentum in fees and trading income more permanent.

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### 3.3 Favourable funding costs and slightly lower capital ratios

**Consistent with euro area banks' loan and profitability performance, costs of funding remain favourable and are expected to stay low in the period ahead.**

After a sharp increase during the first half of 2020 amid the uncertainty induced by the coronavirus, bond funding costs gradually returned to pre-pandemic levels. Having marginally increased since August in tandem with inflation expectations, bond funding costs are currently slightly higher than prior to the pandemic, while the costs of deposit funding have declined further (see **Chart 3.10**, panel a). Even though forward contracts suggest a slight increase in interest rates over the next three years, banks' average bond funding costs will continue to decline since maturing bonds can be refinanced at rates that are still lower than their previous yields at issuance. The spreads banks are paying above the risk-free rate to compensate their bondholders for their inherent credit risk have also declined since March 2020, consistent with the recent decrease in the share of banks with a negative rating outlook (see **Chart 3.10**, panel b). But while this suggests that the bulk of the banking sector's downside risk has receded, the share of institutions with a positive rating outlook has remained unchanged, which indicates that the sector is still considered vulnerable to structural problems, climate-related challenges<sup>65</sup> and profitability pressures from the low-rate environment.

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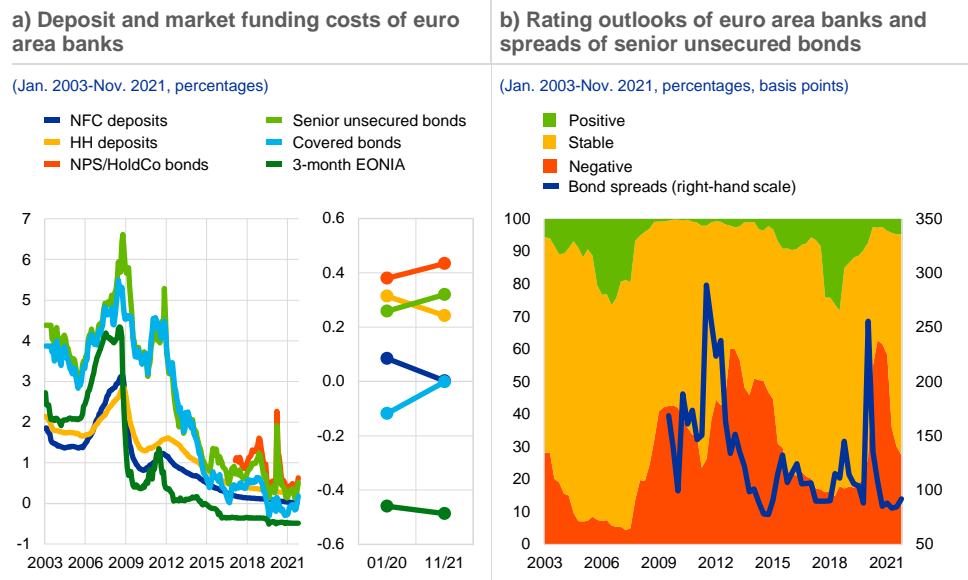
<sup>63</sup> "Corporate Debt: How many investment banks does it take to sell a bond?", Global Capital, January 2018.

<sup>64</sup> Source: Dealogic. For high-yield and leveraged loan deals, this reflects the global average fee.

<sup>65</sup> See also Special Feature B entitled "Climate-related risks to financial stability", *Financial Stability Review*, ECB, May 2021.

**Chart 3.10**

Bank funding costs remain low and improved rating outlooks as well as tighter bond spreads indicate a substantial reduction in downside risks since the pandemic hit

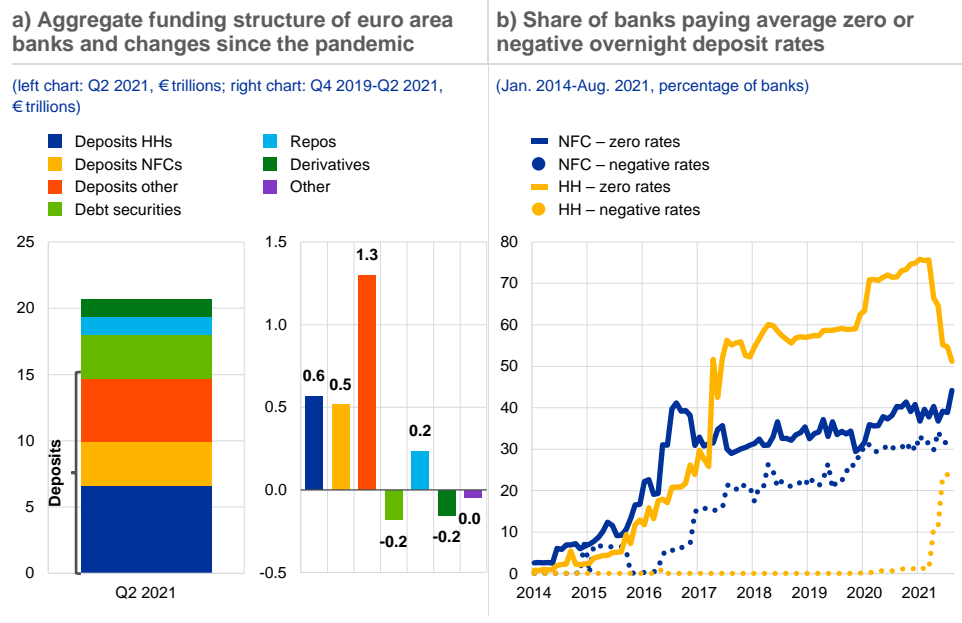


**Euro area banks have seen extraordinary deposit inflows since the start of the pandemic, with the pass-through of negative rates to depositors intensifying.**

Higher household savings, as a consequence of containment measures and corporate borrowing to create liquidity buffers at the start of the pandemic, led to substantial deposit inflows. Between the fourth quarter of 2019 and the second quarter of 2021, the volume of household and corporate deposits at euro area significant institutions increased by €600 billion (+9%) and €500 billion (+18%) respectively, which contributed to a lower need for wholesale funding (see **Chart 3.11**, panel a). While deposits are typically used for payments, the recent rises seem more likely to reflect precautionary saving motives. In turn, while the pass-through of zero or negative deposit rates has largely been extremely gradual since 2014, the extraordinary deposit inflow resulting from the pandemic eventually prompted banks to lower the rates of more household deposits to zero and into negative territory (see **Chart 3.11**, panel b). To compensate for the gradual decline in interest income, banks have also increased fees related to current accounts, credit cards and payment transactions, which is reflected in the increasing contribution of fee and commission income.

### Chart 3.11

There has been an exceptional increase in deposit funding since the start of the pandemic, prompting banks to lower rates for corporate and household depositors



Sources: ECB supervisory data, ECB MFI balance sheet statistics, ECB MFI interest rate statistics and ECB calculations.

Notes: Panel a: based on a balanced sample of 92 significant institutions. Panel b: the computations are based on overnight deposits, using a materiality threshold of  $\pm 1$  basis point, and banks' interest rates are weighted by the respective deposit volumes. HHs: households; MFI: monetary financial institution; NFCs: non-financial corporations; Repos: repurchase agreements.

### While still at robust levels, regulatory capital ratios of euro area banks declined marginally on aggregate during the first half of 2021.

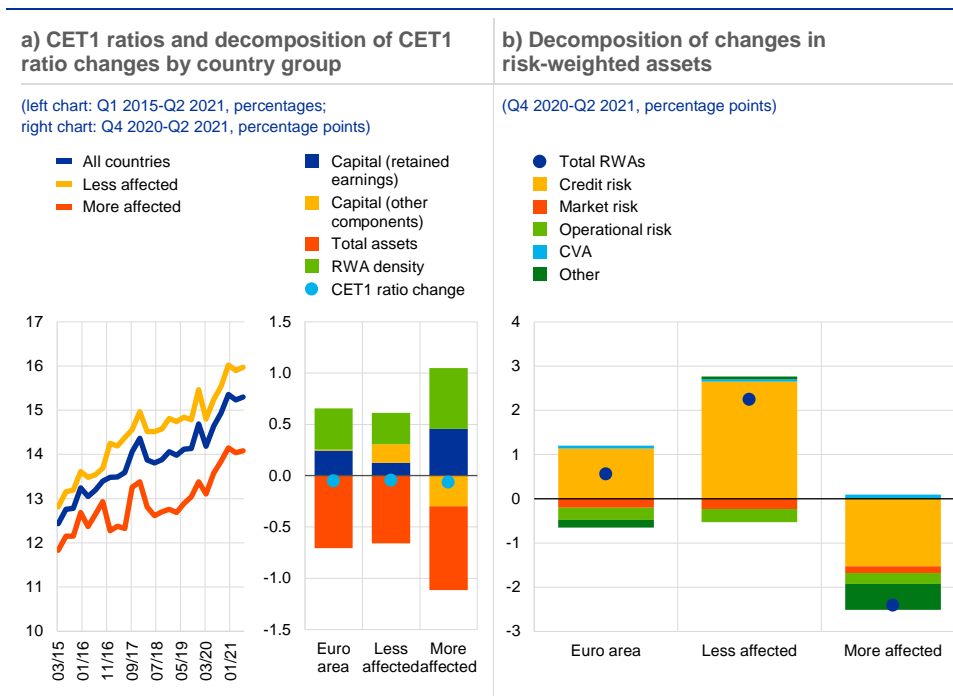
While retained earnings and declining average risk weights contributed to a higher Common Equity Tier 1 (CET1) ratio, this was more than offset by pronounced balance sheet expansion as well as capital erosion (see [Chart 3.12](#), panel a). Noteworthy are the different drivers of the changes in the CET1 ratio across country groups. Balance sheet expansion led to a lower capital ratio in countries less affected by past crises and a mix of balance sheet expansion and capital erosion were the main drivers in more affected countries. Looking at the decomposition of changes in risk-weighted assets reveals that banks in countries less affected by past crises were expanding their risk-weighted assets in the first six months of 2021, whereas banks in more affected countries were still in a risk-off mode (see [Chart 3.12](#), panel b). The increase of risk-weighted assets in the "less affected" country group was mainly driven by higher credit risk associated with an expansion in corporate lending.

### Despite signs of a substantial reduction in pandemic-related tail risks and robust capital positions, credit risks are likely to materialise with a lag.

While banks are equipped with solid capital buffers above regulatory minimum requirements, they face challenges due to the expiry of public support measures alongside a potential rise in corporate insolvencies. The macroprudential stress test conducted by the ECB, given its dynamic balance sheet perspective, complements the EU-wide stress test run by the European Banking Authority and ECB Banking Supervision (see [Box 6](#)).

**Chart 3.12**

Banks' regulatory capital ratios declined slightly with different factors driving the changes across country groups



Sources: ECB supervisory data and ECB calculations.

Notes: Based on a balanced sample of 92 significant institutions. "Less affected" refers to countries less affected by past crises (i.e. by the global financial and euro area sovereign debt crises) and "more affected" to countries more affected by past crises. Countries more affected by past crises include Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain. CET1: Common Equity Tier 1; CVA: credit valuation adjustment; RWAs: risk-weighted assets. Panel a: The CET1 ratio refers to the transitional definition.

**Equity prices of euro area banks have returned to pre-pandemic levels.** The rally in bank stock prices that started in November 2020 with the vaccine approval and was later on driven by higher inflation expectations brought banks' equity prices back to pre-pandemic levels in June (see [Chart 3.13](#), panel a).<sup>66</sup> Since then the magnitude of the anticipated economic recovery, the related inflationary implications and also bank stock prices were affected by fears of coronavirus mutations, on the one hand, and supply-chain price pressures, on the other. That bank stock prices have reached, but not yet substantially exceeded, pre-pandemic levels suggests that market participants consider the sector to have overcome pandemic-induced challenges, but that structural challenges resulting from cost inefficiencies and low profitability still prevail.

**Better capitalised banks tended to outperform other banks on rising prospects of a resumption of dividend payouts and share buybacks.** Since June when the lifting of caps on euro area banks' capital distributions was discussed more actively, stocks of better capitalised banks have tended to outperform the overall sector. Even though only a small number of banks have outlined their payout plans, banks with stronger capital positions seem to have more room for manoeuvre (see [Chart 3.13](#), panel b).

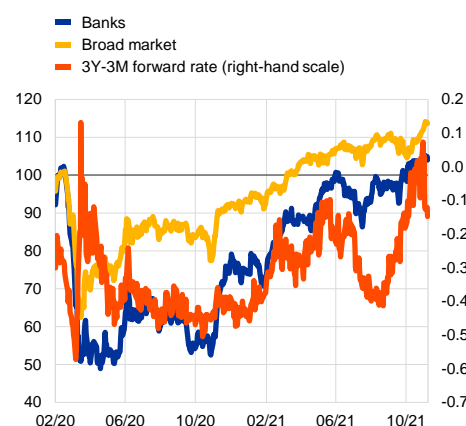
<sup>66</sup> See also Special Feature B entitled "Prospects for euro area bank lending margins in an extended low-for-longer interest rate environment", *Financial Stability Review*, ECB, November 2020.

### Chart 3.13

Bank stock prices are back at pre-pandemic levels and since June better capitalised banks have tended to outperform the sector amid capital distribution plans

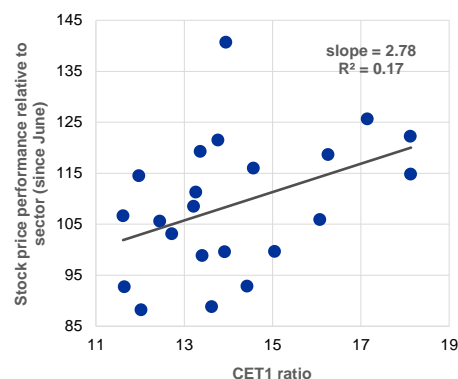
a) Stock prices of euro area banks and the broader market as well as forward rates

(3 Feb. 2020-9 Nov. 2021, left-hand scale: index: 20 Feb. 2020 = 100; right-hand scale: percentages)



b) Bank stock price performance relative to the sector vis-à-vis capital ratio

(4 Jun.-9 Nov. 2021, index: 4 June 2021 = 100)



Sources: ECB, Refinitiv, Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a: the "Broad market" index refers to the Euro Stoxx 50 Price Index; the "Banks" index refers to the EURO STOXX Banks Index; the 3Y-3M forward rate refers to the rate of a three-month EONIA three years from now. CET1: Common Equity Tier 1; M: month; Y: year. Panel b: the chart is based on the listed banks included in the EURO STOXX Banks Index.

### Box 6

#### ECB macroprudential stress test complements the EBA/SSM stress tests results in 2021

Prepared by Katarzyna Budnik and Johannes Gross

**The ECB's biennial macroprudential stress test evaluates the resilience of the euro area banking system, this year also assessing the impact of pandemic-related policy measures<sup>67</sup>.**

The macroprudential stress test exercise complements the supervisory stress test recently published by the European Banking Authority/Single Supervisory Mechanism (EBA/SSM). While relying on the same adverse and baseline scenarios (see **Table A**),<sup>68</sup> it also employs a dynamic balance sheet perspective and introduces amplification mechanisms.<sup>69,70</sup> This year it also examined a number of

<sup>67</sup> [Macroprudential stress test of the euro area banking system amid the coronavirus \(COVID-19\) pandemic](#), ECB, October 2021.

<sup>68</sup> The two scenarios employed in the macroprudential stress test are aligned with the scenarios from the recently published EU-wide stress test (see ESRB, [Macro-financial scenario for the 2021 EU-wide banking sector stress test](#), 2021). The baseline scenario is equivalent to the Eurosystem and ECB staff macroeconomic projections from December 2020, and was revised upwards in September 2021. The adverse scenario follows a different scenario selection procedure to that described in **Box 6** of the November 2020 edition of the FSR.

<sup>69</sup> The dynamic modelling approach builds on a macro-micro model tracking the evolution of all 19 euro area economies and that of 89 significant banking banks covering approximately 70% of the euro area banking sector. Banks' behavioural responses are modelled with empirical relationships representing their reactions in terms of lending volumes, loan pricing, liability structure and profit distribution. A more detailed description of the methodology and structure of the Banking Euro Area Stress Test (BEAST) model and of the implementation of stress test scenarios can be found in Budnik et al., "[Banking euro area stress test model](#)", *Working Paper Series*, No 2469, ECB, November 2020.

<sup>70</sup> In terms of assumptions, the main differences between the constant and the dynamic balance sheet stress test exercises can be summarised by the presence of additional amplification mechanisms, the release of additional constraints such as zero recovery rates and constant dividend payout ratios. The differences and their implication are discussed in detail in [Macroprudential stress test of the euro area banking system amid the coronavirus \(COVID-19\) pandemic](#), ECB, October 2021.

remaining pandemic-related policy measures, including the profit distribution restrictions phased out at the end of September 2021, public guarantee programmes and public moratoria.

**Table A**

Baseline and adverse scenarios in the EBA/SSM and macroprudential stress test exercises

| Year | GDP growth (%)          |         | Unemployment rate (%)              |         |
|------|-------------------------|---------|------------------------------------|---------|
|      | Baseline                | Adverse | Baseline                           | Adverse |
| 2021 | 3.9                     | -1.5    | 9.3                                | 10.4    |
| 2022 | 4.2                     | -1.9    | 8.2                                | 11.5    |
| 2023 | 2.1                     | -0.2    | 7.5                                | 12.4    |
| Year | Three-month EURIBOR (%) |         | Ten-year government bond yield (%) |         |
|      | Baseline                | Adverse | Baseline                           | Adverse |
| 2021 | -0.54                   | -0.54   | -0.11                              | 0.02    |
| 2022 | -0.54                   | -0.54   | 0.01                               | 0.17    |
| 2023 | -0.50                   | -0.54   | 0.13                               | 0.18    |

Source: Macro-financial scenario for the 2021 EU wide banking sector stress test, ESRB 2021.

Note: The table is taken from the macro-financial scenario for the 2021 EU-wide banking sector stress test published by the ESRB on 29 January 2021, excluding the feedback loop between the macro environment and banking sector. EUR swap rate 3M.

**In the baseline scenario, the system-wide CET1 ratio returns from around 15.5% at the end of 2020 to its pre-pandemic level of 14-14.8% in 2023 within a 90% uncertainty band.**<sup>71</sup> The baseline scenario features a strong rebound in economic activity during 2021 and 2022. The slight decline in bank capitalisation compares with a final CET1 ratio of 15.8% in the EBA/SSM exercise (see **Chart A**, panel a). This reflects an expansion of bank assets in the macroprudential exercise coupled with a strong rebound in profit distribution by financial institutions.

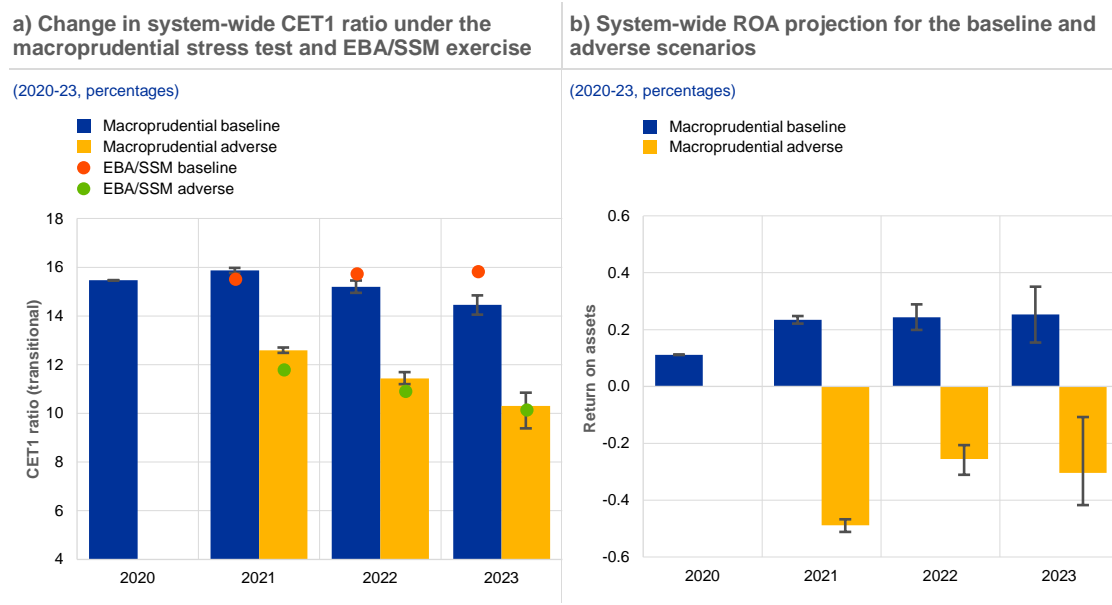
**Despite relatively strong bank capitalisation under the baseline scenario, the results emphasise some financial stability concerns.** In the face of increasing credit default risk due to corporate solvency challenges in sectors highly impacted by the pandemic and the phasing-out of different policies measures, bank profitability remains muted,<sup>72</sup> representing a risk to the long-term sustainability of solvency levels. Bank profitability stays negative throughout the adverse scenario due to increasing credit losses over time along with lasting adverse economic conditions amplified by real-financial feedback loop impacts in the medium term (see **Chart A**, panel b).

<sup>71</sup> The macroprudential stress test projections starting at the beginning of 2021 take into account parameter uncertainty in the estimated core model equations. Bank solvency results are reported as transitional CET1 ratio.

<sup>72</sup> Historical average ROA for the selected bank sample is 0.99% (2015-20).

## Chart A

Macroprudential stress test yields a slight decline in CET1 ratios in the baseline scenario as banks expand balance sheets, but a large decline in solvency and profitability in the adverse scenario

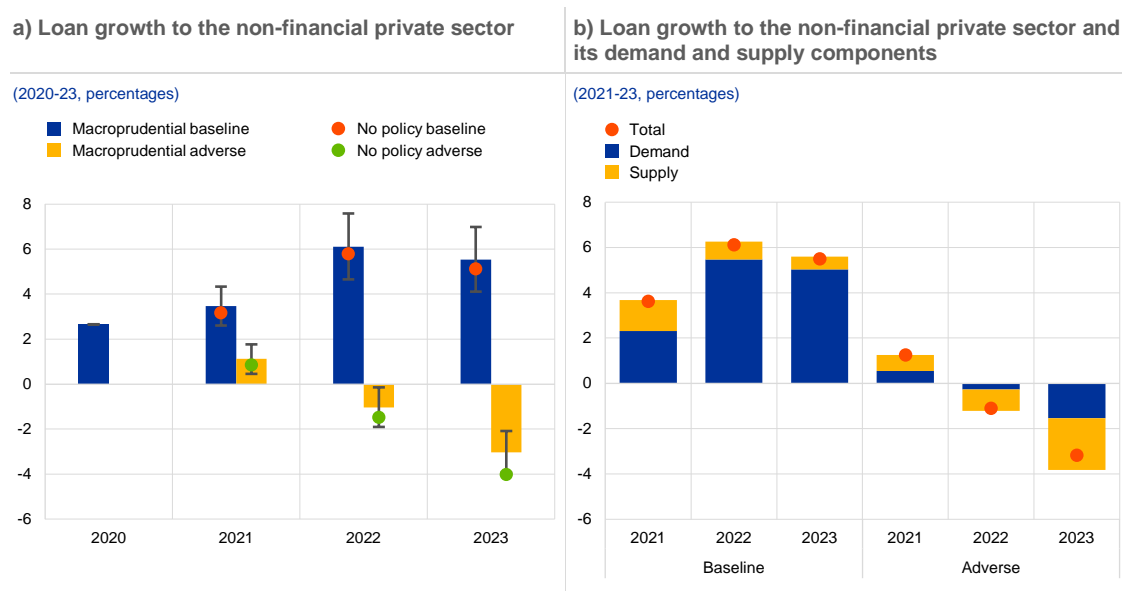


Source: ECB calculations.

Notes: Panel a) illustrates the aggregate CET1 ratio forecast from the macroprudential stress test (blue and orange bars) compared with the EBA/SSM supervisory stress test figures (green and red dots) under a constant balance sheet assumption. Panel b) illustrates bank profitability in terms of return on assets. The whiskers around the bars indicate the parameter uncertainty of the macroprudential stress test projections.

## Chart B

Lending outlook sharply differs for the two scenarios supported by policy support measures, with both demand and supply factors at play

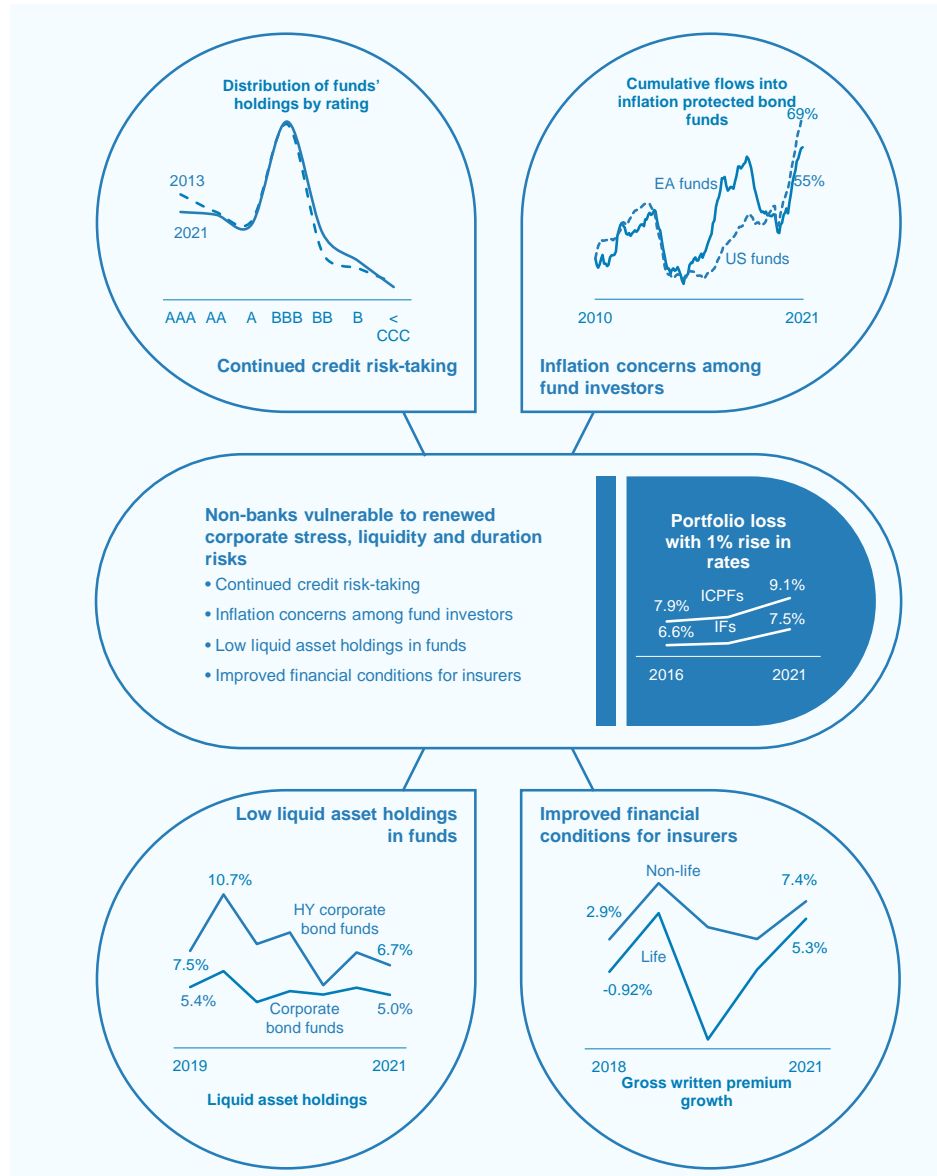


Source: ECB calculations.

Notes: Panel a) illustrates annual loan growth projection for the non-financial private sector in two model settings. The bars represent the annual loan growth with existing policy measures, while the dots represent the resulting loan growth in the absence of policies. The whiskers around the bars indicate model and parameter uncertainty in the macroprudential stress test projections. Panel b) shows the breakdown of annualised loan growth by its demand and supply components.



## 4 Non-bank financial sector



### 4.1 While credit risks moderate, non-banks' vulnerability to duration risk builds amid persistently high liquidity risk

**Although non-banks increased their risk-taking during the pandemic, the economic recovery has reduced their credit risk vulnerability lately.** Credit rating downgrades and the absorption of the relatively high issuance by lower-rated corporates implied that the average credit quality of non-banks' debt portfolios worsened following the start of the pandemic (see **Chart 4.1**, panel a). For example, the share of high-yield assets in investment funds' bond portfolios has increased by

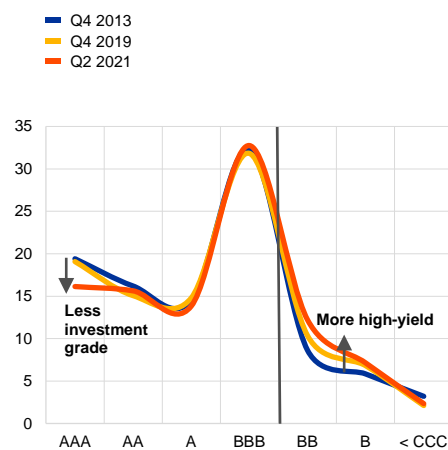
3 percentage points to 22% since the end of 2019. However, near-term vulnerabilities have begun to moderate as macroeconomic conditions have improved amid favourable financing conditions for firms. As a result, the number of downgrades and debt holdings with a negative rating outlook is converging back towards pre-pandemic averages (see [Chapter 2](#)), reducing the credit risk vulnerability of non-banks' portfolios (see [Chart 4.1](#), panel b).

### Chart 4.1

Non-banks increased their risk-taking during the pandemic, but the economic recovery has reduced their credit vulnerabilities

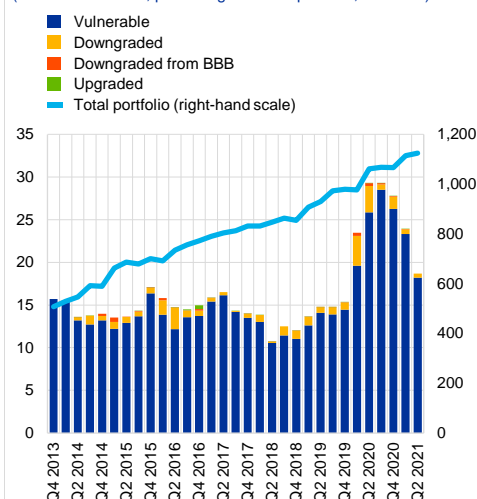
a) Distribution of euro area investment funds' bond holdings by credit rating

(Q4 2013-Q2 2021, percentage of bond portfolio)



b) Non-banks' holdings of euro area non-financial corporate bonds by rating status

(Q4 2013-Q2 2021, percentage of bond portfolio, € billions)



Sources: ECB (securities holdings statistics and Centralised Securities Database) and ECB calculations.

Notes: Panel b: securities are classified as vulnerable when Standard & Poor's has placed the issuer under negative credit watch or negative credit outlook. Non-banks include investment funds, insurance corporations and pension funds.

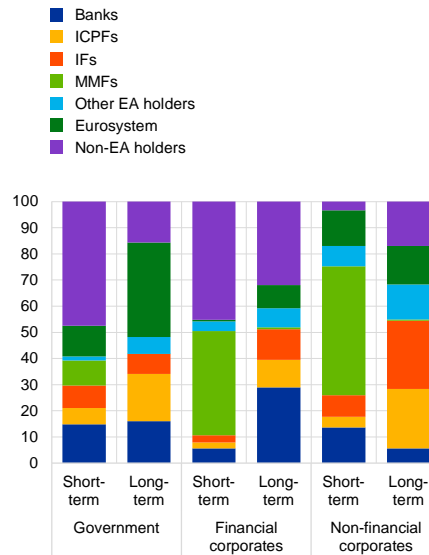
**Non-banks play an important role in debt securities markets (see [Chart 4.2, panel a](#)).** For example, euro area investment funds (IFs) and insurance corporations and pension funds (ICPFs) hold some 50% of euro area non-financial corporate bonds. Short-term commercial paper markets are dominated by money market funds (MMFs), which alone hold about 40% and 50% of the financial and non-financial segments respectively. Moreover, non-banks hold around half of the free-floating euro area sovereign bonds not held by domestic and foreign public sectors. A disruption in market-based credit supply, triggered for example by sudden outflows from MMFs and IFs, could significantly affect the financing cost of sovereigns and firms and have sizeable effects on the real economy (see [Box 7](#)).

**Chart 4.2**

Non-banks play an important role in debt security markets and are increasingly vulnerable to interest rate shocks

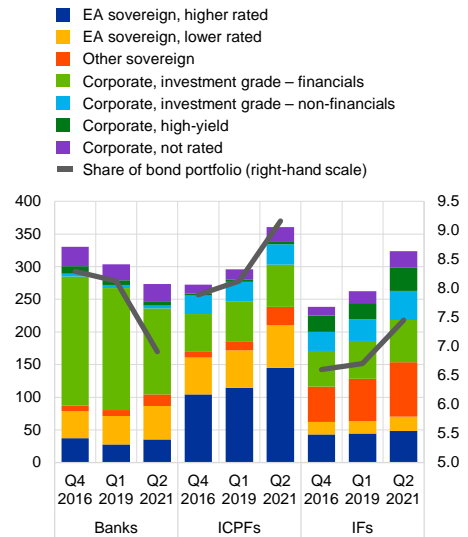
**a) Investor base of debt securities issued by euro area entities**

(Q1 2021, percentages)



**b) Bond portfolio valuation losses by euro area holding sector under a 1 percentage point rise in interest rates**

(Q4 2016, Q1 2019, Q2 2021, € billions, percentage of bond portfolio)



Sources: ECB (quarterly sectoral accounts, securities holdings statistics and Centralised Securities Database) and ECB calculations. Notes: Panel a: the chart shows the breakdown for euro area holding sectors, while all non-euro area holders are aggregated in the purple category due to missing information. Short-term debt securities are defined as having an original maturity of less than one year. Panel b: lower-rated euro area sovereigns refer to countries with credit ratings below AA-. For the calculation, it is assumed that yields-to-maturity of all securities held increase by 1 percentage point. The changes in valuation due to an interest rate increase of one percentage point are calculated as the sum of modified durations multiplied by the amounts held at the security level multiplied by 0.01.

**The duration exposure of non-banks has continued to rise, rendering their portfolios vulnerable to interest rate shocks.**

In their search for yield, non-banks have increased the duration of their debt securities portfolios over recent years. In the absence of hedging strategies, a 1 percentage point rise in yields would lead to bond valuation losses equivalent to 7.5% and 9% of the total fixed income portfolio of IFs and ICPFs respectively (see Chart 4.2, panel b). The wider implications of such valuation losses would depend on the macroeconomic environment. In an adverse scenario, where economic growth deteriorates and yields rise abruptly, such valuation losses could trigger outflows from IFs. Given the continued high liquidity risk among IFs, this could result in forced asset sales that amplify the shock in a procyclical manner (see Section 4.2). By contrast, an increase in yields could instead lead to net capital gains for ICPFs, as a decline in the value of their liabilities could more than offset their losses on assets due to their negative duration gap (see Section 4.3).

## Box 7

### The impact of loan and market-based credit supply shocks on euro area GDP growth

Prepared by Kristina Barauskaitė Griškevičienė, Anh D.M. Nguyen (IMF), Linda Fache Rousová and Lorenzo Cappiello

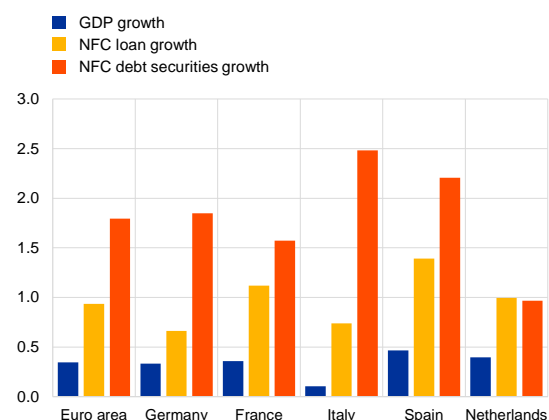
**The global financial crisis put focus on the impact of loan supply on GDP growth – but since then credit to firms has also been increasingly supplied via debt securities.** In the euro area, the credit supplied to non-financial corporations (NFCs) via debt securities, i.e. through market-based debt financing, has doubled from around 10% of total external debt financing to NFCs in 1999 to around 20% in 2020.<sup>73</sup> This structural shift raises the question of the extent to which market-based credit to NFCs, and disruptions in the supply of such credit, play a role in explaining GDP growth – a topic for which there is little empirical evidence so far.

#### Chart A

NFC debt securities growth significantly exceeded NFC loan growth over the last two decades, while supply shocks to both types of NFC debt financing play an important role in explaining GDP growth

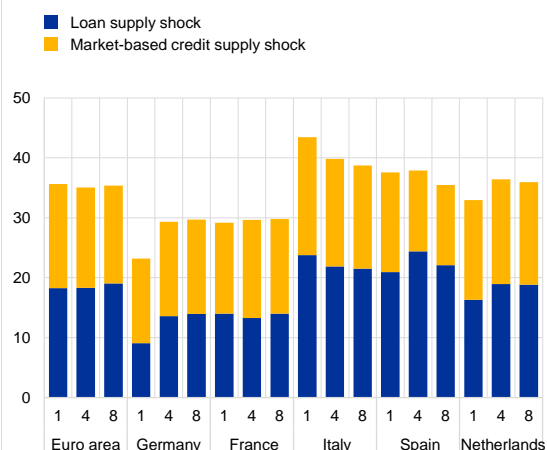
a) Average quarterly growth in GDP, NFC loans and NFC debt securities

(Q1 1999–Q4 2019, percentages)



b) Forecast error variance decomposition of GDP growth one, four and eight quarters ahead

(percentages; forecast horizon)



Sources: ECB (euro area accounts, MFI balance sheet item statistics and financial vehicle corporation statistics), Eurostat, Datastream, Gilchrist and Mojon, and authors' calculations.

Notes: Panel a: NFC loans include loans provided to euro area NFCs by euro area banks, euro area non-banks and the rest of the world. NFC debt securities include debt securities issued by euro area NFCs. Panel b: the bars depict the explanatory power of the two types of shock in explaining real GDP growth in a quarterly Bayesian VAR model estimated on a country-by-country basis with six endogenous variables using data from Q1 1999 to Q4 2019. Corporate bond spreads for the euro area, Germany, France, Italy and Spain are available from Gilchrist, S. and Mojon, B., "Credit Risk in the Euro Area", *The Economic Journal*, Vol. 128(608), 2018, pp. 118-158; corporate bond spreads for the Netherlands are calculated by the authors.

**To help fill this gap, this box uses a Bayesian vector autoregression (BVAR) model to estimate the impact of both loan and market-based credit supply shocks on quarterly GDP growth in the euro area.**<sup>74</sup> The model includes six endogenous variables: NFC nominal loan growth, NFC nominal debt securities growth, real GDP growth, inflation, the corporate bond spread and the one-year nominal interest rate. To identify credit supply shocks, the model applies sign restrictions consistent with the recent macroeconomic literature,<sup>75</sup> while a novel identification

<sup>73</sup> See *Financial Stability Review*, ECB, November 2020, Section 4, Chart 4.1 (left panel).

<sup>74</sup> For a fuller discussion of the model and its results, including various robustness checks (e.g. different identification schemes), see Barauskaitė et al., "The impact of credit supply shocks in the euro area: Market-based financing versus loans", *Working Paper Series*, ECB (forthcoming).

<sup>75</sup> See, for example, Gambetti, L. and Musso, A., "Loan supply shocks and the business cycle", *Journal of Applied Econometrics*, Vol. 32(4), 2017, pp. 764-782, and Mumtaz et al., "What do VARs tell us about the impact of a credit supply shock?", *International Economic Review*, Vol. 59(2), 2018, pp. 625-646.

scheme with inequality restrictions is used to distinguish between the two types of credit supply shock (loan supply shocks and market-based credit supply shocks).<sup>76</sup> The model is estimated country-by-country for the five largest euro area countries and the euro area as a whole. Except for the Netherlands, the average debt securities growth significantly exceeded the average loan growth between 1999 and 2019, which in turn exceeded the average GDP growth in all five countries (see **Chart A**, panel a).

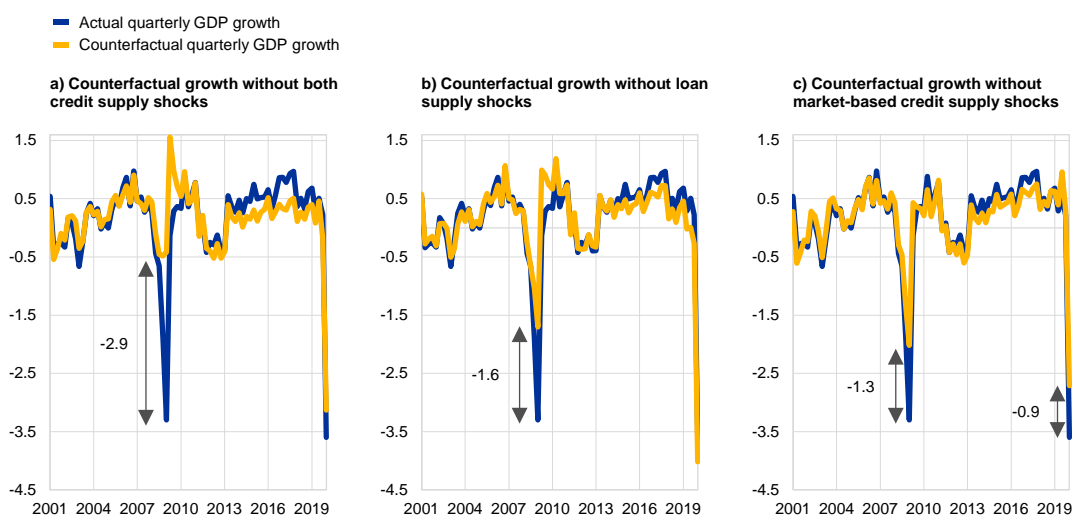
**Overall, market-based credit supply shocks are found to play an important role in explaining GDP growth (see Chart A, panel b).** On aggregate for the euro area, the explanatory power of market-based credit supply shocks is found to be comparable to that of loan supply shocks. In Germany and France, where corporate debt markets are relatively well developed, the explanatory power of market-based credit supply shocks exceeds that of loan supply shocks, and their impact on GDP growth is also highly persistent.

### Chart B

Both types of credit supply shock had a major impact on euro area GDP growth during the global financial crisis, while their impact was less pronounced in the early 2020 pandemic-induced recession

#### Historical decomposition of euro area quarterly GDP growth

(Q1 2001-Q1 2020, percentages)



Sources: ECB (euro area accounts, MFI balance sheet item statistics and financial vehicle corporation statistics), Eurostat, Datastream, Gilchrist and Mojon, and authors' calculations.

Notes: The historical decomposition reveals how much of the actual fluctuations in GDP growth is explained by the two credit supply shocks. The blue lines show actual quarterly GDP growth. The yellow lines depict the counterfactual quarterly GDP growth when excluding (i) both loan and market-based credit supply shocks (panel a), (ii) loan supply shocks (panel b), and (iii) market-based credit supply shocks (panel c). The difference between the blue and yellow lines depicts the contribution of the credit supply shock(s) excluded from the counterfactual GDP growth in explaining the actual GDP growth. For instance, in Q1 2009, the two credit supply shocks explain a GDP drop of around 2.9%, as depicted by the arrow in panel a. The results are based on the same model as in Chart A (panel b) for the euro area, except that the time period also includes the first two quarters of 2020 and a stochastic volatility framework is used over the entire sample to account for the exceptionally large shocks caused by the pandemic-related crisis.

#### The historical decomposition for the euro area also underscores that the two credit supply shocks explained most of the fall in GDP during the global financial crisis (see Chart B).

Specifically, in the first quarter of 2009, GDP fell by 3.3%, with the two credit supply shocks explaining a GDP drop of around 2.9% (see **Chart B**, panel a), comprised of 1.6% attributable to a loan supply

<sup>76</sup> Specifically, the contemporaneous response of loans (debt securities) is assumed to be the largest for the loan (market-based credit) supply shock as compared with the responses of other variables to this shock, along the lines of Peersman, G., "What caused the early millennium slowdown? Evidence based on vector autoregressions", *Journal of Applied Econometrics*, Vol. 20(2), 2005, pp. 185-207.

shock and 1.3% attributable to a market-based credit supply shock (see **Chart B**, panels b and c respectively).

**By contrast, the impact on GDP of the two credit supply shocks was less pronounced during the pandemic-induced recession in early 2020.** The market-based credit supply shock appears to have had an adverse impact on GDP (explaining a GDP drop of around 0.9%), while this is not the case for the loan supply shock. These results likely reflect the greater impact of the March 2020 market turmoil on non-bank financial intermediaries than on banks (see below). Overall, the lesser impact of credit supply shocks on GDP growth than in the global financial crisis is in line with the non-financial origin of the 2020 pandemic-induced recession.<sup>77</sup>

**As market-based credit is mostly provided by non-bank financial intermediaries, our findings suggest that their resilience is important for GDP growth.**<sup>78</sup> In this respect, enhancing the macroprudential framework for non-banks would strengthen the resilience of market-based financing, while also supporting GDP growth. For instance, in March 2020, non-banks shed assets on a large scale and market-based debt financing dried up, while NFCs continued to benefit from loans and credit lines provided by banks. Several factors supported the flow of bank credit to NFCs during the turmoil, including government guarantees and moratoria on loans together with the provision of liquidity to banks by central banks. Nevertheless, the regulatory reforms of the banking system after the global financial crisis, including macroprudential measures, also made banks more resilient to shocks. From this perspective, our results call for more regulatory attention relating to non-banks going forward (see **Section 5.2**).

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## 4.2 Bond funds could amplify market dynamics in a scenario of abruptly increasing global rates

**After an extended period of strong inflows into riskier fund types, investors' risk appetite has softened in recent months.** Investor demand for riskier fund types surged at the end of 2020 on the back of rising optimism regarding the vaccination outlook and economic recovery, and this lasted well into 2021.<sup>79</sup> Since mid-2021, however, there have been signs that risk-taking is moderating, with investors rebalancing towards less risky assets. There have been outflows from some riskier fund types such as small cap and emerging market equity funds, while flows into money market funds, sovereign bond funds and high-quality corporate bond funds have increased.<sup>80</sup> Environmental, social and governance (ESG) funds have continued to grow rapidly and still exhibit comparably large inflows, albeit at a slightly slower pace (see **Chart 4.3**, panel a). Combined with other evidence, this suggests that ESG

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<sup>77</sup> This supports the results for the COVID-19 shock estimated by the model, which are subject to a large uncertainty owing to the limited sample period.

<sup>78</sup> See Chart 4.2 and the related text.

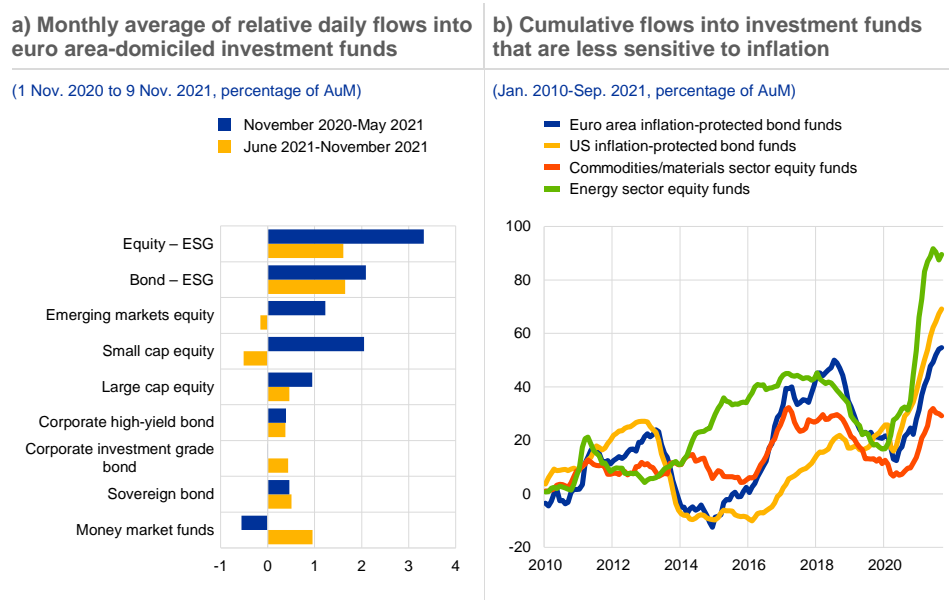
<sup>79</sup> See Section 4.1, *Financial Stability Review*, ECB, May 2021.

<sup>80</sup> On the back of continued inflows and increasing valuations, equity funds are larger than bond funds in terms of total assets since November 2020 and account for 32% of the euro area investment fund sector as of August 2021. According to ECB statistics, bond funds had been the largest segment since 2008 but only account for 25% of the investment fund sector as of August 2021.

fund flows may depend less directly on financial performance than on investor sensitivity to environmental and social issues.<sup>81</sup>

### Chart 4.3

Investors' risk appetite moderated while demand for inflation hedges increased



Sources: EPFR Global and ECB calculations.  
Notes: AuM: assets under management. Panel a: the geometric monthly averages ensure comparability of the flows over time periods of different length. Panel b: euro area and US-domiciled inflation-protected bond funds are dedicated to investing in inflation-linked securities, which pay a yield that rises and falls with inflation and whose value is therefore immune to inflation changes.

**Flows into inflation-protected bond funds and commodity or energy-dominated funds have increased sharply since the end of 2020, on the back of positive economic and inflation outlooks.** The value of tangible asset classes such as commodities, materials and energy tends to increase as economic growth and inflation pick up. Funds exposed to these asset classes received strong inflows starting from the end of 2020 as investors sought profit opportunities and looked to hedge against inflation risks (see [Chapter 2](#)). Flows into energy and materials/commodities funds have stabilised more recently, while inflows into euro area and US inflation-protected bond funds are still growing strongly (see [Chart 4.3](#), panel b).

**Investment funds have taken on lower duration risk in recent transactions, although they have still accumulated an increased duration risk exposure in recent years.** Investment funds have slowed their purchases of long-duration bonds and increased their exposures to bonds with relatively short maturities (see [Chart 4.4](#), panel a). However, these recent developments have not reversed the steady increase in duration risk in the sector's bond portfolio, which has accumulated over several years of search-for-yield behaviour (see [Chart 4.2](#), panel b). This elevated duration exposure will leave the unhedged parts of investment funds' bond portfolios vulnerable to valuation losses if there is a material increase in global yields (see [Chapters 1 and 2](#)). In an adverse economic scenario characterised by deteriorating

<sup>81</sup> See the special feature entitled "Climate-related risks to financial stability", *Financial Stability Review*, ECB, May 2021.

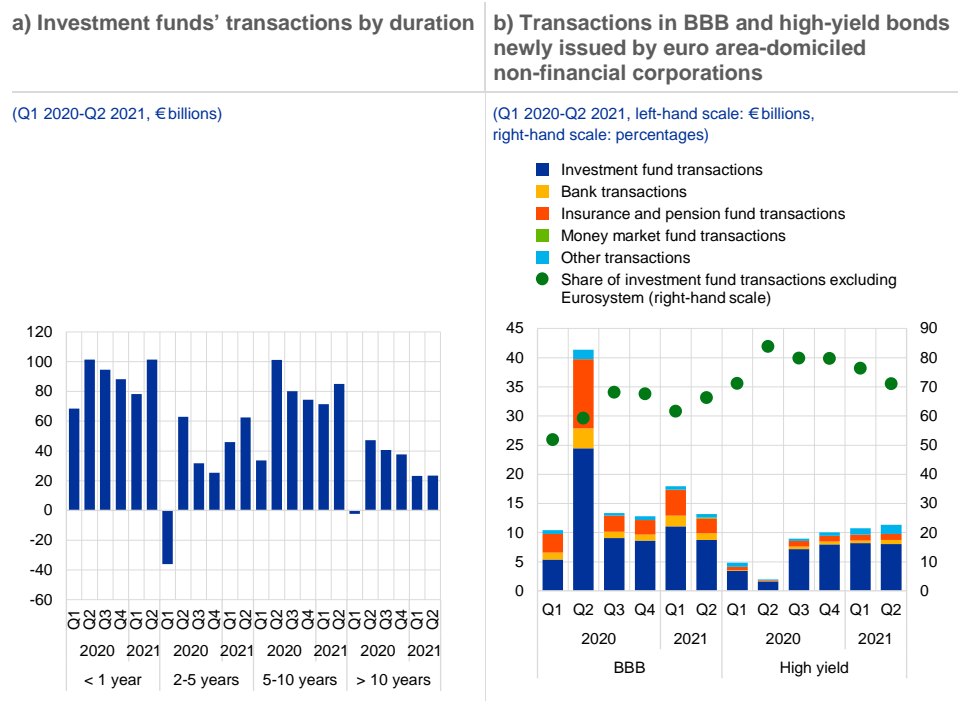


growth and an abrupt rise in yields, such valuation losses could trigger outflows from bond funds.

**Investment funds have further increased their exposure to credit risk, although this risk is unlikely to materialise in the short run.** Once again, the sector absorbed a large share of the record high issuance of BBB and high-yield bonds by euro area non-financial corporations in the first two quarters of 2021 (see **Chapter 2** and **Chart 4.4**, panel b), providing financing to these companies and increasing the credit risk on funds' bond portfolios. However, this risk is unlikely to materialise in the short term as the economy is recovering and financing conditions remain favourable on the back of official sector support (see **Section 4.1**).

#### Chart 4.4

Investment funds have taken on duration and credit risk since the crisis, although there are first signs of rebalancing towards lower duration



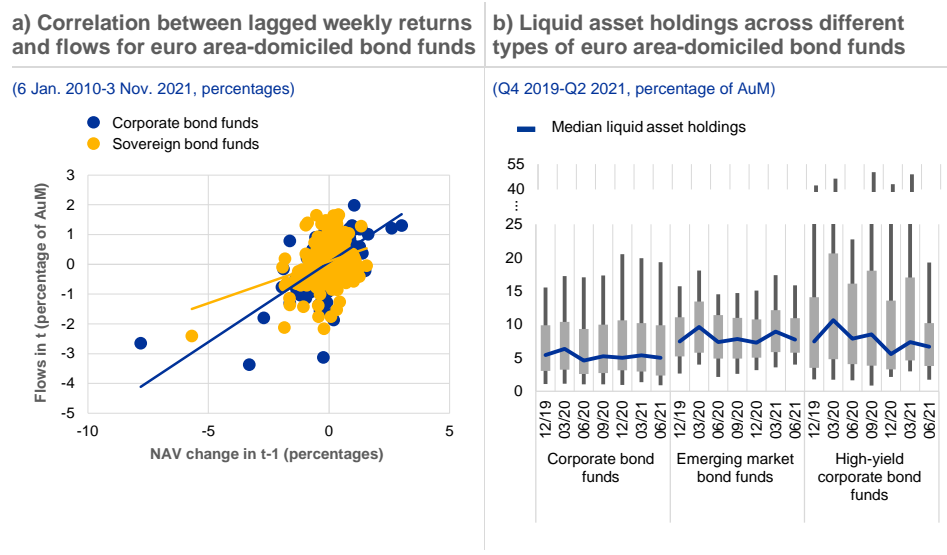
Sources: ECB (securities holdings statistics and Centralised Securities Database) and ECB calculations.  
 Note: Panel a: overall, investment funds are net buyers of duration as the duration in their bond portfolios shrinks continuously with bond holdings approaching their maturities. The chart illustrates a change in buying pattern for different duration buckets. Panel b: the data displayed only include long-term debt securities.

**Real estate markets may give rise to additional risks.** The real estate fund segment in the euro area is fairly small, with total assets standing at €1.1 trillion in August 2021 representing 6.5% of the total investment fund sector. This segment might, however, be vulnerable to future price corrections stemming from continued weakness in the commercial real estate market or from medium-term downside risks in the residential real estate market. Funds exposed to non-prime commercial real estate segments might be especially vulnerable in the short term (see **Section 1.5**). In addition, given the fact that open-ended real estate funds – which account for 80% of the total assets of real estate funds – are invested in highly illiquid assets, material price corrections could trigger procyclical sales and further exacerbate negative

market dynamics.<sup>82</sup> This highlights the importance of better aligning the redemption terms of such funds with their asset liquidity (see [Chapter 5](#)).

### Chart 4.5

Low liquidity in investment funds may contribute to procyclical investor dynamics



Sources: EPFR Global, Refinitiv, ECB (Centralised Securities Database) and ECB calculations.  
Notes: Panel a: the correlation between returns in period t-1 and flows one period ahead (in t) based on weekly data since 2010. The chart shows single observations and regression lines for corporate and sovereign bond funds. NAV: net asset value. Panel b: distribution of liquid assets over total assets across funds by fund type. The boxes correspond to the interquartile range and the whiskers to the 10th-90th percentiles. Liquid assets include cash, cash equivalents and high-quality liquid asset bonds according to Basel liquidity coverage ratio requirements for HQLA (Commission Delegated Regulation (EU) 2015/61). Data refer to euro area-domiciled bond funds only. High-yield corporate bond funds primarily invest in high-yield bonds. This sample is distinct from the corporate bond fund sample, which can have a broader investment focus irrespective of rating quality. AuM: assets under management.

**Liquid asset holdings in certain bond fund categories remain low, and there is evidence of pockets of high leverage in bond and hedge funds.**<sup>83</sup> Both financial and synthetic leverage amplify returns in good times, but in bad times leverage amplifies losses. In addition, if leverage is built up synthetically by using derivatives for instance, margin calls could add to the liquidity needs of funds during periods of stress. Funds are also exposed more generally to high liquidity risks. Given the low liquid asset holdings in certain fund types (see [Chart 4.5](#), panel b), large redemptions prompted by valuation losses or other shocks might force funds to sell assets that are less liquid. This could lead to a negative feedback loop between asset valuations and redemptions which could amplify adverse market dynamics. In addition, investors tend to behave more procyclically in riskier and less liquid fund segments, such as corporate bond funds (see [Chart 4.5](#), panel a), as well as in more highly leveraged

<sup>82</sup> Although not all open-ended funds offer high frequency redemptions, liquidity mismatches remain a key vulnerability in the open-ended commercial real estate fund sector ([EU Non-bank Financial Intermediation Risk Monitor](#), No 6, ESRB, August 2021).

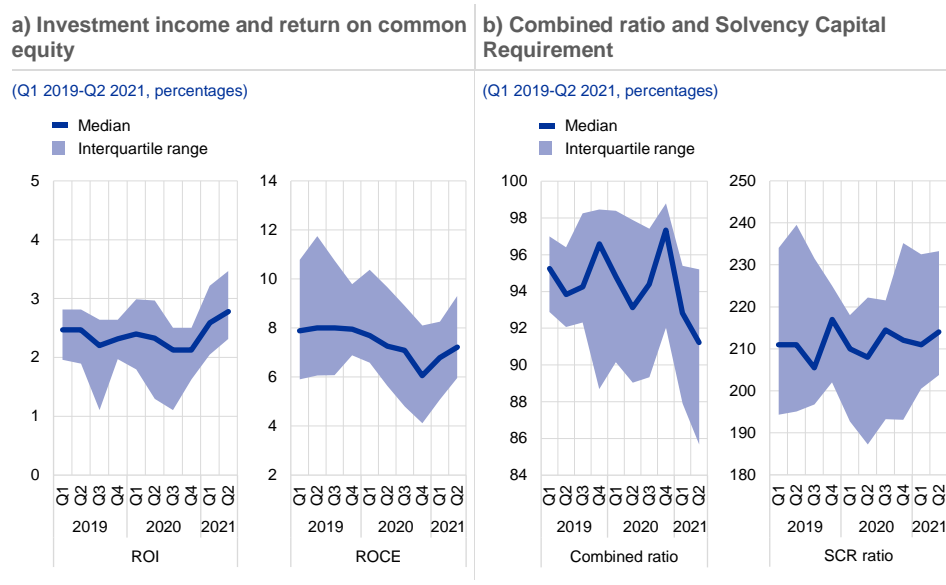
<sup>83</sup> According to the European Securities and Markets Authority, leverage (including both financial and synthetic leverage) in the alternative fund sector is concentrated in hedge funds. While end-2020 median and third quartile leverage stood at 124% and 250% respectively, there is evidence of single funds with higher leverage ([ESMA Report on Trends, Risks and Vulnerabilities](#), No 2, ESMA, September 2021; [EU Alternative Investment Funds](#), ESMA, April 2021). There is also evidence of highly leveraged bond funds (see the special feature entitled “[Towards a framework for calibrating macroprudential leverage limits for alternative investment funds](#)”, *Financial Stability Review*, ECB, November 2016).

funds.<sup>84</sup> These structural vulnerabilities highlight the need to strengthen the resilience of the investment fund sector from a macroprudential perspective (see [Chapter 5](#)).

### 4.3 Insurers’ financial condition improves, though the sector faces several medium-term headwinds

**The euro area insurance sector continued to withstand the impact of the pandemic and other shocks well.** Overall insurance sector profitability improved in the first half of 2021 (see [Chart 4.6](#), panel a). Underwriting and investment income went up, in line with the economic recovery and buoyant financial markets (see [Chapters 1](#) and [2](#)). Claim-related losses and expenses as a proportion of earned premiums – known as the combined ratio – decreased further and remained well below 100% for most non-life insurers (see [Chart 4.6](#), panel b). The improved combined ratios resulted from (i) subdued claims volumes in some business lines (e.g. health), and (ii) premium and rate increases at recent renewals (see [Chart 4.7](#)). This solid performance, coupled with a slight increase in long-term risk-free interest rates, enabled insurers to continue accumulating capital during the first half of the year, with the median Solvency Capital Requirement (SCR) ratio at over 214%, significantly higher than the 100% regulatory requirement (see [Chart 4.6](#), panel b).

**Chart 4.6**  
Insurers’ profitability and solvency ratios have improved, supported by solid underwriting and investment income



Sources: Bloomberg Finance L.P. and ECB calculations.  
Notes: Based on a sample of up to 25 large euro area insurers offering life and non-life products. The full sample is not covered in 2021 due to reporting lags. Panel a: ROI: return on investment; ROCE: return on common equity; SCR: Solvency Capital Requirement.

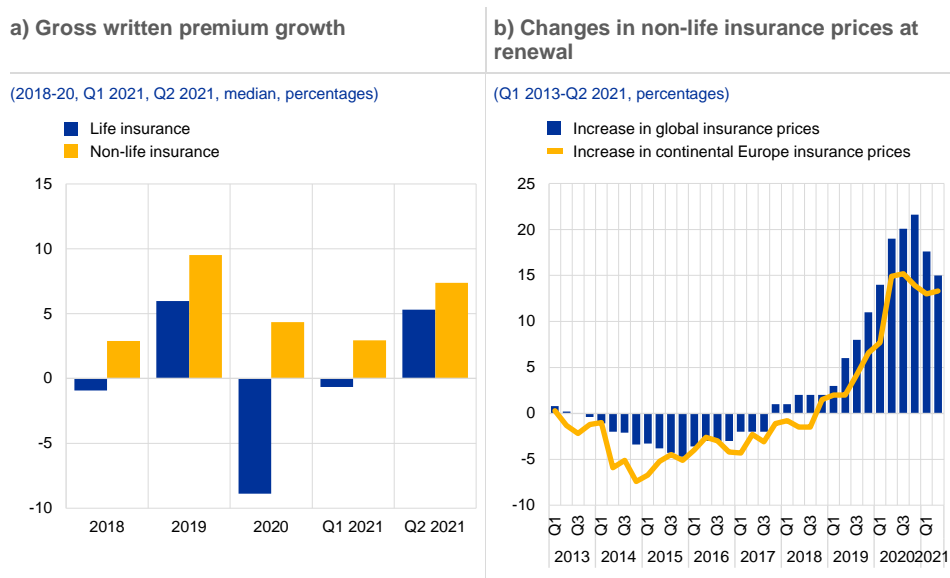
#### The outlook for insurers’ profitability and credit ratings has also been improving on the back of supportive trends for demand, pricing and

<sup>84</sup> See Molestina Vivar, L., Wedow, M. and Weistroffer, C., “Burned by leverage? Flows and fragility in bond mutual funds”, *Working Paper Series*, No 2413, ECB, May 2020.

**cost-cutting.** Demand for insurance products has increased amid growing risk awareness among corporates and households coupled with the strong and swift economic recovery (see [Chapter 1](#)). This is reflected in the growth in life (mainly driven by sales of unit-linked products) and non-life gross written premiums (see [Chart 4.7](#), panel a). Non-life insurance lines are still benefiting from a positive pricing environment (see [Chart 4.7](#), panel b), with renewals made at sustained double-digit price increases for the last five quarters in Europe. A second shift relates to consumer demand for digitalisation, which has accelerated insurers' initiatives to build up new digital capabilities, paving the way for cost reductions and enhanced profitability. These improvements in the operating environment are reflected in the increasing changes from negative to stable rating outlook for some insurers.

### Chart 4.7

Rising risk awareness amid the upbeat cyclical economic momentum has supported the increase for insurance demand in a positive pricing environment



Sources: Marsh, Bloomberg Finance L.P., ECB Insurance Corporations Operations (ICO) dataset and ECB calculations.  
Note: Panel a: annual numbers refer to total insurance corporations in the euro area and quarterly numbers are based on available data of a sample of 25 large euro area insurers offering life and non-life products.

**Despite the improved outlook, insurers still face conjunctural and structural challenges, including from the cost of cyber incidents.** While pandemic-related claims have been lower than expected, there is still considerable uncertainty in some euro area jurisdictions about some 2020 claims with pending resolution of coverage disputes (mainly in life, health and business interruption lines). Separately, the pandemic has accelerated the digitalisation of the economy, leading to an increase in the amount and cost of cyber incidents, including several high-profile breaches.<sup>85</sup> Despite the potentially systemic<sup>86</sup> and cross-border nature of cyber risk, cyber insurance still represents a small proportion of the global non-life insurance market. Patchy data and a poor understanding of cyber risks by both underwriters and

<sup>85</sup> According to estimates by Cybersecurity Ventures, the global cost of cybercrime could exceed USD 6 trillion in 2021. Ransomware attacks increased over 400% since 2019, according to CrowdStrike, with the average total cost of a ransomware breach being around USD 4.5 million in 2021, according to IBM.  
<sup>86</sup> See *Systemic cyber risk*, ESRB, February 2020.

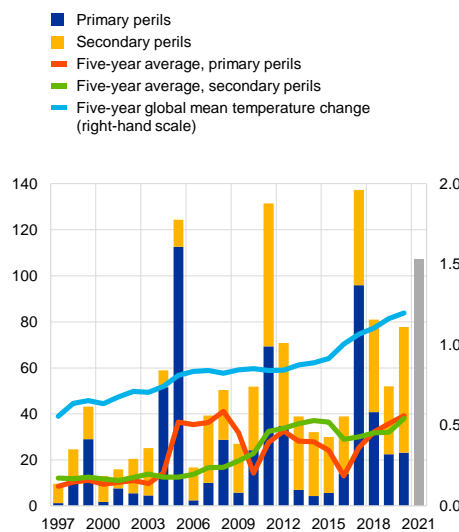
policyholders remain major obstacles for greater growth in this business line and hamper the closing of the cyber insurance protection gap.

### Chart 4.8

Insured losses from secondary, weather-related perils are rising, while catastrophe bond returns continue to attract investors

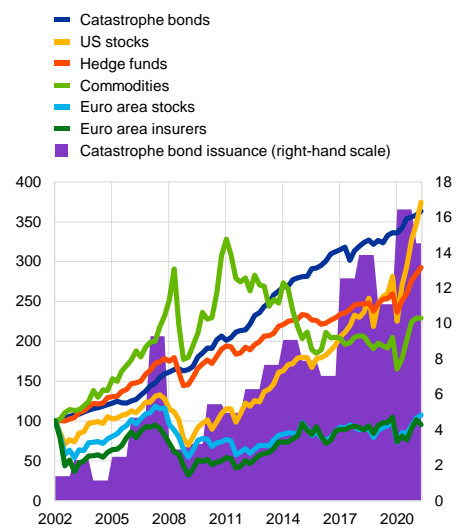
a) Annual global insured losses from primary and secondary perils

(1997-2021, USD billions, degrees Celsius above pre-industrial levels)



b) Cumulative return profiles, broken down by asset class and global catastrophe bond issuance

(Q1 2002-Q2 2021, index: Q1 2002 = 100, USD billions)



Sources: Swiss Re, ECMWF, Copernicus Climate Change Service (C3S), [www.artemis.bm](http://www.artemis.bm) and Steve Evans Ltd., Bloomberg Finance L.P. and ECB calculations.

Notes: Panel a: 2021 is a year-to-date estimate taking into account total insured losses from natural catastrophes with available data and best estimates up to beginning of November 2021. Panel b: S&P 500 and EURO STOXX 50 are used as benchmark indices for US and euro area stocks respectively.

**Notwithstanding some limited increases in long-term yields during the first half of 2021, the protracted low interest rate environment weighs on insurer profitability and incentivises risk-taking.**<sup>87</sup> While the biggest issues arise for small and medium-sized life insurers offering longer-term products with guaranteed returns, low rates affect the sector as a whole through different channels.<sup>88</sup> Despite a recent improvement in profitability, pressure for further risk-taking remains high in the low interest rate environment. In particular, insurers have (i) increasingly shifted their fixed income portfolios towards higher yielding bonds (see **Chart 7** in the **Overview**, panel b), (ii) gradually increased their exposures to higher yielding but potentially riskier alternative assets,<sup>89</sup> and (iii) increased their duration exposure (see **Chart 4.2**, panel b). An increase in interest rates might benefit insurers' capitalisation in a benign scenario characterised by an improvement in the economic outlook, given negative duration gaps.<sup>90</sup> But in a stress scenario featuring a sharp and sudden increase in risk

<sup>87</sup> See *Lower for longer – macroprudential policy issues arising from the low interest rate environment*, ESRB, June 2021.

<sup>88</sup> See the special feature entitled “Euro area insurers and the low interest rate environment”, *Financial Stability Review*, ECB, November 2015.

<sup>89</sup> See Chart 4.7 in *Financial Stability Review*, ECB, May 2021.

<sup>90</sup> See Chart 4.8 in *Financial Stability Review*, ECB, May 2021.

premia, the negative impact on insurers could be significant, especially if they faced correlated and larger than expected losses under strong liquidity pressures. For this reason, the Solvency II framework should introduce a symmetric volatility adjustment and more stringent liquidity measures for insurers with a vulnerable liquidity profile (see [Section 5.3](#)).

**Climate change poses significant and increasing challenges for the euro area insurance sector.**<sup>91</sup> Global insured losses from natural catastrophes in the first half of 2021 made this the second-highest six-month period on record after 2011. The summer floods and wildfires in Europe, together with a worse than average Atlantic hurricane season, have also generated significant losses, setting 2021 on course to be one of the most expensive years for (re)insurers ever in terms of natural hazards.<sup>92</sup> Insured losses from both primary and secondary perils have been on an upward trajectory in recent years (see [Chart 4.8](#), panel a).<sup>93</sup> In Europe, secondary perils have already caused significantly more insured losses than primary perils in the last decade. The rise in losses from weather-related secondary perils underscores how climate-related physical risks are already more frequent and have a larger average magnitude than before. In the medium term, increasing risks related to climate change may also lead to lower insurance coverage against natural catastrophes which would worsen the macroeconomic and fiscal impact of such events.<sup>94</sup> This reaffirms the need to act quickly to tackle the risk of a growing insurance protection gap.

**The natural catastrophe bond market continues to grow, providing stable extra funds to reinsurance capacity.**<sup>95</sup> Catastrophe bonds have been issued at a record-breaking pace in 2021 (see [Chart 4.8](#), panel b), despite the increasing trend of natural catastrophe events and insured losses. In the ongoing search-for-yield environment, natural catastrophe bonds continue to attract inflows as they offer significantly uncorrelated and relatively high returns. In addition, investors prefer the more liquid, transparent and better understood nature of catastrophe bonds (which focus on primary perils) over other segments of the insurance-linked securities (ILS) market (like private ILS funds and collateralised reinsurance) that deal with the greater uncertainty of secondary perils and have suffered some unexpected losses during the last year.

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<sup>91</sup> See [Climate-related risk and financial stability](#), ECB-ESRB Project Team on climate risk monitoring, ECB, July 2021, and the special feature entitled “[Climate-related risks to financial stability](#)”, *Financial Stability Review*, ECB, May 2021.

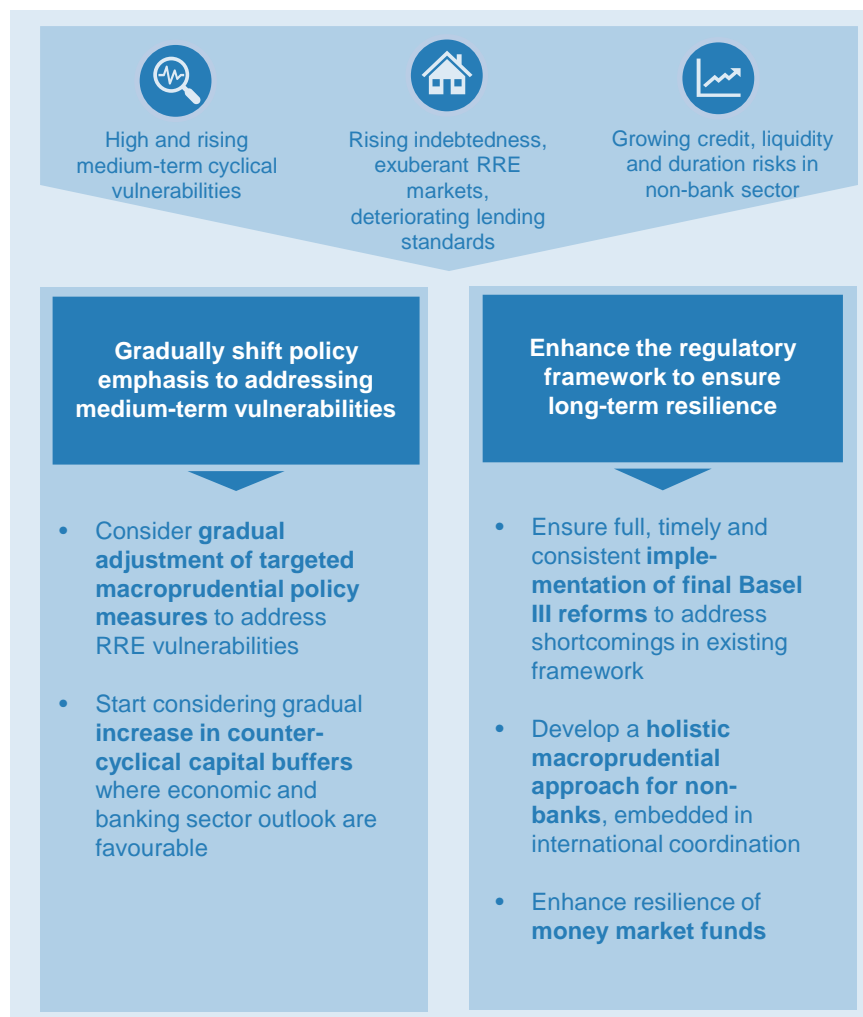
<sup>92</sup> For example, Cresta (a subsidiary of catastrophe data provider Perils) estimates gross insured losses of USD 11 billion from the flooding affecting Belgium, Germany, France, Luxembourg, the Netherlands and Austria in mid-July.

<sup>93</sup> Primary perils refer to big events such as earthquakes, tsunamis or tropical cyclones. Secondary perils are high-frequency, low-to-medium-severity weather-related events such as thunderstorms, hailstorms, wildfires, droughts and flash floods.

<sup>94</sup> See Fache Rousová, L., Giuzio, M., Kapadia, S., Kumar, H., Mazzotta, L., Parker, M. and Zafeiris, D., “[Climate change, catastrophes and the macroeconomic benefits of insurance](#)”, *Financial Stability Report*, European Insurance and Occupational Pensions Authority, July 2021.

<sup>95</sup> Catastrophe bonds are financial instruments designed to transfer part of the risk associated with catastrophes from the (re)insurance sector to capital markets.

## 5 Macprudential policy issues



### 5.1 Emphasis gradually shifts from providing short-term policy support to addressing emerging vulnerabilities

**As the economic recovery proceeds, macroeconomic policies that helped limit economic scarring at the height of the pandemic are being gradually adjusted.**

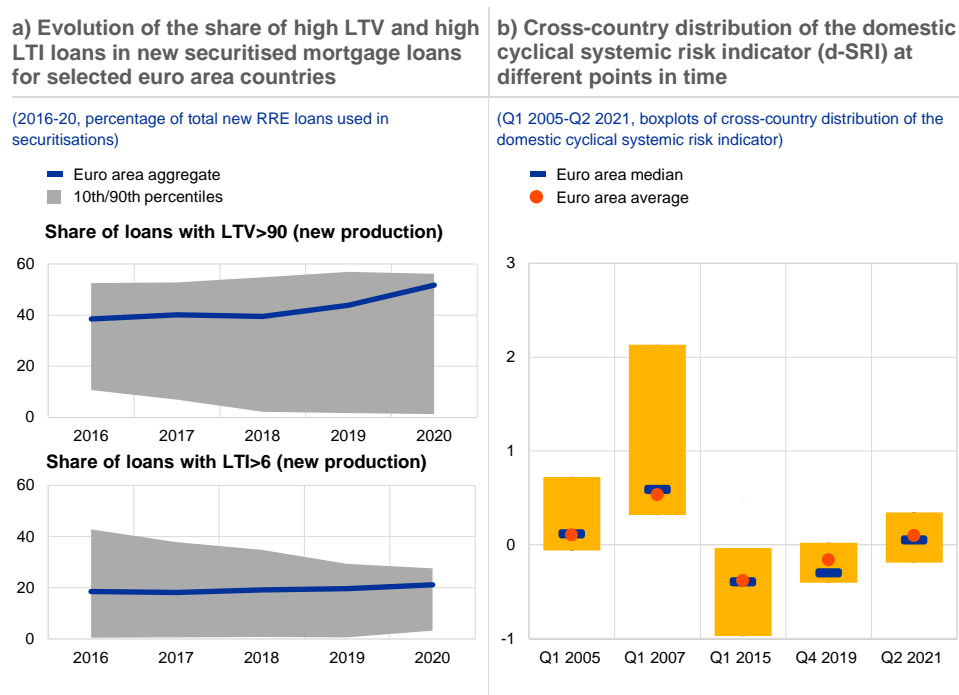
Given the rebound of the euro area economy sparked by the progress made in the vaccination campaign and the subsequent easing of containment measures, fiscal stimulus has been gradually reduced. It is expected to decline further, from 4.6% of GDP in 2021 to 1.5% and 1.2% in 2022 and 2023 respectively (see [Chapter 1](#)). Where not removed completely, fiscal support measures have become more targeted and focused on strengthening solvency of viable firms rather than broad liquidity support, through grants and quasi-equity instruments. At the same time, monetary policy has continued to underpin the recovery by maintaining accommodative financing conditions (see [Chapter 2](#) and [Box 8](#)).



Since the May 2021 FSR, a number of financial sector policies that helped preserve financial stability during the pandemic have expired or have been adjusted further. Almost all loan moratoria and government guarantee schemes which helped to support banks' asset quality have now elapsed, while the recommended restrictions on dividend distributions and share buybacks that had been imposed on euro area banks were lifted in September 2021 (see [Chapter 3](#)).<sup>96</sup> At the onset of the pandemic, ECB Banking Supervision allowed banks to temporarily operate below the level of capital defined by Pillar 2 guidance (P2G) and the combined buffer requirement until the end of 2022 at the earliest, making the timeline for P2G replenishment conditional on economic conditions.<sup>97</sup> After the latest stress test results, the ECB confirmed the previously stated timeline for P2G replenishment.

### Chart 5.1

Signs of further loosening of RRE lending standards are accompanied by increasing systemic risk measures relevant for macroprudential capital buffers



Sources: Panel a: European Datawarehouse GmbH (EDW), ECB and ECB calculations. Panel b: Eurostat, ECB and ECB calculations. Notes: Panel a: data available for Belgium, Germany, Spain, France, Italy, the Netherlands and Portugal, total weighted by GDP. The dataset includes loan-level data for asset-backed securities transactions and may therefore not accurately represent the overall lending standards associated with new mortgage loans. In addition, an additional bias may arise as banks may not report the characteristics of defaulted loans. While data coverage for some countries is low, comparison with other data sources shows a high level of congruence with the information in the EDW data. LTI: loan-to-income ratio; LTV: loan-to-value ratio; RRE: residential real estate. Panel b: the d-SRI measures the build-up of risks from credit developments, real estate markets, asset prices, and external imbalances; it has better early warning properties for financial crises in European countries than the Basel credit-to-GDP gap. The d-SRI is based on Lang, J.H., Izzo, C., Fahr, S. and Ruzicka, J., "Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises", *Occasional Paper Series*, No 219, ECB, 2019. The yellow area is the 0.25-0.75 interquartile range.

<sup>96</sup> See [Recommendation of the European Central Bank of 23 July 2021 repealing Recommendation ECB/2020/62](#). In accordance with the ESRB Recommendation ESRB/2020/15 repealing Recommendation ESRB/2020/7, the relevant authorities should request financial institutions under their supervisory remit (including banks) to refrain until 30 September 2021 from making dividend distributions or buying back ordinary shares.

<sup>97</sup> See ECB Banking Supervision press release dated [12 March 2020](#) and the [FAQs on ECB supervisory measures in reaction to the coronavirus](#).

**As the recovery progresses, policies should gradually shift to addressing emerging medium-term vulnerabilities in a proportionate and targeted manner.**

Most notably, residential real estate (RRE) vulnerabilities are on the rise. Although they vary across countries, indicators of household indebtedness, credit and price developments, and overvaluation have risen since the start of the pandemic (see **Overview, Chapter 1** and **Box 2**), while the signs of the loose or deteriorating RRE lending standards in the euro area that had been noted before the pandemic broke out are still there (see **Chart 5.1**, panel a).<sup>98</sup> Consistent with the role of macroprudential policy as first line of defence in preserving financial stability, a gradual shift towards addressing medium-term vulnerabilities is therefore warranted. In order not to hamper the economic recovery and the ability of banks to provide credit, such action should be proportionate and should target the identified risks.

**Countries where emerging vulnerabilities are primarily driven by RRE markets should consider gradually adjusting targeted macroprudential policy measures.**

Some countries have adopted capital measures, such as higher risk weights, which would enhance banks' loss-absorption capacities if accumulated housing market risks were to materialise (see **Table 5.1**). Moreover, several euro area countries have implemented borrower-based macroprudential policies, such as loan-to-value (LTV) or debt service-to-income (DSTI) limits.<sup>99</sup> However, in some countries that received a European Systemic Risk Board (ESRB) warning or recommendation on medium-term vulnerabilities in the RRE sector in 2019,<sup>100</sup> either no macroprudential measures are active or those that are seem to have room for tightening. The implementation (or further tightening) of macroprudential measures should therefore be considered in some of the countries where RRE vulnerabilities are continuing to build up, especially in relation to the deterioration of lending standards and growing household indebtedness. The timely activation of borrower-based measures helps to ensure that borrowers and banks are resilient, while they can be designed and calibrated to limit side effects.<sup>101</sup> Many countries have also tailored the calibration of these measures to allow different limits for different types of borrower (e.g. first-time or buy-to-let buyers) and to allow a certain proportion of new lending to be above the limits. Such targeted limits and allowances can prevent access to mortgage credit from becoming impaired for certain groups of borrowers (e.g. young or low-income borrowers) and can therefore keep the undesired side effects of

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<sup>98</sup> Chart 5.1 (panel a) uses information on securitised mortgage loans only (potentially resulting in selection bias) which [may not accurately represent the overall lending standards associated with new mortgage loans](#). In addition, aggregation across countries may hide heterogeneity in the underlying developments and the effect of enacted policies. However, similar trends were identified before the pandemic using data from euro area significant institutions representing roughly 75% of the entire RRE loan market in the euro area. See Special Feature A entitled "[Trends in residential real estate lending standards and implications for financial stability](#)", *Financial Stability Review*, ECB, May 2020.

<sup>99</sup> See Box 3 entitled "Macroprudential policy for residential real estate before, during and after the COVID-19 pandemic", *Economic Bulletin*, Issue 7, ECB, November 2021.

<sup>100</sup> Germany and France were subject to a warning from the ESRB, while Belgium, Luxembourg, the Netherlands and Finland received ESRB recommendations. See "[ESRB issues five warnings and six recommendations on medium-term residential real estate sector vulnerabilities](#)", ESRB press release, 23 September 2019.

<sup>101</sup> As LTV and DSTI limits apply to new loans, rather than outstanding loans, these measures should be adopted in a timely manner during a real estate boom to prevent large pockets of credit with loose lending standards emerging (see the article entitled "[Macroprudential analysis of residential real estate markets](#)," *Macroprudential Bulletin*, No 7, ECB, March 2019). Several euro area countries have already implemented such measures structurally to prevent the future deterioration of lending standards.

borrower-based macroprudential measures to a minimum. “Hybrid” measures, such as risk weights calibrated according to different levels of lending standards (e.g. LTV or DSTI), may also be used to increase banks’ resilience while targeting the riskiest borrower segments.

**Table 5.1**

Overview of macroprudential instruments implemented to address RRE vulnerabilities in euro area countries

|    | ESRB warning/<br>recommendation<br>in September 2019 | Borrower-based measures     |   |                              |                   |   | Capital measures               |                                       |                                       |  |
|----|--|-----------------------------|---|------------------------------|-------------------|---|--------------------------------|---------------------------------------|---------------------------------------|--|
|    |  | Loan-to-<br>-value<br>limit | Debt-<br>-service-to-<br>-income<br>limit | Debt-to-<br>-income<br>limit | Maturity<br>limit | Interest<br>rate<br>sensitivity<br>test | Legally<br>binding<br>measures | Risk<br>weight on<br>IRB<br>mortgages | Risk<br>weight on<br>STA<br>mortgages |  |
| BE | Recommendation                                       | ●                           | ●   | ●                            |                   |   |                                | ●                                     |                                       |  |
| FI | Recommendation                                       | ●                           |   |                              |                   | ●                                       | ✓                              |                                       |                                       |  |
| LU | Recommendation                                       | ●                           |   |                              |                   |   | ✓                              | ●                                     | ●                                     |  |
| NL | Recommendation                                       | ●                           | ●   |                              | ●                 |   | ✓                              | ●                                     |                                       |  |
| DE | Warning  | No measures in place        |   |                              |                   |   |                                |                                       |                                       |  |
| FR | Warning  |                             | ●   |                              | ●                 |   | ✓                              |                                       |                                       |  |
| AT |  | ●                           | ●   |                              | ●                 |   |                                |                                       |                                       |  |
| CY |  | ●                           | ●   |                              |                   |   | ✓                              |                                       |                                       |  |
| EE |  | ●                           | ●   |                              | ●                 |   | ✓                              | ●                                     |                                       |  |
| IE |  | ●                           |   | ●                            |                   |   | ✓                              |                                       | ●                                     |  |
| LV |  | ●                           | ●   | ●                            | ●                 |   | ✓                              |                                       |                                       |  |
| LT |  | ●                           | ●   |                              | ●                 | ●                                       | ✓                              |                                       |                                       |  |
| MT |  | ●                           | ●   |                              | ●                 |   | ✓                              |                                       | ●                                     |  |
| PT |  | ●                           | ●   |                              | ●                 |   |                                |                                       |                                       |  |
| SK |  | ●                           | ●   | ●                            | ●                 | ●                                       | ✓                              |                                       |                                       |  |
| SI |  | ●                           | ●   |                              | ●                 |   | ✓                              |                                       | ●                                     |  |

Sources: ESRB and national notifications.

Notes: In France, a borrower-based measure will become legally binding as of 1 January 2022. In the Netherlands, the announced Article 458 CRR measure scheduled for Q3 2020 (LTV-dependent risk weight floor for domestic IRB mortgage loan portfolios) was postponed in March 2020 in light of the pandemic and should come into effect on 1 January 2022. In Portugal, the calculation of the DSTI incorporates the impact of an interest rate increase. In Slovenia, the DSTI and maturity limits are legally binding, while the LTV limit is implemented through a recommendation. IRB mortgages: mortgages granted by banks following the internal ratings-based approach; STA mortgages: mortgages granted by banks following the standardised approach.

**As signs of medium-term vulnerabilities continue to emerge, authorities could start considering gradual increases in macroprudential capital buffers, where economic and financial conditions allow.** Where justified by rising cyclical systemic risk indicators and relevant credit indicators (see [Chart 5.1](#), panel b), increases in the countercyclical capital buffer could be considered. Considering timely CCyB increases is important to allow for the default one-year implementation lag after announcement as well as gradual policy changes. Such increases should take place when supported by favourable economic and banking sector conditions, such as sufficient capital generation capacity, to avoid hampering the economic recovery and impairing the provision of credit. It is reassuring that the latest stress test results show that under the baseline economic scenario, banks would be able to increase their relatively strong capital ratios still further.<sup>102</sup> This implies that unless economic conditions deteriorate markedly, there are unlikely to be bank credit supply constraints in most euro area

<sup>102</sup> See the July 2021 release of the [SSM-wide stress test results](#).

countries. Overall, the prudential action should be mindful of the potential effect of the European banking supervision timeline for replenishing the P2G and the implementation of the final leg of Basel III reforms on the supply of credit.

**More generally, relatively favourable macro-financial conditions in some countries may provide an opportunity to create additional macroprudential policy space by increasing the amount of releasable capital buffers.** The pandemic has been a reminder that large, disruptive systemic shocks may occur independently of a country's position in the financial cycle to respond to unexpected shocks. A higher amount of releasable buffers would strengthen the ability of macroprudential authorities to act countercyclically even in the event of such shocks.

## Box 8

### The role of financial stability in the ECB's new monetary policy strategy

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**Financial stability is a precondition for price stability and vice versa.** In recognition of this fundamental tenet, the ECB's recent strategy review included a thorough assessment of whether financial stability considerations should play a role in monetary policy decisions at all – and if yes, in what form.<sup>103</sup> The analyses covered a wide range of relevant issues, including the side effects of monetary policy on financial stability, the interactions between monetary and macroprudential policies, whether the medium-term orientation of the ECB's price stability objective can cater for financial stability considerations and how relevant financial stability analyses could be integrated into the analytical framework based on which monetary policy decisions are taken. This box summarises the most relevant aspects and their implications for monetary policy.

**The pursuit of price stability through monetary policy, and of financial stability primarily through macroprudential policy, are to a large extent complementary.** Financial crises tend to be associated with sharp de-risking and deleveraging, with negative repercussions for economic growth and the inflation outlook. The associated impairments in the transmission mechanism of monetary policy make it more difficult for central banks to maintain price stability. By preventing systemic crises and increasing the resilience of the financial sector, prudential policies (macroprudential, supervisory policies as well as a well-designed regulatory framework for financial institutions) safeguard smooth monetary policy transmission and support price stability. In a similar vein, monetary policy supports financial stability via a number of channels. During recessions, it stabilises the economy, thereby reducing the losses for the financial sector, as well as inflation, which mitigates the risk of debt-deflation spirals. Crucially, it also contains episodes of bank runs and fire sales in periods of outright financial stress. In the long run, and in most cases also over the short to medium term, the actions of the two policy domains are complementary.

**Monetary policy needs to take the financial stability environment and the stance of macroprudential policy into account.** Monetary policy and macroprudential policy operate through common transmission channels, meaning that the scope for interaction between the two policy spheres is wide. For example, an increase in macroprudential capital buffers may improve the resilience of the financial system and mitigate the consequences for inflation stemming from financial shocks. Yet, depending on the state of the economy, such a move may be associated with a lower

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<sup>103</sup> See the [ECB's monetary policy strategy statement](#) and [Overview](#), as well as the report of the Eurosystem work stream on macroprudential policy, monetary policy and financial stability entitled "[The role of financial stability considerations in monetary policy and the interaction with macroprudential policy in the euro area](#)", *Occasional Paper Series*, No 272, ECB, September 2021.

supply of bank credit and create a disinflationary impulse. In an environment of buoyant economic activity and associated price pressure, the two policy domains would reinforce each other. By contrast, when the build-up of systemic risk occurs in the context of subdued inflation, some trade-offs may emerge. Irrespective of the actual constellation, information about the macroprudential stance is relevant for monetary policy.

**It has been acknowledged that monetary policy, through both conventional and unconventional measures, can in principle also adversely influence financial stability.** For instance, lower interest rates create incentives to engage in more risk-taking which could become excessive and lead to the build-up of systemic risk.<sup>104</sup> It has been shown that the financial stability footprint of monetary policy can be minimised by adjusting the design of some of its instruments, as is the case with the ECB's targeted longer-term refinancing operations (TLTROs, which entail a lending target that excludes housing loans, the aim being to avoid contributing to the possible formation of real estate bubbles under specific circumstances) or its tiered system for excess reserve remuneration.<sup>105</sup> However, potential financial stability side effects cannot be completely ruled out. They can arise as financial intermediaries assume more credit, liquidity and duration risks in their search for yield, and due to the associated asset price misalignments. In addition, low interest rates affect the resilience of financial intermediaries. As regards banks, falling interest rates reduce net interest margins, yet at the same time they are associated with one-off valuation gains on securities and a brighter economic outlook, the latter boosting lending volumes and asset quality. While for now these effects have largely offset each other, the adverse effects of low interest rates could worsen over time. For some types of non-bank, low rates may be detrimental to their financial positions.

**A systematic leaning against the wind<sup>106</sup> is fraught with conceptual controversies and practical difficulties.** It is widely accepted that an aggressive monetary policy response is necessary to restore the functioning of the monetary policy transmission mechanism in a financial crisis, as possible distortions in incentives can, in principle, be addressed by an effective macroprudential framework. By contrast, previous economic literature indicates that monetary policy is too blunt a tool to address sector or country-specific financial imbalances. This is particularly relevant in a monetary union where financial cycles are not fully synchronous across participating states.<sup>107</sup> In addition, given the slow-moving nature of financial cycles, a systematic leaning against the wind may require relatively long periods of inflation undershooting, which are not compatible with price stability and risk destabilising inflation expectations. Importantly, monetary policy is not responsible for guaranteeing financial stability.

**Instead, macroprudential policies are the first line of defence against the build-up of systemic risk.** The adverse side effects described above should be addressed by appropriate micro- and macroprudential measures which are designed to target the affected subset of the financial system

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<sup>104</sup> Similarly, monetary policy can also have side effects on financial stability when tightening, as for example in the presence of fragile public and private sector balance sheet conditions.

<sup>105</sup> See Altavilla, C., Lemke, W., Linzert, T., Tapking, J. and von Landesberger, J., "Assessing the efficacy, efficiency and potential side effects of the ECB's monetary policy instruments since 2014", *Occasional Paper Series*, No 278, ECB, September 2021.

<sup>106</sup> "Leaning against the wind" describes a monetary policy approach which, in the presence of financial exuberance and a buoyant credit cycle, calls for a tighter stance than the one required to achieve price stability, in an attempt to limit the build-up of financial vulnerabilities.

<sup>107</sup> Asynchronous national financial cycles are the prime reason for shared responsibility between national competent authorities and the ECB in the field of macroprudential policy. National authorities aim to preserve financial stability at the national level, while European authorities help to coordinate macroprudential policy among Member States, limit policy spillovers and address inaction bias. Both national and European macroprudential authorities contribute to financial stability for the European Union as a whole.

and address precisely the underlying vulnerability. In fact, the existing empirical evidence shows that – whenever available – macroprudential measures have proven to be effective in addressing systemic risk. Yet at present, the macroprudential framework does not adequately cover non-bank financial intermediaries. Moreover, the ability of macroprudential policies to affect bank lending countercyclically (by releasing macroprudential buffers) in a downturn is limited. Both aspects may increase the need for aggressive monetary policy accommodation in the face of adverse developments.

**Against this background, the ECB’s new monetary policy strategy envisages a flexible approach in considering financial stability.** The medium-term orientation of the ECB’s price stability objective allows the institution to consider financial stability in its monetary policy decisions, whenever this is relevant to the pursuit of price stability. Accordingly, an in-depth assessment of the interaction between monetary policy and financial stability will be conducted at regular intervals as part of monetary and financial analysis and considered at monetary policy meetings of the Governing Council. These assessments will provide a more systematic evaluation of the longer-term build-up of financial vulnerabilities and their implications for the tail risks to output and inflation. In addition, they will gauge the extent to which macroprudential policies can mitigate possible financial stability risks that are relevant from a monetary policy perspective.

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## 5.2 Enhancing the regulatory framework to ensure the long-term resilience of the financial system

**Structural improvements to the regulatory framework, in both the bank and the non-bank sectors, will support the financial system and bring long-term benefits.** In the banking sector, on 27 October 2021 the European Commission issued legislative proposals for the EU-wide implementation of the final set of Basel III reforms agreed by the Basel Committee on Banking Supervision (BCBS) in 2017. For non-banks, policy options to address risks in money market funds (MMFs) are being finalised at both the international and the European level, while future policy should target a broader set of entities and activities, including investment funds and margining practices.

### 5.2.1 Finalising the implementation of Basel III

**Implementing the final Basel III reforms is essential to address the shortcomings of the existing framework and to further enhance the long-term resilience of the financial system.** Recent events have demonstrated that the international regulatory initiatives introduced after the global financial crisis made the financial system more resilient and more able to withstand a large unexpected shock such as that caused by the COVID-19 pandemic. The final package of Basel III



reforms aims to address the remaining shortcomings in the existing framework, among other things by introducing an output floor.<sup>108</sup>

**The ECB, the European Banking Authority (EBA) and a large group of European national supervisors and central banks are committed to the full, timely and consistent implementation of the final set of Basel III reforms.**<sup>109</sup> The EU must continue to uphold its commitment to international financial standards and cooperation. Implementation approaches that are inconsistent with international agreements should be avoided and, in any case, do not remedy deficiencies in the existing framework. The Commission's legislative proposals for amending the Capital Requirements Regulation and the Capital Requirements Directive ("CRR III" and "CRD VI") to implement the final Basel III reforms, published on 27 October, are therefore welcomed. The ECB will publish its opinion on the proposals in due course.

**The finalisation of the Basel III reforms as internationally agreed will lead to a level playing field across banks, with only moderate phase-in costs.** The impact of the reforms will vary across banks, depending on their business models, size and degree of reliance on internal models. The overall increase in capital is not expected to be significant, save for a few banks that have benefited the most from reduced capital requirements thanks to risk optimisation from the use of internal models. Recent impact studies by the ECB and the EBA show that implementing the final Basel III reforms is likely to entail only modest transitional costs which will be outweighed by the long-run economic benefits.<sup>110</sup> Further delays in the implementation of the final leg of the reforms would only postpone, without any appreciable benefits, the necessary adjustments in the banking sector.<sup>111</sup>

## 5.2.2 Strengthening the policy framework for non-banks

**The policy framework for non-banks should be strengthened to ensure the financial system is resilient.** Given the increasing role played by non-banks in financing the real economy and their interconnections with the wider financial system, it is crucial for risks in the sector to be tackled from a system-wide perspective. The market turmoil in March 2020 highlighted the need to strengthen the policy framework for non-bank financial intermediaries,<sup>112</sup> and there has been considerable progress with regard to the international policy agenda for MMFs in 2021. The next step is to

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<sup>108</sup> See the BCBS note entitled "[Basel III: Finalising post-crisis reforms](#)". A key objective of the revisions incorporated into the framework is to reduce the excessive variability of risk-weighted assets (RWAs) and to help to restore the credibility of the calculation of RWAs.

<sup>109</sup> See the ECB-EBA letter entitled "[EU implementation of outstanding Basel III reforms](#)" and the [joint letter to the European Commission](#) from several national authorities in the EU calling for the full implementation of Basel III, both of which were addressed to the European Commission on 7 September 2021, and the speech by Andrea Enria entitled "[Basel III implementation: the last mile is always the hardest](#)", 3 May 2021.

<sup>110</sup> See the article entitled "[Macroeconomic impact of Basel III finalisation in the euro area](#)", *Macprudential Bulletin*, No 14, ECB, July 2021; and "[Basel III reforms: updated impact study](#)", EBA, 2020.

<sup>111</sup> The aforementioned ECB impact study suggests there would be no (or only marginal) additional benefits or capital relief from a further delay of Basel III finalisation and the application of EU-specific provisions.

<sup>112</sup> See "[Holistic Review of the March Market Turmoil](#)", FSB, 17 November 2020.



develop policies for open-ended investment funds and margining practices.<sup>113</sup> Strengthening the resilience of non-banks from a macroprudential perspective will help mitigate systemic risk in good times, while also reducing the likelihood of the need for costly policy interventions in a crisis.

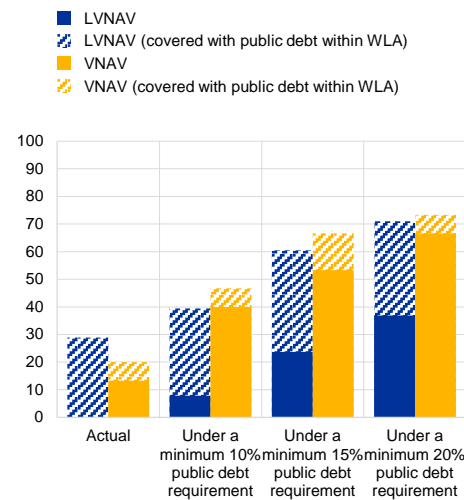
**The reforms should be embedded in international policy coordination.** The Financial Stability Board (FSB) has recently issued policy proposals to tackle vulnerabilities in MMFs internationally.<sup>114</sup> The FSB proposals aim to increase the resilience of MMFs by reducing liquidity mismatches and unintended cliff effects arising from any breaches of regulatory requirements, enhancing loss absorption and imposing costs on redeeming investors. Against this background, the ESRB is discussing policy options which could inform the European Commission’s review of the EU’s MMF Regulation<sup>115</sup> in 2022.

### Chart 5.2

A higher share of MMF public debt holdings would help managers to deal with large and unexpected outflows, while outstanding short-term public debt would be more than sufficient to meet increased demand

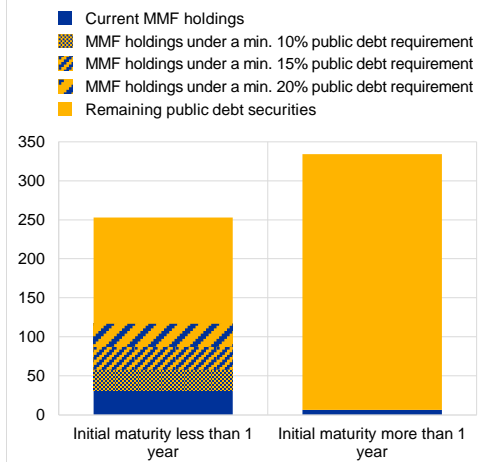
**a) Share of MMFs able to meet outflows by liquidating public debt based on March 2020 market turmoil**

(March 2020, percentages)



**b) Euro area public debt with a residual maturity of less than one year**

(€ billions)



Sources: Crane Data, ECB securities holdings statistics by sector and ECB calculations.

Notes: Panel a) shows the share of MMFs whose public debt at the end of January 2020 was enough to cover their largest weekly outflows in March 2020 for actual and hypothetical values of public debt holdings, including existing government reverse repo assets. This assumes that MMFs unwind their government reverse repo assets and use the proceeds to purchase government bonds outright. The shaded area shows the share of funds that could cover their outflows with public debt that is within their weekly liquid assets (WLA), while the solid area refer to the share of funds that could cover their outflows with public debt that is in excess of their WLA. Panel b) shows short-term euro area government debt (euro-denominated) outstanding with an initial maturity of less than one year (left-hand bar) and longer-term debt with a residual maturity of less than one year (right-hand bar). The shaded parts of the left-hand bar show the additional amounts that euro-denominated MMFs would need to hold if they were required to hold 10, 15 or 20 percentage points of public debt.

<sup>113</sup> See BCBS, CPMI and IOSCO, “Consultative report: Review of margining practices”, Bank for International Settlements and International Organization of Securities Commissions, October 2021.

<sup>114</sup> See “Policy Proposals to Enhance Money Market Fund Resilience – Final report”, FSB, October 2021.

<sup>115</sup> Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds.

**Strengthening the asset liquidity of private debt funds should be a key element of MMF reforms in the EU.**

The overall liquidity requirements should be raised and private debt MMFs required to hold a minimum share of their assets in liquid short-term public debt as a complement to the existing daily and weekly maturing asset requirements.<sup>116</sup> This would limit liquidity mismatches in these funds and diversify their sources of liquidity, thereby helping managers to meet large and unexpected outflows. ECB analysis shows that public debt holdings of, say, 15% would have allowed around 61% of low-volatility net asset value (LVNAV) funds (and 67% of variable net asset value (VNAV) funds) to meet their weekly outflows during the March 2020 market turmoil without having to draw down their other liquidity buffers or sell private debt assets (see [Chart 5.2](#), panel a).<sup>117</sup> To further increase the resilience of MMFs, any impediments to the use of all their liquidity buffers during a crisis should be removed. In addition, the consistent implementation of liquidity management tools, such as anti-dilution levies, could complement the reform agenda.

**The calibration of liquidity requirements should take into account possible costs and constraints, while aiming to strengthen the resilience of MMFs.**

First, if MMFs are required to hold a certain share of public debt, this might lead to a reduction in short-term funding to banks and non-financial corporations (NFCs). This effect would probably be small for NFCs, as MMFs would be more likely to reduce their holdings of higher-rated bank debt than NFC debt, whereas banks would have good alternative sources of short-term funding, including deposits and interbank liabilities.<sup>118</sup> Second, the requirements would increase the footprint of MMFs in short-term public debt markets. However, ECB analysis shows that the amount outstanding of euro-denominated short-term public debt would be more than sufficient to absorb the expected increased demand from a 5-15% public debt requirement (see [Chart 5.2](#), panel b). Finally, public debt requirements might reduce the yields that MMFs could offer should a part of the private debt assets be replaced by lower-yielding public debt. Overall, the calibration should ensure that any costs would be outweighed by the benefit of increased resilience.

**In addition, policies for the broader investment fund sector should address liquidity mismatches as a key priority.**

An important objective is to ensure that asset liquidity is better aligned with redemption terms. For funds investing in illiquid assets such as real estate, minimum notice periods or lower redemption frequencies are often in place in many jurisdictions. Similar measures could also be considered for funds that currently offer daily liquidity but invest in relatively illiquid assets such as loans or high-yield debt. Liquidity buffers or limits on less liquid assets would likewise help to bolster the resilience of funds that offer daily redemptions and invest in less liquid assets. Liquidity management tools, such as swing pricing or anti-dilution levies, may be complementary and can help to reduce first-mover advantages. However, such tools are often difficult to calibrate and can be difficult to deploy in crisis situations

<sup>116</sup> See “[Eurosysteem contribution to the European Securities and Markets Authority \(ESMA\) consultation on the framework for EU money market funds](#)”, ECB, 30 June 2021.

<sup>117</sup> For a 10% public debt requirement, the corresponding figures are 39% for LVNAV funds and 47% for VNAV funds; for a 20% requirement, this covers 71% of LVNAV and 73% of VNAV funds' outflows.

<sup>118</sup> Assuming that MMFs aim to avoid large changes to the overall risk/return profile of their portfolio, they have an incentive to reduce their holdings of higher-rated bank debt and replace them with public debt, rather than replace their holdings of higher-yielding NFC debt.

without generating adverse effects. In addition, they are not effective in reducing the underlying liquidity mismatch vulnerability.

**Furthermore, it is important to understand and tackle the risks associated with leverage in the non-bank financial sector.** To monitor and address vulnerabilities arising from the use of leverage, it is important to have globally consistent leverage metrics. Further work should be undertaken internationally to assess the extent and distribution of non-bank leverage, including from the use of derivatives to generate synthetic exposure. This will help inform the policy discussion with a view to mitigating the systemic risk arising from the use of leverage outside the banking sector.

**International work on margining practices should aim to increase transparency, reduce excessive margin procyclicality and ensure that non-banks are better prepared for margin calls.** As the initial margins collected by some central counterparties (CCPs) may be overly procyclical (too low in good times and/or too high in bad times), their fluctuations can amplify liquidity stress and lead to selling pressures in financial markets. Changes in initial margins during March 2020 suggest that it is important to better understand the models used by CCPs to calibrate initial margin requirements and to possibly review such models (see [Box 9](#)).<sup>119</sup> The transparency and predictability of initial margin models used by both CCPs and clearing members should also be improved to ensure that both banks and non-banks are better prepared for margin calls. In addition, all types of non-bank should have adequate liquidity management frameworks in place which ensure they are sufficiently prepared to meet margin calls. This will mitigate liquidity risk across the system, including among MMFs which are used for storing cash, as well as among investment funds, insurers and pension funds, which use derivatives and are therefore subject to margin calls.<sup>120</sup>

## Box 9

### Lessons learned from initial margin calls during the March 2020 market turmoil

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Prepared by Thomas Carraro, Linda Fache Rousová, Oana Furtuna, Maddalena Ghio, Kristina Kallage, Charles O'Donnell, Francesco Vacirca and Sebastiano Michele Zema

**Margin requirements on derivatives portfolios increased significantly in March 2020, exacerbating liquidity stress as entities took action to meet margin demands.** In particular, some non-bank financial entities met margin calls by redeeming shares in money market funds, selling bonds or borrowing in repo markets.<sup>121</sup> Extraordinary interventions by public authorities were

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<sup>119</sup> This would also be in line with the ESRB recommendations related to the need to limit cliff effects in relation to the demand for collateral and mitigate procyclicality in the provision of client clearing services; see [“Recommendations of the European Systemic Risk Board of 25 May 2020 on liquidity risks arising from margin calls \(ESRB/2020/6\)”](#).

<sup>120</sup> The ad hoc group established by the BCBS, CPMI and IOSCO is currently consulting on potential further work on these and other areas; see BCBS, CPMI and IOSCO, [“Consultative report: Review of margining practices”](#), Bank for International Settlements and International Organization of Securities Commissions, October 2021.

<sup>121</sup> See Box 8 entitled [“Interconnectedness of derivatives markets and money market funds through insurance corporations and pension funds”](#), *Financial Stability Review*, ECB, November 2020 and BCBS, CPMI and IOSCO, [“Consultative report: Review of margining practices”](#), Bank for International Settlements and International Organization of Securities Commissions, October 2021.

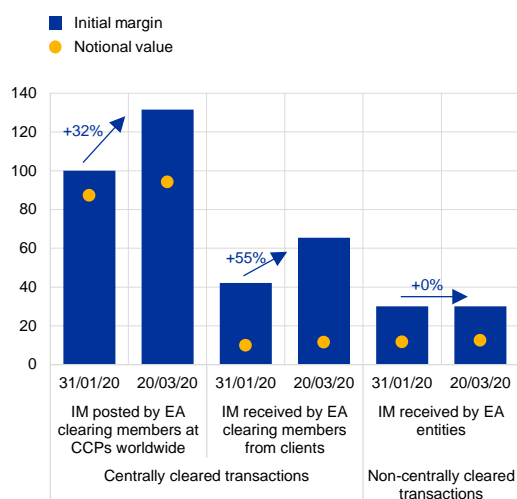
ultimately crucial in stemming stress in these markets.<sup>122</sup> While margin consists of two main components – initial margin and variation margin – this box focuses on initial margin (IM), since it is subject to model risk and depends heavily on the calibration choices of central counterparties (CCPs) (for centrally cleared transactions) or counterparties (for non-centrally cleared transactions).<sup>123</sup> As IMs are calibrated to reflect possible future changes in market prices, they are sensitive to market volatility. However, if IMs are overly procyclical (too low in good times and/or too high in bad times), their movements can amplify liquidity stress and lead to selling pressures in financial markets.

## Chart A

Centrally cleared IM increased significantly, driven mainly by equity, credit and interest rate portfolios

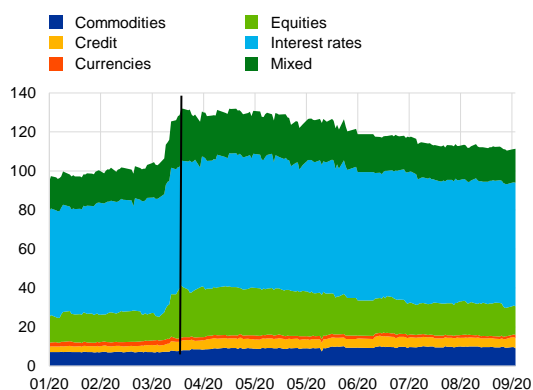
a) IM and notional values of derivatives portfolios held by euro area market participants

(31 Jan. 2020, 20 Mar. 2020, initial margin: €billions, notional value: €trillions)



b) IM posted at CCPs worldwide by euro area clearing members, broken down by asset class

(1 Jan.-30 Sep. 2020, €billions)



Sources: European Market Infrastructure Regulation (EMIR) data and authors' calculations.

Notes: Panel a: counterparties to euro area clearing members (CCPs or clients) include both euro area and non-euro area counterparties. Among "client" sectors, the investment fund sector experienced the largest increase in IM requested by euro area clearing members, amounting to €14 billion. Panel b: vertical line indicates the announcement of the pandemic emergency purchase programme. Data on four dates are excluded owing to outliers and/or low data coverage (13 January, 17 and 18 February, 28 September).

**The increase in IM amid the March 2020 turmoil was concentrated almost entirely in centrally cleared derivatives and driven mainly by equity, credit and interest rate portfolios (see Chart A, panel b).** Between 31 January and 20 March 2020, CCPs collected roughly €30 billion of additional IM from euro area clearing members (a 32% increase), who largely met this by collecting IM from their clients (€23 billion; a 55% increase), most notably from investment funds (€14 billion).<sup>124</sup> The IM remained elevated throughout the rest of 2020 as – among other factors – the high volatility

<sup>122</sup> See, for instance, "The ECB's commercial paper purchases: A targeted response to the economic disturbances caused by COVID-19", blog post by Luis de Guindos and Isabel Schnabel, April 2020; Box 7 entitled "Recent stress in money market funds has exposed potential risks from the wider financial system", *Financial Stability Review*, ECB, May 2020; *Holistic Review of the March Market Turmoil*, Financial Stability Board, November 2020.

<sup>123</sup> Initial margins are typically collected to cover potential future exposure over the appropriate close-out period in case of counterparty default. IMs are calibrated using historical market price volatility during a certain "look-back period" and tend to increase when recent volatility significantly exceeds previously observed values – but the exact sensitivity to market volatility depends on the underlying model and its calibration. Variation margins are collected and paid out to set the current market exposure to zero, reflecting market prices changes.

<sup>124</sup> IM collected by CCPs rose by around USD 300 billion globally. See Graph 2.2 in "Lessons Learnt from the COVID-19 Pandemic from Financial Stability Perspective", Financial Stability Board, July 2021.

from the turmoil continued to feed into CCP models over an extended period of time. For non-centrally cleared derivatives, IM remained broadly unchanged, likely reflecting design features of the underlying margin model – the standard initial margin model (SIMM) – which is less responsive to short-term fluctuations in market volatility.<sup>125</sup>

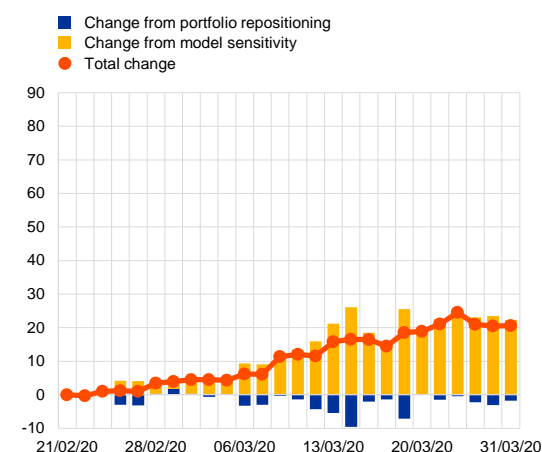
**Analysis of portfolios of centrally cleared interest rate and credit derivatives suggests that CCP model sensitivity to market volatility was the main driver of the increase in IM.** In addition to model sensitivity to market volatility, the increase in IM may also reflect portfolio repositioning by investors, motivated by factors like changes in risk appetite and hedging needs. The IM increase is decomposed into the impact from market volatility and repositioning by comparing static portfolios with those where repositioning took place (see **Chart B**).<sup>126</sup> For both types of derivative, the results suggest that the increase in IM was mostly driven by model sensitivity to the rise in market volatility. While portfolio repositioning contained the IM increase for interest rate derivatives, it worked in the opposite direction for credit derivatives, reflecting the increased activity in the credit default swap market.

### Chart B

The key driver of the increase in IM was the sensitivity of CCP models to market volatility

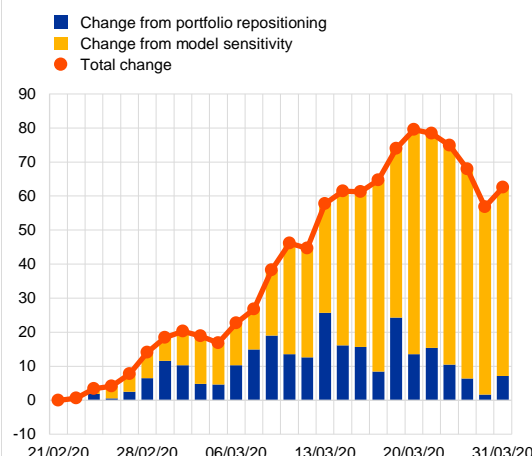
a) Decomposition of centrally cleared IM posted on interest rate derivatives portfolios

(21 Feb.-31 Mar. 2020, percentage changes)



b) Decomposition of centrally cleared IM posted on credit derivatives portfolios

(21 Feb.-31 Mar. 2020, percentage changes)



Sources: EMIR data and authors' calculations.

Notes: The charts show the relative increase in IM posted by euro area clearing members to CCPs worldwide. The decomposition is obtained by analysing the change in IM for those portfolios that did not alter in composition during the period observed (static portfolios) and projecting the same change to those portfolios that did alter during the same period (dynamic portfolios). The method relies on the assumption that for static portfolios, changes in IM requirements are attributable to changes in volatility only.

**The IM developments of March 2020 suggest that it is important to develop a clearer understanding of the models which CCPs use to calibrate IMs and possibly review such models.** This would also be welcomed by some market participants, who would prefer higher margin levels in good times to help reduce the risk of unexpected large margin calls in bad times. Any recalibration should build on a common understanding of “excessive procyclicality”, a concept that would determine when margin calls should be considered too large because they could result in

<sup>125</sup> See the article entitled “[Investigating initial margin procyclicality and corrective tools using EMIR data](#)”, *Macprudential Bulletin*, ECB, October 2019.

<sup>126</sup> Given that the composition of equity derivatives portfolios changes very frequently, such an approach is not suitable for this asset class.

significant repercussions for systemic liquidity. Such a “macro” concept would provide guidance for recalibrating IM models on a “micro” level and also facilitate comparisons of the different models used by CCPs. To increase the resilience of the financial system to liquidity shocks, it would also be important to enhance the transparency of IM models in both centrally and non-centrally cleared markets. The supervisory and regulatory framework governing the liquidity management of market participants, and in particular that of some non-bank financial intermediaries, should also be strengthened (see **Section 5.2**).

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## 5.3 Other ongoing policy initiatives that support euro area financial stability

| Topic  | Recent initiatives  |
|--|---|
| <b>Banking union</b>                                     | Achieving a complete banking union will require the implementation of a fully-fledged European Deposit Insurance Scheme (EDIS) as well as further improvements to the crisis management framework, especially for smaller and medium-sized banks. In its <a href="#">reply to the Commission's consultation</a> , the ECB put forward a number of proposals aimed at improving the management of banking crises. These range from improving the powers available to authorities before a bank is deemed to be failing or likely to fail, to ensuring a more complete set of tools and the funding required are available after a bank fails.  |
| <b>Review of the EU's macroprudential framework</b>      | In the context of the review of the EU's macroprudential framework for banks in 2022, the European Commission addressed a Call for Advice (CfA) to the ESRB, the EBA and the ECB. Key areas of the review include (i) the design and functioning of the buffer framework, (ii) missing and obsolete instruments, (iii) internal market considerations, and (iv) global risks. The ECB is preparing its own response to the CfA and is coordinating its stance with the ESRB and the EBA.  |
| <b>Climate change</b>                                    | <p>During the Finance Day of the 2021 United Nations Climate Change Conference (COP26), the ECB reported on its progress with regard to central banking and supervisory activities and, along with the other Network for Greening the Financial System members, made a <a href="#">pledge</a> to contribute to the goals of the COP26.</p> <p>The BCBS, the FSB and the EBA have launched initiatives to explore whether the current regulatory framework can sufficiently capture the unique features of climate-related financial risk.</p> <p>Following the publication in November 2020 of the <a href="#">Guide on climate-related and environmental risks</a>, ECB Banking Supervision asked banks to self-assess their current practices and draw up plans to align these practices with the Guide. <a href="#">Preliminary findings</a> show that although banks have made some progress, the pace is still too slow. This implies that many banks will not meet supervisory expectations in a timely manner. ECB Banking Supervision therefore urged banks to take decisive action to address the identified shortcomings.</p> |
| <b>Green EU capital markets</b>                          | The further development of sizeable, mature and integrated green capital markets in the EU requires decisive action. The key is to enhance the disclosure of firms' forward-looking environmental data (e.g. emission-reduction targets and green investments) and to advance the EU capital markets union, focusing on areas which are relevant for green capital markets. This includes addressing structural impediments, such as national differences in insolvency rules, investor protection and taxation, and strengthening cross-border supervision.  |
| <b>Review of Solvency II for (re)insurance companies</b> | On 22 September the Commission adopted the "Solvency II review package" proposing to amend the <a href="#">Solvency II Directive</a> and introduce a new <a href="#">Insurance Recovery and Resolution Directive</a> . The Solvency II proposal includes elements which would help to increase the resilience of the sector, including the introduction of some new tools with a macroprudential impact. However, further amendments could be warranted, such as the introduction of a symmetric volatility adjustment. <sup>1</sup> Finally, when assessing climate-related catastrophe risks faced by (re)insurers, it is also important to maintain insurance coverage against such risks going forward. <sup>2</sup>  |
| <b>Systemic importance of UK central counterparties</b>  | In accordance with the European Market Infrastructure Regulation (EMIR), the European Securities and Markets Authority (ESMA) is currently assessing whether UK central counterparties (CCPs) or some of their clearing services are of such substantial systemic importance that they should not be recognised to provide certain clearing services in the EU. <sup>3</sup> The Eurosystem is contributing to this assessment with respect to clearing services for euro-denominated financial instruments, through its participation as central bank of issue in ESMA's CCP Supervisory Committee. The current degree of reliance of EU market participants on UK clearing services poses financial stability risks that could be addressed reducing EU exposures to UK CCPs and building up clearing services in the EU. The costs and financial stability risks of potentially restricting access to UK clearing services also need to be considered, meaning that such a reduction of exposures should take place over an appropriate adaptation period.   |

1) See also "Response letter to a consultation of the European Commission on the review of Solvency II", ESRB, 16 October 2020; "ESRB Response to the EIOPA Consultation Paper on the 2020 review of Solvency II", ESRB, 2020; and "Enhancing the macroprudential dimension of Solvency II", ESRB, February 2020.

2) See Fache Rousová, L., Giuzio, M., Kapadia, S., Kumar, H., Mazzotta, L., Parker, M. and Zafeiris, D., "Climate change, catastrophes and the macroeconomic benefits of insurance", *Financial Stability Report*, European Insurance and Occupational Pensions Authority, July 2021.

3) See "ESMA publishes methodology for assessing third country CCPs systemic importance", July 2021.



# Special features

## A Bank capital buffers and lending in the euro area during the pandemic

Prepared by Cyril Couaillier, Marco Lo Duca, Alessio Reghezza, Costanza Rodriguez d'Acri and Alessandro Scopelliti

*Bank capital buffers are supposed to help banks to absorb losses while maintaining the provision of key financial services to the real economy in times of stress. Capital buffers that are usable along these lines should lessen the damaging effects that can arise from credit supply shortages. Making use of buffers entails using the capital space on top of regulatory buffers and minimum requirements and, in case of need, also using regulatory buffers. This special feature analyses bank lending behaviour during the pandemic to gain insights into banks' propensity to use capital buffers and the impact of the regulatory capital relief measures implemented by the authorities. From a macro perspective, the euro area banking system as a whole was able to meet credit demand and withstand stress. However, this aggregate view reflects several factors, including the impact of extraordinary policy measures. A micro perspective thus can help to comprehend how the capital buffer framework and capital releases affected banks' behaviour during the pandemic. The microeconomic analysis performed in this special feature shows that the banks that had limited capital space above regulatory buffers adjusted their balance sheets by reducing lending which could be interpreted as an attempt to defend capital ratios. This suggests that they were unwilling to use capital buffers. The results also show that the regulatory capital relief measures adopted during the pandemic, which added to banks' existing capital space, were associated with higher credit supply. While more research is desirable, also on macro aspects, these findings suggest that more releasable capital could enhance macroprudential authorities' ability to act countercyclically when a crisis occurs.*

### Introduction

**A core goal of the Basel III capital buffer framework is to reduce the amplification effects of the banking system on the economic cycle.** The framework envisages that bank capital is built up during periods when credit risk and financial vulnerabilities are increasing. Capital is then employed in case of need to absorb losses and meet credit demand during downturns and crises. Regulatory capital buffers sit on top of minimum capital requirements and constitute the combined buffer requirement (CBR).<sup>127</sup> During downturns, banks can draw on the capital space above the CBR (i.e. management buffers or excess capital) and, in case of need, also the CBR itself, albeit with some limitations, notably the maximum distributable amount

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<sup>127</sup> The CBR consists of the capital conservation buffer, the countercyclical capital buffer, the systemic risk buffer and the buffers for global and other systemically important institutions.

(MDA). When dipping into the CBR, banks must compute an MDA that caps the capital they can distribute, for example in the form of dividends, share buybacks or variable remuneration.<sup>128</sup> In addition, to further support the financial intermediation capacity of banks, prudential authorities can release the countercyclical capital buffer (CCyB) or – dependent on the underlying risks – lower other regulatory buffers such as, for example, the systemic risk buffer (SyRB) in periods of distress, which should help to further facilitate the use of the underlying capital.

**Concerns have been raised about whether some factors could impair the expected functioning of the framework.** Specifically, in periods of economic or financial distress, banks may be unable to draw down the CBR if minimum requirements act as a binding constraint. Furthermore, banks may also be unwilling to dip into the CBR due to a number of factors.<sup>129</sup> These include limitations to distributions that are triggered when capital ratios fall within the CBR<sup>130</sup> and market pressure or stigma associated with the consumption of capital ratios. Ultimately, should impediments to the use of capital buffers affect a large portion of the banking system they can dampen aggregate lending supply to the real economy when most needed, thereby causing the banking system to behave procyclically and amplify a shock via credit supply shortages.

**The pandemic offers some insights into the functioning of the capital framework, specifically banks' propensity to use capital buffers and the impact of regulatory capital relief measures.** Banks in the euro area entered the COVID-19 pandemic with relatively strong capital ratios, which were further supported by extraordinary policy measures throughout the pandemic.<sup>131</sup> As a result, the euro area banking system as a whole was able to meet credit demand and withstand stress.<sup>132</sup> Nevertheless, the behaviour of banks with little capital headroom above regulatory buffers (see **Chart A.1**) offers insights about the propensity of banks to use these

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<sup>128</sup> The higher the use of the CBR, the lower the distributable amount. Banks must also provide a capital conservation plan, including profit forecasts and intended measures to bridge the gap in capital.

<sup>129</sup> For an explanation of the factors, see the article entitled "[Macroprudential capital buffers – objectives and usability](#)", *Macroprudential Bulletin*, No 11, ECB, October 2020.

<sup>130</sup> As the distributable amount decreases as use of the CBR increases, banks have an incentive to steer away from activating the MDA, so as to maintain discretion over their dividend policies and avoid the associated stigma. See "[Macroprudential capital buffers – objectives and usability](#)", op. cit.

<sup>131</sup> In June 2020, the EU Council ratified the Capital Requirements Regulation (CRR) "quick fix", which contained adjustments to the CRR to facilitate lending by banks. First, it extended the International Financial Reporting Standard (IFRS) 9 transitional arrangements to mitigate the capital impact stemming from IFRS 9 expected credit loss provisions. Second, it attributed a preferential treatment to non-performing exposures guaranteed by the public sector. Third, it delayed by a year the leverage ratio buffer applied to globally systemically important institutions. Fourth, it adjusted the leverage ratio to exclude certain central bank exposures. Fifth, it accelerated the application of the revised small and medium-sized enterprise (SME) supporting factor and the infrastructure supporting factor, as well as a few other deductions. Finally, banks benefiting from guarantees granted by national governments or other public entities were made subject to a zero risk weight on the guaranteed portion of the exposure.

<sup>132</sup> See, for example, *Financial Stability Review*, ECB, November 2020.

buffers, and about the impact of the prudential capital releases which took place in early 2020.<sup>133</sup>

## Evidence on banks' behaviour in the proximity of the combined buffer requirement

**Differences in banks' responses, depending on their distance to the CBR, provide a lens through which their willingness to use capital buffers can be assessed.** A difference-in-differences analysis allows explicit testing of whether the lending behaviour of a selected group of banks, specifically those with a distance to the CBR smaller than 3 percentage points in the first quarter of 2020,<sup>134</sup> differed significantly from that of banks with larger headroom above the CBR.<sup>135</sup> Bank-level and loan-level data on the corporate loan books of a sample of euro area banks between the second quarter of 2019 and the fourth quarter of 2020 are employed to control for the heterogeneity of bank-specific characteristics and credit demand across firms.<sup>136</sup> Additionally, information on the use of central bank funding (targeted longer-term refinancing operations or TLTROs) by banks and on whether individual loans are under payment moratoria or government guarantee schemes is used to isolate credit supply effects and control for the impact of policy support on lending.<sup>137</sup>

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<sup>133</sup> Starting on 12 March 2020, euro area prudential authorities decided to temporarily reduce buffer requirements, releasing more than €140 billion of Common Equity Tier 1 (CET1) capital held by euro area banks. Specifically, €20 billion originated from the release of macroprudential buffer requirements. The remaining €120 billion stemmed from microprudential and bank-specific capital releases, as banks could partially use additional Tier 1 (AT1) and Tier 2 (T2) capital instruments to meet Pillar 2 requirements (frontloading a measure already foreseen in the Capital Requirements Directive, CRD V) and were allowed to operate below Pillar 2 guidance. As a result, the CET1 management buffer of euro area significant institutions increased by about 1.3 percentage points.

<sup>134</sup> 3% corresponds to the first quartile of the distance to the CBR distribution before the pandemic. The reliability of the results is tested, also considering variations in the distance to the CBR threshold. To be valid, the difference-in-differences must meet the so-called "parallel trend assumption", meaning that trends in the outcome variable should move similarly in both the control and the treatment group before the pandemic. This assumption has been tested and validated.

<sup>135</sup> Since the proximity of the CBR is not completely exogenous as banks closer to the CBR may suffer from weaker balance sheets than banks further away from it, propensity score matching (PSM) difference-in-differences are employed as robustness checks. Banks in the proximity of the CBR show lower profitability and greater asset quality deterioration; hence, the PSM guarantees a more comparable sample of control group banks displaying similar ex ante shock characteristics. In addition, PSM is employed to separate the impact of the CET1 ratio from the distance to the CBR, which is important given the correlation between the two variables. The PSM is performed on variables capturing size, profitability, asset quality, solvency and funding structure. For more detailed information see Couaillier, C., Lo Duca, M., Reghezza, A. and Rodriguez d'Aciri, C., "Caution: Do not cross! Distance to regulatory capital buffers and lending in COVID-19 times", *Working Paper Series*, ECB (forthcoming).

<sup>136</sup> The bank-level analysis includes a sample of 110 banks, while 298 banks are employed for the analysis based on the AnaCredit dataset. The existence of multiple bank lending relationships enables the identification of supply-driven shocks because demand factors are captured by the inclusion of firm fixed effects, which requires a multiplicity of lending relationships, following the approach used by Khwaja, A. and Mian, A., "Tracing the impact of bank liquidity shocks: Evidence from an emerging market", *American Economic Review*, Vol. 98, 2008, pp. 1413-1442. Since a large number of single-bank relationships involve SMEs, this analysis also employs firm industry-location-size fixed effects. This makes it possible to control for credit demand of firms of the same size in specific industries and geographical areas and to retain single-bank relationships in the estimation (see Degryse, H., De Jonghe, O., Jakovljevic, S., Mulier, K. and Schepens, G., "Identifying credit supply shocks with bank-firm data: Methods and applications", *Journal of Financial Intermediation*, Vol. 40, 2019).

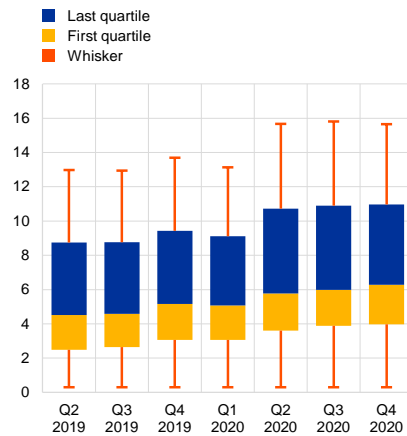
<sup>137</sup> In AnaCredit, it is possible to identify loans that are affected by the above-mentioned policies.

### Chart A.1

The distance to the regulatory capital buffers is heterogeneous across banks, but increased during the pandemic on the back of policy actions and de-risking

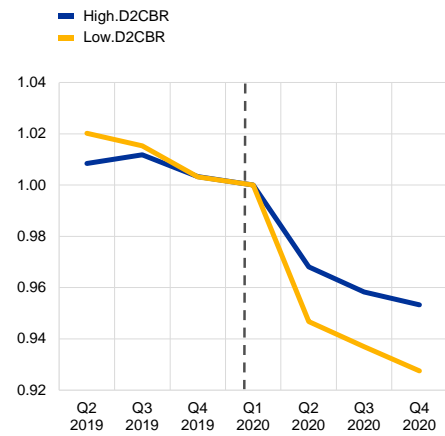
a) Evolution of the distribution of the distance to the CBR

(percentages)



b) Developments in bank risk weight density by distance to the CBR bucket

(risk weight density (normalised trend: Q1 2020 = 1); vertical dashed line indicates the pandemic shock)



Sources: ECB supervisory data, ECB market operations database, ECB Statistical Data Warehouse and ECB calculations.

Notes: Panel a: the blue section of the bar corresponds to the difference between the median and the last quartile of the distance to the CBR distribution. The yellow section of the bar indicates the difference between the first quartile and the median of the distance to the CBR distribution. The whisker extends from the upper (lower) quartile to the highest (lowest) decile. Panel b: "High D2CBR" refers to those banks that have a distance to the CBR above the first quartile of the distance to the CBR distribution. "Low D2CBR" refers to those banks that have a distance to the CBR below the first quartile of the distance to the CBR distribution. The trend is normalised so that the variable takes the value of 1 in Q1 2020.

### Banks closer to their CBR were found to de-risk their balance sheet and curtail their lending to non-financial corporations (NFCs) more than other banks.

Descriptive trends already suggest that banks closer to their CBR reduced their risk weight densities (defined as the ratio of risk-weighted assets (RWA) to total assets (TA)) more strongly during the pandemic than banks further away from it (see [Chart A.1](#), panel b). The econometric analysis further shows that, during the pandemic, proximity to the CBR was associated with a 1.3 percentage point decline in risk weight densities relative to other banks, a material drop compared with an initial risk weight density of 35%. In addition, closer proximity to the CBR was related to lower lending to NFCs by a substantial 2.7 percentage points (see [Table A.1](#)). Overall, these results could provide a validation of the concern that banks are reluctant to dip into regulatory buffers.

**Table A.1**

Estimated impact of proximity to the CBR on bank risk weight density and lending

| Variables                                   | RWA/TA<br>(1)       | RWA/TA<br>(2)      | Log(lending)<br>(3)    | Log(lending)<br>(4)    |
|---|---------------------|--------------------|------------------------|------------------------|
| Effect of CBR proximity during the pandemic | -1.302**<br>(0.541) | -0.870*<br>(0.504) | -0.0269***<br>(0.0007) | -0.0129***<br>(0.0008) |
| Observations                                | 626                 | 626                | 15,719,410             | 16,053,709             |

Sources: ECB AnaCredit data and ECB supervisory data.

Notes: The dependent variables are the risk-weighted assets-to-total assets ratio (columns 1 and 2) and the log of lending volumes (columns 3 and 4). "Effect of CBR proximity during the pandemic" is defined as the product of Low D2CBR and COVID-19. Low D2CBR is a dummy equal to 1 for banks that have a distance to the CBR below the first quartile of the distance to the CBR distribution (corresponding to 3%), 0 otherwise. COVID-19 is a dummy equal to 1 for the period after the pandemic, 0 otherwise. To control for heterogeneity among banks, the panel OLS regressions include a large number of lagged bank-specific control variables (size, profitability, asset quality, solvency and funding structure) as well as fiscal (moratoria and guarantees) and monetary policy (TLTROs) controls. Columns 1 and 4 are based on bank-level (columns 1 and 2) and loan-level (columns 3 and 4) difference-in-differences between the second quarter of 2019 and the fourth quarter of 2020. Standard errors clustered at bank level (columns 1 and 2) and firm level (columns 3 and 4) are reported in brackets. The first column includes bank and time fixed effects, the second bank and country-time fixed effects, the third firm fixed effects, and the fourth industry-location-size fixed effects to control for credit demand. \*\*\*, \*\*, \* indicate statistical significance at 1%, 5% and 10% respectively.

**Lower levels of lending by banks closer to their CBR resulted in greater credit constraints for non-financial firms reliant on these banks.** In principle, the effect on individual firms of a reduction in credit supply from banks in the proximity of the CBR could be offset if other banks picked up the slack. In reality, however, firms which are heavily reliant on banks in the proximity of the CBR may struggle to replace existing sources of financing with alternative ones, or to establish new credit relationships, in turbulent times. Firm-level analysis provides evidence of these substitution impediments. Firms exposed to banks in the proximity of the CBR<sup>138</sup> exhibited 5.3% lower borrowing after the onset of the pandemic than firms borrowing mostly from banks with larger capital buffers (see [Chart A.2](#), panel a, left bar). In addition, borrowing from firms which, prior to the pandemic, had only a single relationship with a bank in the proximity of the CBR declined by an additional 1.7 percentage points after the onset of the pandemic (see [Chart A.2](#), panel a, right bar).

**In addition, government loan guarantees for NFCs alleviated some of the effects of weaker lending by banks closer to their CBR.** Additional regressions<sup>139</sup> show that new lending increases linearly as the distance to the CBR increases. Specifically, a 1 percentage point greater distance to the CBR yielded a 2.6% greater increase in unguaranteed new lending (see [Chart A.2](#), panel b, dotted blue line). At the same time, the analysis shows that lending would have been lower without government loan guarantees and the loss in lending capacity would have been larger for banks closer to the CBR (see [Chart A.2](#), panel b, dotted yellow line).<sup>140</sup> This highlights the important role played by credit guarantee schemes in supporting firms' liquidity needs and facilitating risk transfer.

<sup>138</sup> These are defined as firms receiving at least 75% of their borrowing from banks closer to the CBR before the COVID-19 pandemic.

<sup>139</sup> These additional cross-sectional regressions include more than 1.5 million newly granted loans in a smaller set of countries including Germany, France, Italy and Spain in the second quarter of 2020. This part of the analysis uses the protection received for each loan contract to disentangle the effect of the distance to the CBR on guaranteed and unguaranteed credit.

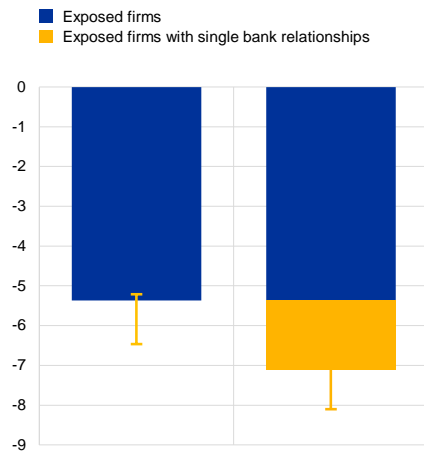
<sup>140</sup> Government guarantees support lending by banks closer to the CBR as the guaranteed portion of the exposure is subject to a zero risk weight.

## Chart A.2

NFCs face tighter credit from banks close to the CBR, although government guarantees soften the effect

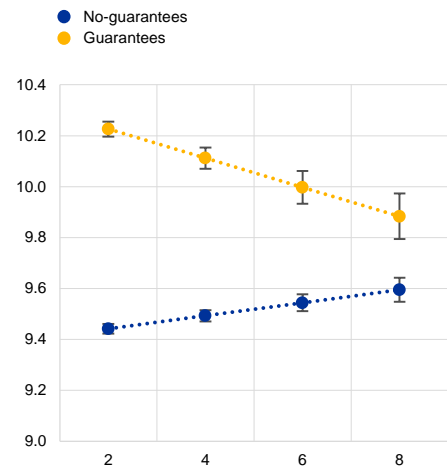
a) Estimated reduction in borrowing capacity for firms exposed to CBR-constrained banks

(estimated effect, percentages)



b) Impact of distance to CBR on new lending with and without guarantees

(y-axis: marginal effects on log loan amount; x-axis: distance to the CBR, percentages)



Sources: ECB AnaCredit data, ECB supervisory data and ECB calculations.

Notes: Panel a: based on a firm-level analysis. The dependent variable is the logarithmic change in firm borrowing. "Exposed firms" is a dummy variable taking the value of 1 if a firm's borrowing prior to the pandemic originating from CBR-constrained banks is greater than 75% of total borrowing. "Exposed firms with single bank relationships" is a dummy that takes the value of 1 if a firm has only a single bank relationship, 0 otherwise. 95% confidence intervals are displayed in yellow. To control for heterogeneity among banks, the regressions include a large number of bank-specific control variables, as well as fiscal and monetary policy controls. Panel b: the impact of being x percentage points above the CBR on log credit volume is displayed, distinguishing between guaranteed and non-guaranteed credit. The graph is based on cross-sectional loan-level regressions performed on the four largest European economies (Germany, France, Italy and Spain). The dependent variable is the logarithm of new lending granted after the pandemic (Q2 2020). "No guarantees" describes the relationship between the distance to the CBR and new lending that is not covered by government guarantee schemes. "Guarantees" indicates the relationship between the distance to the CBR and new lending that is covered by government guarantee schemes. The vertical lines indicate the confidence interval at the 95% level.

## Impact of regulatory capital relief measures on bank lending

**The second part of the analysis investigates how regulatory capital relief measures affected credit supply.**<sup>141</sup> During the pandemic, the prudential authorities

adopted these measures to support banks' capacity to accommodate possible increases in risk weights and losses without curtailing lending.<sup>142</sup> However, the size of

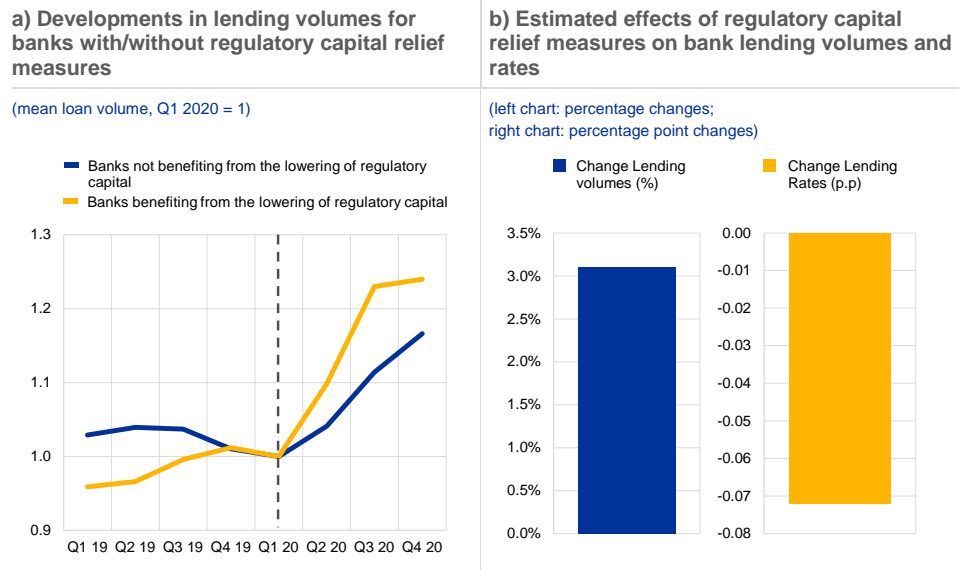
<sup>141</sup> The main focus of this special feature is on the role of regulatory capital buffers and on related reductions by authorities. Authorities lowered the capital that was not supposed to be released ex ante due to a lack of releasable buffers. Therefore, the regulatory capital relief measures considered in this analysis include not only the release of the CCyB, but also the ad hoc reduction of the SyRB and other systemically important institution (O-SII) buffers, as well as the frontloading in the change of the composition of the Pillar 2 requirement (P2R). This was a one-off supervisory measure, undertaken to anticipate a legislative change, and was not meant to be used on a cyclical basis. Banks benefiting from capital relief measures are defined as those which were subject to lower CCyB, SyRB or O-SII rates and/or had AT1 and T2 capital in excess of their Pillar 1 requirement which they could use to partially meet their Pillar 2 requirement (P2R), thereby reducing their CET1 requirement.

<sup>142</sup> Measures complementary to capital relief aimed at preserving the resilience of the financial system during the COVID-19 pandemic include the ECB recommendations urging credit institutions to refrain from distributing dividends or performing share buy-backs.

the corresponding reduction in regulatory capital varied across banks because of the heterogeneity in existing capital buffers and the composition of capital.<sup>143</sup>

### Chart A.3

#### Regulatory capital relief measures supported bank lending volumes and rates to firms



Sources: ECB AnaCredit data, ECB supervisory data and ECB calculations.

Notes: Panel a: banks benefiting from regulatory capital relief measures took advantage of the frontloading of the change in the composition of the P2R and/or of the release of the CCyB or the reduction of other buffers of the CBR. The trend is normalised so that the variable takes the value of 1 in Q1 2020. Panel b: the estimates are based on loan-level difference-in-differences regressions, after propensity score matching on ex ante bank characteristics. The treatment variable is the dummy CAPREL, equal to 1 for banks benefiting from regulatory capital relief measures. The regressions include – as control variables – bank balance sheet characteristics (including the take-up of central bank liquidity operations) and firm-bank loan-level characteristics to account for loan guarantees and moratoria, as well as fixed effects for the firm and country of the lender bank. Standard errors are clustered at the firm and bank level.

**The results show that regulatory capital relief measures had positive effects on lending, especially for banks closer to the CBR.** A comparison of the credit trends suggests that – after the policy measures – banks benefiting from lower capital requirements expanded lending volumes more than other banks (see [Chart A.3, panel a](#)).<sup>144</sup> A difference-in-differences analysis using firm-bank data on corporate loans to control for credit demand,<sup>145</sup> and accounting for bank-specific characteristics and other concurrent policies, confirms these results.<sup>146</sup> In particular, credit volumes increased by 3.1% after the regulatory capital relief measures, while interest rates on loans to firms eased by 7 basis points (see [Chart A.3, panel b](#)). Furthermore, the

<sup>143</sup> For the CCyB and the SyRB, only some national authorities had activated these buffers before the pandemic, while for the change in the P2R composition only some banks had available AT1 and T2 instruments to replace the CET1 capital. So, in the overall sample, out of 371 banks, 211 benefited from at least one form of capital requirement release (P2R and/or CBR). For these banks, the size of the released capital was 0.47% on average, with a median of 0.32% and an interquartile range between 0.06% (25th percentile) and 0.71% (75th percentile).

<sup>144</sup> An alternative specification expressing the capital requirement releases and the P2G in percentage points (vs dummies in the main specification) confirms those results.

<sup>145</sup> This approach exploiting the multiplicity of lending relationships in loan-level data also follows the methodology proposed by Khwaja and Mian, op. cit.

<sup>146</sup> Like the previous analysis, the difference-in-differences estimation is conducted after a propensity score matching, based on pre-COVID-19 bank balance sheet characteristics. The dataset uses loan-level data for 188 banks, including both significant and less significant institutions, and covers a sample period from the second quarter of 2019 to the fourth quarter of 2020, where the pre-COVID-19 period is defined as being from the second quarter of 2019 to the fourth quarter of 2019 and the COVID-19 period is defined as being from the second quarter of 2020 to the fourth quarter of 2020.



measures provided capital space to banks which were reluctant to use or get closer to the CBR, thereby supporting the credit supply from these banks (see [Chart A.4](#), panel a).

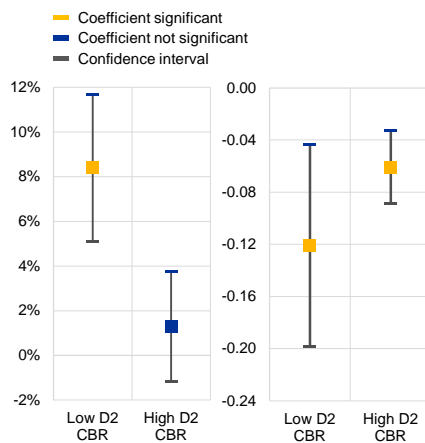
**Small and medium-sized enterprises benefited the most from the regulatory capital relief measures** (see [Chart A.4](#), panel b). The measures appear more effective for the provision of credit to those firms more reliant on bank lending, which have typically low or no access to debt securities funding and are thus less able to substitute across funding sources. Such a result is consistent with the objectives of the various policy actions undertaken during the pandemic.

### Chart A.4

Stronger expansionary effects for banks closer to the CBR, as well as for SMEs

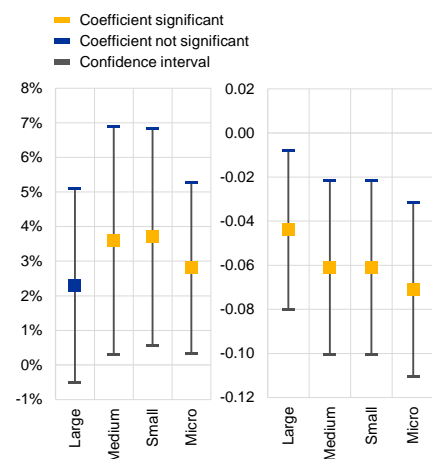
a) Estimated effects of the regulatory capital relief measures for banks with different distances from the CBR

(left chart: percentage changes in credit volumes;  
right chart: percentage point changes in lending rates)



b) Estimated effects of the regulatory capital relief measures for firms of different size classes

(left chart: percentage changes in credit volumes;  
right chart: percentage point changes in lending rates)



Sources: ECB AnaCredit data, ECB supervisory data and ECB calculations.

Notes: Based on loan-level difference-in-differences regressions, after propensity score matching on ex ante bank characteristics. The estimates report the coefficients of the interaction between the dummy CAPREL and a dummy for bank-specific characteristics, while the confidence intervals are shown at the 90% level. "Low D2CBR" ("High D2CBR") is a dummy equal to 1 for banks that have a distance to the CBR below (above) the first quartile of the distance to the CBR distribution. Panel b: large firms are those with more than 250 employees, medium firms more than 50, small firms more than ten and micro firms fewer than ten.

## Conclusions

**The behaviour of individual banks during the pandemic offers some insights into the functioning of the Basel III capital buffer framework, in particular the usability of capital buffers and the impact of regulatory capital relief measures.**

First, the results show that proximity to the combined buffer requirement (CBR) is associated with contractionary balance sheet adjustments (i.e. lower lending to NFCs) to insulate capital ratios. This could indicate that banks in proximity of the CBR have been reluctant to dip into regulatory capital buffers. While from a macro perspective credit growth has been strong and the euro area banking system has been able to meet credit demand during the pandemic, the behaviour of banks with limited capital space above the CBR could indicate possible impediments to the smooth functioning

of the capital framework in periods of economic distress. Second, this special feature finds that regulatory capital relief measures, which increased the capital space above the CBR, had positive effects on the supply of credit by individual banks. This supports the role of the reduction of regulatory capital buffers in mitigating the potentially procyclical behaviour of the banking system in periods of economic distress. From a policy perspective, those results could also suggest that more releasable capital would be desirable to enhance macroprudential authorities' ability to act countercyclically when a crisis occurs and more banks approach the CBR, insofar as the stability of the system is not jeopardised. However, more research, on macro aspects, is desirable to further test and substantiate this hypothesis.

## B Bank mergers and acquisitions in the euro area: drivers and implications for bank performance

Prepared by Isabel Figueiras, Sándor Gardó, Maciej Grodzicki, Benjamin Klaus and Laura Lebastard

*Bank mergers and acquisitions (M&As) have been subdued in the euro area since the global financial crisis. Most M&A activity has had a domestic focus and has involved smaller targets, with larger and sounder acquirers acting as consolidators. Consolidation seems on average to have had a moderately positive impact on the profitability of the banks involved, although high levels of variance reveal the presence of large execution and design risks amid low overall returns on capital in the banking sector. Improved post-transaction profitability can be linked to targets' lower cost efficiency, liquidity and capitalisation. Cross-border M&A transactions have been concentrated within a few small groups of euro area countries, supported by prior financial links and geographical proximity. Such transactions tend to be followed by a stronger improvement in profitability than domestic mergers, although this effect has diminished since the global financial crisis.*

### Introduction

**Bank mergers and acquisitions are often regarded as an option for reducing overcapacity and weak profitability in the euro area banking sector.** The euro area banking market has become increasingly concentrated (see [Chart B.1](#), panel a), and a third of its banking groups – mainly the smallest banks – have disappeared since the global financial crisis. Despite this, the sector continues to struggle with weak profitability and excess capacity, with too many undersized banks and a costly physical banking infrastructure.<sup>147</sup> Some measures of bank efficiency lag behind those of other advanced economies too (see [Chart B.1](#), panel b). The efficiency and stability of the banking system would benefit from further consolidation<sup>148</sup> which – as several policymakers have noted – should be driven by market forces, with each proposed transaction assessed individually.<sup>149</sup> Against this background, this special feature reviews recent trends in the consolidation of the euro area banking sector, examines the characteristics and drivers of bank M&A transactions, and analyses the impact of bank mergers and acquisitions on the performance of euro area banks.

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<sup>147</sup> Gardó, S. and Klaus, B., “[Overcapacities in banking: measurements, trends and determinants](#)”, *Occasional Paper Series*, No 236, ECB, November 2019.

<sup>148</sup> See the box entitled “Market power, competitiveness and financial stability of the euro area banking sector”, *Financial Stability Review*, ECB, November 2019.

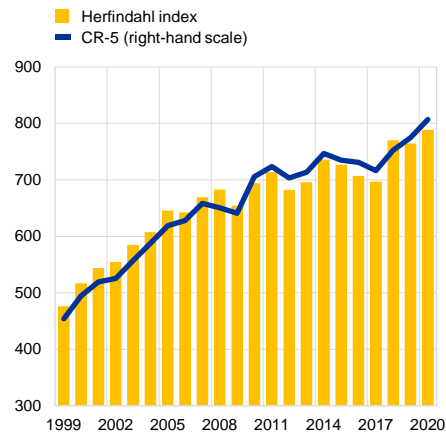
<sup>149</sup> Fernandez-Bollo, É., Andreeva, D., Grodzicki, M., Handal, L. and Portier, R., “[Euro area bank profitability and consolidation](#)”, *Financial Stability Review*, Banco de España, Vol. 40, 2021, pp. 83-110; Enria, A., *Introductory statement at the press conference on the results of the 2019 SREP cycle*, Frankfurt, 28 January 2020.

### Chart B.1

Consolidation has led to a more concentrated market since the global financial crisis, but there is more room for efficiency gains

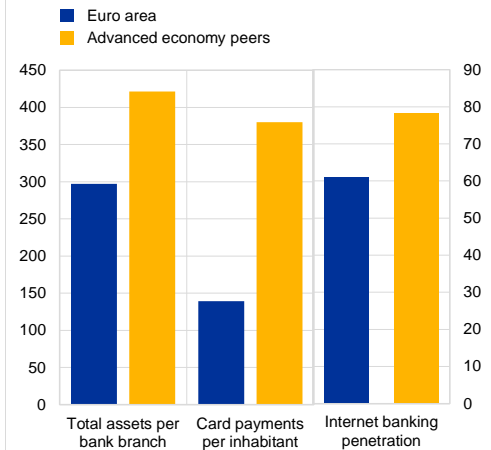
#### a) Measures of banking sector concentration in the euro area

(1999-2020, index, percentages)



#### b) Measures of bank efficiency

(2020, total assets per bank branch: € millions, card payments: number per inhabitant (both left-hand scale), internet banking penetration: percentage of population (right-hand scale))



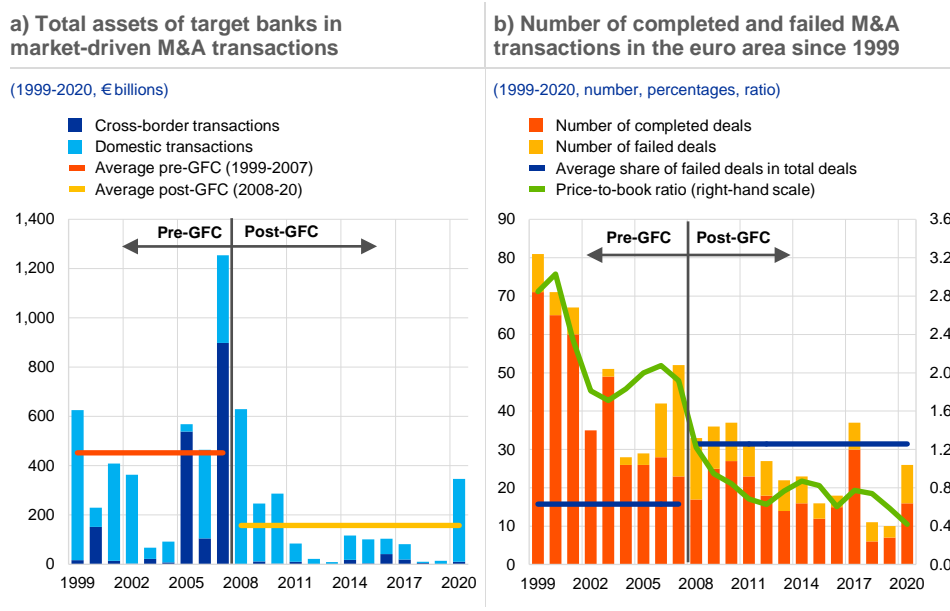
Sources: Bank for International Settlements, Federal Deposit Insurance Corporation, Norges Bank, ECB and ECB calculations. Notes: Panel a: the Herfindahl index is a measure of bank size relative to the sector, computed as the sum of the squared individual bank asset shares of euro area banking system assets. Higher values indicate a higher degree of concentration. The concentration ratio (CR-5) refers to the weighted average of concentration ratios of national banking sectors in the euro area. Panel b: the category "advanced economy peers" comprises Denmark, Norway, Sweden, the United Kingdom and the United States.

## Developments in the euro area

**M&A activity slowed markedly in the euro area banking sector in the wake of the global financial crisis.** In line with developments globally, the value of M&A transactions, proxied by the total assets of M&A targets, fell by about two-thirds between the pre-crisis decade and the period since 2008 (see [Chart B.2](#), panel a). Large transactions have become particularly uncommon, while the drop in the total number of transactions has been less steep. It has also become more difficult to finalise M&A transactions in the aftermath of the global financial crisis. On average, one in three attempted transactions has ended without a deal in the post-crisis period, up from one in six in the pre-crisis decade (see [Chart B.2](#), panel b). This highlights the difficulties euro area banks face in finding an attractive match in an increasingly challenging operating environment that is characterised by low interest rates, low returns on capital and the ongoing digital transformation of the financial industry. Only recently has bank M&A activity started to recover, although it remains below pre-crisis levels.

## Chart B.2

Bank M&A activity has remained muted since 2008 in terms of both deal values and numbers, with the share of failed deals increasing



Sources: Dealogic, Orbis Bank Focus, Refinitiv and ECB calculations.

Notes: Relevant M&A transactions exclude the acquisition of assets, repurchases, privatisations, leveraged buyouts, joint ventures and restructurings. They meet the following criteria: (1) the acquired stake is above 10%, corresponding to a qualifying holding; (2) the initial stake is below or equal to 50%; and (3) the final stake is above 50%. In cases where multiple banks are involved in a deal as target and/or acquirer, at least one of the targets and/or acquirers have to be domiciled within the euro area. The transactions are reported by the year in which they were announced. The periods before and after the global financial crisis (GFC) are defined as 1999-2007 and 2008-20 respectively. Panel a: total assets refer to the last available observation prior to the year in which the merger was completed. Data on total assets of the target are available for 350 out of 603 deals reported by Dealogic for 1999-2020. Panel b: the price-to-book ratio shown refers to the median of listed euro area banks' price-to-book ratios at the end of each year.

### Larger institutions and banks with stronger fundamentals have played a dominant role as consolidators of the banking market.

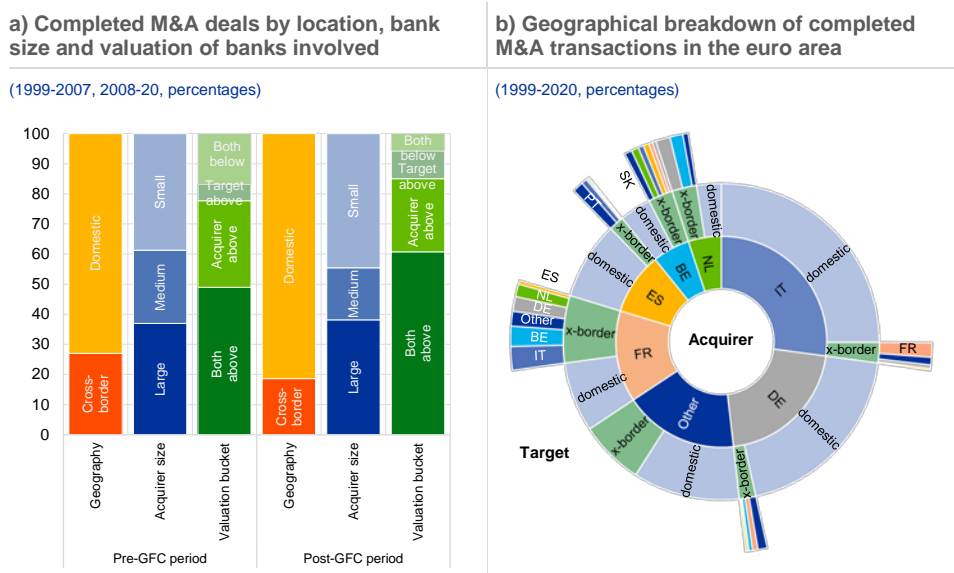
From the acquirer perspective, medium-sized and large institutions have accounted for around 60% of all bank M&As in the euro area (see [Chart B.3](#), panel a), predominantly targeting smaller institutions. This may indicate that targets have been selected to complement the existing business model of the acquirer rather than to combine two institutions with similar balance sheet footprints. The preference for smaller banks might also reflect disincentives for increasing the size of large domestic institutions in the capital buffer framework. Moreover, most bank M&A deals since the global financial crisis have contained at least one bank perceived by investors to be stronger than the median bank. Around 15% of all deals (mostly domestic deals) seem to have involved weaker institutions to the extent that lower bank valuations and weaker bank profitability are indicative of less solid bank fundamentals.

### Bank M&A activity in the euro area has mainly focused on transactions within national markets.

Around 80% of all completed deals in the euro area have been domestic. Italy and Germany, which have two of the least concentrated banking sectors within the euro area, have witnessed the largest number of transactions, but very few of these have reached beyond national borders. Cross-border activity has been less frequent since the global financial crisis, comprising rather small deals involving mainly Belgian, French and Dutch banks (see [Chart B.3](#), panel b).

### Chart B.3

Domestic M&A deals predominate and often involve a large acquirer and at least one strong bank, while cross-border M&A activity varies markedly across countries



Sources: Dealogic, Orbis Bank Focus, Refinitiv and ECB calculations.

Notes: Panel a: cross-border deals refer to transactions within the euro area. Acquirer size looks at the total assets of the acquirer in the year in which the deal was announced. An acquirer is classified as small with total assets of less than €5 billion, medium-sized with assets of €5-30 billion, and large with assets in excess of €30 billion. Valuation buckets are obtained by running a regression of the price-to-book ratio on the return on equity (ROE) for a sample of 27 listed euro area banks. Using the resulting coefficients, an imputed price-to-book ratio for each acquirer and target involved in a deal is computed using the ROE for the year in which the deal was announced, to also cover non-listed banks which do not have a price-to-book ratio. The imputed price-to-book ratio for each bank is compared with a median computed using a balanced sample of 564 euro area banks with balance sheet data available since 1996. The periods before and after the global financial crisis (GFC) are defined as 1999-2007 and 2008-20 respectively.

## Drivers of bank mergers

**Studies have found that bank mergers and acquisitions follow diverse rationales and have no single dominant motivation.** These studies, mostly

focused on the 1990s and early 2000s, indicate that mergers often aim at improving profitability and efficiency. More profitable banks were more likely to bid for other, weaker banks, as M&A targets.<sup>150</sup> This also held for cross-border mergers,<sup>151</sup> which were moreover found to occur more frequently when countries were closely linked by a common language or trade, for instance.<sup>152</sup> Banks also engaged in M&As to gain

<sup>150</sup> Berger, A., Demsetz, R. and Strahan, P., "The consolidation of the financial services industry: Causes, consequences, and implications for the future", *Journal of Banking & Finance*, Vol. 23, Issue 2-4, 1999, pp. 135-193; Focarelli, D., Panetta, F. and Salleo, C., "Why Do Banks Merge?", *Journal of Money, Credit and Banking*, Vol. 34, No 4, 2002, pp. 1047-1066.

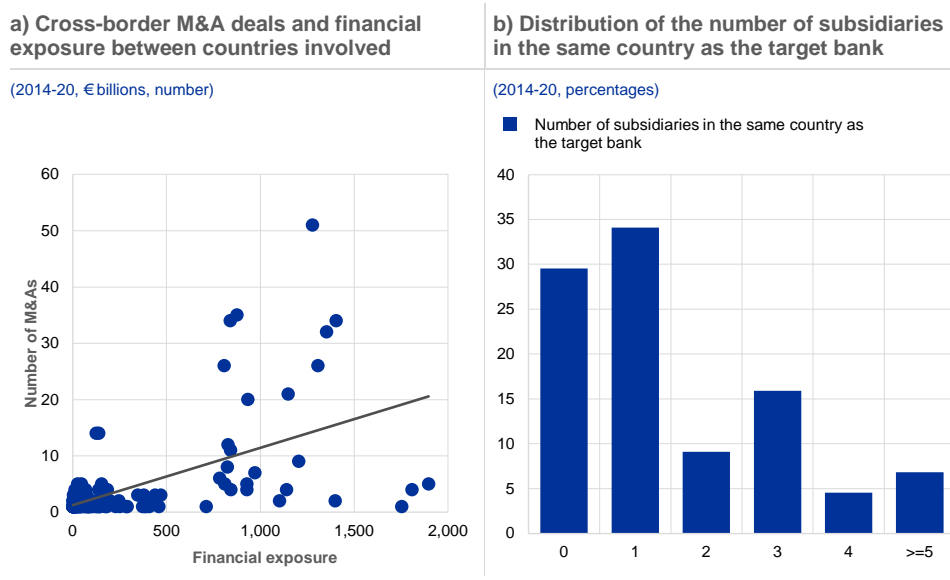
<sup>151</sup> Focarelli, D. and Pozzolo, A.F., "The patterns of cross-border bank mergers and shareholdings in OECD countries", *Journal of Banking & Finance*, Vol. 25, Issue 12, 2001, pp. 2305-2337; Caiazza, S., Pozzolo, A.F. and Trovato, G., "Do domestic and cross-border M&As differ? Cross-country evidence from the banking sector", *Applied Financial Economics*, Vol. 24, Issue 14, 2014, pp. 967-981.

<sup>152</sup> Buch, C. and DeLong, G., "Cross-border bank mergers: What lures the rare animal?", *Journal of Banking & Finance*, Vol. 28, No 9, 2004, pp. 2077-2102; Gulamhussen, M., Hennart, J.-F. and Pinheiro, C., "What drives cross-border M&As in commercial banking?", *Journal of Banking & Finance*, Vol. 72(S), 2016, pp. 6-18.

market share and market power, or to diversify revenues.<sup>153</sup> European studies support most of these rationales, finding in particular that smaller and less efficient banks were more likely to be acquired.<sup>154</sup>

#### Chart B.4

Cross-border deals often mirror existing financial linkages between two countries



Sources: Dealogic, ECB supervisory data and ECB calculations.

Note: Based on a sample of acquirer and target banks domiciled in all EU countries and the United Kingdom.

#### Empirical analysis shows that cross-border bank M&A transactions in the euro area tend to follow existing financial links.

A gravity model was used to evaluate the determinants of M&A transactions in Europe based on data covering 385 transactions over the period from 2014 to 2020.<sup>155</sup> Stronger links through bilateral interbank loans and securities holdings are associated with a higher number of cross-border M&As (see **Chart B.4**, panel a). Banks also often tend to acquire targets in countries where they already have a physical presence through subsidiaries,<sup>156</sup> while entry into new countries seems relatively less frequent (see **Chart B.4**, panel b).

<sup>153</sup> Amel, D. and Rhoades, S., "Empirical Evidence on the Motives for Bank Mergers", *Eastern Economic Journal*, Vol. 15, Issue 1, 1989, pp. 17-27; Elsas, R., Hackethal, A. and Holzhäuser, M., "The anatomy of bank diversification", *Journal of Banking & Finance*, Vol. 34, Issue 6, 2010, pp. 1274-1287. Other literature cautions that managerial incentives can be a powerful driver of M&A activity; see, for instance, Hadlock, C., Houston, J. and Ryngaert, M., "The role of managerial incentives in bank acquisitions", *Journal of Banking & Finance*, Vol. 23, Issue 2-4, 1999, pp. 221-249.

<sup>154</sup> Beccalli, E. and Frantz, P., "The Determinants of Mergers and Acquisitions in Banking", *Journal of Financial Services Research*, Vol. 43, Issue 3, 2013, pp. 265-291; "Cross-border mergers and acquisitions in the EU banking sector: drivers and obstacles", *Financial Stability Review*, ECB, November 2017, pp. 154-157.

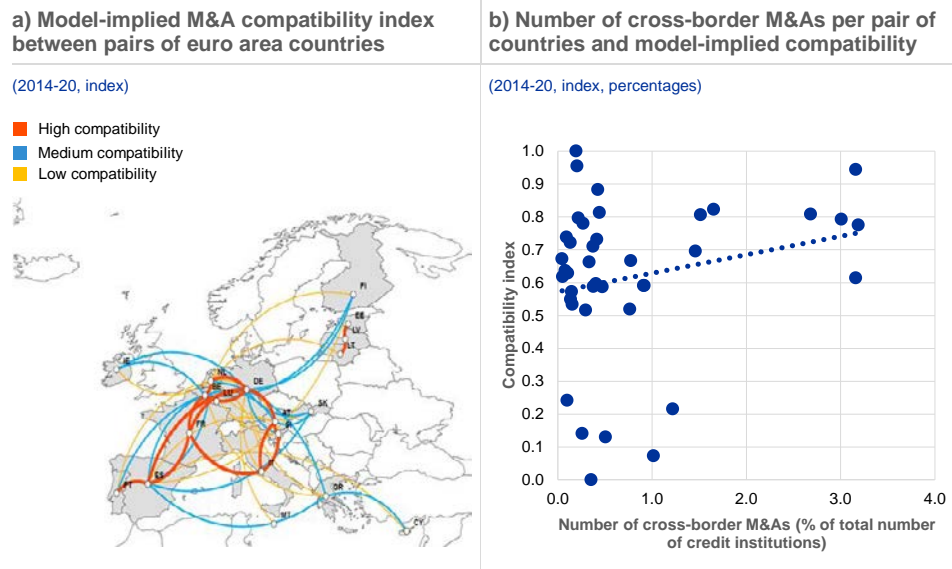
<sup>155</sup> ECB supervisory data are available only as of 2014, when the Single Supervisory Mechanism became operational. For methodological details and further results, see Lebastard, L., "Finance exposure and bank mergers – Micro and macro evidence from the EU", forthcoming, 2022.

<sup>156</sup> A similar conclusion was reached, for central and eastern European countries, by Lanine, G. and Vander Vennet, R., "Microeconomic determinants of acquisitions of Eastern European banks by Western European banks", *The Economics of Transition*, Vol. 15, Issue 2, 2007, pp. 285-308.



### Chart B.5

Cross-border transactions are likely to emerge within clusters of euro area countries, but actual transactions do not always follow model-implied compatibility



Sources: CEPII<sup>157</sup>, Dealogic, ECB supervisory data, Refinitiv and ECB calculations.

Notes: Panel a: index calculated using the coefficients of a gravity equation and averaged over 2014-20. Following the literature,<sup>158</sup> the gravity equation estimates, at the macro level, the impact of bilateral bank interlinkages, bilateral trade, bilateral migration, distance, common border, common language, common religion, common origin of legal system and difference of time zone on the number of bilateral M&As, using country-year fixed effects. The coefficients obtained are then used to estimate the M&A compatibility of countries and to build the index for each pair of countries. The index is scaled such that the highest compatibility has a value of one and the lowest zero. Links represent the 45 highest values in the index. The values from 1 to 15 are shown in red, from 16 to 30 in blue and from 31 to 45 in yellow. Panel b: the x-axis represents the sum of M&As by pair of countries divided by the sum of credit institutions in the two countries.

### Cross-border transactions are more likely to occur within clusters of euro area countries.

An M&A compatibility index was constructed using a gravity equation which captures the impact of financial, trade, and cultural linkages on the frequency of bank M&As over the period from 2014 to 2020. It shows that mergers between banks operating in some core euro area countries, including Belgium, Germany, the Netherlands and Austria, are the most probable constellation. Consolidation is deemed likely within two further clusters: French banks are thought likely to engage with banks in neighbouring countries, and Spanish banks are seen as a good fit with their Portuguese peers (see [Chart B.5](#), panel a). By contrast, banks operating in physically distant countries are not so suitable as merger partners. However, the actual frequency of cross-border mergers involving some country pairs seems to lie significantly below model-implied potential (see [Chart B.5](#), panel b). This suggests that factors not captured by the compatibility index, such as the prominence of cooperative and savings banks in a given country, may impede M&A activity, in spite of the strong financial links already existing between the countries involved.

<sup>157</sup> CEPII gravity database (the latest data point is for 2019). See also Head, K., Mayer, T. and Ries, J., "The erosion of colonial trade linkages after independence", *Journal of International Economics*, Vol. 81, Issue 1, 2010, pp. 1-14; Head, K. and Mayer, T., "Gravity Equations: Workhorse, Toolkit, and Cookbook", in Gopinath, G., Helpman, E. and Rogoff, K. (eds.), *Handbook of International Economics*, Vol. 4, Elsevier, 2014, pp. 131-195.

<sup>158</sup> Di Giovanni, J., "What drives capital flows? The case of cross-border M&A activity and financial deepening", *Journal of International Economics*, Vol. 65, Issue 1, 2005, pp. 127-149; Gulamhussen, M., Hennart, J.-F. and Pinheiro, C., op. cit.

## Impact on financial performance

**While the aggregate effects of mergers on bank performance seem mixed in the literature, they are conditional on sound execution and strategic fit.** US studies provide only partial support for M&A-driven improvements in bank profitability or efficiency.<sup>159</sup> A similar picture is painted by many European studies. For example, an analysis of the period prior to the global financial crisis finds that M&A transactions had a moderate but positive impact on the profitability of the banks involved. It also underscores the role of strategic similarities which generate economies of scale as a success factor in bank M&As, while integration of dissimilar banks often proves costly.<sup>160</sup> The positive impact of M&As also appears to be more pronounced when transactions are executed in a financial crisis,<sup>161</sup> as distressed valuations may prove opportune to a well-positioned bidder. At the same time, other studies find that M&As have a slightly negative impact on profitability but a positive impact on cost efficiency. This is interpreted as a sign that cost savings are passed on to customers in a competitive banking market.<sup>162</sup>

### **Bank profitability following cross-border mergers seems to differ from that following domestic mergers, depending on the timing of the transactions.**

Mergers completed in the late 1980s and early 1990s tended to generate no clear improvement in ROE, while later cross-border mergers seem to have delivered a superior performance than domestic mergers.<sup>163</sup> Although poor bank performance following cross-border mergers is often a result of problems preceding the transactions, it may also reflect an excessively optimistic price, poor execution and an inability to change the strategic course of the target.<sup>164</sup>

### **M&A transactions involving banks with weaker capital and liquidity positions and higher cost inefficiencies seem to yield higher post-merger profitability.**

Before the global financial crisis, ROE improved following about 51% of transactions, rising slightly to 57% after the global financial crisis, as investors became more selective about approving mergers. Mergers involving more cost-efficient banks tend to be less likely to generate improved profitability over a two-year horizon (see

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<sup>159</sup> Rhoades, S., "A Summary of Merger Performance Studies in Banking, 1980-93, and an Assessment of the 'Operating Performance' and 'Event Study' Methodologies", *Staff Studies*, No 167, Board of Governors of the Federal Reserve System, 1994; DeLong, G. and DeYoung, R., "Learning by Observing: Information Spillovers in the Execution and Valuation of Commercial Bank M&As", *Journal of Finance*, Vol. 62, Issue 1, 2007, pp. 181-216. The literature reviewing the effects of bank mergers and M&A announcements on stock market valuations usually finds that shareholders of target banks tend to benefit from M&A news while shareholder gains of the acquirer are at best limited and often negative.

<sup>160</sup> Altunbas, Y. and Marqués-Ibañez, D., "Mergers and acquisitions and bank performance in Europe: the role of strategic similarities", *Journal of Economics and Business*, Vol. 60, Issue 3, 2008, pp. 204-222.

<sup>161</sup> Shen, C.-H., Chen, Y., Hsu, H.-H. and Lin, C.-Y., "Banking Crises and Market Timing: Evidence from M&As in the Banking Sector", *Journal of Financial Services Research*, Vol. 57, Issue 3, 2020, pp. 315-347.

<sup>162</sup> Beccalli, E. and Frantz, P., "M&A operations and performance in banking", *Journal of Financial Services Research*, Vol. 36, Issue 2, 2009, pp. 203-226; at the national level, M&A transactions were found to improve the cost efficiency of Spanish banks; see Castro, C. and Galán, J.E., "Drivers of Productivity in the Spanish Banking Sector: Recent Evidence", *Journal of Financial Services Research*, Vol. 55, 2019, pp. 115-141.

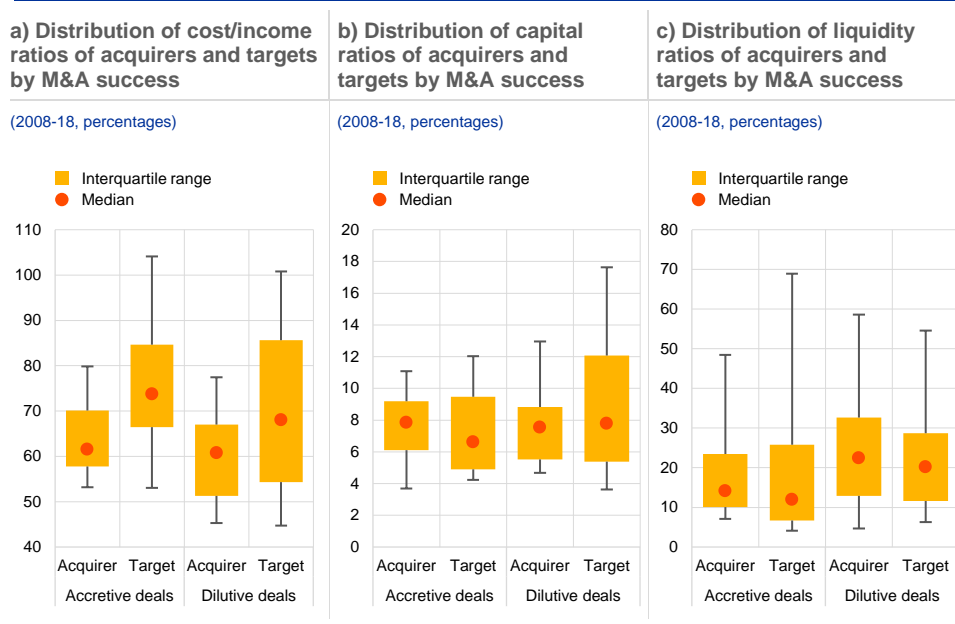
<sup>163</sup> Vander Vennet, R., "The effect of mergers and acquisitions on the efficiency and profitability of EC credit institutions", *Journal of Banking & Finance*, Vol. 20, Issue 9, 1996, pp. 1531-1558; Altunbas, Y. and Marqués-Ibañez, D., op. cit.

<sup>164</sup> Peek, J., Rosengren, E. and Kasirye, F., "The poor performance of foreign bank subsidiaries: were the problems acquired or created?", *Journal of Banking & Finance*, Vol. 23, Issue 2-4, 1999, pp. 579-604.

**Chart B.6**, panel a). This indicates that M&As may serve as a catalyst for cost synergies which may be absent from transactions between highly efficient banks. While the link between the capitalisation of M&A participants and merger success is less clear, in the case of profitability-enhancing deals the median capital ratio of the acquirer is higher than that of the target (see **Chart B.6**, panel b). Finally, M&A transactions involving banks with lower levels of liquidity appear to translate into positive profitability effects (see **Chart B.6**, panel c), suggesting that higher levels of bank liquidity may deter banks from exploiting business opportunities.

### Chart B.6

M&A transactions involving banks with weaker capital and liquidity positions and higher cost inefficiencies seem to yield higher post-merger profitability



Sources: Dealogic, Orbis Bank Focus, ECB and ECB calculations.  
 Note: Accretive deals are classified as those which resulted in an increase in the ROE of the merged bank over a two-year horizon after the M&A transaction, relative to weighted average ROE, after accounting for the change in the aggregate ROE of the sector. The remaining deals are classified as dilutive. Horizontal lines on the whiskers denote the range between the 10th and the 90th percentile of the distribution.

**Econometric analysis suggests that on average M&As lead to an improvement in the profitability of the merged entity.** Following the methodology applied by Beccalli and Frantz (see footnote 166), the findings indicate that M&A transactions were followed by a statistically significant increase in the ROE of the merged bank after two years, relative to the weighted average of the acquirer and target, and the effect is larger for cross-border mergers (see cross-border dummies reported in **Table B.1**). However, large variance within this effect indicates that the risk to an M&A's success may be sizeable. The effect of cross-border mergers seems to have waned over time too.

**Table B.1****Cross-border M&A deals are followed by a slight improvement in bank profitability****Regression results explaining the average ROE of the merged bank two years after an M&A**

(regression coefficients, standard errors)

|                             | (1)<br>M&A impact on profits | (2)<br>M&A impact on profits,<br>before and after the GFC |
|-----------------------------|------------------------------|---|
| Pre-merger ROE at t-2       | 0.252***<br>(0.0682)         | 0.251***<br>(0.0685)                                      |
| Cross-border dummy          | 1.497+<br>(0.787)            |   |
| Pre-GFC cross-border dummy  |                              | 1.851+<br>(1.026)   |
| Post-GFC cross-border dummy |                              | 0.683<br>(1.009)  |
| Year dummies                | YES                          | YES   |
| Constant                    | 2.882**<br>(1.010)           | 2.837**<br>(1.022)  |
| Observations                | 245                          | 245   |
| R-squared                   | 0.273                        | 0.274   |
| Adj. R-squared              | 0.204                        | 0.202   |
| F-statistic                 | 9.059                        | 8.472   |

Sources: ECB calculations based on Dealogic, Orbis Bank Focus and ECB data.

Notes: Standard errors in parentheses. Significance levels: + p&lt;0.10, \* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001. In line with Beccalli and Frantz (see footnote 166), constants and dummies are interpreted as the average change in ROE following an M&amp;A transaction. GFC: global financial crisis (see notes to Chart B.2).

**Credit risk and funding structures seem relevant to explaining the improvement in bank profitability after a merger.** A study of pre- and post-merger performance in the euro area before 2001 finds that domestic mergers performed better when participating banks were similar, as measured using a similarity index defined as the distance between normalised financial variables of the two banks. However, cross-border mergers enhanced profitability when banks followed diverse lending and credit risk strategies.<sup>165</sup> When mergers over the last two decades are examined, stronger profitability improvements are found for transactions in which one of the sides is burdened by high levels of non-performing loans (see [Table B.2](#)). This may point towards acquirers having better capacity to manage credit risk. When two participating banks differ in terms of funding structure, and the acquirer is more reliant on deposit funding, then historically the performance of the combined bank was marginally weaker.

<sup>165</sup> Altunbas, Y. and Marqués-Ibañez, D., op. cit.

**Table B.2**

Credit risk and funding structures are associated with higher post-merger profitability

**Effect of M&A on profitability depending on characteristics of participating banks**

(regression coefficients, standard errors)

|                       | Explanatory variables:<br>acquirer's<br>characteristics<br>(1)<br>Post-merger ROE<br>(average t+1 and t+2) | Explanatory variables:<br>acquirer's<br>characteristics<br>(2)<br>Change in ROE<br>(average t+1 and t+2<br>vs t-2) | Explanatory variables:<br>similarity indices<br>(3)<br>Change in<br>standardised ROE<br>from t-2 to t+2 | Explanatory variables:<br>similarity indices<br>(4)<br>Change in<br>standardised ROE<br>from t-2 to t+2 |
|-----------------------|--|--|---|---|
| Pre-merger ROE at t-2 | 0.229**<br>(0.0739)  |  | -0.192*<br>(0.082)  | -0.147<br>(0.0927)  |
| Cost efficiency       | -0.0374<br>(0.0263)  | 0.0539+<br>(0.0314)  | 0.00126*<br>(0.000547)  | 0.000644<br>(0.000557)  |
| Liquidity             | 0.0127<br>(0.0173)   | 0.0209<br>(0.0202)   | -0.000104*<br>(0.0000465)   | -0.0000695<br>(0.0000458)   |
| Capitalisation        | 0.121<br>(0.0965)  | 0.0364<br>(0.136)  | 0.00193<br>(0.00501)  | 0.00326<br>(0.00564)  |
| Credit risk           | 2.295*<br>(0.938)  | 4.040***<br>(1.184)  | 0.178+<br>(0.0999)  | 0.201*<br>(0.0898)  |
| Deposit activity      | -0.0342*<br>(0.0146)   | -0.0205<br>(0.0164)  | -0.00164***<br>(0.000406)   | -0.00147**<br>(0.000494)  |
| Constant              | 3.610<br>(2.737)   | 5.898<br>(3.855)   | 0.134<br>(0.131)  | 0.227<br>(0.141)  |
| Time dummies          | YES  | YES  | NO  | YES   |
| Observations          | 245  | 245  | 245   | 245   |
| R-squared             | 0.377  | 0.353  | 0.183   | 0.266   |
| Adj. R-squared        | 0.290  | 0.266  | 0.140   | 0.163   |
| F-statistic           | 7.624  | 4.395  | 12.51   | 5.780   |

Sources: ECB calculations based on Dealogic, Orbis Bank Focus and ECB data.

Notes: Standard errors in parentheses. Significance levels: + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. Similarity indices measure how close banks are to each other in terms of lending and funding strategies, and risk profiles. They are computed by first normalising the bank financial variables and then, for each pair of merging banks, taking the square root of the squared difference between the normalised variables, in line with Altunbas, Y. and Marqués-Ibañez, D., op. cit. The higher the index value, the less similar the two banks are.

## Conclusions

**Bank M&As have recently shown signs of recovery in the euro area after more than a decade of subdued activity.** Transactions have focused on consolidation within national borders, and cross-border transactions have remained limited. Larger institutions and banks with stronger fundamentals appear to have played a dominant role as consolidators of the banking market. Cross-border transactions are also likely to follow existing financial links and emerge within clusters of euro area countries.

**The empirical results presented in this special feature imply that M&As may lift bank profitability.** While they are not the only solution that would raise euro area bank profitability to levels sufficient to cover the cost of capital, M&As have the potential to substantially boost bank returns on equity. However, profitability outcomes

vary greatly, underscoring the need to design and execute such transactions well and to assess proposed transactions on their own merit. At the same time, assessment of M&A transactions should also consider the systemic footprint of the combined entity. The room for improving profitability seems larger in cross-border transactions, as well as where participating banks are less cost efficient and targets are burdened by high levels of non-performing loans.

**Completion of the banking union, which would address one of the key sources of financial fragmentation, could unlock the potential of cross-border M&A transactions.** Although appealing from a profitability perspective, such transactions may be impeded by the limited financial integration of the euro area (see **Box A**). Analysis of the drivers of cross-border M&As reveals that the single European market remains disjointed, as transactions have been clustered within a few small groups of neighbouring countries. While the supervisory approach to bank mergers has been clarified by the ECB,<sup>166</sup> further harmonisation of the regulatory and supervisory framework could help to overcome the fundamental drivers of fragmentation.

## Box A

### O-SII buffer calibration and cross-border bank mergers

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Prepared by Maciej Grodzicki, Barbara Meller and Wouter Wakker

**Buffer requirements for systemically important banks should adjust as the systemic risk of the institution changes, including after a merger or acquisition.** Other systemically important institutions (O-SIIs), which are banks considered crucial for the financial system of a Member State or the Union, are required to hold capital buffers to increase their resilience. The O-SII buffer is determined as a function of a bank's systemic relevance, as captured by the O-SII score, defined in the EBA guidelines<sup>167</sup> as the average of the bank's size, importance, complexity and interconnectedness scores, as compared to its domestic banking sector. The buffer's calibration is reviewed every year; O-SII buffers currently represent up to 2.5% of risk-weighted assets.

**However, some features of the current calibration regime could unintentionally create disincentives for cross-border mergers.** While one of the objectives of the O-SII buffers is to discourage banks from expanding so much that they become too big to fail, this box shows that the O-SII requirements for cross-border bank mergers depend crucially on the location of the head office. The buffer size may be affected by country-specific heterogeneous buffer settings and surcharges for cross-border exposure within the banking union.<sup>168</sup>

**The O-SII buffer requirement for a merged bank can vary significantly, depending on the direction of the merger.** There are two country-specific factors that influence the size of the combined bank's O-SII buffer: the relative size of the acquirer's banking sector and national buffer-setting practices. The effects of a merger are stronger for acquirers coming from smaller

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<sup>166</sup> [Guide on the supervisory approach to consolidation in the banking sector](#), ECB, January 2021.

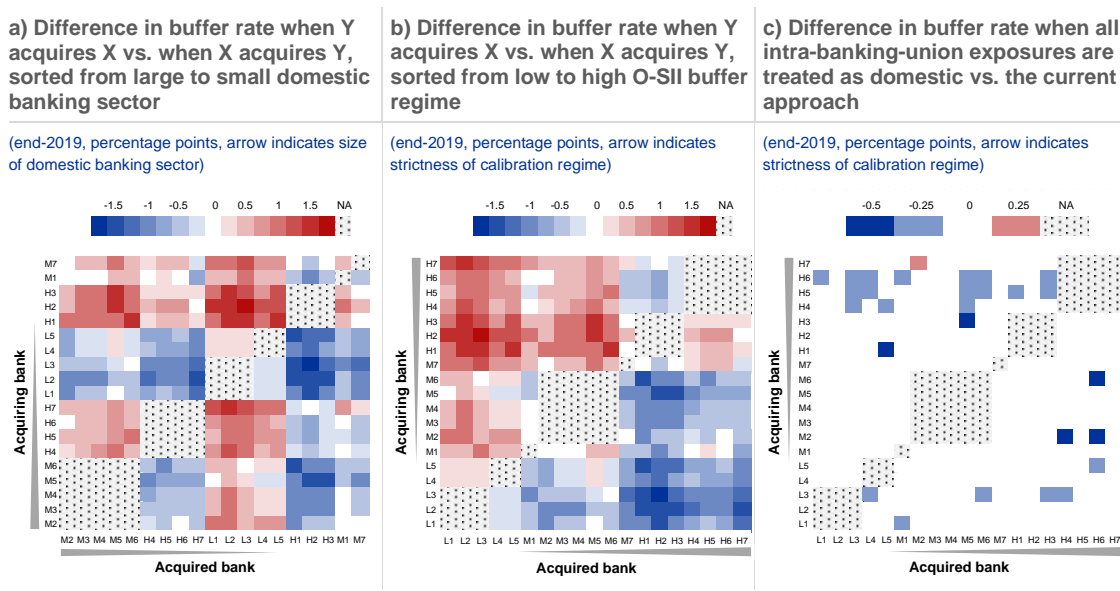
<sup>167</sup> [Guidelines on the criteria to determine the conditions of application of Article 131\(3\) of Directive 2013/36/EU \(CRD\) in relation to the assessment of other systemically important institutions \(O-SIIs\)](#) (EBA/GL/2014/10), European Banking Authority, December 2014.

<sup>168</sup> O-SII buffers are only one of several potential obstacles. Other obstacles to cross-border integration embedded in the European regulatory framework were emphasised in Enria, A., "[How can we make the most of an incomplete banking union?](#)", speech at the Eurofi Financial Forum, Ljubljana, 9 September 2021.

countries, where a large foreign acquisition has a relatively high impact on the score of the combined bank, or for acquirers coming from countries where buffers are set at relatively high levels. The impact of these factors is presented in heat maps (see **Chart A**, panels a and b) which show the difference in O-SII buffer for a combined bank, depending on which bank is the acquirer. The size differential between the two banking sectors is not systematically aligned with the increase in the buffer rate (see **Chart A**, panel a). By contrast, buffers are systematically higher when the acquiring country has a stricter calibration regime (see **Chart A**, panel b). For the largest banks under European banking supervision, the difference in O-SII buffer rate in a hypothetical cross-border merger can be as high as 1.75 percentage points, depending on the direction of the merger. In the banking union, such buffer-setting practices give an advantage to acquirers based in countries where O-SII buffers are set low.

### Chart A

O-SII buffers of merged banks depend on the direction of cross-border mergers, and may increase disproportionately for some pairs of banks due to surcharges on intra-banking-union exposure



Sources: National authorities, ECB supervisory data and ECB calculations.  
Notes: Panels a) and b) show the difference in O-SII buffer of a merger, depending on which bank was the acquirer. Panel a) is sorted from big to small banking sector, while panel b) is sorted from countries which set low O-SII buffers to countries with high O-SII buffers. Taking the upper left corner in panel a) as an example, the merger between bank M7 and bank M3 has an O-SII buffer which is 0.5 percentage points higher with bank M7 as the acquirer than bank M3 as the acquirer. If banking sector size or the buffer-setting regime were crucial factors determining post-merger O-SII buffers, differences in buffers should be lowest on the diagonal and increase towards the upper left and lower right. Banks are labelled based on the highest possible O-SII buffer in their home country (high: Germany, Netherlands; medium: Belgium, France, Finland; low: Spain, Italy). Domestic mergers are greyed out. Panel c) shows the difference in the post-merger O-SII buffer rates depending on whether the intra-banking-union exposure was treated as domestic exposure or not. The sample includes the 19 largest banks under European banking supervision in terms of size, at the highest level of consolidation, excluding subsidiaries. O-SII scores are approximated based on FINREP data from end-2019. As the bank sample available to the authors is not complete, where possible the denominator for each category is obtained by regressing the category score from the national O-SII notification on the values from the sub-categories that make up the respective category. If the standard error is larger than 2% of the estimate, a sample-based denominator is used instead, where the sample consists of all banks in the country at the highest level of consolidation. To account for discrepancies between reported scores and calculated scores, the estimated merged score and the SGA score are obtained by applying the percentage change between the calculated non-merged total score and the merged total and SGA score respectively to the reported score. The payments indicator is excluded from the calculation as it is not available from FINREP, and a 50% weight is applied to both private sector deposits from depositors in the EU and private sector loans to recipients in the EU to calculate the importance sub-score. The increase in buffer rates is estimated using methodologies disclosed by the national authorities.

**While having less impact than asymmetric O-SII buffer-setting practices, the link between cross-border exposure and the level of the buffer may also be an impediment to some cross-border mergers.** A bank's cross-border exposure, which includes non-domestic exposure within countries participating in European banking supervision, forms one-sixth of the overall O-SII score. Cross-border mergers can therefore inflate the total score of the combined bank more than a domestic merger, as the previous domestic exposure of the acquired bank will become a cross-border



exposure. This makes cross-border transactions less attractive than domestic transactions.<sup>169</sup> Under a single rulebook, a single supervisor and a single resolution authority responsible for systemically important banks, however, cross-border exposures within the banking union may no longer be a valid indicator of greater complexity. This has already been recognised by the European legislators in CRD V in the context of globally systemically important institutions.<sup>170</sup> Should that be considered to warrant all exposures towards countries participating in European banking supervision being treated on a par with domestic exposures, the O-SII buffers for some hypothetical mergers would decrease, in some cases by up to 0.5 percentage points (see **Chart A**, panel c).

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<sup>169</sup> The framework may further disincentivise mergers within the EU relative to acquisitions of non-EU banks, as two of the indicators used to calculate O-SII scores, total loans to and total deposits from the private sector, are geographically restricted to transactions with counterparties located in the EU.

<sup>170</sup> For more details, please refer to Fernandez-Bollo, É., Andreeva, D., Grodzicki, M., Handal, L. and Portier, R., "[Euro area bank profitability and consolidation](#)", *Financial Stability Review*, Banco de España, No 40, 2021.

## C Creditor coordination in resolving non-performing corporate loans

Prepared by John Fell, Miha Cajnko, Maximilian Fandl, Maciej Grodzicki, Claudia Mayer, Edward O'Brien, Martina Spaggiari and Pär Torstensson<sup>171</sup>

*Numerous European and national initiatives have been launched since 2014 to reduce non-performing loan (NPL) stocks on euro area bank balance sheets. NPL ratios have fallen as a result, but very gradually, mainly thanks to sales to non-bank investors. Despite stronger market activity, prices paid by NPL investors have only improved marginally and continue to stand well below values assigned to NPLs by banks. One type of NPL that has proven particularly difficult to resolve is loans to non-financial firms that have borrowed from multiple banks – multi-creditor loans. Analysis of these and other loans finds lower provision coverage by the lending banks, reflecting more optimistic valuations by individual banks and limited recognition of the expected costs of multi-creditor coordination. This special feature proposes a strategy to overcome creditor coordination failures and costs, through the use of data platforms providing ex ante transparency to NPL investors. These, together with NPL securitisation, could substantially reduce the gap between the value of the loans carried on banks' balance sheets and the prices offered by investors for NPL portfolios.*

### Introduction

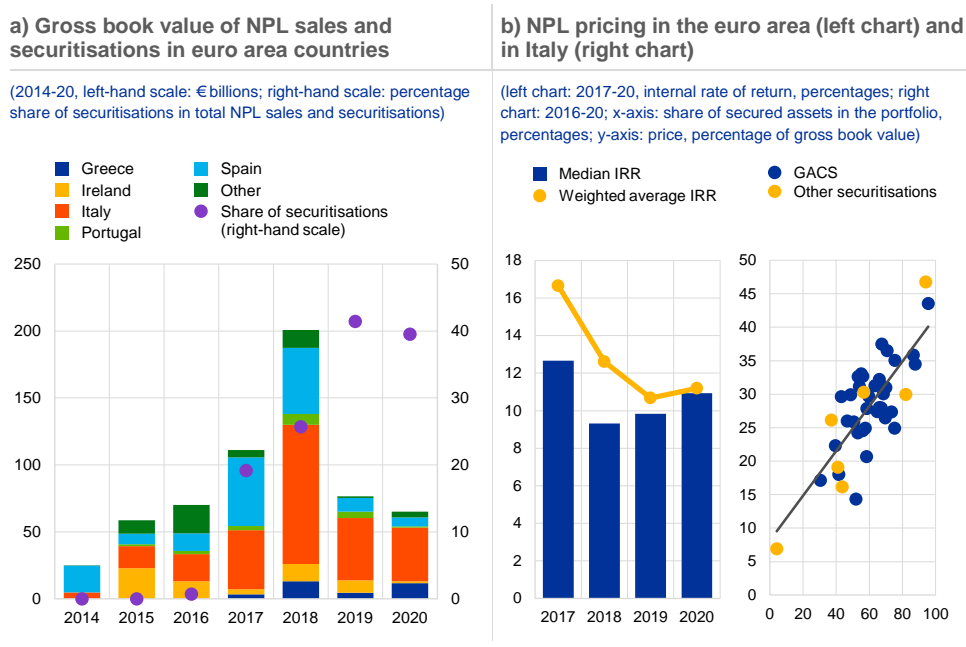
**Stocks of NPLs on euro area bank balance sheets reached a peak of over €1 trillion by 2014 and NPL ratios have taken about seven years to return to pre-global financial crisis levels.** The aggregate NPL ratio of euro area banks increased from 2.4% in 2007 to about 8% by 2014. It then declined again to 2.4% by mid-2021. Various factors have been cited in explaining the persistence of these stocks, including failures in the markets for NPLs and inefficiencies in insolvency frameworks. Numerous policy actions, perhaps most notably the [EU Council's 2017 NPL Action Plan](#), were set in train to address these challenges. Further policies should build on the considerable progress made and on the lessons learnt about the effectiveness of policy initiatives.

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<sup>171</sup> The authors are grateful to Nathaniel Butler Blondel, Antonella Pellicani and Wouter Wakker for excellent research assistance.

### Chart C.1

NPL markets have grown rapidly since 2014, while transaction prices reflected the collateralisation of loan portfolios



Sources: KPMG, Deloitte, EY, Banca Ifis, Acuris Debtwire, bank announcements and ECB calculations.

Notes: Data include sales of mixed portfolios which, in addition to NPLs, may include performing loans and repossessed collateral.

Panel b: left chart based on 56 transactions with a gross book value of €157 billion. For the methodology of the IRR estimates, see Box 7 entitled "Recent developments in pricing of non-performing loan portfolio sales", *Financial Stability Review*, ECB, May 2018. Right chart based on 34 NPL securitisation transactions. GACS: Garanzia Cartolarizzazione Sofferenze scheme; IRR: internal rate of return; NPL: non-performing loan.

**The decline so far has been achieved mainly via market disposals, often aided by government guarantee schemes.** Since end-2014, NPLs worth €584 billion have been sold by banks, mainly to non-bank investors. This represents 96% of the total net NPL reduction in this period. The market for NPL sales and securitisations in euro area grew more than eight-fold from 2014 to its peak in 2018 (see [Chart C.1](#), panel a).<sup>172</sup> In Italy and Greece, government guarantees were offered on senior tranches of NPL securitisations, and these schemes account for the largest part of NPL reductions in those countries.<sup>173</sup> For the guaranteed senior notes in NPL securitisations, usually retained by the selling bank, the sovereign risk weight can be used to determine the capital requirement, which substantially reduces the cost and amount of funding needed by NPL investors. While no system-wide asset management companies (AMCs) have been created since 2014, government-owned AMCs have also played a supportive role in dealing with distressed banks in Italy and Cyprus.<sup>174</sup>

**In parallel, NPL prices have improved, and supporting market infrastructure has developed.** The underlying asset pools in the NPL market have expanded to include secured loans. The wider use of NPL securitisations has fostered the development of market standards, such as the use of the GACS data template for information sharing

<sup>172</sup> Most of the transactions took place in Spain, mainly via sales, and in Italy, predominantly through NPL securitisations, which were accelerated by the introduction in 2016 of the Garanzia Cartolarizzazione Sofferenze (GACS) scheme, an Italian government guarantee for senior notes of NPL securitisations.

<sup>173</sup> The Hercules Asset Protection Scheme (HAPS) is the Greek equivalent of the Italian GACS scheme.

<sup>174</sup> AMCO in Italy and KEDIPES in Cyprus.

in Italy.<sup>175</sup> At the same time, market transparency for prospective NPL buyers remains limited, sustaining the “market for lemons” problem in the NPL market and limiting investor participation.<sup>176</sup> Loan servicing infrastructure has expanded to accommodate the growing NPL markets. Further harmonisation will be facilitated by the proposed EU Directive on credit servicers and credit purchasers, on which political agreement was reached in June, and by the actions envisaged by the EU’s 2020 NPL Action Plan.<sup>177</sup> Based on a sample of transactions, it appears that NPL prices – which move inversely with the internal rate of return demanded by investors – improved after 2017, despite a slight setback observed during the coronavirus (COVID-19) pandemic. Higher prices were achieved for NPL portfolios with a higher proportion of secured assets (see [Chart C.1](#), panel b). Nonetheless, the remuneration required by NPL investors remains high and indicates that banks selling NPLs usually incur sizeable losses. While single-seller transactions remain the standard practice, transactions involving multiple selling banks which pool their NPLs have appeared, and smaller banks have entered the NPL market as well.<sup>178</sup>

This special feature is structured as follows. It first discusses the creditor coordination problem for corporate NPLs as a source of market failure and financial stability risks, as banks may incur substantial losses on NPL sales. The subsequent section explores remedies to the market failure, and the last section concludes.

## The creditor coordination problem as a source of market failure

**Sources of market failure may remain despite significant improvements in NPL markets.** Market failures that have an adverse impact on NPL prices can be attributed to information asymmetry, oligopsonistic market structure and/or imperfect excludability.<sup>179</sup> While the first two sources have to some extent been addressed, limited progress has been made with respect to the third issue, which, in this context, means that the existence of multiple creditors leads to uncertainty about rights to the assets and cash flows of the debtor for any specific creditor. This can have a negative impact on asset values because an investor may discount the value of a loan asset to

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<sup>175</sup> The European Banking Authority (EBA) initiative to develop data templates for use by banks and investors aimed to improve data quality. The templates are being streamlined as part of the 2020 NPL Action Plan. Separately, two securitisation data repositories were approved by ESMA in June 2021 (see [“ESMA registers European DataWarehouse GmbH and SecRep B.V. as Securitisation Repositories”](#), press release, European Securities and Markets Authority, 25 June 2021). While reporting could be an important step towards improving post-transaction market transparency, it should be proportional and avoid creating barriers to entry into the NPL market.

<sup>176</sup> See Special Feature B entitled [“Addressing market failures in the resolution of non-performing loans in the euro area”](#), *Financial Stability Review*, ECB, November 2016.

<sup>177</sup> See [“Action plan: Tackling non-performing loans in the aftermath of the COVID-19 pandemic”](#), European Commission, December 2020.

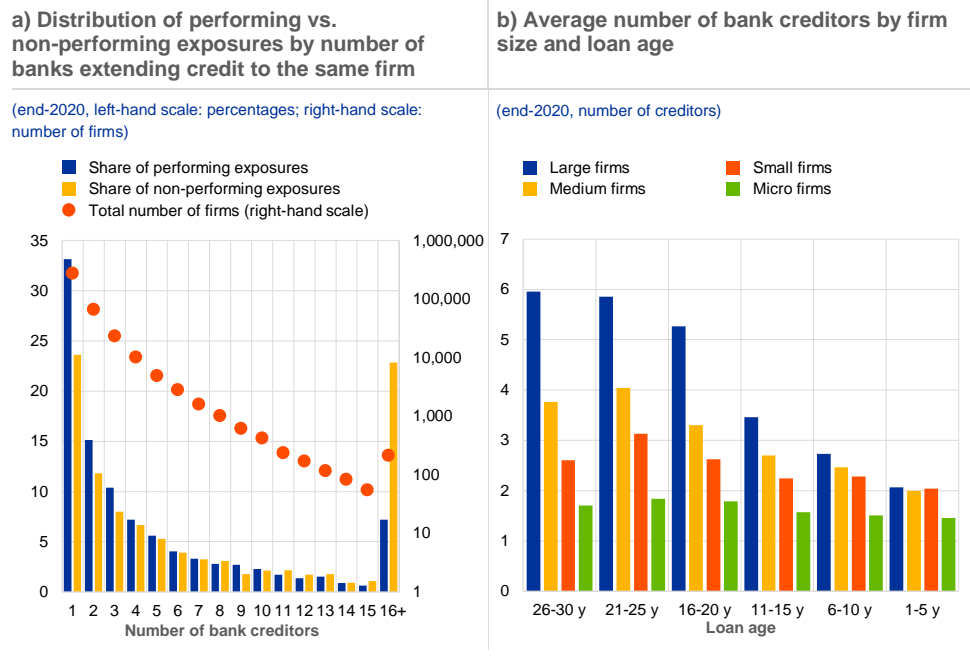
<sup>178</sup> 16 out of the 34 GACS transactions from 2016 to 2020 included multiple banks, with a total gross book value of €42.4 billion. Transaction types involved owner/subsidiary transactions (i.e. a parent bank sells NPLs jointly with one or more bank or non-bank subsidiaries), cooperative group transactions and private group transactions (i.e. a collection of cooperative and private banks which are not formally associated with carrying out joint transactions).

<sup>179</sup> See Special Feature A entitled [“Overcoming non-performing loan market failures with transaction platforms”](#), *Financial Stability Review*, ECB, November 2017.

reflect the reality that the underlying debtor may have multiple creditors, and resolution in cooperation with other creditors may be difficult and costly.<sup>180</sup>

### Chart C.2

Multi-creditor lending relationships are common and tend to be resolved less efficiently than single-creditor loans



Sources: ECB AnaCredit and ECB calculations.  
Notes: Sample of all credit instruments outstanding as at end-2020. Data only cover loan relationships with euro area banks and may underestimate the total number of bank creditors.

**Loan relationships with multiple banks are common in corporate lending in the euro area.** Loan-level data show that most corporate credit exposures in the euro area are extended to firms which have more than one bank creditor. Granular data show that the number of creditor relationships that large firms have (2.7 on average) is larger than for other firms, but small and medium-sized enterprises (SMEs) also borrow from multiple banks (with 2.1 and 2.5 lenders respectively, on average). Multi-bank credit relationships are disproportionately represented among non-performing loans (see [Chart C.2](#), panel a). At the same time, seasoned loan vintages tend to have, on average, more creditors compared with younger loan vintages (see [Chart C.2](#), panel b). All in all, these findings imply that multi-creditor relationships take longer to resolve and that coordination challenges can be faced when resolving both large and small NPLs.<sup>181</sup>

<sup>180</sup> Addressing difficulties in creditor coordination for corporate NPLs is a key motivation for out-of-court debt workout mechanisms (see, for example, “[Statement of Principles for a Global Approach to Multi-Creditor Workouts II](#)”, INSOL International, April 2017) and an often-cited advantage of system-wide AMC solutions (see, for example, Section 3 of the [2020 NPL Action Plan](#)).

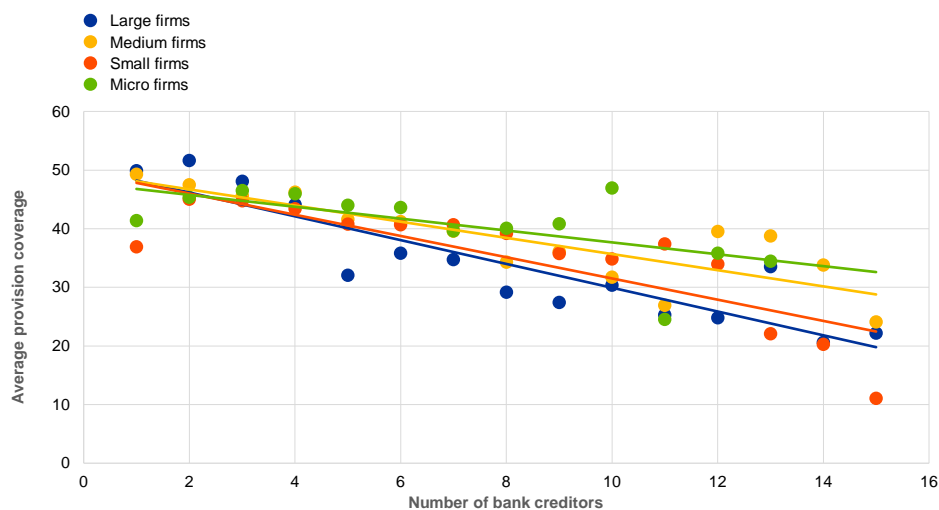
<sup>181</sup> The positive relationship between loan age and the number of creditors can also be observed for loans with an original maturity below one, three and five years. This would argue against an explanation that this observation is only due to a statistical effect which could arise if long-term loans, which are larger in size and often used by firms to finance capital expenditure, are more often split among multiple creditors.

### Chart C.3

Multi-bank credit relationships are associated with lower provision coverage

#### Provision coverage by number of bank creditors and firm size

(end-2020, percentages)



Sources: ECB AnaCredit and ECB calculations.

Notes: Sample of non-performing credit instruments reported in AnaCredit. Data only cover loan relationships with euro area banks.

#### Further analysis reveals that provision coverage of NPLs tends to be lower for borrowers with multiple creditors.

It could be expected that banks would recognise the higher cost of creditor coordination and lower recoveries in their provision estimates. However, **Chart C.3** shows a clear negative correlation between provision coverage and the number of bank creditors.<sup>182</sup> This may be driven by several factors, including that the costs of creditor coordination are not fully internalised by banks or that creditors do not fully identify and capture evolving credit risk information in timely assessments.

### Market-led solutions to creditor coordination problems

#### Combining theory, evidence and practice may offer some insight into possible policy solutions for more effective NPL resolution.

Poor coordination among creditors may result in market failure when transparency is limited; previously presented data highlight the potential extent of this problem. Consolidation of the entire debt of a distressed firm by one investor, as done by some system-wide AMCs, would address this challenge.<sup>183</sup> A pre-trade NPL data hub could deliver substantial benefits in NPL resolution. Experience with securitisation schemes, such as GACS and the Hercules Asset Protection Scheme (HAPS) in Greece, highlights the potential for private sector-led schemes to resolve NPLs without the need for public sector

<sup>182</sup> This is confirmed by regression analysis, controlling for collateral coverage, days past due and firm size.

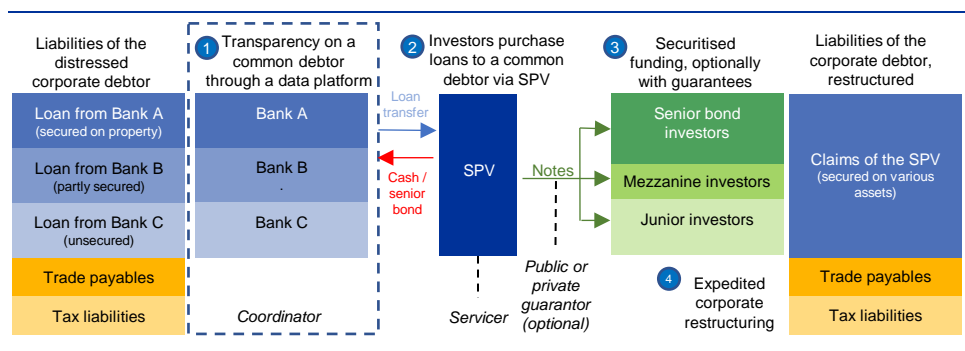
<sup>183</sup> System-wide AMCs in Ireland and Slovenia followed a debtor-level approach to tackle imperfect excludability and acquired most of the exposure of the banking system towards suitable debtors. This simplified the task of gaining control over the business of the debtor and resolving the respective NPLs.

sponsorship and the State aid implications of a system-wide AMC. A layered approach could be followed, depending on the degree of ambition of the scheme.

**Transparency on common debtor relationships among banks could be delivered by data and coordination platforms.**<sup>184</sup> Figure C.1 provides an overview of such an approach. In a first step, a dedicated coordinating platform would collate data on common debtors from participating banks,<sup>185</sup> using common data definitions already employed for existing data collections. Participation would increase prospects for favourable NPL resolution and higher NPL sales prices.<sup>186</sup>

**Figure C.1**

Schematic outline of a securitisation-based approach to working out multi-creditor corporate NPLs



Source: ECB staff illustration.  
Note: SPV: special-purpose vehicle.

**Once multi-creditor relationships are identified, investors may purchase a distressed firm's claims from multiple banks to obtain a qualified majority of the debt.** As illustrated in the second step in Figure C.1, investors could buy claims of the entire banking sector on the same debtor. This would reduce the costs of creditor coordination, to the benefit of the debtor, who, instead of dealing with several small and competing creditors, could face a single, specialised investor with a more in-depth and tailored involvement, greater financial firepower and turnaround expertise. It would also help reduce recourse to judicial procedures, accelerate and increase recoveries, improve pricing of NPLs and reduce losses to the banking sector.<sup>187</sup> Real economy benefits may also accrue from the transaction as a result of rapid resolution

<sup>184</sup> An alternative approach is inter-bank cooperation, which provides less additional transparency for outside parties than data platform solutions and can be hindered by misaligned incentives of participating banks. Project Solar in Greece, which involves joint servicing for common SME borrowers by Greek significant institutions, and PNCB, the private Portuguese NPL coordination platform, are examples of inter-bank cooperation to solve creditor coordination problems, albeit on a relatively small scale.

<sup>185</sup> For example, data would be collated by an external adviser hired by a bank association, bank consortium or public entity

<sup>186</sup> To encourage the participation of a minimum number of systemic banks per jurisdiction, which would be essential for the success of the scheme, it might be advisable to avoid an upfront sale commitment of participating institutions for the assets on which data are provided to the platform. At the same time, to mitigate the risk of individual bank data being misused, safeguards would be necessary to avoid that the identity of the seller banks is disclosed at an early stage of the transaction.

<sup>187</sup> The data platform may be extended to form a transaction platform, which could be used by credit institutions that are unable to originate NPL transactions on their own (e.g. less significant institutions, due to the limited size of the portfolio), or transactions could be executed via the platform. See "Overcoming non-performing loan market failures with transaction platforms" (op. cit.) for a discussion on NPL transaction platforms.



and investor participation, underpinning growth and employment and staving off instances of corporate zombification.

**To leverage the potential of the scheme, it could be combined with securitisation (see Figure C.1, step 3).** A securitisation scheme would facilitate the funding of the NPL transfers and provide a strong incentive for banks to participate, as the benefits of securitised funding may be substantial. Selected tranches could additionally carry a private or public guarantee, priced in line with State aid rules. However, this should be used with caution to avoid increasing moral hazard and recreating the sovereign-bank nexus. Capital relief provided by state guarantees serves as a strong incentive for banks. Guarantees would further increase the price offered by investors by reducing capital requirements on the retained senior tranche and the cost of debt funding. The state could require adequate servicing performance and set up dedicated monitoring committees to mitigate the fiscal risks.<sup>188</sup> National authorities may also wish to further facilitate the scheme by encouraging public sector creditors to participate in such market transactions alongside private investors. At the same time, the SPVs should remain governed by the private sector, with no political interference in the operations of the independent servicers.

**More efficient creditor coordination would improve the pricing of multi-creditor corporate loan portfolios, leading to better outcomes for banks and non-financial firms.** The EBA insolvency benchmarking exercise<sup>189</sup> showed that, on average, euro area banks recover about 40% of the gross book value of a non-performing SME loan portfolio over an average period of 4.1 years. On a net present value basis, this is worth about 36% of the gross book value. These data can be used to illustrate the impact of more efficient resolution on prices of NPL portfolios. An NPL investor, assumed to expect a 10% rate of return on its high-risk investment and discount the costs charged by an external servicer, would pay 13.2 percentage points less for the portfolio than the bank book value. If improved creditor coordination were to shorten the workout to 2.5 years, this gap would narrow by nearly 6 percentage points (see **Chart C.4**).<sup>190</sup> If the selling banks co-finance the transaction by retaining senior tranches of the securitisation, even without any public sector involvement, the gap could shrink by a further 5 percentage points, to about 2.3 percentage points, one-sixth of its original size.

**Independent servicers are an essential element of the described approach and would need to be appropriately incentivised to rehabilitate viable companies.** Loan servicing would be assigned to an independent specialist firm, in line with the common practice for NPL sales and securitisations (see **Figure C.1**, step 3). Their efforts should focus on offering sustainable long-term loan modifications, taking

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<sup>188</sup> Ultimately, the decision to intervene, and the choice and magnitude of the intervention, would lie with the respective Member State or a European institution in the case of a European guarantee. Generally, a Member State's intervention on market terms, where risk is remunerated accordingly, does not constitute State aid. However, it is the European Commission, as the body responsible for EU State aid control, that must assess in each case that any measure implemented is in line with EU rules.

<sup>189</sup> "EBA publishes Report on benchmarking of national insolvency frameworks across the EU", press release, European Banking Authority, 18 November 2020.

<sup>190</sup> While data on the duration of the individual stages of the recovery process are not available, the World Bank Doing Business 2020 data show that more than half of the time needed for enforcement of a contract in large euro area countries is spent in the trial phase. This suggests that a 40% reduction in recovery time could be achieved if a court procedure is avoided.

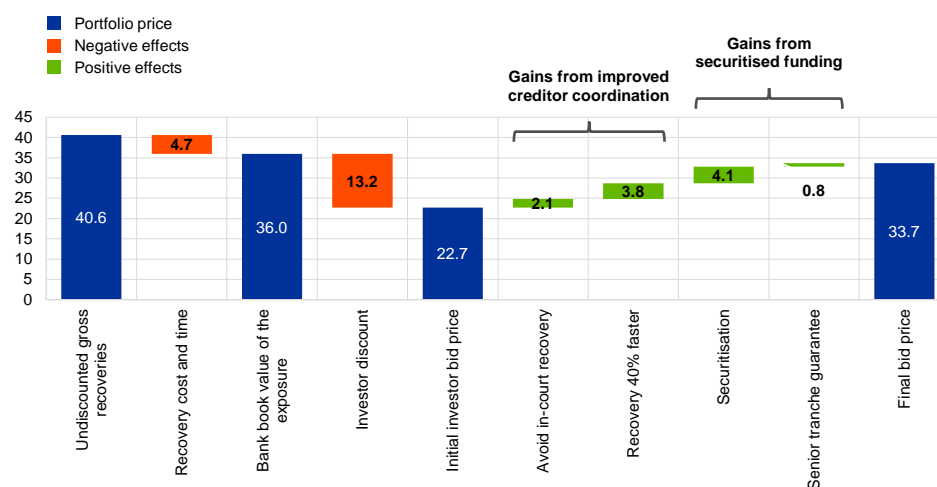
advantage of reduced coordination needs with other creditors and avoiding judicial procedures. Even in cases where an amicable resolution cannot be achieved, the servicers could engage in a single judicial process for all debts of an individual debtor. Public support measures could facilitate the corporate restructuring efforts.<sup>191</sup>

#### Chart C.4

#### Improved creditor coordination may generate a sizeable increase in prices of multi-creditor NPL portfolios

#### Illustrative example of the impact of improved creditor coordination and securitisation on NPL portfolio pricing

(percentage of gross book value)



Sources: ECB, Refinitiv, EBA and ECB calculations.

Notes: Recovery rates and judicial costs collected from the 2020 EBA insolvency benchmarking report. Investor discount rate assumed to stand at 10% and bank discount rate assumed to be equal to the 12-month average of lending rates on the outstanding stock of loans to non-financial corporations. Servicers are assumed to charge 12% of recoveries achieved. Improved creditor coordination is assumed to reduce the recovery period from 4.1 years to 2.5 years. Benefits of the securitisation estimated under the assumption that the senior tranche funds 80% of the purchase price and carries a stand-alone BBB rating, paying a yield consistent with observed BBB-rated unsecured senior bank bonds, with a capital requirement determined by a 100% risk weight. The guarantee is assumed to reduce the risk weight to zero and the cost of funding to that implied by the sovereign five-year yield, plus the guarantee fee determined using a basket of European corporate credit default swaps, plus an additional liquidity premium of 25 basis points.

#### Such schemes may be best suited for medium-sized and large companies, and could be open to non-bank creditors.

As creditor coordination issues are particularly relevant for corporate NPLs, a threshold for exposure size and a specific sectoral focus may help maximise benefits.<sup>192</sup> Non-bank financial creditors as well as commercial creditors may wish to accelerate recoveries, and the platform would provide them with a channel through which they can sell their claims. The public sector, which may hold claims arising from COVID-19-related guarantee schemes or from unpaid taxes or social security contributions, could also join the scheme.

<sup>191</sup> For example, support measures could include a partial debt write-off by the public sector in the event of private debt restructuring (see Blanchard, O., Philippon, T. and Pisani-Ferry, J., “A new policy toolkit is needed as countries exit COVID-19 lockdowns”, *Policy Contribution*, Issue No 12, Bruegel, June 2020) or governments conditioning equity injections on investments by private banks and investors, which signal confidence in a firm’s viability (see Díez, F.J., Duval, R., Fan, J., Garrido, J., Kalemli-Özcan, S., Maggi, C., Martínez-Peria, S. and Pierri, N., “Insolvency Prospects Among Small and Medium Enterprises in Advanced Economies: Assessment and Policy Options”, *IMF Staff Discussion Note*, SDN/2021/002, International Monetary Fund, April 2021).

<sup>192</sup> Excluding small business loans secured on primary residences from the asset perimeter would be particularly advisable, given the political and social sensitivities involved in such foreclosures. See, for example, “AMC Blueprint”, European Commission, March 2018.

## Conclusions

**This special feature proposes an approach to addressing creditor coordination problems which can inhibit the market-based resolution of NPLs.** These problems are relevant in the euro area as many firms borrow from multiple banks. By providing pre-trade transparency about multi-creditor lending relationships, which would ease the time and reduce the cost of resolution, the investor discount on large and medium-sized corporate loan portfolios may be substantially reduced. Building on the experience of the Greek and Italian schemes, markets may be deepened further with guarantee schemes in place for NPL securitisation, even though such solutions involving state participation (via state guarantees or publicly owned AMCs) should be considered with caution. Beyond the benefits of improved NPL workout for the financial sector, debtors too may ultimately be better off under such a scheme. The recovery of the real economy may also be supported and the destruction of value, often associated with drawn-out and ineffective resolution, minimised.

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