From Climate Change to Cyber-attacks: Incipient Financial Stability Risks for the Euro Area
From Climate Change to Cyber-attacks: Incipient Financial Stability Risks for the Euro Area

Monetary Dialogue Papers, February 2020

Abstract
The November 2019 European Central Bank Financial Stability Review is a very comprehensive report, covering the key risks to financial stability in the euro area. We summarise the report’s main conclusions and complement them with our analysis of housing markets, market interest rate expectations and safe assets, from a financial stability perspective. We emphasise financial stability risks related to climate change and cybersecurity. We compare housing market vulnerabilities and the implementation of macroprudential policies in euro area countries.

This document was provided by Policy Department A at the request of the Committee on Economic and Monetary Affairs.
This document was requested by the European Parliament’s Committee on Economic and Monetary Affairs.

AUTHORS
Zsolt DARVAS, Bruegel and Corvinus University of Budapest
Marta DOMÍNGUEZ-JIMÉNEZ, Bruegel
Guntram B. WOLFF, Bruegel

ADMINISTRATOR RESPONSIBLE
Drazen RAKIC

EDITORIAL ASSISTANT
Janetta CUJKOVA

LINGUISTIC VERSIONS
Original: EN

ABOUT THE EDITOR
Policy departments provide in-house and external expertise to support EP committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

To contact the Policy Department or to subscribe for updates, please write to:
Policy Department for Economic, Scientific and Quality of Life Policies
European Parliament
L-2929 - Luxembourg
Email: Poldep-Economy-Science@ep.europa.eu

Manuscript completed: January 2020
Date of publication: January 2020
© European Union, 2020

This document was prepared for the February 2020 Monetary Dialogue between the ECON Committee and the ECB President. It is available on the internet, also as part of a compilation, at: https://www.europarl.europa.eu/committees/en/econ/monetary-dialogue.html

DISCLAIMER AND COPYRIGHT
The opinions expressed in this document are the sole responsibility of the authors and do not necessarily represent the official position of the European Parliament. Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the European Parliament is given prior notice and sent a copy. For citation purposes, the study should be referenced as: DARVAS, Z., DOMÍNGUEZ-JIMÉNEZ, M. and WOLFF, G.B., From Climate Change to Cyber-attacks: Incipient Financial Stability Risks for the Euro Area, Study for the Committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2020.
# CONTENTS

**LIST OF ABBREVIATIONS**  
4

**LIST OF FIGURES**  
5

**EXECUTIVE SUMMARY**  
6

1. **INTRODUCTION**  
8

2. **A SUMMARY OF THE ECB’S ASSESSMENT OF KEY RISKS**  
9
   2.1. Prominent downside risks to economic growth, global environment  
9
   2.2. Sovereign debt concerns  
10
   2.3. Household resilience & a growing housing market  
10
   2.4. Corporate debt  
11
   2.5. Risky assets and low rates  
11
   2.6. The banking sector  
12
   2.7. Non-bank financial sector  
12
   2.8. Climate change  
12

3. **FINANCIAL STABILITY ISSUES REQUIRING SPECIAL ATTENTION**  
14
   3.1. The housing market  
14
   3.2. The unreliability of market expectations  
15
   3.3. The shortage of safe assets  
16
   3.4. Climate change  
18
   3.5. Cybercrime  
19
   3.6. Digital currencies  
19

4. **MACROPRUDENTIAL MEASURES TO ADDRESS RISKS**  
20

5. **CONCLUDING REMARKS**  
25

**REFERENCES**  
26
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCoB</td>
<td>Capital conservation buffer</td>
</tr>
<tr>
<td>CCyB</td>
<td>Counter-cyclical capital buffer</td>
</tr>
<tr>
<td>CDS</td>
<td>Credit Default Swaps</td>
</tr>
<tr>
<td>ECB</td>
<td>European Central Bank</td>
</tr>
<tr>
<td>EFSF</td>
<td>European Financial Stability Facility</td>
</tr>
<tr>
<td>D/LTI</td>
<td>Debt/loan-to-income</td>
</tr>
<tr>
<td>DSTI</td>
<td>Debt-service-to-income</td>
</tr>
<tr>
<td>EIB</td>
<td>European Investment Bank</td>
</tr>
<tr>
<td>ESM</td>
<td>European Stability Mechanism</td>
</tr>
<tr>
<td>ESRB</td>
<td>European Systemic Risk Board</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>FED</td>
<td>Federal Reserve</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>LTC</td>
<td>Loan-to-collateral</td>
</tr>
<tr>
<td>LTV</td>
<td>Loan-to-value</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>P/E</td>
<td>Price/Earning (ratio)</td>
</tr>
<tr>
<td>RRE</td>
<td>Residential real estate</td>
</tr>
<tr>
<td>S&amp;P</td>
<td>Standard &amp; Poor’s</td>
</tr>
<tr>
<td>SyRB</td>
<td>Systemic risk buffer</td>
</tr>
<tr>
<td>WEO</td>
<td>(IMF) World Economic Outlook</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 1: House price increases, housing loans and construction share of output, 2004Q1-2008Q1 and 2014Q3-2019Q3 14
Figure 2: Euro area interest rates and expectations 15
Figure 3: Debt security liabilities of euro area general governments by credit rating 17
Figure 4: Outstanding stock of euro-denominated debt securities by credit rating, € billions 18
Figure 5: Countercyclical capital buffer requirements, % of bank total exposure 20
Figure 6: Systemic Risk Buffer requirements, % of total bank exposure 21
Figure 7: Use of residential real estate instruments 22
Figure 8: Counter-cyclical capital buffers against house price increase (LHS) and residential real estate overvaluation (RHS) 23
Figure 9: Borrower-based macro-prudential measures against house price increase (LHS) and RRE overvaluation (RHS) 24
EXECUTIVE SUMMARY

- We analyse critically the European Central Bank’s November 2019 Financial Stability Review, which highlights the downside risks to economic growth in an environment of global uncertainty. It also discusses sovereign-debt concerns in case interest rates increase, and risks stemming from household and corporate debt. It provides an assessment of the risks arising from a possible overvaluation of asset prices and especially stock prices. Finally, the report evaluates risks within the banking and non-banking system, and risks related to climate change.

- On the whole, we think the ECB report is very comprehensive and covers the key risks to euro area financial stability. While radical uncertainty makes the prioritisation of risks difficult, we broadly concur that one of the main current risks to financial stability is the risk of a macroeconomic downturn in both the global and EU economies. The global economy has seen an upswing of unprecedented length, which has been supported more recently by continued monetary and fiscal accommodation in the US and in the EU. Should this upswing end, either because of political risks or external shocks, asset prices and interest rates could change. Such developments would put a strain on the balance sheets of financial and non-financial companies and institutions, and could create financial instability.

- We discuss in some detail the aspects of financial stability that in our assessment deserve more attention than they receive in the ECB report, and augment the discussion with new evidence.

- First, we argue that the assessment of risks in the housing market needs to be more nuanced. A striking feature of current housing markets relative to those pre-crisis is that they seem to be far less driven by mortgage credit. This is possibly good news for financial stability because an eventual house price correction would transmit less into mortgage defaults. Moreover, we find that the size of the construction sector hasn’t increased with recent house price increases, unlike in the pre-crisis period. An eventual correction to house prices might therefore be less likely to lead to corrections to economic activity.

- Second, we argue that there should be greater emphasis on changes in market expectations of interest rates. In recent years, changes in forward-looking market expectations have been very significant. Such changes, especially when interest rates are close to zero, can have substantial effects on asset prices because they might change substantially the discount rate of expected future profits. This could be particularly relevant if interest rate changes are not driven by real-economy developments.

- Third, the financial system crucially relies on a safe asset as a reference for its entire pricing curve of all assets. We show that the supply of safe sovereign assets in the euro area has fallen dramatically in the last 10 years, and is expected to fall further. This fall has been driven by two main factors. On the one hand, countries have seen their credit ratings deteriorate. On the other hand, the safest countries and in particular Germany, have decreased their absolute supplies of bonds as they reduced their debt levels. An increase in the supply of safe assets via greater issuance by Germany, structural reforms that lift productivity growth and ratings in the weaker euro area countries, and greater supply from EU institutions such as the European Investment Bank, would support financial stability, in particular if additional borrowing was used in economically productive ways.

- Fourth, we strongly support the ECB in its assessment that climate risks to financial stability need to be taken seriously, and we would advise the European Parliament to prioritise work on
this. We also argue that it is not advisable to reduce risk weights on green assets since they still contain normal financial stability risks. Instead, the debate should concentrate on increased risk weights for brown assets.

- Fifth, we worry that the ECB does not consider cybersecurity and hybrid threats in its financial stability assessment. These threats are significant operational risks for individual financial institutions. But more worryingly, the EU is badly prepared to deal with such threats should they materialise at a more systemic level. The financial consequences thereof would be substantial.

- One important set of policy instruments to address financial stability concerns is macroprudential measures. While assessment of macroprudential policy measures adopted in various euro area countries is hindered by lack of experience with the impacts of these measures, we discover notable discrepancies between Member States: countries with the same levels of housing price overvaluation have adopted markedly different macroprudential measures. This suggests that some countries might have done too much, while others have done too little. We call for a thorough cross-country analysis of macroprudential policy measures, in light of the vulnerabilities countries face.

- When it comes to preventing the next recession or at least reducing its impact on financial stability and the economy more broadly, we argue that EU policymakers need to be better prepared to use discretionary fiscal policy earlier and more forcefully. The ability of monetary authorities to react to the next cyclical downturn is very limited because rates cannot be reduced much further and the effectiveness of bond purchase programmes might also be more limited. The main remaining tool to respond to a downturn is fiscal policy, and its earlier and more proactive use would be necessary.
INTRODUCTION

In this Monetary Dialogue paper, written at the request of the European Parliament, we critically analyse the European Central Bank’s (ECB’s) November 2019 Financial Stability Review. On the whole, we think that the report is very comprehensive and covers the key risks to financial stability in the euro area.

As always in such assessments, it is relatively easy to argue where risks could emerge but it is much more difficult to quantify the size of the risks and rank them in terms of importance. In addition, given the radical uncertainty resulting from the unpredictability of politics and socio-economic and natural developments at the current juncture, totally unexpected risks could emerge. Unfortunately, we cannot solve this problem in our short paper. Nevertheless, through a combination of literature review, data analysis and interviews, we complement the ECB’s analysis in a number of ways.

Housing markets have historically often been one of the key factors in financial crises, as was the case, for example, in the great crisis of 2008-11. We therefore decided to take a deeper look into housing in Section 3. In Section 3, we also discuss in some detail changes to market expectations and their consequences. We zoom in on the importance of a safe asset for financial markets. Finally, we emphasise two risks that the ECB and the European Parliament should prioritise: climate risks and cyber risks to financial stability. We then provide an overview of one of the key policy instruments for achieving financial stability, so-called macroprudential policies. The last section concludes.

We highlight that in our note, we have not discussed the risks related to the incomplete set-up of monetary union and in particular banking union. Certainly, the current system will be better equipped to deal with shocks from failing or likely-to-fail banks than before banking union, but the set-up remains fragile. Questions of liquidity provisioning in resolution and differences of insolvency regimes are key concerns. We also have left aside the question of whether the currently high degree of monetary accommodation in itself is contributing to or reducing financial stability – a hotly debated topic.
2. **A SUMMARY OF THE ECB’S ASSESSMENT OF KEY RISKS**

The November 2019 ECB *Financial Stability Review* (hereafter ECB, 2019c) is a comprehensive and useful report assessing various aspects of financial stability risks in the euro area. We summarise the key messages of the report, and augment the assessment of some issues with our own findings in the next sections.

### 2.1. Prominent downside risks to economic growth, global environment

The euro area is experiencing an economic slowdown and the ECB expects near-term growth to remain modest. Growth and inflation projections have been revised downward. Manufacturing has been particularly affected and this vulnerability appears to be spreading. Current ECB projections expect growth in real GDP to be 1.1% in 2019, 1.2% in 2020 and 1.4% in 2021. This slight and gradual recovery is expected to be aided by accommodative monetary policy, which could strengthen lending to corporates, and a mildly supportive fiscal stance. Global demand is also expected to improve, not least because of the January 2020 trade agreement between China and the United States, which could help exports.

That said, global geopolitical risks remain the most prominent downside risks. The January 2020 China-US trade deal might just be a temporary pause in escalation of the trade conflict, with the deal leaving most of the recently introduced tariff measures in place. According to the October 2019 International Monetary Fund (IMF) *World Economic Outlook*, US-China trade tension will cumulatively reduce the level of global GDP by 0.8% by 2020, which was a major reason for the downgrade of the global economic outlook. The IMF argued that subdued growth is a consequence of rising trade barriers, elevated uncertainty surrounding trade and geopolitics, idiosyncratic factors causing macroeconomic strain in several emerging market economies, and structural factors, including low productivity growth and aging demographics in advanced economies.

In Europe, a no-deal Brexit has been avoided. Under the EU-UK Withdrawal Agreement, the transition period during which the United Kingdom will remain a member of the EU’s customs union and single market will last until the end of 2020. However, there are major uncertainties about whether and what kind of trade and financial services agreement will be concluded between the EU and the UK for the period following the transition period. While European and British institutions have made comprehensive preparations for an eventual abrupt end to the passporting rights enjoyed by UK-based financial firms, an eventual failure of the EU and UK to agree on arrangements beyond the transition period would likely affect growth negatively on both sides of the channel. The growth effects would be concentrated in specific EU countries with close ties to Britain. However, the direct financial risks may be more limited.

The evolution of the US economy will be a key determinant of European economic and financial developments. US growth has remained robust, spurred on by record-low unemployment, ample consumption and an appealing fiscal and monetary environment. However, the current economic expansion is by far the longest in the US’s post-war economic history and political developments (such as the election of a Democrat in the 2020 US presidential election) might change economic sentiment and bring the current US economic cycle to an end.

Similarly, while the Chinese slowdown has so far been gradual, risks to growth are negatively skewed and could result in a sharper decline, especially given the weakness caused by the trade conflict, the lack of clarity over available stimulus policies and the very high level of private debt.

A global economic slowdown could threaten financial stability in the euro area. Slower euro area economic growth resulting from a global slowdown would reduce household incomes and corporate
profits, and could threaten the ability to meet debt obligations, especially given high non-financial sector debt in some Member States. More vulnerable sovereigns could also come under strain. Global stock prices might also contract, spilling-over to the euro area, leading to a negative wealth effect.

2.2. Sovereign debt concerns

Sovereign debt positions appear largely sustainable. The euro area’s fiscal position is expected as expansionary in 2019 and subsequent years. While debt-to-GDP remains above 85 %, well above the Maastricht 60 % benchmark, it is expected to fall given the generally large positive differential between the economic growth rate and the interest rate (see Darvas et al, 2019, for a quantification and discussion of the growth-interest rate differential for all EU countries). Countries with sufficient fiscal space are counselled to make use of it, while for those with less-sustainable debt positions, prudence is the order of the day, according to the ECB report.

Sovereign debt sustainability is aided by benign financing conditions. Many euro area countries have used recent low interest rates (across the yield curve) to extend the average maturities of their debts, reducing refinancing needs. Most hold ample liquidity buffers.

That said, a more pronounced downturn could pose risks for countries with medium to high levels of debt. Debt sustainability could suffer especially if risk premiums rise as a result. Political and policy uncertainty could also expose sovereign debt to greater vulnerability, especially for Member States in need of a significant share of debt refinancing. Overall global pessimism could undermine the current favourable financing conditions.

2.3. Household resilience & a growing housing market

Household real disposable incomes are growing, given the favourable labour market outlook. Bank lending to households, especially mortgage lending, remains solid in some parts of the euro area, while in other parts (typically in countries with higher public debts, weaker banks, weaker growth outlooks) credit is hardly growing. Throughout the euro area, a slowdown appears to be on the horizon with indicators beginning to paint a more pessimistic picture.

Household debt remains broadly stable throughout the euro area, standing at 95 % of disposable income and 58 % of GDP (though this hides substantial variation, from 40 % of disposable income in Latvia and Lithuania, to 200 % in the Netherlands). That said, the Netherlands has seen recent deleveraging, as have Spain, Portugal and Ireland. France, by contrast, appears to be re-leveraging. Household repayment capacity remains robust, especially given the interest rate environment. But a significant downturn could put this into question.

There are signs of over-valuation in the residential housing markets according to the ECB report (on average above 7 %, although divergence is widespread). In contrast, commercial real estate appears to be in a downturn, although the market continues to grow in countries that were most heavily affected by the crisis, including Greece and Spain.

Overall, according to the ECB’s assessment, property markets pose a growing risk to financial stability. The low-rate environment and strong labour market outlook could increase pressure on prices in the medium-term. At the same time, the negative growth outlook and risk of deteriorating financing conditions could place a strain on the sustainability of household and corporate debt. Foreign investors are more significantly affected by the evolution of global financial markets.
2.4. Corporate debt

Corporate profits have been negatively affected by the growth outlook, with declining business sentiment and increasingly competitive markets. These profits and the subsequent fall in retained earnings could affect future investment and medium-term profits. Retained earnings remain the main overall source of finance expansion.

The level of corporate debt is high but stable (and has been for several quarters), although divergences between countries remain significant (and some surpass the 75% of GDP threshold implied in the Macroeconomic Imbalance Procedure). That said, the performance of credit default swaps (CDS) for corporate bonds would indicate the market believes credit risk is small.

Low interest rates and liquidity buffers recently accumulated by companies further increase the sustainability of corporate debt. Furthermore, the increase in market financing reduces dependence on the banking sector and the risks to corporations of banking sector vulnerabilities.

While overall risks remain under control, specific companies should be carefully monitored according to the ECB. Companies with high-yield corporate bonds seem to have increased both their gross and net leverage, while investment grade companies have slightly deleveraged. Furthermore, the increase of risk premiums in case of downturn is troubling. There has been increased issuance of BBB-rated corporate bonds in the past five years, as well as of corporate bonds with an already high leverage ratio. The possible downgrade of these in case of aggregate economic weakness would cause a large increase in risk premiums and threaten debt sustainability. The average maturity of corporate bonds is also increasing, as shown in Chart 2.10 of ECB (2019c).

We add that the IMF’s October 2019 Global Financial Stability Report (IMF 2019b) concluded that worldwide, including in Europe, the profits of non-financial companies would be insufficient to service their increased debt if a downturn takes place that is only half as severe as the 2008-2009 financial crisis.

We also highlight the study by Couaillier et al (2020), which highlighted the deteriorated interest coverage ratio in France, which together with the high degree of leverage in the corporate sector, result in vulnerabilities. By the end of 2018, vulnerable French companies had an aggregate gross debt of EUR 187 billion, which could rise by 60% if their costs of financing increase by 100 basis points.

2.5. Risky assets and low rates

The prices of riskier assets remain dependant on low rates. The prices of equities and corporate bonds have risen steadily, bar fluctuations arising from political uncertainty (the trade war, the possibility of a no-deal Brexit). This performance is well above growth in expected earnings or business sentiment. Using a dividend discount model, ECB (2019c) concludes that half of the increase in aggregate equity prices since the end of the euro area sovereign debt crisis can be attributed to lower benchmark yields (Chart A on page 44).

The search for higher yield has resulted in increased demand for longer-maturity and lower credit-quality assets. While some risk-taking is an objective of loose monetary policy, continued low yields can result in misaligned valuations and increase the possibility of a stark price correction. US equity prices seem overvalued using both the unadjusted and the cyclically adjusted price/earnings (P/E) ratio, while the euro area P/E ratio is close to the upper end of the historical distribution when using raw data, but well in the middle of the distribution when using cyclically adjusted data, suggesting fair valuation (Chart 2.9 on page 43 of ECB, 2019c).
Low funding costs due to a very low and very flat term structure further incentivise companies to leverage themselves. This may amplify the degree of re-pricing in a downturn.

2.6. The banking sector
ECB (2019c) highlights cyclical and structural factors that contribute to weak profitability, and evaluates the resilience of the banking system in adverse scenarios.

Bank profitability remains low in a historical comparison, driven by slowly growing net interest income, while net fee and commission income fell. Euro area banks have high cost-to-assets and cost-to-income ratios. Some banks have sought to reduce branches and personnel and invest in digitalisation, yet a sub-sample of significant institutions (SIs) showed IT expenses were the main drivers of operating costs increases in 2014-18. Poor profitability performance remains widespread, yet banks in EU countries where the effects of the financial crisis were more significant remain weaker.

The evaluation of resilience uses a baseline and an adverse scenario. The adverse scenario assumes a significant downturn in 2021 (GDP fall by 1.7%, unemployment rate rises to 10%), a 16% residential real estate price fall, and an increase in 130 basis points of the weighted average euro area 10-year bond yield.

The baseline scenario sees a small fall in bank profitability, small changes in lending to non-financial corporates, while bank solvency improves with the aggregate Common Equity Tier 1 (CET1) capital ratio rising by almost 1 percentage point to 15.3% in 2021.

The adverse scenario implies significant losses surpassing 15% of bank equity, big falls in lending to non-financial corporates, and a fall in CET1 by 3.1 percentage points to 11.3%.

The ECB’s overall assessment is that the banking system remains largely resilient to major risks. The question is of course the likelihood of a scenario which is more adverse than the adverse scenario considered by the ECB.

2.7. Non-bank financial sector
The non-bank financial sector includes insurance corporations, pension funds, investment funds, money market funds and other financial institutions. The combined balance sheet of these non-bank financial institutions grew in the first half of 2019, because of inflows and valuation gains, and now represents 56% of total financial sector assets.

While valuation gains and inflows imply good news for the sector, their profitability is challenged by low yields. Nearly three-quarters (72%) of insurers’ and pension funds’ bond holdings yield less than 1% (Chart 4.2 in ECB, 2019c). The low yield environment stimulates demand for riskier, longer-duration and less-liquid assets from non-bank financial entities, which can pro-cyclically affect prices and increase vulnerability, while maturity mismatch increases between liabilities and assets, leading to increased vulnerability to any re-pricing. Emerging market exposure is also increasing, though this remains small and also entails foreign-exchange risk.

Despite these increasing vulnerabilities and risks, the ECB foresees a stable outlook for the sector.

2.8. Climate change
The May 2019 ECB Financial Stability Review included a comprehensive assessment of the channels through which climate change can affect financial stability. It illustrates with various data the exposure of euro area financial institutions to risks from climate change (see pages 120-133 of ECB 2019b). Notwithstanding the limited data availability, the analysis shows that climate change-related risks have
the potential to become systemic for the euro area, in particular if markets do not price these risks correctly. The ECB report further highlighted the need for a forward-looking framework to improve the estimation of risks, and for better databases.

The November 2019 ECB Financial Stability Review included a box on climate-related disclosures by banks and insurers and a brief analysis of their market impact (see pages 64-66 of ECB 2019c). This box tackled the difficulty in gauging climate risks inherent in financial assets, which in turn complicates the assessment of how these risks could affect financial institutions. The Greenhouse Gas Protocol includes three ‘scopes’ of emissions for voluntary disclosure (direct, indirect from energy use and other indirect). However, financial firms disclose less than 30% of climate risks embedded in their financial assets (Chart A on page 65 of ECB 2019c), even though emissions related to financial assets of financial firms are very significant. The ECB argues that inconsistent reporting might explain why disclosures appear to have no effect on market valuations for banks, in contrast to pension funds, for which the ECB finds a statistically significant correlation (Chart B on page 66 of ECB 2019c).
3. **FINANCIAL STABILITY ISSUES REQUIRING SPECIAL ATTENTION**

We broadly agree with the key messages of the ECB’s comprehensive analysis. In this section, we augment the ECB report by focusing on certain issues we believe require special attention.

3.1. **The housing market**

We complement the ECB’s analysis by comparing pre-crisis developments, which were unsustainable in some countries, with the recent episode of house price increases. Housing loan developments are available from the ECB only starting in January 2003, while the housing boom started earlier in some euro area countries. Nevertheless, two important conclusions can be drawn from Figure 1.

First, before 2008 there was a positive correlation between the speed of credit growth and house-price increases, suggesting that credit growth might have fuelled house-price growth. But this has not been the case in the past five years, since the correlation is rather weak. Certainly, there are some exceptions, such as in France in the pre-crisis period, where house prices increased very rapidly but credit growth was limited. Slovakia is an exception in the past five years since fast house-price increases there have coincided with rapid credit growth. But the big picture remains: in most euro area countries credit growth does not appear to be the most important driver of house-price increases in the past five years. This finding suggests reduced financial stability concerns compared to the pre-crisis period, because an eventual house-price correction will affect fewer borrowers and therefore impact less on bank profitability.

Second, in the pre-crisis period the share of construction in output increased to over 10% in Ireland, Spain and Greece. Employment in the construction sector, and public-sector revenues related to construction, were therefore significant. The global and euro area financial crisis led to massive contraction in construction, with increased unemployment and loss of fiscal revenues. By contrast, in France, the share of construction in output remained almost unchanged in the pre-crisis period, despite the very fast pace of credit growth, and thereby the global and euro area crises did not cause major disruption. In the past five years, construction has not expanded much, suggesting again that an eventual housing bust would be less disruptive than it was in Greece, Ireland and Spain after 2008.

*Figure 1: House price increases, housing loans and construction share of output, 2004Q1-2008Q1 and 2014Q3-2019Q3*

(A) House price increase and housing loans

![Graph A: House price increase and housing loans](image-url)
3.2. **The unreliability of market expectations**

While there has been a secular decline in safe real interest rates since the early 1980s (Del Negro *et al.*, 2019), markets have been surprised by the continued fall in euro area interest rates, as indicated by Error! Reference source not found..

![Graph showing Euro area interest rates and expectations](source-image)

Source: Bruegel using data from Bloomberg.

Note: the share of construction in output refers to the maximum value reached during the sample period.
Given that market expectations have been wrong many times in recent years, current expectations might turn out to be inaccurate too. The euro area AAA-rated yield curve is below zero up to 14 years of maturity\(^1\). We regard an unexpected increase in the yield curve as more likely than an unexpected decline.

Since the current low rates have raised valuations of equities, a key question is how much equity valuations will change if and when interest rates rise. The direct effect of an interest rate rise would be a fall in equity prices. However, the crucial factor would be the reason for the interest rate increase.

Developments in the United States serve as a useful example. The Federal Reserve stopped net asset purchases in October 2014 and raised interest rates from December 2015. The effective federal funds rate increased from 0.1% in November 2015 to 2.4% in December 2018, while since October 2017, the Fed has even started to shrink its balance sheet, withdrawing liquidity. Despite these significant monetary tightening measures, US stock markets have not crashed and volatility has hardly changed. Most likely, robust US economic growth (boosted by a fiscal stimulus and weakened by the trade disputes and weaker global growth) increased expected corporate profits, which counter-weighted the impact of interest rate increases and Fed balance sheet contraction.

In Europe, too, the expected impact on equity prices of interest rate rises will likely depend on economic developments: if the economic outlook improves, higher interest might not lead to large equity price falls. But if interest rate increases are not accompanied by an improved economic outlook, equity prices could fall significantly. Equity prices could also fall significantly if the currently expected mild slowdown turns out to be a more protracted slowdown, or even a recession, even if interest rates do not change. An eventual major US stock price fall would likely cause European equities to fall too.

A crucial issue is the possibly heterogeneous recovery from the current economic slowdown in the euro area. There is the risk of differentiated growth – for example, western and northern euro area members could grow faster than southern European countries. Since western and northern euro area members account for a large share of the euro area while the ECB considers the euro area average, such an asymmetric development would lead to area-wide interest rate increases, leading to interest rates that are too high for southern European countries. Such a situation would depress equity prices in the south and make economic recovery in southern countries even more difficult.

An asymmetric recovery could also have implications for public debt sustainability. If countries with higher public debt levels do not grow as much as countries lower debt levels, the currently favourable growth/interest rate differential might turn less favourable for countries with higher public debt levels. Coupled with domestic political risk, that might lead to an increase in risk premiums in some countries with weaker fiscal positions, which could further undermine fiscal sustainability, economic growth and financial stability, given the large government bond holdings of the banking system and the weaker economic performance.

### 3.3. The shortage of safe assets

A sufficient supply of safe assets is essential for the smooth functioning of the financial system. The pricing of financial instruments and their valuations depend on returns on safe assets, while safe assets are also used as collateral in various transactions, including repurchase agreements. A low supply of safe assets is an important contributing factor to low interest rates. We miss a discussion in the ECB Financial Stability Review of the possible shortage of safe assets in the euro area.

---

Safe assets can be issued by governments and EU institutions.

As regards general government debt securities, currently only three countries (Germany, Luxembourg and the Netherlands) have AAA credit ratings for their long-term debt. Figure 3 shows that their outstanding stock is expected to decline in euro terms (because of budget surpluses) and even more as a share of GDP (because of the increase in nominal GDP).

The AA-rated countries are Austria, Belgium, Estonia, Finland and France, while the A-rated countries are Ireland, Latvia, Lithuania, Malta, Slovakia, Slovenia and Spain. Italy’s current rating is BBB, along with Cyprus and Portugal. Greece is at B.

**Figure 3: Debt security liabilities of euro area general governments by credit rating**

<table>
<thead>
<tr>
<th>EUR billions</th>
<th>% GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Constant AAA (DE+LU)</td>
<td>Remaining AAA</td>
</tr>
</tbody>
</table>

Source: Bruegel using data from Eurostat for government debt securities and IMF WEO for gross public debt and GDP, S&P ratings.

Note: Eurostat data on government debt securities is available for 2018. For our projections for 2019-2024, we assumed that the 2018 ratio of government debt securities to gross public debt remains the same and we use the IMF WEO projection for public debt in 2019-2024.

Meanwhile, the supply of safe assets from EU institutions such as the European Investment Bank (EIB) is relatively modest and has also been shrinking (Figure 4).
To address concern about the low supply of safe assets, we would encourage European policymakers to pursue three avenues. First, the top-rated euro area countries, in particular Germany, should not further reduce their absolute levels of debt. In a negative interest-rate environment, there surely must be projects with positive returns which could be funded by borrowing. Second, Figure 3 also shows that the supply of safe assets would be significantly increased if the ratings of less-well-rated countries improved. To a significant extent, this is a question of boosting long-term productivity growth. We consider therefore reforms boosting such growth to be fundamental also for the smooth functioning of the financial system. Third, it would be desirable for the euro area in particular to issue a common bond. If the EIB and other institutions could increase their supplies of bonds to fund economically and publicly sensible investments, for example green projects, financial stability would improve. The key argument is that credible fiscal actors should increase the supply of bonds to contribute to rising rates. Moreover, if less-well-rated bonds became safe assets, this would also increase the supply of safe bonds, helping to increase the interest rates on safe assets on which much financial market pricing is based.

3.4. Climate change

Financial risks can also result from climate change and its expected and unexpected consequences. The ECB’s report calls for mandatory and harmonised firm-level reporting. This would allow better pricing and monitoring of financial institutions’ exposures to climate-related risks, even if assessing firm-level risks to climate change is a complicated exercise.

Bolton et al (2020) regard price and financial stability as the primary mandate of a central bank, but fulfilling the mandate is challenged by climate-related risks. Therefore, they call for a more pro-active approach to coordinating central banks’ responses to climate-related risks. Coordination with other public authorities and with the private sector also seems necessary for sufficient preparation in the face of climate risks.
We recommend that Members of the European Parliament push the ECB and other financial supervisory authorities to pay significantly more attention than currently to the impact of climate risks on financial stability. In the near term, we see a concrete task for Members of the European Parliament: fostering legislation on mandatory and harmonised firm-level reporting of emissions (and of climate-change related risks more broadly). Only comprehensive reporting by firms will enable the proper monitoring of financial institutions’ exposures to climate-related risks. Proper reporting would allow better pricing of non-financial firms and banks. We would also like to stress that in terms of regulation, increasing capital requirements for ‘brown’ assets is in our view the appropriate way to capture the additional risk resulting from climate change. Decreasing the capital requirements on ‘green’ assets could undermine the credibility of green finance, since other risks remain unchanged.

3.5. Cybercrime

ECB (2019a) presents a banking risk assessment, which includes cybercrime and IT disruption as one of three main drivers of risk in the banking system. Such risks could potentially disrupt the functioning of financial markets. However, the November 2019 ECB Financial Stability Review (ECB 2019c) referred to the issue only once – and briefly. Demertzis and Wolff (2019) documented the rise in cyber-attacks throughout the EU, highlighting the fact that while some institutions have implemented significant safeguards (the efficiency of which is as of yet unclear), very little has been done at Eurosystem level to ensure all financial institutions are adequately protected. Demertzis and Wolff (2019) further called for the integration of the EU’s broader security architecture, for example with centralised screening of FDI flows.

In our assessment, the ECB and European policymakers more broadly need to pay significantly more attention to the risks arising from cyberattacks for the stability of the EU’s financial system. We recommend that MEPs emphasise this point in their hearing.

3.6. Digital currencies

The ECB report does not mention digital currencies. Digital cryptocurrencies have seen significant volatility in recent years. In our assessment, the market for digital currencies is still relatively small, so financial stability concerns are limited. Nevertheless, there have been warnings of the risks to financial stability that could arise from the proliferation of digital currencies in the future, including from Mark Carney (as reported by Reuters, 2019), Randal K. Quarles (2019) and the BIS (2019). Central bank digital currencies could result in cyclical runs on banks (given popular access to central bank reserves) and reduced financial intermediation (Claeys and Demertzis, 2019). We would therefore recommend that increased attention should be paid to various forms of digital currency from the point of view of financial stability.
4. MACROPRUDENTIAL MEASURES TO ADDRESS RISKS

Macroprudential measures adopted in euro area countries can be roughly divided into two primary groups: capital-based and borrower-based measures. Capital-based measures introduce minimum regulatory capital requirements, while borrower-based measures focus on lending conditions and impose a maximum threshold on credit. These measures have recently been employed to target potentially over-heated residential real-estate markets.

The primary capital requirement macroprudential measure employed in the euro area is the capital conservation buffer (CCoB), a capital buffer on banks’ total exposure that works as an additional safeguard to the 4.5 % requirement of Common Equity Tier 1 capital\(^2\).

Additionally, counter-cyclical capital buffers (CCyB) have been introduced to counter the pro-cyclicality inherent to the financial system. This buffer is activated when cyclical systemic risk is increasing in the banking sector. The subsequent build-up of capital during booms should support the credit supply in the cycle downswing. Figure 5 shows which euro area countries have introduced counter-cyclical capital buffers.

A third capital requirement in place in some euro area countries is the systemic risk buffer (SyRB), which protects the financial system against longer term and non-cyclical risks. It may be applied at different levels to all institutions or a group of institutions, on all exposures or a collection of exposures. Current rates are shown in Figure 6.

---

Finally, global systemically important institutions (G-SII) have a compulsory additional surcharge or buffer that raises the amount of Common Equity Tier 1 capital they have to hold. Similarly, other systemically important institutions (O-SIIIs), designated by member states, must also meet supplementary requirements to their Tier 1 Capital.

Additionally, risk assessments of residential real estate markets sometimes lead to the introduction of measures that focus on three aspects, as argued by ESRB (2019): the collateral stretch (concentrated on price misalignments and house-price evolution), the lending stretch (assesses the evolution of lending) and the household stretch (concentrates on household balance sheets and their potential vulnerabilities). Two types of borrower-based measures have been employed to prevent residential real estate from over-heating. First, loan-to-value (LTV) and loan-to-collateral (LTC) measures limit credit, based on collateral to address the collateral stretch. Second, debt-service-to-income (DSTI) and debt/loan-to-income (D/LTI) measures limit credit based on household income to address the household/income stretch. Additionally, counter-cyclical capital buffers address the lender stretch.
Given this state of play, it is worth comparing the deployment of these macroprudential measures with indicators of residential real estate vulnerability. Measuring the latter is difficult. We use two indicators: house-price increases between 2014 and 2019, and the over/under-valuation as estimated by the ECB (see Chart 1.14 of ECB, 2019c). The left panel of Figure 8 shows that Slovakia adopted the highest counter-cyclical capital buffer (CCyB). Some other countries had similar, or even faster, house-price increases, but adopted lower CCyB, or have not adopted buffers at all.

A possible explanation for these differing responses in different countries could be that the house-price increase does not reflect well whether the housing market is overheated. For example, fast growth from a low level might not reflect a problem. We therefore also use the ECB’s estimate of house-price overvaluation in the right panel of Figure 8. The message from this panel is even more controversial: while the ECB estimates that Austrian and Luxembourgish house prices are overvalued by about 25-30 %, Austria has not introduced any CCyB, while the Luxembourgish value is very low at 0.25 %. In contrast, Slovakian housing prices are seen undervalued by the ECB, yet Slovakia implemented the largest CCyB.
A similar picture is evident when one considers borrower-based measures (Figure 9). We calculated a new index, which has a value of zero if no measures have been introduced, one if either measures addressing the collateral stretch (LTC and LTV) or the household stretch (DSTI and D/LTI) have been introduced, and two if measures addressing both of these have been introduced. Certainly, the strictness of measures could vary from country to country, even if they have the same score, which is a limitation of our index.

Luxembourg, Germany and Spain have not introduced any borrower-based measures, even though these countries experienced relatively fast house-price increases (left panel of Figure 9), and overvaluation is particularly high in Luxembourg, but also sizable in Germany and Spain (right panel of Figure 9). Furthermore, Spain has adopted no CCyB, while Luxembourg implemented one of only 0.25 % in January 2020 and Germany is due to implement only 0.25 % as of July 2020. France and Belgium have not adopted borrower-based measures even though their residential real estate markets are also overvalued.

The inconsistencies between residential real estate vulnerability indicators and adopted macroprudential measures call for a comparative assessment of cross-country vulnerabilities and adopted macroprudential measures.
Figure 9: Borrower-based macro-prudential measures against house price increase (left panel) and residential real estate overvaluation (right panel)

Source: Bruegel using data from Eurostat for house prices (data is for 2014Q3 to 2019Q3), ESRB data to calculate the borrower-based measures index, and residential real estate (RRE) overvaluation is from Chart 1.14 of ECB (2019c).

Note: House price data is for 2014Q3 to 2019Q3. The Borrower Based Measure index exhibits a value of zero if no measures have been introduced, one if either measures addressing the collateral stretch (LTC & LTV) or the household stretch (DSTI & D/LTI) have been introduce, and two if measures addressing both of these have been introduced.
5. CONCLUDING REMARKS

EU policymakers need to be informed about risks to financial stability and the ECB report (ECB, 2019c) provides a great overview of key concerns.

We have highlighted a few areas that deserve special attention from policymakers based on our analysis: housing markets, the low interest-rate environment, climate-related risks and cyber risks. Concrete measures can be put in place to address these concerns.

We would also like to emphasise two major macroeconomic topics that interact with financial stability. The first is possible risks related to sovereign debt. We concur with the view that risks to sovereign debt are rather limited because rates are very low and therefore the budgetary burden of debt is very limited. We would also argue that rate increases in normal circumstances are unproblematic. In fact, governments have lengthened the maturity of debt, insuring them against the effects of rate raises. More importantly, rate raises are usually connected with higher real growth, which should also boost tax revenues to service the debt. In the euro area, however, the main concern is that rates could increase because of an average increase in real growth, but some countries will not share in the growth increase. We therefore caution against fiscal expansion in countries with high debt burdens and low growth potential.

Second, we would like to stress the importance of more proactive fiscal policies to guard against the next downturn. Any major macroeconomic downturn will increase financial stability risks. Macroeconomic management is therefore not only beneficial for growth and jobs but also for financial stability. Policymakers need to understand clearly that there will be little scope to use monetary policy tools in the next recession, and should prepare accordingly. In fact, interest rates cannot be cut much further and other monetary-policy instruments are more limited in their effectiveness. It is therefore the responsibility of fiscal policymakers to prepare for the next recession with significantly more proactive fiscal policies than they have traditionally pursued.
REFERENCES

- International Monetary Fund (2019a) ‘World Economic Outlook, October 2019. Global manufacturing downturn, rising trade barriers’, International Monetary Fund, available at:


The November 2019 European Central Bank Financial Stability Review is a very comprehensive report, covering the key risks to financial stability in the euro area. We summarise the report’s main conclusions and complement them with our analysis of housing markets, market interest rate expectations and safe assets from a financial stability perspective. We emphasise financial stability risks related to climate change and cybersecurity. We compare housing market vulnerabilities and the implementation of macroprudential policies in euro area countries.

This document was provided by Policy Department A at the request of the Committee on Economic and Monetary Affairs.