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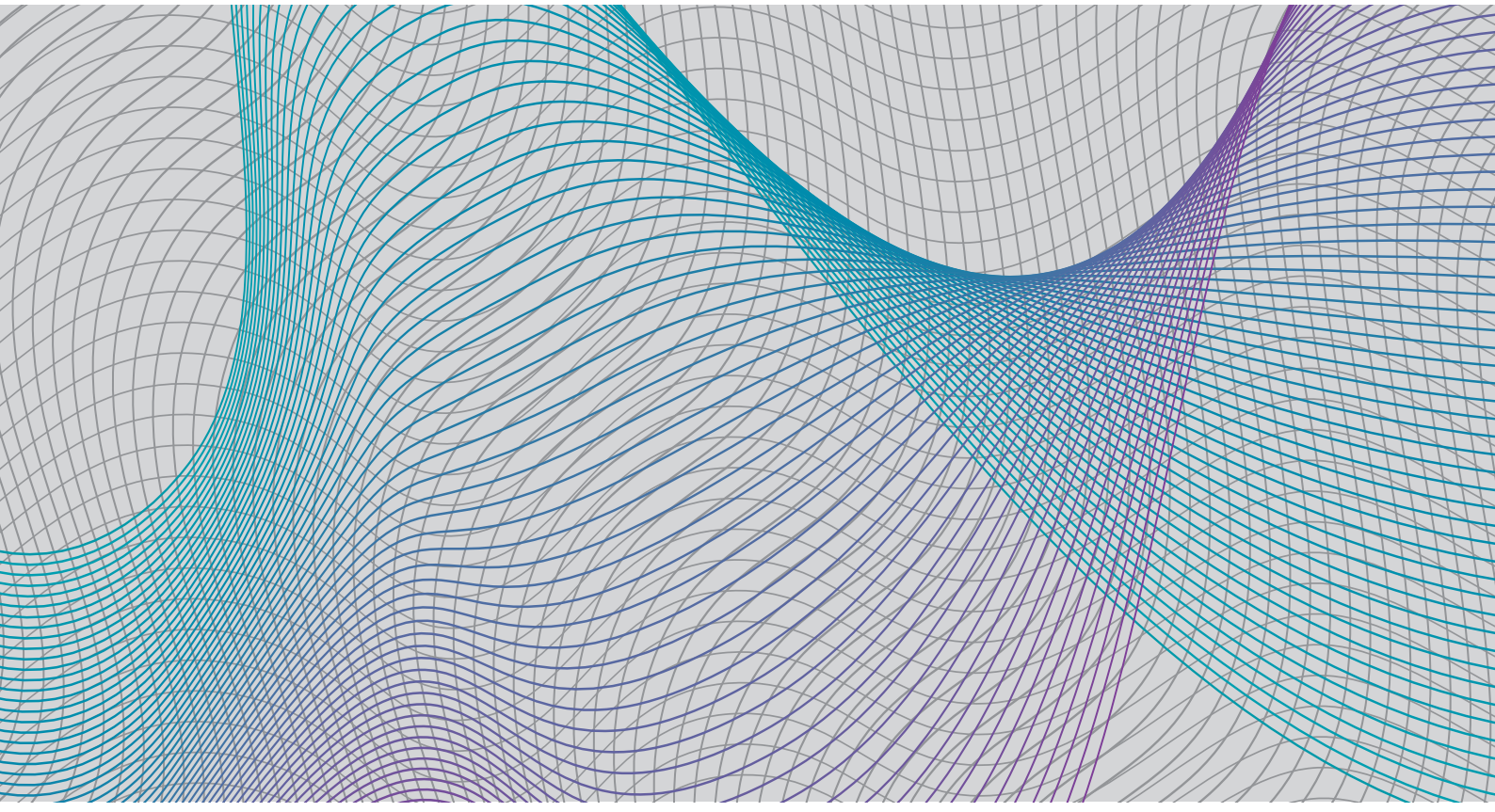
Financial Stability Review 2020



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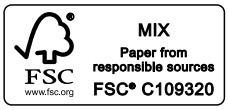

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Abbreviations and symbols

p	Provisional
e	Estimated
.	Data unknown, not to be published or not meaningful
–	Nil

Discrepancies in the totals are due to rounding.

Introduction

The outbreak of the coronavirus pandemic served as a stark reminder that unexpected events can jeopardise the stability of the financial system. Under the Financial Stability Act (*Finanzstabilitätsgesetz*), the Bundesbank is responsible for monitoring the stability of the German financial system. It is charged with identifying and assessing risks to financial stability. The Bundesbank understands financial stability as a state in which the financial system is able to fulfil its functions at all times. In its annual Financial Stability Review, the Bundesbank documents relevant developments as well as vulnerabilities in the German financial system and highlights risks to its stability.

This report focuses on the risks stemming from the coronavirus pandemic and the associated real economic shock. In particular, it analyses how this shock has affected the financial system and how it could impact its stability in the future. The risk assessment takes into account the extensive monetary policy, fiscal policy and supervisory measures that have been taken, while also accounting for the vulnerabilities that have built up in the German financial system over the past few years.

The functional viability of the financial system is of vital importance for the real economy. The financial system coordinates savings and investment, makes it possible to hedge against risks, and facilitates payments. Unforeseeable events, such as the outbreak of the coronavirus pandemic, can jeopardise the stability of the financial system. The financial system should neither cause nor excessively amplify a downturn in overall economic activity. It therefore needs to be sufficiently resilient – in other words, able to absorb losses and, ultimately, reduce contagion or feedback effects.

The analyses focus on systemic risks that could jeopardise the stability of the financial system. For instance, the distress of one or more market participants can endanger the functioning of the entire system. This may be the case when a distressed market participant is very large or closely interlinked with other market participants. Interconnectedness may be a channel through which adverse developments are transmitted to the financial system as a whole, impairing its stability. Many market participants are connected to each other, either through a direct contractual relationship, or indirectly. Systemic risks can also arise if a large number of market participants are exposed to similar risks or risks that are closely correlated with one another.

The Bundesbank also contributes its analytical findings to the work of the German Financial Stability Committee, which is the central body for macroprudential oversight in Germany. It provides the Committee with its assessment of the general risk situation. If the Bundesbank identifies systemic risks, it can make proposals to the Committee for warnings and recommendations to address these risks. Afterwards, the Bundesbank evaluates the extent to which the recommendations have been implemented.

This report takes account of developments up to the cut-off date of 30 September 2020.

Overview

The coronavirus pandemic and the measures taken to contain it led, in the first half of 2020, to the severest economic downturn for decades, with nearly all sectors of the real economy being affected. Even though the shock did not originate in the financial system – unlike the global financial crisis in 2007-08 – its indirect impact there was nonetheless significant. In adverse scenarios, there are risks to financial stability which call for adequate preparation.

Pandemic led to stress in the financial markets and to enterprises requiring liquidity

The outbreak of the pandemic saw an abrupt rise in stress and uncertainty in the financial markets worldwide. This was significantly driven by the fact that it was all but impossible to tell how long the pandemic would last and how strongly it would affect the economy. There was a rapid drop in the prices of shares and corporate bonds at the end of February 2020. Many market participants increased their demand for liquid funds and took flight into safer assets. One of the things they needed was highly liquid collateral in order to be able to service margin calls in secured transactions. German banks and investment funds, too, sold some of their riskier securities (see the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.).

Many market participants increased their demand for liquid funds.

In spring, the need for liquidity in the corporate sector shot up. There was a dramatic fall in sales in some cases, but no matching reduction in enterprises' payment obligations. The slump in sales was due, first, to the fact that many governments took health policy measures to contain the pandemic. Second, consumers and firms adjusted their behaviour voluntarily in order to reduce the risk of infection. Enterprises' liquidity reserves and their existing credit lines were often insufficient to cushion the drops in sales, however. The rise in demand for liquidity this triggered coincided with a decline in liquidity in the financial markets and with intermediaries. At the same time, firms' business prospects in many sectors deteriorated rapidly and became extremely uncertain. This dampened the banks' and financial markets' willingness to make financial resources available.

Enterprises' liquidity reserves were often insufficient to cushion drops in sales.

Against this backdrop, in spring there was the threat of a liquidity crunch in the corporate sector (see Chart 1.1). This could have led to a wave of insolvencies, causing massive economic harm, high unemployment, and defaults on loans. This would also have affected those firms which – up to the outbreak of the coronavirus pandemic – had a sustainable business model and were successful within their own sector. In the financial system, loan defaults would have led directly to major losses. A procyclical reaction by the financial system could have intensified the economic slump. Taking everything into account, the risk to financial stability in spring 2020 was extremely high.

Liquidity crunch in the corporate sector averted by monetary policy, fiscal policy and supervisory measures

Across the globe, central banks and governments were quick to take comprehensive measures to contain the effects of the coronavirus pandemic on the real economy and the financial system. For example, the Eurosystem purchased securities on an unprecedented scale and has been making additional liquidity available to banks in order to stabilise the financial markets as well as lending to enterprises and households. Loan guarantees, tax deferrals and transfer payments, such as short-time working benefits, were among the measures used by governments to support the real economy.

Loan guarantees were among the measures used by governments to support the real economy.

Besides action taken by monetary and fiscal policymakers, microprudential and macroprudential supervisors responded in order to create scope for lending. The flexibility of the regulatory framework was used, for example, to grant temporary relief measures for banks, and the countercyclical capital buffer was released in many countries.

In the initial phase of the pandemic, which was accompanied by very high uncertainty, the threat of a liquidity crisis loomed. Government measures were required to avert this liquidity crisis and any related solvency crisis as well as to calm the financial markets. The focus here was on ensuring that the measures were comprehensive and could be adopted quickly. Altogether, the monetary policy, fiscal policy and supervisory measures have reduced uncertainty and also stabilised the economy and the financial markets. Even though a liquidity crunch in the corporate sector was prevented in the first instance, the threat to financial stability has not been resolved yet.

Extensive government measures were required to avert a solvency crisis.

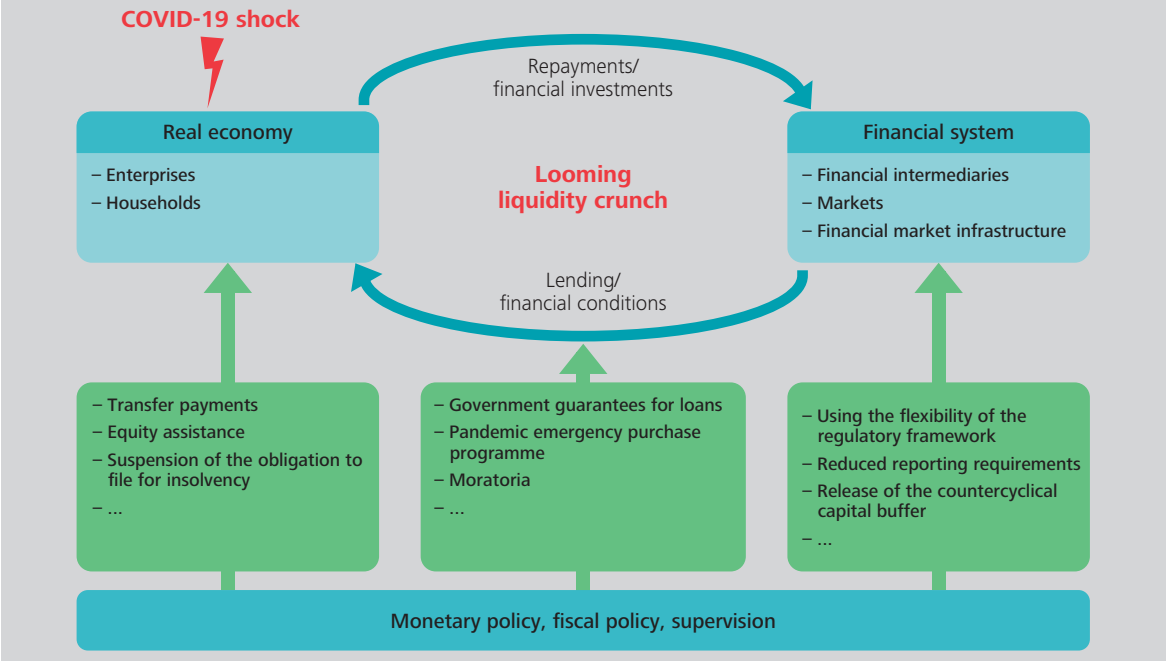
Risk of rising corporate insolvencies

Owing to the rapid policy responses, the effects of the real economic crisis have not yet fully arrived in the German financial system. Enterprises' solvency problems are likely to become all the more noticeable in the financial system the longer the crisis continues. Typically, it is only after some time that a recession leads to rising insolvencies in the corporate sector. The severity of the economic slump in the second quarter of 2020 hence gives cause for concern that there will be a significant increase in the number of corporate insolvencies and in unemployment over the coming quarters (see the chapter entitled "Risk of a sharp rise in insolvencies" on pp. 35 ff.). This could lead to rising defaults on loans to enterprises and loans for house purchase, and subsequently losses and higher loss allowances at banks.

What impact such a development has on lending in the banking sector depends a great deal on how well banks can absorb the emerging losses. If insolvencies were to evolve along the lines of earlier recessions, the resulting losses and loss allowances would probably be well manageable for the German banking system. This is due, not least, to the comprehensive reforms that were implemented following the global financial crisis in order to improve banks' capital adequacy and make them more resilient to unexpected developments. Banks now have additional capital buffers. Supervisory measures – using the existing flexibility provided by the regulatory framework – were taken following the outbreak of the pandemic to enable banks to use these buffers more easily in order to maintain lending. This is where macroprudential policy comes

Banks have additional capital buffers.

Looming liquidity crunch as a result of the COVID-19 shock Chart 1.1



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into play: it acts in a preventive manner, say, through building up additional capital buffers which can be lowered in times of crisis. All things considered, banks' capacity to grant credit should be maintained in the baseline scenario (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.).

It is nevertheless debatable whether corporate insolvencies will follow the typical patterns of the past, as is assumed in the baseline scenario. The economic downturn triggered by the coronavirus shock was exceptionally severe and different in nature from past recessions. The comprehensive support measures are exceptional, too, and how the pandemic develops in future remains highly uncertain.

A scenario in which the real economic fallout is significantly more unfavourable than expected at present could pose additional challenges for the financial sector. The adverse effects on the real economy can already be seen, and assessing the long-term consequences and risks of this for the financial system is scarcely possible. Added to this is the uncertainty with regard to possible second-round effects and feedback effects between the real economy and the financial system.

In a yet more unfavourable scenario, a number of developments could come together. There could be a far greater number of corporate insolvencies than currently expected, for example, and asset prices could drop sharply. Besides real estate prices, asset prices in the financial markets might respond strongly, since valuations are markedly higher in some instances than fundamentals seem to justify.

In an unfavourable scenario, a restriction of lending would put a brake on economic recovery.

In such a scenario, the banking sector would suffer large losses with some institutions possibly becoming distressed. This would bring an increased risk of banks simultaneously shrinking their balance sheets in order to maintain the capital ratios required by the market or by supervisors. How strongly a restriction of lending in such a scenario would put a brake on economic activity depends on how well prepared the financial system is and the extent to which banks use existing capital buffers.

Given these risks, market participants, policymakers and supervisors should prepare early on for very unfavourable developments and identify related bottlenecks so that the financial system itself can fulfil its functions even in such circumstances.

Sufficient capacities and experience in handling insolvencies – both at banks and public authorities – is likely to be of relevance for the future development of the economy. Insolvency proceedings ultimately have the aim of coordinating the different interests of creditors and debtors of distressed enterprises. Precisely because insolvencies were at an all-time low in Germany over the past decade, capacities in the private and public sectors might not be sufficient to deal with sharply rising numbers of insolvencies. Accordingly, preparations for such an eventuality are needed.

Banks should use their capital buffers to go on granting loans in an appropriate manner. Temporarily forgoing a distribution of profits, as recommended by supervisors, has precisely this aim – maintaining the functional viability of the banking sector.

Banks should use their capital buffers to go on granting loans in an appropriate manner.

Policymakers face the challenge of striking the right balance: on the one hand, their aim is to support the economy with fiscal policy measures and to limit the damage caused by the pandemic; on the other hand, any structural change that needs to happen should not be delayed unnecessarily. Furthermore, possible cliff effects should be taken into consideration. There is a threat of these materialising, for instance, if insufficient provision is made for the fact that time-limited measures will be discontinued, with ensuing large-scale adjustments in the real economy or financial system.

With the passing of time, there will be less uncertainty about how the pandemic will evolve; the future economic structures will gradually become discernible. In this phase, it will be a matter of facilitating economic structural change and organising the transition as efficiently as possible in order to minimise welfare losses. This will require close coordination across all policy areas, not least so as to be able to respond appropriately to new developments. There should be targeted use of fiscal policy instruments to support enterprises, and their effects should be evaluated. This can include shifting away from the current quite extensive liquidity assistance measures in the corporate sector and more towards – hitherto far more cautiously applied – equity assistance.

There should be targeted use of fiscal policy instruments, and their effects should be evaluated.

Vulnerabilities in the financial system likely to increase in the medium term

In the years preceding the coronavirus pandemic, cyclical systemic risks had built up in the form of vulnerabilities to negative macroeconomic developments.[1] These were evidenced by the fact that loans to enterprises and households rose dynamically in a low interest rate environment. There were, moreover, in-

1 For a detailed description of these vulnerabilities, see Deutsche Bundesbank (2019a).

dications of a tendency to underestimate credit risk. At the same time, residential real estate prices shot up, accompanied by an increased risk of tending to overestimate the recoverability of loan collateral. Above and beyond that, vulnerability in the financial system to interest rate changes was comparatively high. The pandemic means that the real economy has suffered a severe macroeconomic shock, which would probably have hit the financial system hard if it had not been for the extensive government measures. Even so, the shock is likely to reveal more starkly the existing vulnerabilities in the financial system.

On the international stage, too, the vulnerabilities in the financial system are, if anything, going to increase in the medium term. Private and public debt is rising sharply worldwide in the wake of the coronavirus pandemic and the support measures. The International Monetary Fund (IMF) is expecting a marked increase in public debt in 2020, in particular in the industrial countries.[2] In some countries and sectors, critical thresholds could be breached.

Private and public debt is rising in the wake of the pandemic.

A sharp rise in public debt could raise doubts about countries' debt sustainability. This might, in turn, call into question the credit rating of their banking systems, as a considerable percentage of government bonds is still held by the banks resident in the respective countries. Such a sovereign-bank nexus may produce feedback effects and transfer risks from the government to banks.[3] These risks could then spread across borders.

The private sector, too, is likely to emerge from the pandemic with a markedly higher level of debt. This represents the continuation of a development that was already partly shaping the risk situation in the global financial system in the past. For instance, there has already been a sharp rise in non-financial sector debt in some countries, especially in the emerging market economies. Furthermore, in the United States in particular, loans were being granted on a wide scale to enterprises with a low credit rating.[4] In the current situation, many enterprises have been tending to incur debt in order to maintain existing capacities rather than to finance investment and innovation.

Many enterprises have been borrowing to maintain their capacities.

Elevated levels of public and private debt can put pressure on central banks to mitigate the strains of high indebtedness by means of an accommodative monetary policy and low interest rates. Fiscal or financial dominance of this kind would ultimately jeopardise the independence and credibility of central banks.[5] That is why a rigororous reduction of the sometimes very high levels of debt will be vital after the crisis. Fiscal or financial dominance can, moreover, be counteracted by an effective macroprudential policy that acts in a preventive manner. This will assist the single monetary policy in the euro area in being able to fulfil its mandate of safeguarding price stability.[6] Macroprudential policy might itself come under pressure, however, to delay its preventive measures.

Adequate resilience in the financial system also important after the pandemic

How the coronavirus pandemic will affect the financial system and the underlying macroeconomic conditions in the long term is an open question at present. Interest rate expectations in the financial markets suggest, however, that low interest rates

2 See International Monetary Fund (2020b).
3 See Deutsche Bundesbank (2017).
4 See International Monetary Fund (2019).
5 On fiscal dominance, see Brunnermeier and Sannikov (2014).
6 See Deutsche Bundesbank (2015).

are likely to persist even longer. This means that the structural risks that may result from an extended period of low interest rates will assume even greater significance in future. Persistently low interest rates put pressure on many financial intermediaries' profitability and might reinforce incentives to search for yield. If market participants fail to take due account of the possibility of an abrupt rise in interest rates, their portfolios will become structurally vulnerable to interest rate changes. This would increase the vulnerability of the financial system.

Structural risks will assume even greater significance in future.

In addition, the coronavirus pandemic could have dampening effects on potential growth.[7] Some business models might no longer be sustainable if consumer behaviour and production structures undergo deep and lasting change. Lower potential growth could reduce debt sustainability and thus weaken the resilience of enterprises and households. In the medium term, this would increase financial stability risks.

A functioning financial system is crucial for making a success of structural change in the real sector of the economy. Unlike in the global financial crisis, it is not a matter of repairing the financial system itself, but rather of using the financial system to repair the damage done to the real economy. This requires stable banks and functioning bond markets, but also innovation financing and equity investment.

A functioning financial system is crucial for structural change in the real sector.

Structural change will not leave the financial system untouched either. Trends such as digitalisation, which were already under way before the coronavirus pandemic, will gather pace. Structural change in the banking sector – as in the corporate sector, too – should not be delayed unnecessarily. This includes banks being able to exit the market if their business models are no longer sustainable – without, however, jeopardising financial stability. A functioning regime for the resolution and restructuring of banks has precisely this purpose.[8] A current evaluation by the Financial Stability Board (FSB) shows that significant improvements have been achieved since the global financial crisis and that the authorities have better instruments at their disposal for dealing with systemically important banks in distress.[9]

The coronavirus pandemic serves as a stark reminder of how important adequate resilience in the financial system is for preventing self-reinforcing developments. In particular, capital buffers allow losses to be cushioned and lending to be maintained. The reforms of the past decade, particularly more stringent requirements for capital, have improved banks' ability to absorb losses.

The pandemic shows the importance of having adequate resilience in the financial system.

For the immediate future, it will chiefly be a matter of using the available buffers, as losses in the financial system will increase if there are more defaults on loans. This will potentially reduce the buffers. Once the real economic effects of the coronavirus pandemic have been overcome, however, the buffers will have to be built up again over the medium term. This will again create scope for the financial system to be able to fulfil its functions also in future periods of stress. The relief measures granted in spring 2020 within the regulatory framework must not be kept in place permanently.

7 See Deutsche Bundesbank (2020d).
8 See Deutsche Bundesbank (2019a).
9 See Financial Stability Board (2020).

Macroeconomic environment and effects of the coronavirus pandemic to date

In the first half of 2020, the coronavirus pandemic and the healthcare policy measures to contain it led to the most severe global economic downturn in decades. Unlike the 2007-08 global financial crisis, the shock did not originate in the financial system.

The coronavirus shock put a massive strain on the financial markets in the second quarter of 2020. All over the world, equity indices collapsed, risk premia rose, and investors fled to safe assets. The functioning of individual market segments was temporarily at risk. The stress in the financial markets was accompanied by an extreme increase in uncertainty – particularly with regard to the macroeconomic implications of the pandemic and the measures taken to contain it.

In the second quarter of 2020, a large number of enterprises ran into liquidity problems within a very short space of time as their sales plummeted, but there was no matching reduction in their expenditure. Given the unclear business outlook, doubts arose about the solvency of many enterprises, and it became difficult to obtain sufficient funding. A liquidity crunch loomed large. This could have culminated in a wave of insolvencies, causing immense economic damage and high unemployment. The banking sector would have been put under pressure by the abrupt rise in insolvencies. It could have reacted procyclically, and thus intensified the economic downturn.

In order to break this spiral and prevent a liquidity crunch, central banks, governments and supervisory authorities in many countries took extensive measures. As a result, the real economy and the financial system have stabilised for the time being.

The coronavirus shock

The coronavirus pandemic led to a massive economic shock. Even though the shock did not originate in the financial system – unlike the global financial crisis of 2007-08 – its indirect impact there was nonetheless significant.

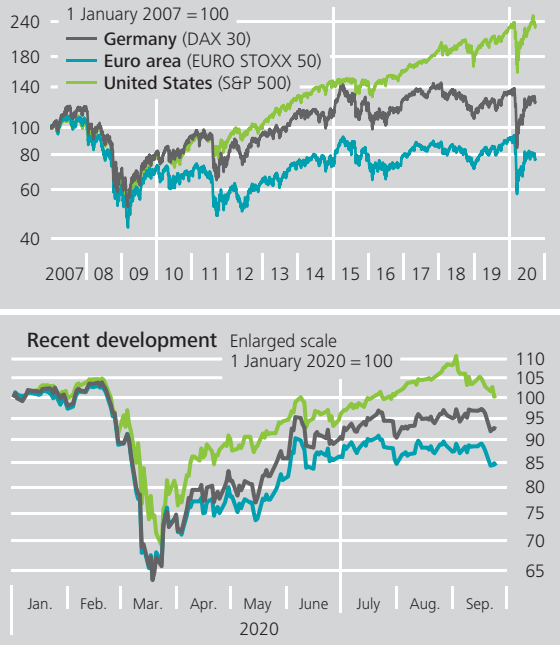
Huge price losses worldwide and global economic downturn

The coronavirus pandemic was already having an impact on the financial markets as early as the end of February 2020. Stock indices collapsed almost simultaneously all over the world, and risk premia in the bond markets rose substantially. It was striking how quickly the financial markets reacted to the outbreak of the coronavirus pandemic (see Chart 2.1). The German DAX equity index lost 38% in value in just a little under a month.[1] During the global financial crisis, it had taken from the end of December 2007 to October 2008 for the DAX to record such a loss in value, and one year for it to reach its lowest point, with a decline of 48%. Similar developments were observed for the European EURO STOXX 50 and US S&P 500 stock indices. Risk premia in the bond markets also rose exceptionally quickly.[2] Pre-existing vulnerabilities contributed to the significant financial market responses. High valuations in the bond markets and, in some cases, the equity markets had built up over recent years, owing in part to persistently low interest rates.[3]

Risk premia in the bond markets rose exceptionally quickly.

Equity indices Chart 2.1

Log scale, daily data



Source: Bloomberg.
Deutsche Bundesbank

Many governments around the world responded to the increasing spread of the coronavirus pandemic by taking measures that severely restricted public life. A great number of enterprises in the services sector were temporarily closed down, travel was restricted, events were cancelled, and schools, universities and day care facilities for small children were temporarily closed. The aim of these healthcare policy measures was to limit the spread of infection, to avoid overburdening the healthcare system and to contain the pandemic.

On top of this, many consumers and enterprises adapted their behaviour to reduce the risk of infection. Households in Germany cut back on their travel, restaurant visits and participation in large-scale events even before government restrictions were imposed. Healthcare policy measures and behavioural adjustments had a direct impact on the domestically oriented services sector, which had played a key role in the economic boom of recent years. By contrast,

1 This figure refers to the change from the yearly high to the yearly low.
2 The risk premia were approximated using credit default swap (CDS) spreads.
3 See Deutsche Bundesbank (2017, 2018, 2019a).

export-oriented manufacturing enterprises were hit primarily by global border closures, lower production and a slump in demand.

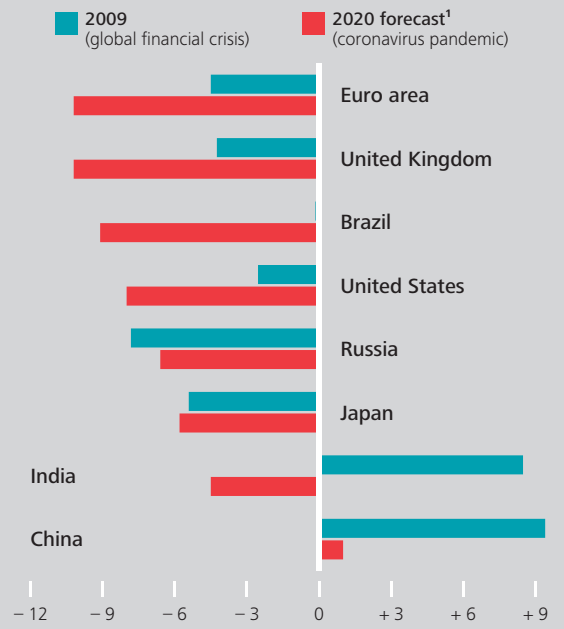
The implications for the real economy are immense. According to estimates from the International Monetary Fund (IMF), economic output in many countries is expected to decline more sharply in 2020 than it did in the wake of the global financial crisis (see Chart 2.2).[4]

The German economy, too, contracted very sharply in the first half of 2020. First-quarter gross domestic product (GDP) was 2% down on the quarter. In the second quarter, GDP fell by 9.7%, leaving it 11.3% down on the level of the previous year in what was the sharpest decline seen in the history of the Federal Republic of Germany.

In Germany, GDP collapsed by 9.7% in the second quarter of 2020.

Real gross domestic product Chart 2.2

Year-on-year percentage change



Source: IMF. **1** According to the World Economic Outlook Update, June 2020.
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Sharp rise in uncertainty

The coronavirus pandemic had a direct impact on the supply of and demand for goods and services. These effects were amplified by an exceptionally high degree of uncertainty. It was particularly at the outset that this uncertainty arose; it revolved around the severity of the pandemic and the measures needed to contain it. Moreover, it was unclear how effective the monetary policy, fiscal policy and supervisory measures taken to support the real economy would be. Indicators of macroeconomic uncertainty rose sharply as a result (see Chart 2.3).[5]

Uncertainty was directly reflected in the financial markets. The abrupt, steep rise in implied stock market volatility observed in many countries shows that market participants' expectations regarding price developments varied hugely at the end of February 2020. In mid-March 2020, volatility metrics reached levels similar to those seen during the global financial crisis (see Chart 2.4).

Uncertainty was directly reflected in the financial markets.

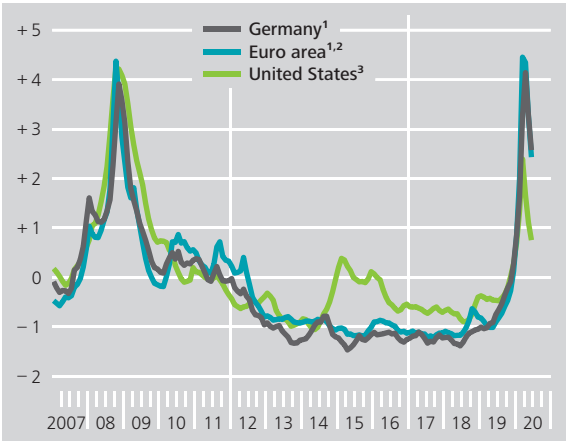
Falling share prices reflected the high level of uncertainty.[6] The price fluctuations of large equity indices normally correlate strongly with common measures of market and credit risk. However, in periods of stress, the share of variation that cannot be explained by such measures increases. This share

4 See International Monetary Fund (2020b).
5 See Jurado, Ludvigson and Ng (2015).
6 To this end, changes in equity index returns are explained by additional factors, such as changes in equity volatility and CDS indices as measures of market and credit risk insurable on the market, the risk-free interest rate and the yield curve slope as well as general changes over time. In some cases, other authors already directly interpret a high VIX level as a measure of uncertainty. For more information on the role of uncertainty, see Bloom (2009); Fernández-Villaverde, Guerrón-Quintana, Kuester and Rubio-Ramírez (2015); Knight (1921).

Indicators of macroeconomic uncertainty*

Chart 2.3

Standardised monthly data, last observation: June 2020



Sources: https://www.sydneyludvigson.com, OECD and Bundesbank calculations. * The indices are based on forecast errors of a large number of macroeconomic and financial indicators. Forecast horizon: three months. **1** See also P. Meinen and O. Röhe (2017), On measuring uncertainty and its impact on investment: Cross-country evidence from the euro area, European Economic Review, Vol. 92, pp. 161-179. **2** Based on the 2019 GDP-weighted average of the indices for Germany, Spain, Italy and France. **3** See also K. Jurado, S. Ludvigson and S. Ng (2015), Measuring Uncertainty, American Economic Review, Vol. 105, No 3.

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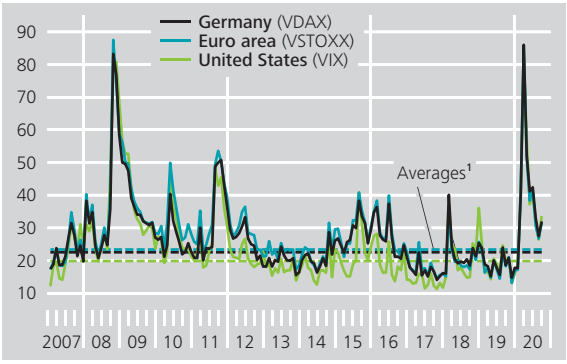
Implied equity market volatilities*

Chart 2.4

Monthly highs in percentage points



Sources: Bloomberg and Bundesbank calculations. * Derived from options prices. **1** Calculated based on daily data.

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can be interpreted as non-diversifiable risk or as uncertainty associated with non-insurable events (see Chart 2.5).[7]

According to econometric studies, the uncertainty triggered by the coronavirus pandemic is likely to account for around one-third of the decline in economic activity (see the box entitled "The impact of uncertainty on real economic activity" on pp. 19 f.). In times of high uncertainty, households and enterprises tend to "wait and see", deferring economic decisions until they are better able to assess further developments. Similarly, high uncertainty can result in lenders postponing decisions and no longer granting loans for a time. In such a scenario, the financial system would no longer be in a position to provide enterprises and households with sufficient liquidity.

Liquidity crunch loomed large in corporate sector

Demand for goods and services fell sharply due to the pandemic, and many enterprises cut back their production. This led to a massive decline in sales in many sectors. At the same time, enterprises urgently needed liquidity, as their financial obligations decreased less sharply than their sales. Many of them consequently ran into liquidity problems within a very short space of time. This even affected enterprises that had been running viable business models up until the outbreak of the coronavirus pandemic. In some cases, the need for liquidity was also very high because only relatively small liquidity reserves were available.

The declines in sales and the supply of liquidity varied markedly between sectors and coincided unfavourably in some of them. In the accommodation and food service activities sector, for instance, enterprises were hit especially hard by falling sales figures: in March 2020, sales were down by more than 40% on the year. At the same time, enterprises in this

7 See Knight (1921). Accordingly, events can be divided into insurable events (risk) and non-insurable events (uncertainty), depending on whether or not stochastic methods can be used to determine a probability of their occurrence. See Deutsche Bundesbank (2017).

sector had comparatively small liquidity reserves (see Chart 2.6). A survey of industry associations confirms the impression that the impact of the pandemic varies in magnitude across sectors (see the box entitled "Financing conditions for enterprises in the coronavirus pandemic: results of a survey of industry associations" on pp. 22 f.). Solvency problems are increasingly threatening the accommodation and food service activities sector in particular.

The impact of the pandemic varies in magnitude across sectors.

Against this backdrop, there was high uncertainty regarding the sustainability of many enterprises' business models as well as their solvency. In particular, doubts arose as to whether enterprises in the particularly hard-hit sectors would be able to recoup the lost sales they had suffered since the outbreak of the pandemic. Uncertainty was at such a high level that it was difficult to assess the creditworthiness of entire sectors. During this phase of the pandemic, there was a risk of a liquidity crunch, which would have left enterprises unable to meet their liquidity needs. It remains unclear what structural changes the coronavirus pandemic will bring in its wake. This is one reason for the continued uncertainty surrounding the sustainability of business models in some sectors.

It became difficult to assess the creditworthiness of entire sectors.

Financial markets reflected real economic risks at an early stage

In the financial markets, signs of a looming liquidity crunch in the corporate sector soon materialised in the form of higher risk premia. Here, the degree to which enterprises were affected by the impact of the coronavirus pandemic played a major role. Financing costs rose, above all, for enterprises that were harder hit by the coronavirus shock or had previously been considered relatively risky. The limited access to financing in mid-March 2020 thus exacerbated the existing liquidity problems faced by these enterprises. The functioning of individual market segments was at risk.

Indicator of uncertainty in the equity market*

Chart 2.5

Sources: Bloomberg, Markit and Bundesbank calculations. * The squared deviation of the equity index from an estimated value (conditional variance) is shown. The estimate is based on the variation of credit and volatility indices, government bond yields and temporal effects. The deviation represents price developments that cannot be explained by the estimation. It can be interpreted as a non-diversifiable risk or as an indicator of uncertainty.
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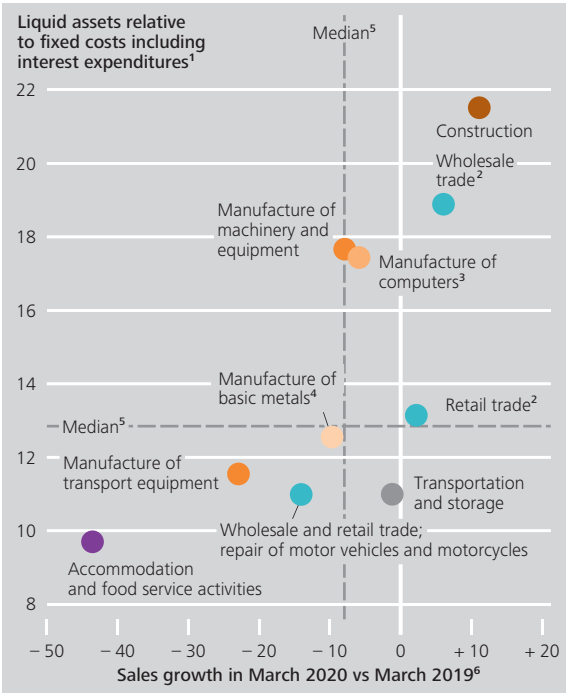
In the second quarter of 2020, securities worldwide posted high price losses across all sectors, and risk premia rose. Securities from the automotive, tourism and energy sectors were hit especially hard by the coronavirus shock. Price losses in these sectors were significantly higher than the market average.[8] Enterprises in the energy sector also came under pressure from the simultaneous sharp fall in the price of oil. The value of securities from enterpris-

8 See Alfaro, Chari, Greenland and Schott (2020); Baker, Bloom, Davis, Kost, Sammon and Viratyosin (2020).

Sales and liquidity of German enterprises in selected sectors*

Chart 2.6

%



Sources: Extrapolated disclosures from financial statements of German enterprises, Federal Statistical Office and Bundesbank calculations. * Colours used for individual sectors matches the colour scheme used in Chart 3.4. **1** Balance sheet item "Cash and bank balances" in relation to the sum of "Staff costs", "Other expenses" and "Interest expenditures" in financial year 2017. **2** Excluding trade in motor vehicles. **3** Computer equipment including electronic and optical products. **4** Including the manufacture of fabricated metal products. **5** Calculated from the aggregates of all economic sectors shown. **6** For construction as well as transportation and storage: Q1 2020 vs Q1 2019.

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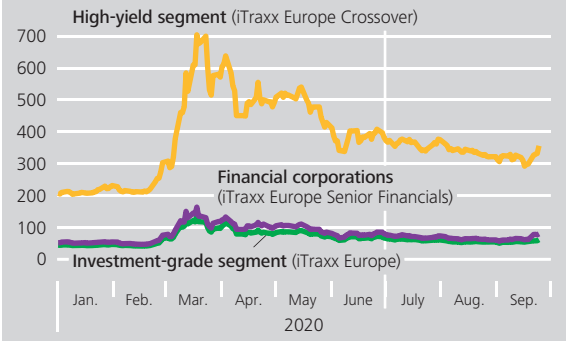
Credit default swap spreads for European corporations

Chart 2.7

Basis points, daily data



Source: Markit.

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es in the health and telecommunications sectors decreased by less than average compared with the market as a whole. To some extent, the pandemic is likely to have fuelled demand for these firms' products and services. In addition, credit risk premia rose significantly, especially for enterprises in the high-yield segment (see Chart 2.7). These enterprises are considered to be particularly risky, are generally more heavily indebted, and have less liquidity at their disposal than enterprises in the investment-grade segment (see the chapter entitled "Risk of a sharp rise in insolvencies" on pp. 35 ff.).

Securities from the automotive, tourism and energy sectors were hit especially hard by the coronavirus shock.

In the primary markets, i.e. when securities were issued, there were severe disruptions for a short period of time during the acute stress phase. At the end of February and the beginning of March 2020, considerably fewer corporate bonds were issued in the euro area than had been before (see Chart 2.8). Enterprises were only able to obtain funding via the capital market to a limited extent or at significantly higher costs. The strained liquidity situation in the corporate sector as well as the high degree of uncertainty regarding the future course of the pandemic therefore had an impact on financial markets, too. The tension in the markets significantly exacerbated the funding situation for enterprises active in the capital market, increasing their dependence on other means of funding, such as credit lines from banks.

There were also signs of tensions and rising transaction costs in the secondary markets – when trading securities. In this vein, the bid-ask spreads for bonds issued by European non-financial corporations increased at the beginning of March 2020, particularly in the high-yield segment (see Chart 2.8). Securities were therefore trading only at significant

The impact of uncertainty on real economic activity

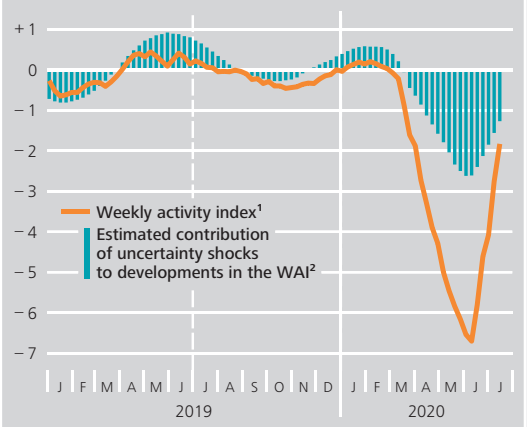
A sharp rise in uncertainty may have negative repercussions for real economic activity. In this situation, enterprises will tend to refrain from making investments and employing new staff, while households will tend to postpone major purchases and put aside money as a precautionary measure.

In order to quantify the effects of a rise in uncertainty, a structural vector autoregressive model (VAR model) on the basis of weekly data for Germany was estimated, covering the period from 2 July 2004 to 17 July 2020. The model comprises the following indicators: the implied volatility of the DAX (VDAX), the realised volatility of Federal bonds (Bunds) and their yield, the liquidity premium as measured by the spread between five-year KfW Group bonds and five-year Federal notes, an index of credit default swap spreads of up to 25 German non-financial corporations with maturities of five years, and a weekly activity index (WAI) that was recently developed by the Bundesbank. The WAI is an experimental index that uses timely, high-frequency indicators to measure real economic activity in Germany in as close to real time as possible.[1]

The next step was to determine how much an unexpected rise in uncertainty (uncertainty shock) has contributed to historical developments in the weekly activity index. These shocks are derived from the disturbance terms of the model equations with the aid of recursive restrictions (Cholesky decomposition).[2] It was assumed that uncertainty shocks have a contemporary effect on financial markets and the weekly activity index.[3] It became evident that coronavirus-related uncertainty has been a significant factor contributing to the decline in the index (see the chart). The lagged contributions of the uncertainty shock are, in part, a product of the construction of the weekly activity index, as it measures the trend-adjusted growth rate of economic activity averaged over 13 weeks compared to the average of the preceding 13 weeks. The high uncertainty explains roughly one-third of the drop.[4] The unexplained part shows that other shocks have also had an impact on the index, for in-

Contribution of uncertainty shocks to the weekly activity index for Germany

Percentage change in 13-week average versus preceding 13 weeks



Sources: Bloomberg, Markit and Bundesbank calculations. **1** The weekly activity index (WAI) is designed to measure real economic activity in Germany in as timely a manner as possible; see S. Eraslan and T. Götz, Weekly activity index for the German economy, available at https://www.bundesbank.de/en/statistics/economic-activity-and-prices/weekly-activity-index. **2** Estimated using a vector autoregressive model. Besides the WAI, the model incorporates stock market and Federal bond volatilities, Federal bond yields, liquidity premia and credit default swap spreads for non-financial corporations.

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1 The weekly activity index cannot, however, be equated with quarterly gross domestic product (GDP). For more information on the construction and methodology of the WAI, see Eraslan and Götz (2020).
2 See Bloom (2009).
3 The uncertainty shocks are measured as orthogonal changes in the VDAX.
4 Estimates of an alternative model specification, in which the weekly activity index is replaced with monthly industrial production and the financial variables are replaced with their monthly averages, provide comparable results.

stance negative supply and demand shocks. By contrast, monetary policy and fiscal policy measures were probably supporting factors.

A representative survey of households conducted by the Bundesbank in April 2020 confirms that the uncertainty caused by the coronavirus pandemic can also negatively impact households' expectations regarding economic activity as well as their consumption plans.[5]

According to the survey, households expected GDP to drop by an average of 3.5% within one year. When additionally confronted with information explicitly pointing to the high uncertainty about further economic developments, households revised their growth expectations down by 1.7 percentage points and anticipated a decline in GDP of 5.2%. Furthermore, the information on uncertainty caused households to say that they were less willing to buy consumer durables over the following 12 months. For instance, these households reported that they were 5.6 percentage points less likely to buy a car within the following 12 months. For other major purchases, such as refrigerators, furniture and electrical appliances, the likelihood dropped by as much as 7.6 percentage points.[6] Overall, there is thus clear evidence to suggest that high uncertainty has had a dampening effect on the demand for goods and services in Germany.[7]

5 This survey asked German households about their expectations and involved some 2,000 participants. For further information on the survey, see https://www.bundesbank.de/en/bundesbank/research/pilot-survey-on-consumer-expectations.
6 This probably does not yet take into account the reduction in value added tax as of 1 July 2020.
7 See Beutel, Metiu and Stockerl (2020).

discounts.[9] In contrast to previous periods of stress, this even briefly affected the markets for German Bunds and US Treasuries, instruments which are generally considered to be particularly safe. In some individual markets, trading even came to a virtual standstill. This was the case, for instance, in the market for commercial paper in the United States after US money market funds recorded high outflows and subsequently pulled out of this market.[10] However, trading volumes in most equity and bond markets were relatively high in spite of increased transaction costs.

In some securities markets, trading came to a virtual standstill.

The concurrent rise in trading volumes and bid-ask spreads on euro area corporate bonds at the beginning of March 2020 suggests that market participants were under high pressure to sell (see Chart 2.8). This was likely to have been mainly attributable to increased liquidity and collateral needs within the financial system. For example, investment funds in the United States and the euro area experienced significant redemptions. In addition, market participants needed highly liquid collateral in order to satisfy margin calls for secured transactions. These include, amongst other things, repo transactions and transactions via central counterparties (CCPs). The financial markets were at risk of liquidity spirals, in which margin calls and illiquidity of securities mutually reinforce each other: if market

9 Bid-ask spreads represent the difference between traders' buying and selling prices and are a measure of how easily securities can be traded in the market. A low bid-ask spread signals higher market liquidity, as securities can be traded without major premiums or discounts. Aside from the bid-ask spreads, the Amihud ratios were also significantly higher. The Amihud ratio is a measure of the volume-weighted price effect of a transaction. For more information, see Amihud (2002).
10 See Avdjiev, Eren and McGuire (2020); Eren, Schrimpf and Sushko (2020).

participants are forced to sell off securities due to margin calls, this can cause the liquidity of the affected securities to fall, which can trigger additional margin calls and thus put financial market participants under increased pressure. For example, US hedge funds that needed to service margin calls for repo transactions were at risk in the second quarter of 2020, when liquidity in the market for US Treasuries temporarily declined.[11]

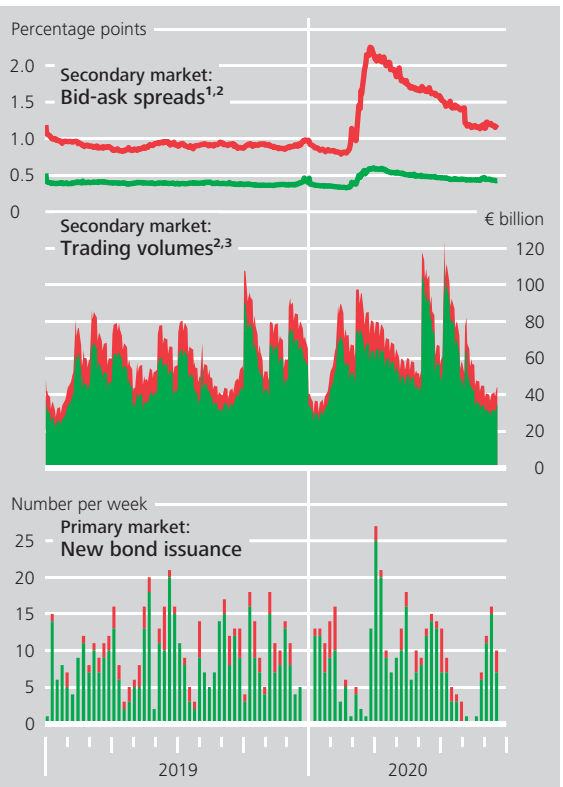
Market participants needed highly liquid collateral.

The strain on the financial markets in the spring of 2020 impacted the securities portfolios of German banks, investment funds and insurers as well (see the box entitled "Effects of the coronavirus shock on the securities portfolios of German financial intermediaries" on pp. 26 f.). In the spring of 2020, intermediaries experienced significant devaluation in their portfolios, especially in equities and high-yield bonds. The securities transactions undertaken by intermediaries are also likely to be attributable to their respective need for liquid funds. German banks were faced with higher demand for lines of credit on the part of enterprises; at the same time, they increasingly required collateral for repo transactions and transactions with CCPs.

Banks therefore mainly sold high-risk securities and purchased securities that were considered safe and liquid. In the German fund sector, there were outflows from retail funds in particular. These contributed to the fund sector selling off securities of all rating classes. By contrast, German insurers were relatively unaffected by additional liquidity outflows, for example due to terminations of insurance policies. As a result, they were even able to purchase securities and, through their countercyclical investment, helped to stabilise the financial markets.

Indicators of the market liquidity of bonds issued by non-financial corporations in the euro area

Chart 2.8



Sources: Dealogic, Markit and Bundesbank calculations. **1** Difference between buying and selling prices. **2** Approximated for the euro area using euro-denominated bonds issued by corporations in the EU excluding the United Kingdom. **3** Daily rolling total of the last 30 calendar days.

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Stabilisation through monetary policy, fiscal policy and supervisory measures

In order to soften the impact of the coronavirus pandemic, governments, central banks and supervisory authorities around the world swiftly took extensive measures (see Chart 2.9). Fiscal and monetary policy measures were complemented by microprudential

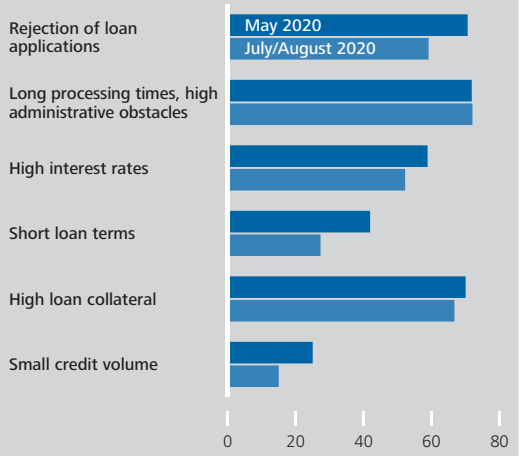
11 See Schrimpf, Shin and Sushko (2020). Similar reinforcement mechanisms have already been observed in past crises; see Brunnermeier and Pedersen (2009).

Financing conditions for enterprises in the coronavirus pandemic: results of a survey of industry associations

Access to financial resources is key for companies to be able to conduct business and bridge liquidity bottlenecks. In order to better assess financing conditions in the corporate sector, the Bundesbank surveyed industry associations. These surveys were first conducted in May 2020 and were repeated between mid-July and the beginning of August 2020. A total of 61 industry associations participated in the survey.[1] These represent around 3.5 million enterprises and companies from all sectors of the economy, especially small and medium-sized enterprises (SMEs). In addition to questions about financing conditions, the survey asked how the associations assess funding provision and government support measures for their member firms.

Enterprises' difficulties obtaining credit during the coronavirus pandemic*

Percentage of associations reporting difficulties



Source: Bundesbank survey of industry associations on the financing situation of enterprises in Germany. * Most of the associations surveyed represent small and medium-sized enterprises. The May (July/August) survey included 61 (35) associations. Respondents were asked to consider the period from early March 2020 (after end-April 2020). Loans from the KfW Group and other government-guaranteed loans are not taken into consideration here.

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The impact of the coronavirus pandemic has differed from sector to sector. Sales fell particularly sharply in the following industries: specialised retail (excluding food trade), hotels and restaurants, tourism, the events sector as well as the automotive industry and its suppliers. According to the associations, many enterprises attempted to cover losses and bridge potential liquidity bottlenecks through greater recourse to own funds and overdraft facilities. Nevertheless, additional financing requirements had initially risen very sharply, they said. This is consistent with the results of the Eurosystem's Bank Lending Survey (BLS). The net share of banks reporting an increase in firms' demand for loans was the highest it has been since the survey began in 2003. In particularly hard-hit sectors such as the hotel and restaurant business, the associations fear that the gloomy business conditions will make insolvencies more likely.

In terms of access to financing, the associations reported in May that loan applications from enterprises belonging to particularly badly affected sectors were frequently rejected. Small and micro enterprises as well as start-ups had also reportedly faced difficulties obtaining credit. Although the measures to contain the pandemic have meanwhile been eased, the associations responding in July/August 2020 continued to cite the rejection of loan applications as a relevant problem. However, they said that the problem was less severe than at the beginning of the

1 A total of 35 industry associations took part in the second survey in July/August 2020. The findings should therefore be viewed more as an ad hoc survey; comparability with the results of the first survey is limited.

coronavirus pandemic (see the chart). The associations further stated that loan conditions had worsened with the onset of the pandemic. This is also in line with the results of the Bank Lending Survey. The banks surveyed there reported that they had tightened the terms and conditions for new loans in the second quarter of 2020. They explained that this was mainly because credit risk was seen to be higher and the refinancing situation had deteriorated. The industry associations reported high interest rates, loan collateral requirements and long processing times as the main obstacles to borrowing.

A large proportion of the associations said that they were satisfied with the scope and focus of government support measures. The measures had, they explained, saved numerous enterprises from existential difficulties. Short-time working arrangements had played a key role in alleviating the immediate consequences of the pandemic. Tax relief measures such as the reduction in value added tax were predominantly viewed positively. However, some areas, such as the events sector, might see hardly any benefit due to remaining restrictions and a lack of demand. Around 10% of the enterprises represented have applied for government-guaranteed loans. However, the associations reported that enterprises had encountered problems when applying for such loans. In particular, they cited long processing times for credit applications. On the whole, the associations continued to see their member enterprises' financial situation as being at risk. If the pandemic were to worsen again, this would also be true of enterprises beyond those in badly hit sectors.

and macroprudential measures (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.). In this context, the instruments help alleviate liquidity and solvency problems via different channels. While monetary policy instruments are aimed more towards supporting liquidity, fiscal policy measures can also directly improve the solvency of enterprises and households. As a result, the creditworthiness of the sector in question will tend to increase. In turn, this can create incentives for market participants, such as banks or bond investors, to additionally provide private funding.

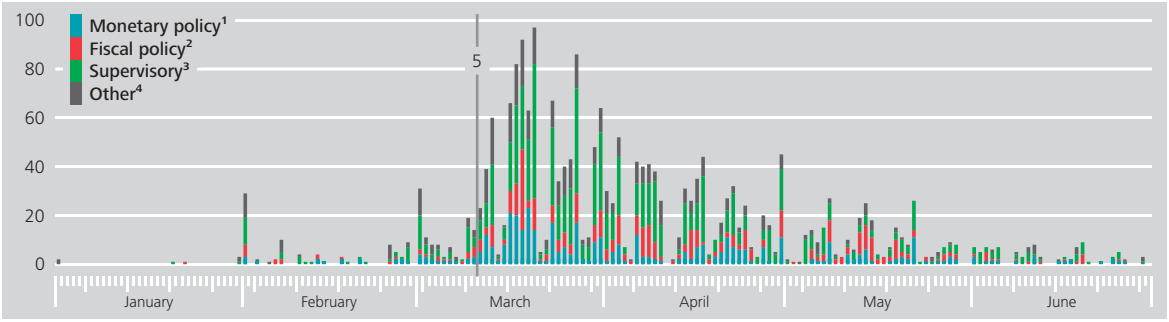
The assistance measures helped alleviate liquidity and solvency problems.

Unlike monetary policy and fiscal policy programmes, the microprudential and macroprudential measures have served, above all, to alleviate potential balance sheet constraints within the banking system and thereby create scope for lending. They are intended to provide temporary relief within the regulatory framework and not a permanent structural lowering of supervisory requirements. Macroprudential instruments, in particular, are employed primarily as preventive measures and are not designed for acute crisis management. Nevertheless, they can help to mitigate the effects of shocks in the financial system: for instance, banks can use macroprudential buffers to maintain lending. This can counteract the financial system potentially amplifying the shock.

The monetary policy, fiscal policy and supervisory measures may have undesirable side effects. It is therefore important to conduct a structured analysis – as part of an evaluation – of whether the intended effects actually materialise and whether any side effects or interactions occur. For example, it would be necessary to examine the measures' suitability for

Measures enforced around the world at the start of the coronavirus pandemic Chart 2.9

Number of measures adopted at the respective date



Source: Financial Stability Board. **1** Policy rate cut, pandemic emergency purchase programme, amongst others. **2** Government loan guarantees, transfer payments, amongst others. **3** Use of the flexibility of the regulatory framework, release of the countercyclical capital buffer, amongst others. **4** Funded by the International Monetary Fund (IMF) or the World Bank, amongst others. **5** Spread of coronavirus classified as a pandemic by the World Health Organization (WHO).

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averting insolvencies and thus maintaining production capacities and human capital. This would have to be weighed up against any undesirable side effects. For instance, it would be necessary to investigate the extent to which enterprises without sustainable business models are kept afloat over the long term. Furthermore, there may be interactions between the measures adopted in different countries. Measures taken in other euro area countries to stabilise their own economies can potentially bolster demand for German export goods. The significance of this international aspect is highlighted by the work of a European Systemic Risk Board (ESRB) working group on cross-sectoral and cross-border effects of fiscal measures.[12] Such an evaluation is vital in order to address any weaknesses in the measures and to gain valuable insights for future policy measures. However, the informative value of the outcome of this evaluation will depend not least on the extent to which information on all relevant assistance measures is factored into the evaluation. In this regard, and in light of the comprehensive measures adopted by German state governments in some cases, it seems that there is still potential for improving the database.

The measures may have undesirable effects.

Monetary policy measures support the functioning of financial markets

Central banks, too, have taken far-reaching measures. These monetary policy measures strengthened the functioning of financial markets and supported banks in continuing to adequately supply enterprises and households with credit (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.).[13] For example, asset purchase programmes and credit operations to provide liquidity helped to relieve any liquidity constraints among financial institutions and in the financial markets.

Overall, due to swap agreements between the major central banks, central banks were able to supply commercial banks with liquidity in foreign cur-

12 Specifically, the ESRB "Working group on financial stability implications of fiscal measures to protect the real economy from the COVID-19 pandemic" is working on a regular monitor of the fiscal policy measures adopted in all 30 ESRB member states, focusing on cross-sectoral and cross-border effects on financial stability. For more information on the working group's mandate, see European Systemic Risk Board (2020).

13 See, inter alia, Bank of England (2020); European Central Bank (2020c); Haddad, Moreira and Muir (2020); International Monetary Fund (2020a).

rencies, especially in US dollars.[14] In this context, increased demand for US dollar liquidity was an important aspect in emerging market economies in particular.[15] In June, the Eurosystem augmented the bilateral swap agreements with a new Eurosystem repo facility for central banks (EUREP), which serves to cover pandemic-related needs for euro liquidity outside of the euro area.

Furthermore, the Eurosystem increased its provision of euro liquidity. First, it made changes to the third series of targeted longer-term refinancing operations (TLTRO-III) in order to bolster lending to enterprises and households. Due to the highly attractive conditions, banks took up a record amount of €1,308 billion in the fourth TLTRO-III operation in June 2020.[16] This was significantly higher than the total of €739 billion that was allotted in the 2016 and 2017 TLTRO-II operations. Second, from March 2020, the Eurosystem initiated further non-targeted refinancing operations to cover institutions' interim liquidity needs until the fourth TLTRO-III operation in June 2020. The new pandemic emergency longer-term refinancing operations (PELTROs) launched in May 2020 offered an additional series of refinancing operations. These aim to ensure sufficient liquidity and smooth money market conditions during the pandemic. As of April, the Eurosystem also temporarily relaxed the criteria for eligible collateral.

The Eurosystem increased its provision of liquidity.

Alongside the refinancing operations, the Eurosystem initially temporarily expanded the asset purchase programme (APP) at the beginning of March by €120 billion. This made a major contribution to ensuring favourable financing conditions for the real economy during times of heightened uncertainty. Furthermore, a pandemic emergency purchase programme (PEPP) was adopted; it initially totalled €750 billion but was then expanded to €1,350 billion in June. By launching the PEPP, the Eurosystem has sought to counter the risks to the monetary policy transmission mechanism and the outlook for the euro area resulting from the outbreak of the coronavirus pandemic. Like the APP, the PEPP comprises purchases of government and corporate bonds, but also purchases of Pfandbriefe and asset-backed securities. In March 2020, the corporate bonds that can be purchased under the PEPP were expanded to include commercial paper with short residual maturities.

Much like the Eurosystem, other major central banks, such as the Federal Reserve and the Bank of England, also set up special facilities and purchase programmes. As a whole, these measures have probably helped stabilise liquidity needs within the global financial system. There were no sustained liquidity spirals and temporary disruptions occurred only in some isolated markets. The measures are therefore likely to have helped prevent the financial system from directly amplifying the real economic downturn.

Other major central banks also set up special facilities and purchase programmes.

The central banks' monetary policy measures also supported financing terms. Especially in the euro area, they helped to stabilise the general interest rate level, as they counteracted the upward pressure on risk-free interest rates and government bond yields.[17] The risk-free interest rate bolstered equity

14 See International Monetary Fund (2020a). In this context, the Eurosystem expanded its offering of US dollar tenders, adding tenders with 12-week maturities to the existing one-week tenders, and also lowered the interest rate for these operations by 25 basis points.
15 See Eren, Schrimpf and Sushko (2020).
16 For example, the maximum amount that can be taken up by counterparties was increased. In addition, the interest rate for the period from June 2020 to June 2021 was lowered in two steps by a total of 50 basis points.
17 For detailed accounts of how the effects of the purchase programmes on the yield curve in the euro area are quantified, see Deutsche Bundesbank (2020b); Eser, Lemke, Nyholm, Radde and Vladu (2019).

Effects of the coronavirus shock on the securities portfolios of German financial intermediaries

The period of stress in the financial markets in spring 2020 manifested as price losses in the securities portfolios of banks, investment funds and insurers in Germany, especially for equities and high-yield bonds (see price effects on the left side of the chart). Sales and purchases of securities differed markedly across the various groups of intermediaries (see volume effects on the right of the chart) and were likely primarily driven by their respective liquidity needs.

At the beginning of the coronavirus pandemic, Germany's banks experienced heightened liquidity needs. As a result, margin calls issued by key European central counterparties (CCPs) to German banks increased significantly. Banks also saw a rise in demand for liquidity from their customers. Enterprises increasingly tapped or renegotiated existing credit lines. This need for liquidity is reflected in how banks rebalanced their portfolios. In the first quarter of 2020, they purchased, in particular, safe and liquid assets such as government bonds and securities with very high ratings. By contrast, they offloaded bonds issued by non-financial corporations, equities and fund shares. These shifts probably also helped to avert losses in trading business and bolster capital ratios, since government bonds and securities with higher ratings do not need to be backed with as much capital.

German retail funds recorded substantial net outflows in March 2020, and these contributed to the fund sector selling securities in all asset and rating classes. In March 2020, German retail equity funds, funds of funds and mixed securities funds parted with a considerably higher share of the securities they held than usual. The fund sector's increased sales activity could have amplified price declines in securities, especially if fund managers had to sell off securities despite already lower prices in order to be able to service fund unit redemptions.[1] Funds that invest primarily in corporate bonds or emerging market economies experienced particularly high outflows. By contrast, government bond funds and index funds, such as exchange-traded funds (ETFs), recorded inflows.

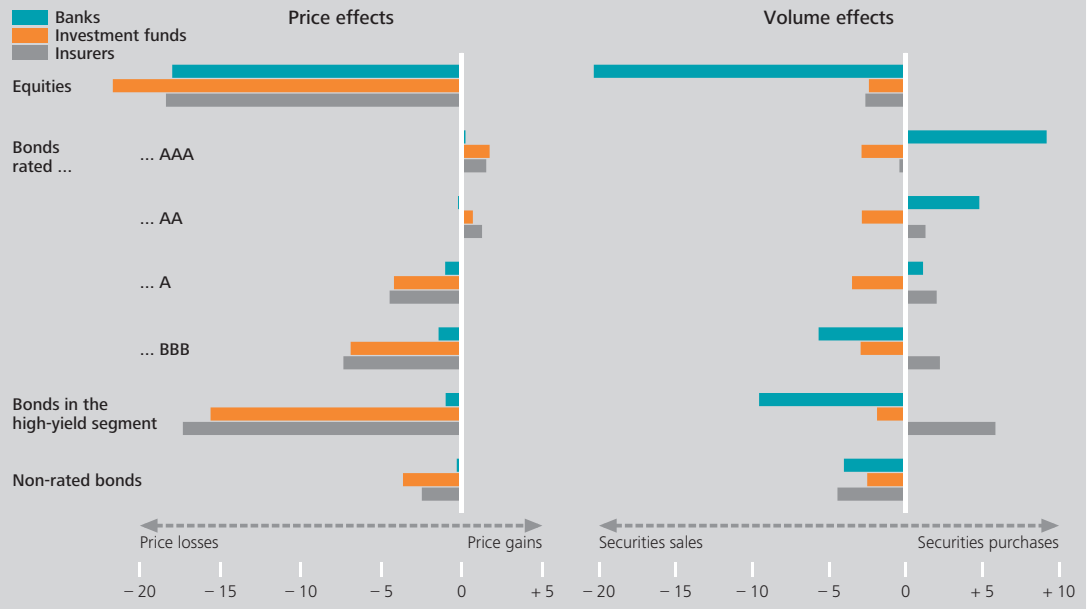
These developments suggest that fund investors have sought to shift to investments which are as liquid and safe as possible. The outflows observed in the spring of 2020 almost exclusively concerned fund share classes with very high minimum investment amounts.[2] Their units are predominantly held not by households but by large institutional investors like funds, banks and non-financial corporations.[3] This suggests that exposure to investment risk in the German retail fund sector was scaled back chiefly by these groups of large investors. German specialised funds, aimed at institutional investors, did not record aggregate outflows until April 2020, however, by which time German retail funds had, on aggregate, already started seeing inflows again.

Overall, insurers increased their holdings of riskier bonds disproportionately in the first quarter

1 See Deutsche Bundesbank (2019a).
2 Asset managers can issue shares with different characteristics for their funds. Shares with identical characteristics are grouped into fund share classes. There may be differences between share classes; for example, in relation to the minimum investment amount required by investors to purchase shares belonging to each class.
3 According to data from Morningstar Direct.

Securities portfolios of German financial intermediaries

Q1 2020, quarter-on-quarter percentage changes



Sources: BaFin, Investment Fund Statistics, Securities Holdings Statistics, Centralised Securities Database and Bundesbank calculations.
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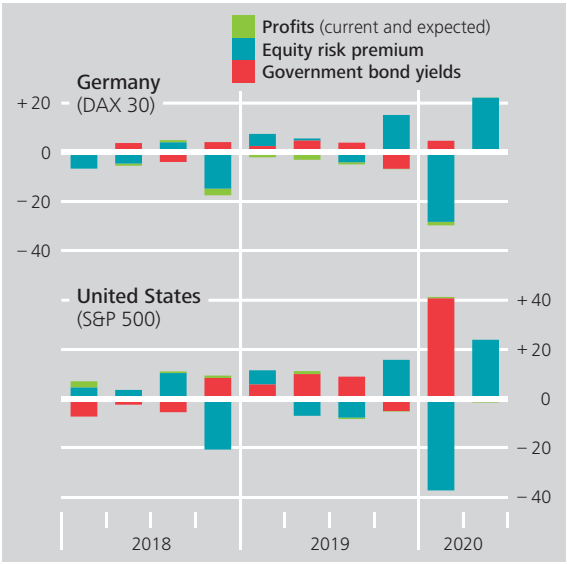
of 2020 (see the chart). Countercyclical behaviour of this kind is noteworthy primarily because the supervisory solvency ratios of insurers came under additional pressure from the interest rate level, which had fallen again in the first quarter of 2020. That said, the sector benefited from a stable liquidity situation owing to its regular premium income. Furthermore, the macroprudential stabilisers built into the regulatory framework had an alleviating effect.[4] For instance, the volatility adjustment at least partially offset the negative impact of increased market volatility on insurers' solvency ratios. Not least on account of the low interest rates, enterprises with sufficient capital buffers are likely to have invested in relatively risky securities, with the risk premia attached to such securities having risen considerably. The insurance sector thus tended towards countercyclical investment in the first quarter of 2020.

In summary, German banks and investment funds, experiencing an increased need for liquidity, sold risky and less liquid securities. Insurers, meanwhile, increased their holdings of risky bonds. With their countercyclical behaviour, they are likely to have helped stabilise the financial markets.

4 See Deutsche Bundesbank (2018).

Explanatory factors* in equity market performance Chart 2.10

%



Sources: Bloomberg, Consensus Economics and Bundesbank calculations. * Based on the residual income valuation formula. A positive contribution (e.g. falling government bond yields, falling equity risk premia or rising corporate profits) results in rising equity prices.

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prices in the first quarter of 2020. This is illustrated by decomposing equity price developments in the German DAX and the US S&P 500, which reveals the influence of economic factors. By contrast, rising equity risk premia and deteriorating corporate fundamentals pushed prices down. The impact of higher risk premia is very pronounced for the United States in particular. In the second quarter of 2020, prices were in turn bolstered by the considerable fall in equity risk premia (see Chart 2.10). Ultimately, at the end of the second quarter of 2020, prices in the equity and bond markets were almost as high as they had been before the outbreak of the coronavirus pandemic. The aggregate valuation level even appeared to be very high again, if account is also taken of the lower earnings expectations and rising debt levels (see the section entitled "Financial markets only reflect economic situation to a limited degree" on p. 40 ff.).

Valuations in the financial markets appeared very high again recently.

Banks, too, have benefited from the monetary policy measures. Since the outbreak of the coronavirus pandemic, they have made increased use of central bank funding. Banks may, as a precautionary measure, have sought more liquidity to prepare for any potential withdrawals of deposits or recourse to credit lines. During the stress phase in the financial markets, accessing these funds was made easier not least as a result of the pandemic programmes adopted by major central banks.

Microprudential and macroprudential measures increase room for manoeuvre

Especially in the event of a massive real economic shock, such as that which occurred at the outbreak of the coronavirus pandemic, it is vital that the financial system can continue to perform its functions and does not amplify the shock. A key prerequisite for this is that the financial system has sufficient buffers and that it uses them to absorb any losses. The role of microprudential and macroprudential supervision is to facilitate the use of the available buffers and to create additional room for manoeuvre by implementing supervisory measures. They thus complement monetary policy and fiscal policy measures.[18] The intention is not to lower supervisory requirements on a permanent, structural basis.

Supervisory requirements should not be lowered on a permanent basis.

At the outbreak of the coronavirus pandemic, the microprudential and macroprudential policy response was to increase the scope on banks' balance sheets in order to support their lending. Furthermore, su-

18 See, inter alia, Nier and Olafsson (2020).

pervisors reaffirmed to the banks the existing flexibility of the regulatory framework with regard to the fulfilment of capital and liquidity requirements (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.). In doing so, microprudential and macroprudential supervisory authorities supported the banking system in continuing to supply the real economy with liquidity.[19] This will be particularly relevant in the coming quarters if the number of insolvencies rises and the banking system is forced to absorb losses (see the chapter entitled "Risk of a sharp rise in insolvencies" on pp. 35 ff.). Despite the economic downturn, the first half of 2020 did not see loss allowances rise significantly.

Fiscal policy measures supported the corporate sector

In the first half of 2020, comprehensive fiscal policy measures were adopted in Germany. Of these, the largest volumes are allocated to the measures aimed at supporting the corporate sector.[20] They mitigate liquidity and solvency issues and impact enterprises' incoming and outgoing payments and/or their income and expenses through a variety of channels. For example, corporate sector income, which collapsed following the outbreak of the pandemic, is being partially compensated for by transfers. At the same time, short-time working benefits lower enterprises' expenses to some extent and stabilise household income and consumption.

Transfers partially compensate for lost income in the corporate sector.

The measures aimed at addressing the liquidity problems of enterprises include extensive loan guarantees. The Federal Government's first supplementary budget made provisions for an additional guarantee facility of more than €500 billion. The volume of guarantees additionally provided to the KfW Group totals €150 billion. The guarantees provided by the Federal Government are passed on by the KfW Group to the enterprises' principal banks. Up to 100% of the total loan amount is guaranteed. In addition, the economic stabilisation fund was established with a guarantee facility of €400 billion, amongst other features. In this context, the fund is oriented toward supporting large enterprises. The measures taken by the Federal Government are complemented by programmes at state government level.

The guarantee programmes significantly reduce the lending banks' credit risk and thereby increase their incentives to grant new loans. This improves the liquidity situation amongst enterprises and reduces their risk of insolvency due to illiquidity. However, the drawbacks of guarantee programmes are that losses of earnings are not compensated for, creditworthiness declines due to rising debt, and, in the worst-case scenario, the enterprise in question may become overindebted.

Guarantee programmes increase incentives for banks to grant new loans.

Tax measures likewise tend to improve enterprises' liquidity situation. These include, for example, tax moratoria or simplified reductions in advance tax payments. Furthermore, at the enterprise level, expanded tax loss carrybacks can improve not only liquidity but also solvency in individual years. This measure is likely to be comparatively well targeted, as it supports those enterprises in particular that had sustainable business models before the coronavirus pandemic.

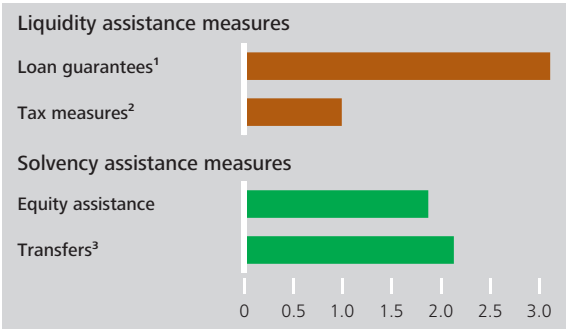
By contrast, transfers and equity assistance are beneficial for enterprises in that they improve their sol-

19 See Altavilla, Barbiero, Boucinha and Burlon (2020).
20 For a more comprehensive discussion of central government's contribution to stabilising the situation in Germany, see Deutsche Bundesbank (2020e).

Key measures to support the German corporate sector during the coronavirus pandemic*

Chart 2.11

As a percentage of GDP



* Bundesbank estimates as at June 2020 for utilisation in 2020 as a whole; see also Deutsche Bundesbank (2020), Monthly Report, August 2020, pp. 92 ff. Provisional information indicates considerably lower volumes. The existing automatic stabilisers (short-time working benefits, profit-related taxes, social security contributions) in these areas are not depicted. **1** Shown here are the government-guaranteed portions of the loans granted. These are primarily loans that are guaranteed by central government and granted by the KfW Group via the borrower's principal bank. **2** Above all, these include simplified reductions in advance tax payments, tax moratoria, and reimbursements of special advance VAT payments. **3** These comprise direct assistance and investment grants from central and state government to private sector firms as well as the assumption of social security contributions on short-time working benefits by the Federal Employment Agency.

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vency over a number of years and – unlike advance tax loss offsetting – are not associated with burdens on the enterprises' future profits or losses. Unlike loan guarantees, they address the problem of overindebtedness directly and thus improve the enterprises' creditworthiness. This includes, for example, direct assistance to small and medium-sized enterprises (SMEs), self-employed persons, and freelancers. Furthermore, the economic stabilisation fund envisages equity assistance totalling €100 billion, which is intended to establish government stakeholdings in major corporations.

Transfers and equity assistance improve the creditworthiness of enterprises.

The fiscal policy measures have made a considerable contribution to supporting the corporate sector (see Chart 2.11). Moreover, the corporate sector is being supported not only by the discretionary fiscal policy measures described here, but also by the automatic stabilisers. These include, for example, regular short-time working benefits – without reimbursement of social contributions – for which enterprises can apply under certain conditions. Furthermore, especially in the cases of loan guarantees and equity assistance, the authorised volume is far from being exhausted. This is set at around 40% of GDP.[21]

Severe disruptions to the functioning of the German financial system avoided so far

The comprehensive monetary policy, fiscal policy and supervisory measures made a significant contribution to reducing real economic and financial risks. Without monetary policy and fiscal policy measures, the coronavirus shock would likely have had a major impact on the financial system. If enterprises' liquidity needs had not been covered at short notice due to the high level of uncertainty, this could have set in motion a self-reinforcing downward spiral within a very short space of time, leading to a large number of insolvencies and a significant rise in unemployment. Even enterprises that had been economically successful up until the outbreak of the coronavirus pandemic would have been affected, with inability to meet their payments triggering insolvency. The problem could have spilled over to the household sector via rising unemployment. This would have depressed demand for goods and services.

At the same time, the stress could have spilled over to the financial system, thus jeopardising its stability, as the collapse in sales and the insolvencies in the corporate sector would have led to loss allowances and credit defaults. Higher unemployment would have also resulted in losses from non-performing real estate and consumer loans. Due to the higher liquidity needs amongst enterprises, all of these developments would have occurred very rapidly. All in all, the finan-

21 See Deutsche Bundesbank (2020e).

cial system might no longer have been able to cope with the losses. In this environment, if no assistance measures had been implemented, banks might well have curbed their lending dramatically and tightened their lending conditions. Sectors and industries that had still had access to financing up until then would have received barely any follow-up financing. As a result, the downward spiral would have affected even more enterprises. Overall, preventive monetary policy and fiscal policy intervention was therefore urgently necessary.

Preventive monetary policy and fiscal policy intervention was urgently necessary.

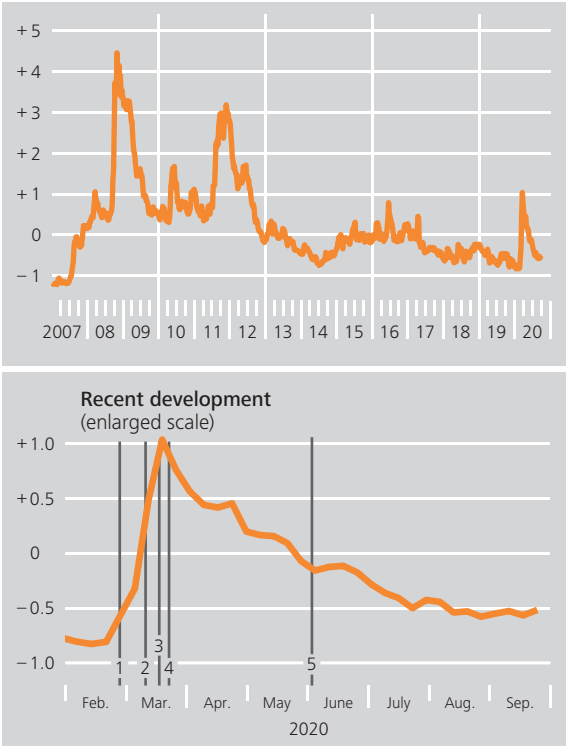
The situation in the financial markets stabilised noticeably following the announcement of the packages of monetary policy and fiscal policy measures. The overall uncertainty abated over the course of the second quarter of 2020. This is also reflected in the German financial stress indicator, which has fallen again since March (see Chart 2.12). This was helped especially by the fact that volatility in the financial markets declined once again (see Chart 2.4 on p. 16). However, by historical standards, it still remains at an above average level. In addition, the premia for credit default swaps for corporate bonds fell significantly again (see Chart 2.7 on p. 18). Furthermore, a survey of industry associations suggests that the measures have saved a large number of businesses from existential difficulties (see the box entitled "Financing conditions for enterprises in the coronavirus pandemic: results of a survey of industry associations" on pp. 22 f.).

In this way, the measures contributed to enterprises again being able to obtain funding in the financial market. For example, from the end of March 2020, enterprises in the investment-grade segment were the first to be able to issue bonds in the market again – despite worse fundamentals and the associated rating downgrades. Nevertheless, some enterprises' access to funding via the financial market was still constrained even after March 2020 – especially enterprises in the high-yield segment as well as SMEs. These enterprises instead made greater use of credit lines from banks.[22]

In March, some enterprises were able to obtain funding in the financial market again.

Financial stress indicator* Chart 2.12

Standardised weekly data



Sources: Bloomberg, Markit, Refinitiv and Bundesbank calculations. * The indicator is the first principal component of 11 variables included in a principal component analysis. The variables comprise various interest spreads as well as measures of liquidity and volatility in the financial market. **1** The German Federal Government establishes its first coronavirus crisis unit. **2** The World Health Organization (WHO) categorises the spread of the coronavirus as a pandemic. **3** The European Central Bank announces the pandemic emergency purchase programme (PEPP). **4** The first fiscal programme to assist the German corporate sector begins. **5** The fiscal stimulus package is adopted in Germany.

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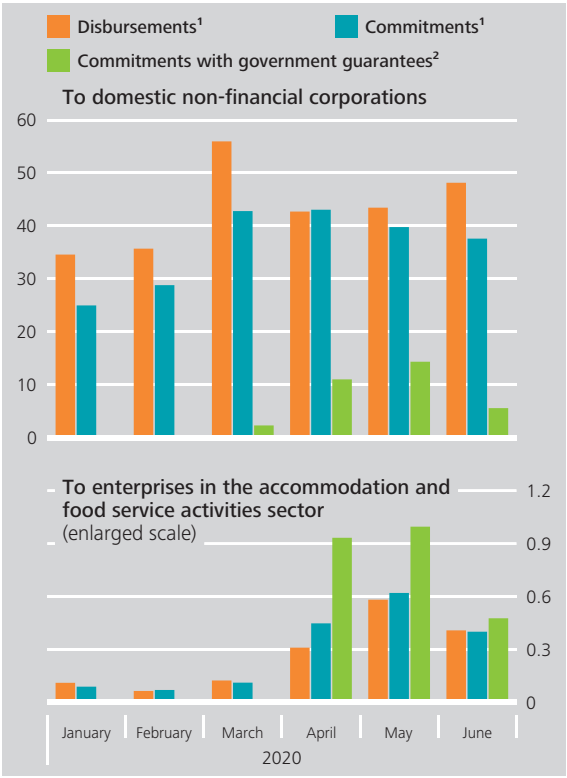
22 See Acharya and Steffen (2020). In addition, data from Dealogic show that the granting of syndicated loans to enterprises from both the investment-grade and high-yield segments in the euro area did not decline in relation to bond issuance.

Loans disbursed and newly committed by German banks Chart 2.13

€ billion



Sources: AnaCredit and the KfW Group. **1** A credit institution is obliged to report to AnaCredit if a borrower's total credit volume is at least €25,000 and the borrower is not a natural person. Government-guaranteed loans are also covered by this reporting obligation. **2** "KfW coronavirus aid: loans for companies" special programme launched by the KfW Group. Due to reporting limitations, these commitments may exceed those in AnaCredit.

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Lending in the banking system was also potentially supported by the measures. During the coronavirus pandemic, banks have continued to grant loans and provide lines of credit (see Chart 2.13 above and Chart 4.1 on p. 55). In March and April 2020, for example, banks disbursed and newly committed considerably more loans than they had in January and February.[23] The banking system thus played a key role in covering the liquidity needs of enterprises during the coronavirus pandemic. On average across all sectors, funding provided by private banks significantly exceeded the government-guaranteed loans. However, it can be observed that particularly hard-hit sectors made much greater use of government guarantees. For example, in April 2020, the accommodation and food service activities sector obtained a comparatively large amount of funding from government-guaranteed KfW loans.

Overall, a wave of insolvencies was successfully prevented in the first half of 2020. Despite the massive collapse in sales, it appears that corporate insolvencies did not rise during this period (see Chart 3.3 on p. 38).[24] However, there was probably another factor behind this: the obligation to file for insolvency was, under certain conditions, suspended for bankrupt and overindebted enterprises until the end of September 2020 following the outbreak of the coronavirus pandemic.[25]

A wave of insolvencies was successfully averted in the first half of 2020.

As financial market stress receded, financial conditions for corporations improved. At the same time, the downside risks to real economic growth diminished. However, this should not be interpreted as a causal relationship, as financial stress is influenced by a multitude of factors that concurrently affect downside risks as well. The extent to which cyclical downside risks are correlated with changes in financial stress can be estimated using the growth-at-risk approach, which analyses how the estimated

23 AnaCredit's data history only goes back as far as September 2019. As a result, no seasonal patterns can be identified. However, a comparison with data from the MFI interest rate statistics indicates that the rise in lending considerably exceeded that of a seasonal effect.

24 See Halle Institute for Economic Research (IWH) (2020); Federal Statistical Office (2020).

25 Only enterprises that became insolvent or overindebted as a result of the coronavirus pandemic were able to make use of the special rule suspending their obligation to file for insolvency. According to the new rule, an enterprise's insolvency is considered to have been a result of the coronavirus pandemic if the enterprise was still solvent at the end of December 2019. In addition, the enterprise must have had prospects of being in a position to meet its payment obligations in the future. As of the beginning of October 2020, insolvent enterprises will once again be required to file for insolvency, while overindebted enterprises will remain exempt from this obligation until the end of 2020.

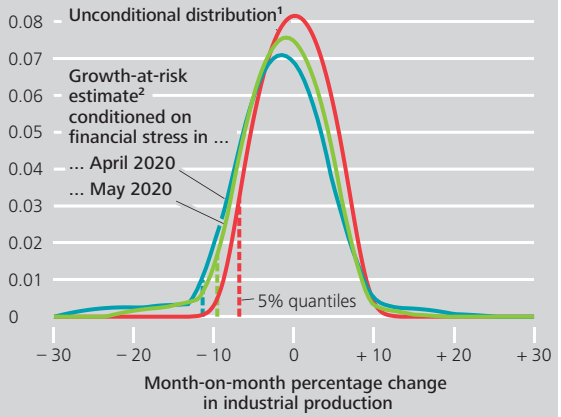
5% quantile of the growth in industrial production fluctuates as financial stress rises and falls.[26] Financial stress is measured using an indicator of financial conditions and an indicator of financial market uncertainty. These indicators merge a large quantity of relevant information and are influenced by monetary policy and fiscal policy, amongst other factors.

The growth rate for industrial production, conditioned on financial stress, initially experienced a pronounced shift into negative territory in April 2020 following the outbreak of the coronavirus pandemic (see Chart 2.14). This suggests that downside risks had grown significantly. As the situation in the financial markets calmed down again in the following month, downside risks declined noticeably. In May 2020, industrial production in fact rose substantially on the month. However, in this context, a variety of factors played key roles that were connected to the extraordinary circumstances of the coronavirus pandemic and that are not captured by this model for estimating downside risks. In particular, the easing of healthcare policy measures to contain the pandemic in May 2020 is not taken directly into account. The effects of these measures can only be captured indirectly by the model if they contribute to reducing financial stress.

Overall, the functioning of the German financial system was at risk of severe disruption in March 2020; however, this never materialised. In particular, the comprehensive assistance measures helped to ensure the resilience of the German financial system during the first half of the year. The banking system and the financial markets were able to continue supplying the economy with funding.

Downside risks to industrial production in Germany due to financial stress Chart 2.14

Probability density



Sources: FRED Federal Reserve Bank of St Louis, Federal Statistical Office and Bundesbank calculations. **1** Based on the monthly changes in industrial production over the January 1990 to February 2020 observation period. **2** Based on a quantile regression in which the quantiles of the distribution of the change in industrial production are regressed on the values of two variables observed in the previous month: a measure of stress in the financial markets (VIX stock market volatility index) and a measure of financial conditions (Chicago Fed's National Financial Conditions Index).

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26 See Deutsche Bundesbank (2019a).

Risk of a sharp rise in insolvencies

The outbreak of the coronavirus pandemic has highlighted the risks that unexpected events pose to financial stability. The effects of the real economic crisis have not yet fully materialised in the financial system, and the current economic recovery remains fragile. Adverse scenarios entail risks to financial stability, and adequate preparation for them is required.

The severe economic downturn gives rise to fears that the number of corporate insolvencies will rise significantly in the coming quarters. Valuations in the financial and real estate markets are currently relatively high as measured by fundamentals. Although the real estate market has remained stable so far, it is not clear at present what impact the coronavirus pandemic will have on it. If unemployment and the number of household insolvencies see a distinct rise, this could lead to increasing defaults on residential real estate loans. A rise in corporate insolvencies and lower demand for office space could have a negative impact on the commercial real estate market.

Growing credit and market risks could put pressure on the banking system. If insolvencies were to evolve along the lines of earlier recessions, the losses would probably be well manageable for the banking system as a whole. What lies ahead is very uncertain, however, as the economic downturn may have a stronger impact on the financial system in future than has so far been expected. In a very adverse scenario, there could be a sharp rise in insolvencies in the corporate sector and stress in the real estate and financial markets. This could result in high losses and banks might restrict their lending, thus potentially delaying the economic recovery or amplifying the economic downturn. Given these risks, market participants, policymakers and supervisors should ready themselves for very unfavourable developments so that the financial system can continue to perform its functions, even in such a scenario.

Potentially sharp rise in insolvencies in the corporate sector

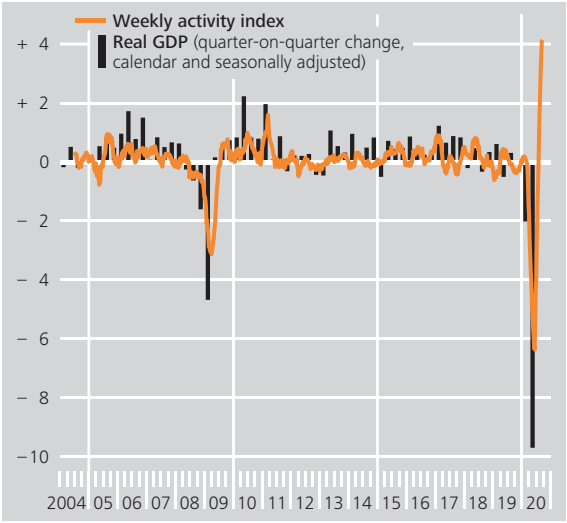
Following a record economic downturn in the wake of the pandemic, the real economy in Germany began to recover around mid-2020. However, the path of recovery is surrounded by a great deal of uncertainty.

Slow recovery in GDP expected

The recovery is clearly reflected in sentiment indicators as well as in an indicator newly developed by the Bundesbank enabling the weekly assessment of economic activity (see Chart 3.1).[1] Following 2020's severe economic downturn, however, macroeconomic forecasts suggest that it is very unlikely that gross domestic product (GDP) will return to the level prior to the outbreak of the coronavirus pandemic before 2022 (see Chart 3.2).

Weekly activity index* and gross domestic product for Germany

Chart 3.1



* The weekly activity index is designed to measure real economic activity in Germany in as timely a manner as possible. It compares activity during a 13-week period with the preceding 13-week period. See also S. Eraslan and T. Götz, Weekly activity index for the German economy, available at https://www.bundesbank.de/en/statistics/economic-activity-and-prices/weekly-activity-index.

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Economic risks remain high. This can be seen, for example, in the unusually strong divergence in GDP forecasts for Germany (see Chart 3.2). Institutional economists have differing expectations regarding the extent to which the slump in GDP will have been recovered by 2021. In addition, surveys of market participants showed a sharp increase in the dispersion of GDP forecasts when the pandemic broke out. In April 2020, for example, the standard deviation of the forecasts for the current and next year was seven to eight times higher than the average of the past ten years.

Economic risks remain high.

Future developments will depend, in particular, on the extent to which the pandemic can be kept under control in Germany, the measures needed to achieve this, how consumers and enterprises adapt their behaviour in this regard, and the medical advances made to combat coronavirus. The fiscal policy stance will also play an important role.

In addition, global developments are of major importance for Germany as an open and export-oriented economy. Should the global economy fail to recover, a swift and sustained economic rebound in Germany is unlikely. If the global recovery is sluggish or if there are more waves of infection with many new cases, Germany's economy would be strongly affected. Furthermore, other developments in the global setting may have a negative impact on the German economy and the

The German economy would be hit hard by a sluggish global recovery.

1 For further information on the weekly activity index, see Deutsche Bundesbank (2020c); Eraslan and Götz (2020).

financial system. For example, the trade dispute between China and the United States could intensify further.[2]

There is also uncertainty about how the coronavirus pandemic will affect the structure of the economy. Households could adjust their consumption behaviour, not just temporarily but also in the long term, owing to gloomy income prospects or concerns about the virus. Their demand for certain goods and services could fall, or they might save more. Enterprises could also make permanent adjustments to their production structures, in order to reduce dependence on global suppliers, say, or to respond to changes in consumers' behaviour. In addition, the pandemic could accelerate structural change in some sectors such as the automotive industry.

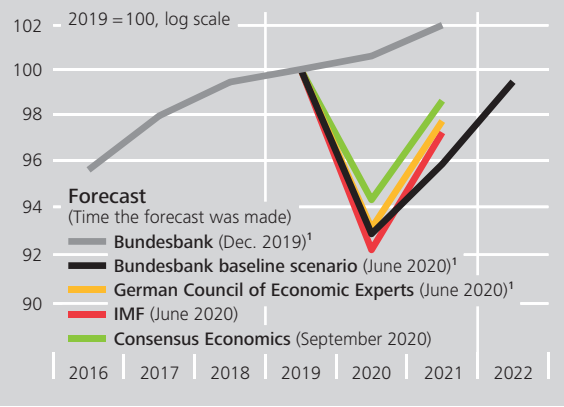
The ability of the financial system to fulfil its functions in the future is an important factor in the continued growth of the economy. If faced with high losses, many banks may respond by simultaneously shrinking their balance sheets and restricting lending in order to continue meeting the capital ratios required by the market or by supervisors. In this scenario, the supply of loans would potentially no longer be adequate for the real economy (see the section entitled "Risk of deleveraging in the banking system" on p. 50 f.). This could delay the economic recovery or exacerbate an economic downturn.

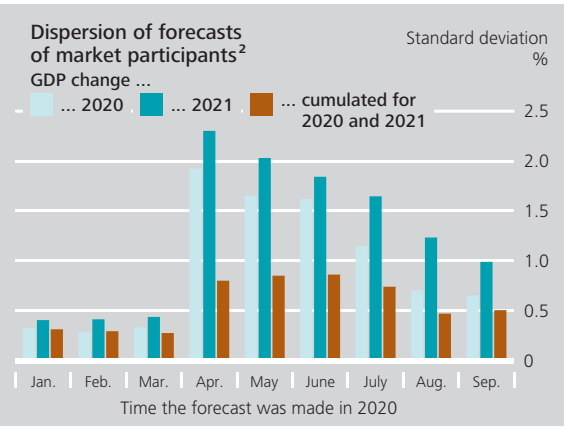
A functioning financial system is vital for economic recovery.

Solvency of many enterprises deteriorating

In light of the downturn, the number of corporate insolvencies is expected to rise in the coming quarters (see Chart 3.3). The suspension of the obligation to file for insolvency under certain conditions is likely to have been a factor behind the low insolvency figures seen so far (see the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.). The current number of insolvencies therefore reflects the economic situation in the corporate sector only to a limited degree. Moreover, historical correlations suggest that insolvencies do not increase until some time after a recession has begun: enterprises can use their liquidity buffers for a certain period of time before they have to file for insolvency.

Forecasts of real gross domestic product for Germany Chart 3.2





Sources: Consensus Economics, International Monetary Fund (IMF), German Council of Economic Experts and Bundesbank calculations. **1** Calendar adjusted. **2** Standard deviations of monthly forecasts of Consensus Economics survey participants.

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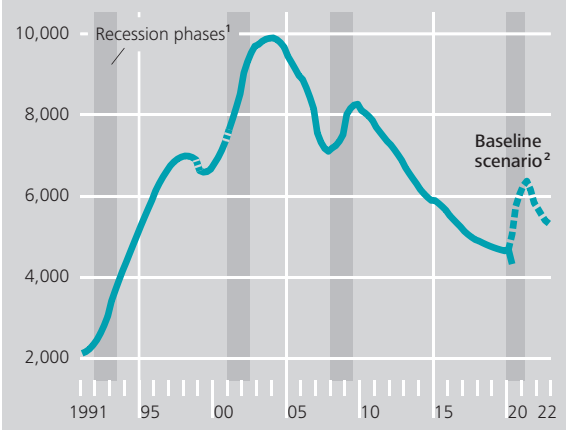
2 See Deutsche Bundesbank (2019a); Deutsche Bundesbank (2020a).

Corporate insolvencies in Germany* Chart 3.3

Number of proceedings filed, quarterly data



Sources: Federal Statistical Office and Bundesbank calculations. * The introduction of a new insolvency law in 1999 and its amendment at the end of 2001 limits statistical comparability with previous years. **1** Until 2017, based on recession dating of the German Council of Economic Experts and thereafter on Bundesbank assumptions. See also German Council of Economic Experts (2017), Annual Report 2017/18. **2** Building on the actual figures from Q1 2020, the scenario begins in Q2 and is based on the Bundesbank's June 2020 forecasts of real economic developments; see Deutsche Bundesbank (2020), Monthly Report, June 2020, pp. 26 ff. The temporary suspension of the obligation to file for insolvency from March 2020 as a result of the coronavirus pandemic has not been taken into account.

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The typical development of insolvencies in the wake of recessions can be simulated using vector autoregressive (VAR) models (see Chart 3.3 and the box entitled "Risk of rising insolvencies as a result of the coronavirus pandemic" on pp. 41 f.). These models enable the development of insolvencies from the second quarter of 2020 onwards to be linked to the forecast of GDP and other macroeconomic variables by the Bundesbank. The simulation suggests that, starting from an exceptionally low figure, the number of corporate insolvencies filed could rise by more than 35% by the first quarter of 2021. Since the early 2000s, the number of insolvency applications has fallen from around 10,000 to roughly 5,000 per quarter at the current end. The simulation points to an increase in insolvency applications to over 6,000 by the first quarter of 2021. The simulated peak roughly matches the figure in 2013. In the manufacturing sector in particular, insolvencies would increase significantly according to this simulation and reach levels similar to those seen during the 2007-08 global financial crisis.[3] Insolvencies in the manufacturing sector have responded more strongly to the business cycle in the past. The model suggests that the percentage of insolvencies will increase less sharply in the services and construction sectors than in the manufacturing sector.

Corporate insolvencies are likely to rise.

However, this simulated rise in insolvencies is subject to major uncertainty for several reasons. First, the future development of economic activity is very uncertain. Second, the simulation is based on past relationships. Given the nature and severity of the coronavirus shock, it is likely that these relationships are valid only to a limited degree in the current situation. Unlike in the past, the services sector has been hit quite hard, for instance. Moreover, the model only captures linear effects and thus does not record self-reinforcing downward spirals, which could occur especially when a shock is particularly large. This could be further exacerbated, for example, by interconnectedness.

The increase in insolvencies is subject to major uncertainty.

The extensive support measures for enterprises have only been partially incorporated into the simulation of insolvencies. Furthermore, any future measures that would be taken in the event of an unexpectedly sharp rise in insolvencies naturally can hardly be taken into account. The simulation captures some of the impact of fiscal policy measures as the estimation period also includes the global financial crisis and thus contains the measures adopted at that time. During the coronavirus pandemic, however, in

3 Back then, the rise in insolvencies was classified as being usual for a recession, although it was not considered to be the main factor behind the damage to potential output at the time. See Deutsche Bundesbank (2009).

some cases exceptional and very specific measures have been taken which do not resemble any measures taken in the estimation period. This is likely to have helped keep actual insolvencies in the second quarter of 2020 significantly lower than in the simulation (see Chart 3.3). Nevertheless, new insolvency applications do not appear in the statistics until several weeks later as they have to be processed by the insolvency courts first.

As soon as the measures come to an end, insolvencies in the corporate sector could rise markedly. From the start of October 2020, bankrupt enterprises, for example, must again file for insolvency; overindebted enterprises, on the other hand, will remain exempt from the obligation to file for insolvency until the end of 2020 (see the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.). In recent years, overindebtedness has been cited as the reason for initiating insolvency proceedings in only a small number of cases. Should this remain the case, the limited extension to the obligation to file would therefore effectively mean that the original obligation to file for insolvency would apply again for many enterprises. This would be an important step towards normality, and insolvencies are expected to rise in the coming quarters.

The impact on the financial system, and on the banking sector in particular, is shaped not so much by the number of insolvencies, but more by the loss allowances and balance sheet losses they entail. There are several reasons why banks' loss allowances and the number of corporate insolvencies can develop differently.

Loss allowances and losses associated with insolvencies are relevant for banks.

First, banks' claims are distributed very differently across activities in the corporate sector (see Chart 3.4). For example, banks hold loans of only €28 billion to the accommodation and food service activities sector in Germany, which has been particularly hard hit by the containment measures. This corresponds to just under 2% of the volume of credit granted by German banks to domestic enterprises. By contrast, they hold credit claims of €476 billion on the housing enterprises and other real estate activities sector, which has been fairly stable thus far. These loans account for a large part of banks' credit claims on domestic enterprises: around 23% of those held by large, systemically important banks and 32% by other banks.

Second, credit events that are less severe than insolvencies may also lead to loss allowances. These should be made, for example, whenever borrowers overdraw credit lines, are in arrears with payments, or have mounting debt.

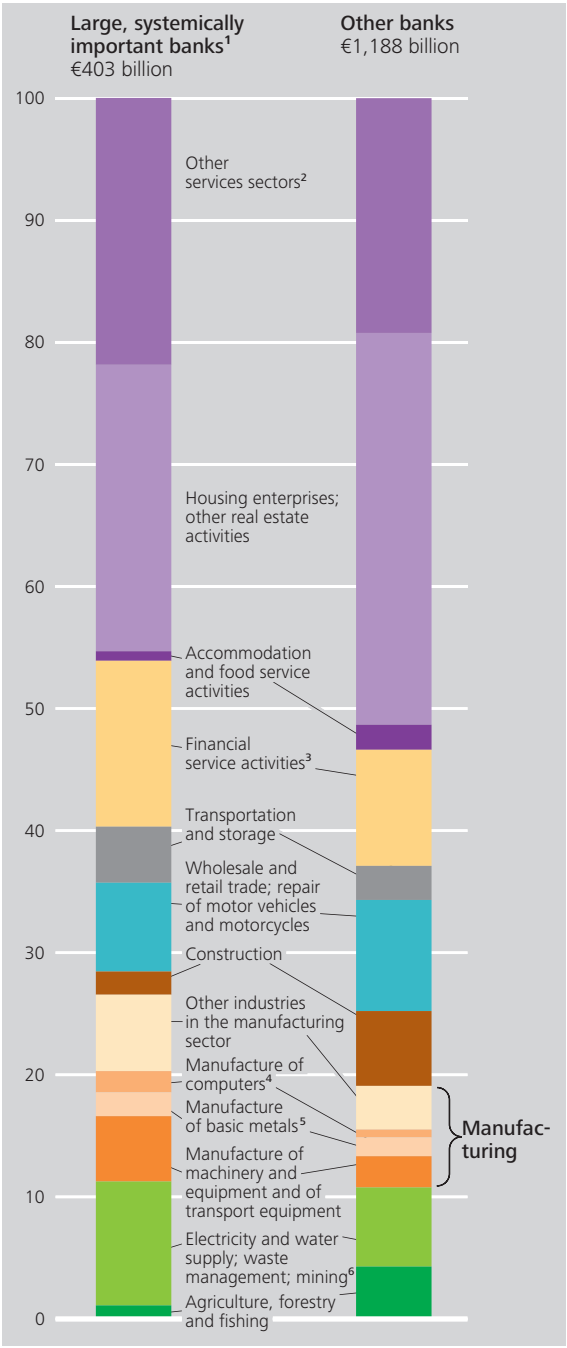
Third, some banks report in accordance with the International Financial Reporting Standards (IFRS). When setting aside loss allowances, these banks take greater account of expectations regarding borrowers' ability to pay and solvency than banks that report in accordance with the German Commercial Code (*Handelsgesetzbuch*).

The aggregate loss allowances on loans to enterprises are simulated using a VAR model, which indicates that loss allowances could rise in the coming quarters from around 0.2% to roughly 0.8% of the lending portfolio (see the section entitled "Loss allowances in credit business could rise significantly" on p. 57). When comparing this increase with that of insolvencies, it should be noted that insolvencies account for just some of the adjustments to loss allowances, as described above.

For the reasons mentioned above, developments in insolvencies and loss allowances may deviate significantly from the baseline scenario of the model described so far. Scenarios could also arise in which significantly more enterprises become insolvent.

Credit claims of German banks on domestic enterprises* by sector Chart 3.4

%, as at Q2 2020



* Excluding loans issued by the KfW Group. Including loans granted to self-employed persons. **1** Comprises the 12 other systemically important institutions (O-SIIs). **2** Including professional services. **3** Excluding monetary financial institutions. **4** Computer equipment including electronic and optical products. **5** Including the manufacture of fabricated metal products. **6** Including quarrying.

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This would result in higher loss allowances for loans, which, in turn, would lead to greater losses for banks. From a financial stability perspective, it is crucial that the financial system can continue to perform its key functions even in these adverse scenarios. This can be examined more closely using scenario analyses (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.).

On the whole, the severe economic downturn in the first half of 2020 suggests that insolvencies will rise. This assessment is highly uncertain, however. On the one hand, the nature and severity of the coronavirus shock are unprecedented, whilst on the other hand, extensive support measures have been taken. Consequently, the patterns of adjustment seen in earlier real economic crises may be irrelevant to the current crisis. Equally, the fallout from the pandemic is shaped not only by economic factors, but also by health policy aspects. The nature and scale of the related restrictions imposed by government influence economic activity. All in all, then, it is unclear to what extent the real economic shock will ultimately spill over to the financial system. In a very unfavourable scenario, there could be significantly more insolvencies than the model simulates and the financial system could suffer considerable losses.

The financial system could suffer considerable losses in a very unfavourable scenario.

Financial markets only reflect economic situation to a limited degree

Market data are an important addition when gauging the development of potential insolvencies and default risk in individual sectors as they supplement the insights gained from simulations based on past experience with market participants' current assess-

Risk of rising insolvencies as a result of the coronavirus pandemic

The coronavirus pandemic and the measures taken to contain it have led to a severe economic downturn. Despite extensive government support measures, corporate insolvencies are likely to increase in the coming quarters, as is usual in economic recessions.[1] This development is relevant because it may result in risks to financial stability.

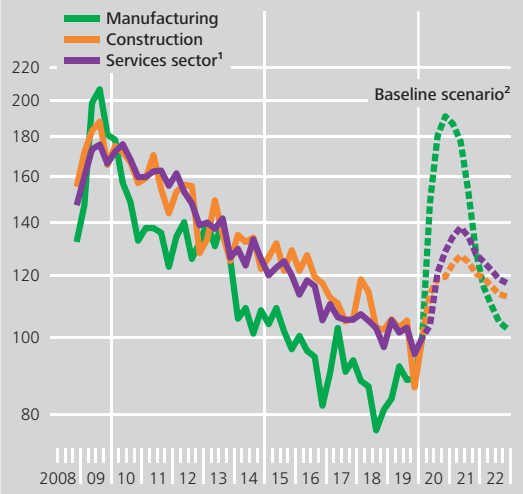
The path of corporate insolvencies over the coming quarters is simulated using Bayesian vector autoregressive models (BVAR models).[2] For the simulation of the baseline scenario, it is assumed that key macroeconomic indicators (real gross domestic product (GDP), the Harmonised Index of Consumer Prices (HICP), the current account balance and the unemployment rate) will move in line with the Bundesbank's June 2020 projections for the period from the second quarter of 2020 up to the end of 2022.[3] In addition, the long-term nominal interest rate and (sectoral) corporate insolvencies are included as variables in the model. According to the Bundesbank's projections, real GDP is forecast to fall by 7.1% in 2020 compared with the previous year and to approach its pre-pandemic level at the end of the forecast horizon in 2022.

At the beginning of June 2020, the coalition committee decided on an economic stimulus package, the expansion of transfer payments to enterprises and tax liquidity assistance. These measures are not included in the projected GDP path, as the forecast was concluded before the measures were announced. Taking these measures into account, the picture would be somewhat more favourable both in terms of GDP and the estimated number of insolvencies. According to a preliminary estimate, the economic stimulus package is likely to have a positive effect on GDP of more than 1% in 2020.[4]

The model simulations suggest that, starting from an exceptionally low figure, the number of applications for corporate insolvency will rise by more than 35% (see Chart 3.3 on p. 38), with developments in corporate insolvencies exhibiting some delay relative to the evolution of GDP. With regard to individual sectors, the simulations indicate that insolvencies will rise significantly,

Corporate insolvencies in selected sectors

Q1 2020 = 100, number of insolvency proceedings



Sources: Federal Statistical Office and Bundesbank calculations. **1** Excluding financial and finance-related services. **2** The scenario is based on the Bundesbank's June 2020 forecasts of real economic developments; see Deutsche Bundesbank (2020), Monthly Report, June 2020, pp. 26 ff. The temporary suspension of the obligation to file for insolvency from March 2020 as a result of the coronavirus pandemic has not been taken into account.

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1 See ifo Institute (2020).
2 For the a priori information used, see Bańbura, Giannone and Reichlin (2010).
3 See Deutsche Bundesbank (2020d).
4 See Deutsche Bundesbank (2020d).

particularly in manufacturing, and reach levels similar to those seen in the wake of the global financial crisis of 2007-08 (see the chart on p. 41). The simulated increase in the construction and services sector is smaller.

In the simulation, the number of corporate insolvencies rises from around 4,700 in the first quarter of 2020 to a peak of around 6,250 in the first quarter of 2021, which is similar to the number of insolvencies observed in 2013. The number of corporate insolvencies swells most in the services sector. In a more severe scenario than the one assumed in the baseline simulation, a considerably larger number of enterprises might become insolvent. Such an adverse scenario could be the result of further waves of infection or a failure to find effective medical treatment for the pandemic.

The simulation does not account for the fact that the obligation to file for insolvency has been suspended since March 2020 if certain conditions are met. Accordingly, the actual increase in insolvency applications is likely to be smaller at present. The figure observed for the second quarter of 2020 is indeed significantly lower than the one simulated with the model (see Chart 3.3 on p. 38).

ments. For example, they provide differentiated information on default risk at the sector level.[4]

In the financial markets, risk premia for corporate bonds in August 2020 were still up on the figure recorded at the end of December 2019 (see Chart 3.5). For many sectors, however, they are now below their long-term average again. In relation to enterprises' leverage, the risk premia seem very low. The decline in risk premia in the bond markets since the start of April 2020 also appears to be at odds with enterprises' weaker fundamentals. This could reflect market participants' expectations that policymakers will continue to significantly dampen the negative impact of the coronavirus pandemic in the future. Market participants may be taking insufficient account of the fact that the support measures have a time limit. The assumption that the recovery in the real economy that began around mid-2020 will continue into the future at the same pace may also be too optimistic (see the section entitled "Solvency of many enterprises deteriorating" on pp. 37 ff. and the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.).

Risk premia lower despite weaker corporate fundamentals.

Nevertheless, it is evident that market participants are differentiating between sectors and assessing default risk differently. The dispersion of default risk, as reflected in risk premia, is currently markedly higher than before the coronavirus pandemic. Market participants, for example, consider default risk

4 The risk premium can be used to measure how market participants assess liquidity risk and, above all, credit risk. The risk premium is the difference between the return on a fixed income security and on a safe asset with the same maturity. It provides information on the probability of default by issuers; see Chan-Lau (2006).

to be significantly heightened for enterprises in the automotive and leisure sectors, which also include enterprises in the tourism and event sectors. Securities in the services and real estate sectors also exhibit relatively high risk premia.

Since mid-March 2020, securities prices have recovered very rapidly after central banks and governments had announced extensive monetary policy and fiscal policy measures. This, too, contrasts with the fact that many enterprises' fundamentals have deteriorated during the coronavirus pandemic and the risk of insolvency has risen (see the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.): relative to firms' leverage, liquidity and profit expectations, valuations of their shares are high by historical standards. The price/earnings ratio for many sectors was very elevated at the end of June 2020. However, it is not just the enterprises that are more likely to emerge stronger from the crisis, such as those in the technology sector, that are highly valued. Securities issued by enterprises in sectors that were hit hard by the coronavirus shock also have relatively high valuations. The price/earnings ratios for some sectors of the STOXX Europe 600 index are close to their peaks. This is attributable not only to higher prices but also to lower profits made by enterprises in these sectors.

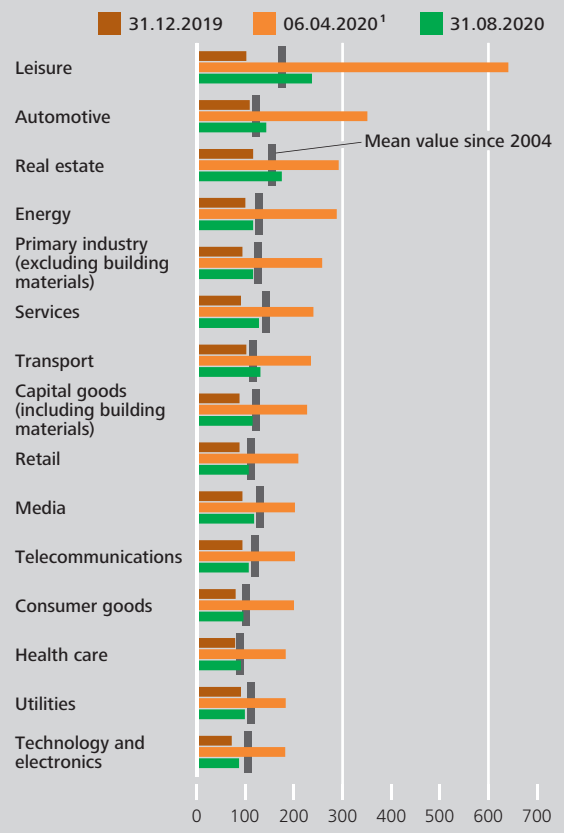
Price developments in the financial markets since mid-March 2020 therefore chiefly reflect the hoped-for impact of the measures and a subsequent normalisation of the economic situation. However, high valuations render the financial system more vulnerable to future periods of financial market stress. In the second quarter of 2020, financial markets reacted strongly to new information about infection rates and vaccines. This underlines the high degree of uncertainty among investors and the sensitivity of the markets to the future development of the pandemic. Gloomier expectations among market participants regarding the progression of the pandemic and economic growth could therefore mean that market prices quickly lose value and funding costs mount for enterprises. Unlike during the period of stress in March 2020, both market and credit risk could then emerge simultaneously in the financial system.

High valuations render the financial system more vulnerable to future periods of stress.

Risk premia on corporate bonds by sector*

Chart 3.5

Basis points



Sources: ICE Data Indices and Refinitiv. * Risk premia on investment-grade euro-denominated bonds issued by non-financial corporations compared with Federal bonds. **1** Date of peak in average risk premia in 2020 across all sectors listed.

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Rating downgrades could weigh on the financial system

If solvency among firms deteriorates markedly over the next few quarters, rating agencies are likely to downgrade a large number of enterprises. If many enterprises are affected, this could amplify stress in the financial system. Assessments by the major rating agencies indicate that enterprises' credit risk has risen.[5] Since the outbreak of the coronavirus pandemic, ratings have already been downgraded or the rating outlook set to negative for a great many enterprises.[6] A Bundesbank analysis suggests that the default rates of enterprises start to rise around six months after extensive rating downgrades.[7]

At the same time, the financial system has become more vulnerable to extensive rating downgrades.[8]

Funding terms of some enterprises could become tighter.

Between the end of February and the end of August 2020, rating agencies assigned a negative outlook to a nominal €177 billion worth of bonds issued by German non-financial corporations.[9] This corresponds to around one-third of the total nominal volume of outstanding bonds issued by German non-financial corporations that have a rating. Rating downgrades usually push up the cost of capital market financing for the enterprises concerned. The terms and conditions of credit lines with banks could also deteriorate in the event of a downgrade. Funding terms could therefore become even tighter in the near future, especially for enterprises that are currently under pressure.

Downgrades from the investment-grade to the high-yield segment, in particular, could trigger a significant rise in enterprises' funding costs. For one thing, risk levels are greater in the high-yield segment; for another, the investor base in this segment is significantly smaller than in the investment-grade segment. Extensive downgrades could therefore result in the high-yield segment being flooded, especially during periods of stress. Bonds from the BBB segment are particularly likely to be downgraded to the high-yield segment, thus becoming unattractive as an investment opportunity for many investors.[10] Bond funds, for instance, may even be obligated by their investment guidelines to sell bonds that have been downgraded from the investment-grade to the high-yield segment. This is true for passive bond funds and exchange-traded funds (ETFs), for example, which track investment-grade indices.[11]

Between 2006 and the end of June 2020, the share of bonds of German non-financial corporations belonging to the BBB segment practically doubled to 61%. The extensive rating downgrades that took place in the first half of 2020 also played a role in this. If economic developments take another turn for the worse, more bonds issued by non-financial corporations could be downgraded. In a scenario that assumes ratings are downgraded to a similar extent as during the global financial crisis, the outstanding volume in the European high-yield segment would expand by around 30%.[12] The volume in the German

5 Between March and June 2020, default rates for particularly risky enterprises in the high-yield segment had already increased, climbing from 2.7% to 3.5% in Europe and from 3.8% to 6.1% in the United States. In August 2020, the rating agency Standard & Poor's expected these rates to rise further, to 8.5% in Europe and 12.5% in the United States, by June 2021.
6 According to information provided by the rating agency Standard & Poor's, around 12% of Germany's non-financial corporations in the investment-grade segment were downgraded in March 2020 (of around 470 enterprises).
7 Correlations between rating changes and default rates over time were calculated using monthly rating downgrades and default rates provided by the rating agency Standard & Poor's between January 2000 and May 2020.
8 See Bank of England (2020); European Central Bank (2020c); International Monetary Fund (2020a).
9 Calculations are based on Bloomberg data.
10 The BBB segment comprises bonds with a rating of BBB(+), BBB or BBB(-).
11 Funds which are limited to the investment-grade segment based on their investment mandates or which use investment-grade indices as their benchmark may also be forced to sell.
12 The calculation assumed that just under 5% of BBB(+) bonds, 12.5% of BBB bonds and 50% of BBB(-) bonds are downgraded to the high-yield segment; see European Central Bank (2020c).

high-yield segment, which has been small until now, would even double.[13]

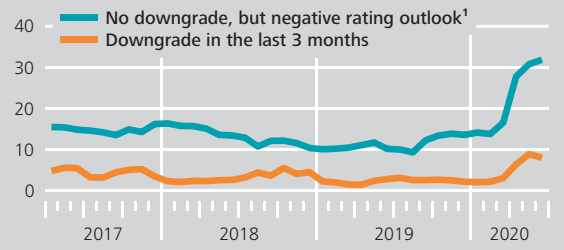
A large number of rating downgrades within a short space of time could also put pressure on financial intermediaries if they hold the affected securities and these lose value, or if the capital requirements for the securities increase owing to the worse rating. Banks and insurers are not the only ones affected – rating downgrades and the resulting portfolio losses have repercussions for the fund sector, too. If fund returns decrease, fund investors might abruptly redeem their shares (flow-performance relationship). In June 2020, rating downgrades had a much stronger impact on the bond portfolios of German banks, investment funds and insurers than before. Bonds that were downgraded between April and June 2020 accounted for 8% of the total bond holdings of German banks, funds and insurers (see Chart 3.6). This figure, largely driven by downgrades in banks' portfolios, clearly exceeds the multi-year average of 3%. At the same time, the share of bonds with a negative rating outlook in the portfolios of German financial intermediaries climbed sharply, too.[14] In June 2020, it stood at 32% – well above the average of the past four years, which came to 14%. Furthermore, German financial intermediaries have a significant exposure to BBB-rated bonds. There is likely to be particularly strong pressure to sell these bonds if they are downgraded. At the end of June 2020, their share in banks' total bond portfolio stood at 7.7%. Insurers' holdings of such bonds came to 13.1% (18.5% including investments through funds), while investment funds held the highest share of BBB-rated bonds in their portfolio, at 26.8%.

A large number of rating downgrades within a short space of time could put pressure on financial intermediaries.

In the past, German banks, funds and insurers have usually sold a portion of their securities after the latter were downgraded. Altogether, banks sold 3.5% of the affected securities within a period of two quarters after a rating downgrade.[15] Insurers made somewhat greater cutbacks to their holdings of the affected securities, by just over 7%, within two quarters of the downgrade. Where securities were downgraded from investment grade to high yield, this share doubled to just under 14%. Investment funds had a similarly strong reaction. Within the space of two quarters, they reduced their holdings of the affected securities by 9% (14% in the case of downgrades to the high-yield segment). In the past, then, all groups of financial intermediaries have shown a tendency to act procyclically – but to a limited extent and not abruptly. However, only downgrades in normal market phases are considered here. If, by contrast, a large number of downgrades were to take place quickly and amidst heightened financial

Rating downgrades in the bond portfolio of German banks, investment funds and insurers Chart 3.6

Portfolio shares as a percentage



Sources: BaFin, Investment Fund Statistics, Securities Holdings Statistics, Centralised Securities Database and Bundesbank calculations. **1** If there is no rating outlook for a specific bond, the issuer's rating outlook is used.

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13 This would mean a volume of around €40 billion of bonds issued by non-financial corporations would be downgraded from the BBB segment to the high-yield segment. These statements are based on information provided by ICE and Bloomberg for the data vintage Q2 2020.

14 For many bonds held by banks, investment funds and insurers, there is no rating outlook, especially for bonds with short maturities. In these cases, the issuer's rating outlook is used.

15 This analysis looks at intermediaries' securities portfolios as of April 2017 because rating information for the securities held by financial intermediaries is available from this date onward.

market stress, all financial intermediaries could face significantly more pressure to sell.

Additional solvency problems among German enterprises in the coming quarters could prompt further rating downgrades. Signs of this are already becoming apparent as many securities have a negative rating outlook. If securities are downgraded, investors are often likely to respond by selling the securities in question. This is especially true for bonds that are downgraded to the high-yield segment. Ultimately, this would increase the funding costs of the enterprises concerned.

Investors could respond to downgrades by selling securities.

Real estate market risks

Although the real estate market has remained stable so far, it is not clear at present what impact the coronavirus pandemic will have. Past experience has shown that it takes some time for real economic developments to filter through to the residential real estate markets.[16] An increase in unemployment and the number of household insolvencies could result in rising defaults on housing loans, while a rise in corporate insolvencies and a change in demand for office space might impact negatively on the commercial real estate market.

Residential real estate market stable so far

So far, the coronavirus pandemic has had no serious repercussions for the residential real estate market. Although supply and demand dipped briefly at the start of the pandemic, partly owing to uncertainty about future developments and contact restrictions, the housing market remained on its longstanding upward trajectory in the first half of the year. In the second quarter of 2020, prices for owner-occupied housing across Germany rose by 6.9% on the year[17] and the stock of housing loans in German banks' portfolios expanded at an annual growth rate of around 6%. Moreover, defaults on mortgage loans have not increased so far.

So far, the pandemic has had no serious repercussions for the residential real estate market.

The stable housing market situation to date has probably been helped by the fact that, although unemployment rose markedly up until August 2020, it still remains comparatively low. It is significantly lower than it was during the global financial crisis (see Chart 3.7). Strong take-up of short-time working arrangements is likely to have prevented a sharper increase, with implementation rates in the wake of the coronavirus pandemic exceeding those observed during the global financial crisis many times over. In addition, it was mainly the manufacturing sector that made use of short-time work during the global financial crisis, whereas a much larger number of sectors are affected by the coronavirus pandemic.[18]

It is not yet clear what impact the coronavirus pandemic will have on the residential real estate market. On the one hand, German households' high resilience and relatively low debt levels make it less likely that default rates on residential real estate loans will rise sharply in the future. Moreover, credit standards for newly originated housing loans in Germany have not been eased by much over the last

Credit standards for housing loans have not been eased by much over the last few years.

16 See Kajuth (2020).
17 According to data from the Association of German Pfandbrief Banks (*Verband deutscher Pfandbriefbanken* – vdp).
18 See Gehrke and Weber (2020).

few years.[19] Compared with loans to enterprises, residential real estate loans also tend to be backed by easily recoverable assets. What is more, property owners tend to have higher incomes, meaning they are better placed to cut back on consumption in order to pay off their debt. Additionally, higher-income households have largely been spared from rising unemployment thus far during the coronavirus pandemic.

On the other hand, if the economic downturn persists and unemployment increases markedly, default rates on housing loans could go up and the boom in the housing market could come to an end. It is also unclear how a regional shift in demand would affect prices and risk if more time spent working from home means that people are willing to live further away from their place of work.

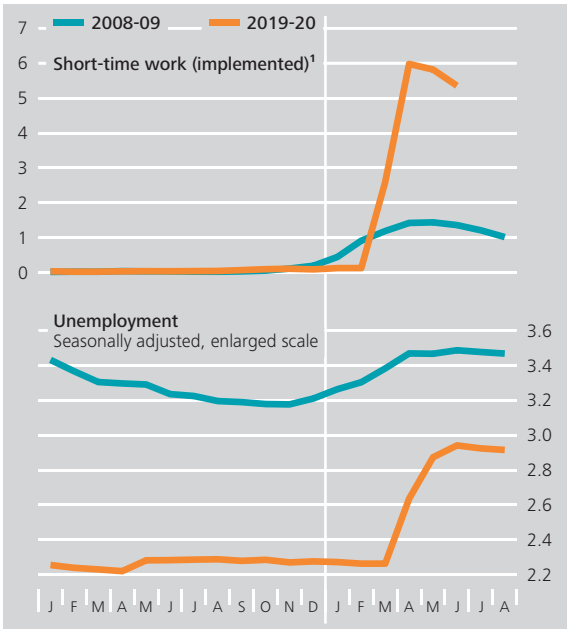
A risk to financial stability could arise if, in a very unfavourable scenario, defaults on real estate loans went hand in hand with a sharp drop in property prices. This risk would be all the greater if high loss allowances on corporate loans were to be made at the same time (see the section entitled "Mounting credit risk could weigh on banks' capital ratios" on pp. 59 f.).

Even if the real estate market boom persists, risks to financial stability will probably continue to grow. For instance, rising prices and a weak labour market mean a greater risk of the recovery value of collateral being overestimated. If prices subsequently collapse and borrowers default on loans, banks could sell the properties posted as collateral, but the proceeds may prove insufficient to offset the losses from the loan defaults.[20]

If the real estate market boom persists, risks to financial stability will probably grow.

Labour market in Germany Chart 3.7

Millions of people



Source: Federal Employment Agency. **1** Cyclical short-time working; data for 2020 are extrapolated.
Deutsche Bundesbank

Coronavirus pandemic could have negative impact on commercial real estate market

When the coronavirus pandemic broke out, Germany's commercial real estate market was in a boom phase that had lasted many years. Credit volumes, prices and rents had risen well into 2019. Office buildings, in particular, recorded strong price growth last year. Prices for retail properties, on the other hand, were significantly more subdued for the second year running. In Germany's 120 urban centres, prices even dipped slightly in 2019.[21]

It is still too early to draw any solid conclusions about how the commercial real estate market has devel-

19 See Deutsche Bundesbank (2017); Deutsche Bundesbank (2019a).
20 See Deutsche Bundesbank (2019a).
21 Bundesbank calculations based on data provided by bulwiengesa AG for 120 German towns and cities, excluding the 7 largest cities.

oped since the outbreak of the coronavirus pandemic. So far, data from the Association of German Pfandbrief Banks on price developments for German real estate in the second quarter of 2020 indicate that office property prices have risen less sharply and retail property prices have fallen slightly. In addition, significantly fewer transactions took place in the commercial real estate market in the second quarter than in the quarter before. However, transaction volumes are currently volatile.

The coronavirus pandemic is likely to have a negative impact on the German commercial real estate market. This chiefly applies to segments which are closely linked to corporate sectors that have been hit particularly hard by the pandemic. Past experience has also shown that commercial property prices, especially for office buildings, follow the economic cycle. In addition, structural demand for real estate could change if, for example, enterprises permanently extend their remote working arrangements and online shopping gains further momentum. The coronavirus pandemic is therefore likely to dampen price developments in the commercial real estate market at the very least.

Commercial real estate prices have tracked the economic cycle in the past.

Market participants' expectations seem to be pointing in a similar direction. For instance, the stock prices of real estate enterprises specialising in residential property have now recovered their losses in the wake of the broad-based support measures. By contrast, the gloomier and uncertain business outlook is weighing on the share prices of enterprises operating in the commercial real estate sector.

Based on the available data, it is not currently possible to reliably gauge how serious the risk of default is for German banks' commercial real estate loans to domestic and foreign customers. However, distortions in the commercial real estate market could affect large parts of the financial system because the volume of credit to sectors that rent out or build commercial real estate has risen significantly over the last few years. This credit volume has seen a smaller growth rate during the coronavirus pandemic. Although this rate fell from 10% to 6.4% in the second quarter of 2020 compared to the same quarter of the previous year, it was still high. The growth rate is lower than before for credit to both domestic and foreign borrowers. Domestic borrowers accounted for around 72% of commercial real estate loans in the second quarter of 2020.

Growth in commercial real estate loans has fallen during the pandemic.

Potential tensions in the credit market

The financial system is considerably more resilient today than it was before the global financial crisis, due in no small part to the extensive reforms – especially higher capital requirements for banks. Adequate capitalisation improves banks' ability to lend and cushion unexpected losses.

However, in light of the potential losses, it is not possible to rule out a procyclical response by the financial system in the next few quarters. Large losses could put banks under pressure even if they previously met all the supervisory requirements. There would then be a risk of banks reducing their lending and shrinking their balance sheets in order to stabilise their capital ratios. In a very adverse scenario, this kind of deleveraging in the banking system could lead to such great tensions in the credit market that even creditworthy enterprises and households would no longer be adequately supplied with credit (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.).

Financial system more resilient than before the global financial crisis

The financial system has become more resilient than it was before the global financial crisis in many ways: banks have structurally higher levels of capital, supervision has been improved, and authorities can deal with banks in distress in a more targeted manner. The competent authorities have more tools for the recovery and resolution of banks. In addition, banks have more equity and liabilities which they can use to cover losses – especially in the event of a crisis.[22] Moreover, the reforms in the wake of the global financial crisis have helped to ensure that derivatives transactions are settled via central counterparties (CCPs) and that financial intermediaries outside the banking sector are better monitored.[23]

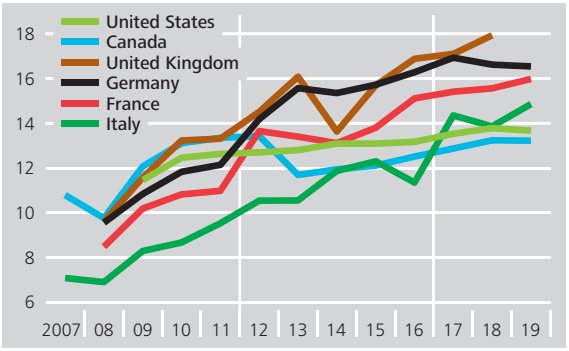
Banks have more capital than before the global financial crisis.

Banks' tier 1 capital ratios increased significantly after the global financial crisis (see Chart 3.8). German banks, too, have built up capital, mainly because the regulatory requirements have been raised. In addition to higher microprudential minimum capital requirements, the reforms in the wake of the global financial crisis included the creation of microprudential and macroprudential capital buffers. Banks can use these to absorb losses in stress situations. Unlike the minimum capital requirements, banks are allowed to temporarily undershoot these buffer requirements during periods of stress. However, the distribution of profits, such as dividends or bonus payments, is limited as long as the capital buffers are in use. These buffers must then be built up again over the medium to long term. In addition to these supervisory buffers, banks hold voluntary surplus capital, i.e. more capital than stipulated in supervisory terms by the minimum capital and capital buffer requirements together. Overall, the banks' ability to absorb losses is thus significantly higher than at the outbreak of the global financial crisis. In this respect, the banking system is better able to lend, even during periods of stress. Moreover, banks' liquidity levels have improved.

Banks can use supervisory capital buffers to absorb losses in periods of stress.

International comparison of banks' tier 1 capital ratios*

Chart 3.8



Source: IMF. * Tier 1 capital in relation to risk-weighted assets.
Deutsche Bundesbank

Financial sector surveillance in Europe has been enhanced by the establishment of the European System of Financial Supervision (ESFS). This includes the European Systemic Risk Board (ESRB), amongst others, which was established as a macroprudential supervisory authority at the European level. It was later supplemented by national bodies – in Germany, this is the German Financial Stability Committee. Another crucial element is the European banking union, which primarily consists of the Single Supervisory Mechanism (SSM) and the Single Resolution Board (SRB). A recent evaluation of all G20 countries by the Financial Stabili-

European financial sector surveillance has been enhanced by new institutions.

22 See Financial Stability Board (2020).
23 See Financial Stability Board (2019).

ty Board (FSB) shows that significant improvements have been made since the global financial crisis and that authorities have better tools for dealing with banks in distress.

Risk of deleveraging in the banking system

If corporate insolvencies and loss allowances increase over the next few quarters as they did in the past, the associated losses for the banking system would probably still be well manageable overall at present (see the chapter entitled "Impact of the coronavirus pandemic on the banking system" on pp. 53 ff.). Nevertheless, simulations which are based on typical relationships in the past are fraught with major uncertainty. For one thing, it is very difficult to say how future economic developments will turn out, especially since the progression of the pandemic is highly uncertain. For another, it is unclear whether the historical relationships are still valid in the current situation, either qualitatively or quantitatively. This is because the economic downturn precipitated by the coronavirus shock was historically severe and different from past recessions. On top of this, the extensive support measures taken are also extraordinary.

The banking system as a whole can probably cope well with the expected losses.

A scenario in which the real economic fallout is significantly greater than expected might present further challenges for the financial sector. The pandemic has already damaged the real economy, and the long-term consequences and risks of this for the financial system are hard to gauge. Added to this is the uncertainty with regard to possible second-round effects as well as feedback effects between the real economy and the financial system.

A yet more unfavourable scenario could see several developments come together. Not only could the number of corporate insolvencies be significantly greater than is currently expected, but there could also be a slump in asset prices. Besides real estate prices, asset prices in the financial markets might subside heavily, since they are markedly higher in some instances than the fundamentals seem to justify. In such a scenario, the banking sector would suffer heavy losses, with some institutions possibly becoming distressed. There would then be an increased risk of many banks simultaneously shrinking their balance sheets in order to maintain the capital ratios required by the market or by supervisors. In a very adverse scenario, this deleveraging process could lead to such high tensions in the credit market that ultimately even creditworthy enterprises and households would no longer receive an adequate supply of credit. The greater use banks make of their capital buffers, the less severe this effect would be (see the section entitled "Use of capital buffers can stabilise lending" on pp. 60 ff.). Restricting lending could delay the economic recovery.

In a very adverse scenario, the risk of banks restricting their lending would rise.

Given these risks, market participants, policymakers and supervisors should prepare early on for very unfavourable developments and identify related bottlenecks so that the financial system itself can perform its functions and lending can be maintained even in such circumstances.

Sufficient capacities and experience in handling insolvencies – both at banks and public authorities – will be crucial for future economic growth. Insolvency proceedings ultimately have the aim of coordinating the different interests of creditors and debtors of distressed enterprises. Precisely because insolvencies were at an all-time low in Germany over the past decade, capacities in the private and public sectors might not be sufficient to deal with rising

numbers of insolvencies. Accordingly, preparations for such an eventuality are needed.

Banks should use their capital buffers to continue lending on an adequate scale. Temporarily forgoing a distribution of profits, as recommended by supervisors, also has precisely this aim – maintaining the functional viability of the banking sector. This is happening not least in view of the continuing uncertainties about the fallout from the economic downturn in the financial system.

Banks should use their capital buffers to continue lending on an adequate scale.

Policymakers face the challenge of striking the right balance: on the one hand, their aim is to support the economy with fiscal policy measures and to limit the damage caused by the pandemic; on the other, any structural change that needs to happen should not be delayed unnecessarily. In the short term, support measures can help to prevent insolvencies and a sharp rise in unemployment. However, they risk keeping afloat companies that no longer have a sustainable business model, thus potentially distorting the market structure. They can also create "free-rider" effects. Above and beyond that, possible cliff effects should be taken into consideration. These effects threaten to emerge, for example, when temporary measures – such as the suspension of the obligation to file for insolvency, or government-guaranteed loans – expire and this was not sufficiently anticipated, resulting in sharp adjustments in the real economy or the financial system.

With the passing of time, there will be less uncertainty about how the pandemic will evolve; the outlines of the future economic structures will gradually become discernible. In this phase, it will be a matter of facilitating economic structural change and organising the transition as efficiently as possible in order to minimise welfare losses. This will require close coordination across all policy areas, not least so as to be able to respond appropriately to new developments. There should be targeted use of fiscal policy instruments to support enterprises, and their effects should be evaluated. This can include moving away from the current quite extensive liquidity measures in the corporate sector and more towards – hitherto far more cautiously applied – equity assistance. The scope of macroprudential policy is likely to be slender, by contrast. It acts in a preventive manner, through building up additional capital buffers which can be released in times of crisis, for example. However, macroprudential policy can help to make the joint response of all policy areas more effective.[24]

24 See, inter alia, Nier and Olafsson (2020).

Impact of the coronavirus pandemic on the banking system

Following the outbreak of the coronavirus pandemic, central banks and governments took extensive measures to stabilise financial markets and the real economy. Monetary policy measures helped to reduce banks' funding costs, and banks also benefited indirectly from fiscal policy measures that supported the corporate sector. This prevented an increase in credit risk and credit defaults. Numerous supervisory measures were also taken to create scope for bank lending.

The impact of further real economic developments on the banking system and the supply of credit will depend, not least, on how banks react to higher credit losses and loss allowances – and whether they make use of their voluntary surplus capital and the supervisory capital buffers. Banks should use their capital buffers in order to continue lending in adequate amounts. Temporarily forgoing a distribution of profits, as recommended by supervisors, has precisely this aim – maintaining the functional viability of the banking system.

If corporate insolvencies develop along similar lines to those observed in previous recessions, the resulting losses appear to be manageable for the banking system at the current juncture. However, such simulations are fraught with great uncertainty, as it is unclear whether the typical relationships of the past continue to apply and how the pandemic and the real economy will develop in future.

In a very adverse scenario, a very steep rise in insolvencies in the corporate sector could coincide with heightened stress in real estate and financial markets. This would result in significantly more credit defaults and greater losses in the banking system than in a baseline scenario. At the same time, many banks could try to shrink their balance sheets in order to reduce the decline in their capital ratios. Existing capital buffers could go unused. In addition, some banks could run into financial distress. There could be such strong tensions in the credit market that enterprises and households that are, in fact, creditworthy would no longer be adequately supplied with credit. This could dampen the recovery in the economy or intensify an economic slump.

Initial effects of the coronavirus shock on the banking system

In March and April 2020, credit institutions faced not only an abrupt spike in private sector demand for liquidity, but also a sharp decline in the value of their financial assets as a result of financial market stress. This had a negative impact on banks' capital and increased their liquidity needs, for example from derivatives contracts. Compounding this situation, it became difficult to assess the business prospects and creditworthiness of entire sectors. There was a risk that the supply of funding to enterprises and households would not suffice (see the section entitled "The coronavirus shock" on pp. 14 ff.).

The coronavirus shock posed a threat to the funding of enterprises and households.

However, unlike the global financial crisis of 2007-08, there was no crisis of confidence in the banking system. Thanks to the monetary policy measures, there was no lasting threat to institutions' financing in the second quarter of 2020. These measures helped to reduce banks' liquidity risk and funding costs (see the section entitled "Supervisory measures and scope for lending" on pp. 63 ff.). Risk premia for credit defaults, which investors demand for financing banks, rose only moderately. In addition, the extensive fiscal policy measures buoyed the corporate sector, thereby avoiding a spike in credit losses and credit risks and reducing the previously very high level of uncertainty.

Real economy safely supplied with liquidity despite higher demand

Immediately after the onset of the coronavirus pandemic, many enterprises no longer had sufficient revenues to cover their operating costs, as their sales plummeted. This forced them to dip into their liquidity reserves. At the beginning of March 2020, these would likely scarcely have been enough to cover more than two months' costs in most cases, with the median ratio of enterprises' liquid assets to annual fixed costs including interest expenditures standing at only 19.6% in 2018. For the manufacturing sector, the ratio was far lower, at 11.2%. Some fiscal policy measures, such as emergency aid and short-time working benefits, therefore directly and significantly reduced firms' liquidity needs.

The increased liquidity needs were partly met by enterprises taking up more loans (see Chart 2.13 on p. 32). They additionally drew on existing credit lines in March 2020 (see Chart 4.1). In response to the increased need for liquidity, banks expanded their credit lines, but have become more reluctant to lend of late. In the Eurosystem's Bank Lending Survey (BLS), the participating banks reported that they had tightened their lending conditions in the second quarter of 2020. This is consistent with the results of a survey conducted by the ifo Institute in which enterprises reported higher obstacles to getting credit in the second quarter.[1] This also echoes the results of a survey of industry associations conducted by the Bundesbank (see the box entitled "Financing conditions for enterprises in the coronavirus pandemic: results of a survey of industry associations" on pp. 22 f.).

In response to the increased need for liquidity, banks expanded their credit lines.

The increased take-up of funds did not jeopardise banks' funding thanks, not least, to the extensive monetary policy measures that were taken. Currency markets, by contrast, ran into significant turbulence, and US dollar funding costs increased markedly for a time (see Chart 4.2). German systemically important

1 See Sauer and Wohlrabe (2020).

institutions, in particular, hold comparatively high US dollar exposures, some funded in euro, leaving them vulnerable to disruptions in currency markets. To enhance the provision of US dollar liquidity, the Eurosystem, as part of a coordinated action with other central banks, offered 12-week tenders in addition to the existing one-week US dollar tenders and reduced the interest rate by 25 basis points. German banks made extensive use of these operations, and US dollar funding costs have since returned to normal.

Monetary policy measures helped to safeguard bank funding.

Liquidity shortages occurred at times in connection with derivatives transactions. Banks typically conduct derivatives transactions to protect themselves against fluctuations in market prices. Most derivatives contracts are standardised these days and cleared through central counterparties (CCPs). To reduce the default risk of contracts, CCPs generally require participants to provide collateral (initial margins) and offset changes in the value of the contracts on a daily basis (variation margins). In times of crisis, however, variation margins can exacerbate liquidity bottlenecks because they have a procyclical effect. Both initial margins and daily variation margins increased significantly at the onset of the coronavirus pandemic, forcing the banks concerned to provide additional collateral. Even after market tensions eased, initial margins remained high for a time, only declining again after peaking at the end of March.

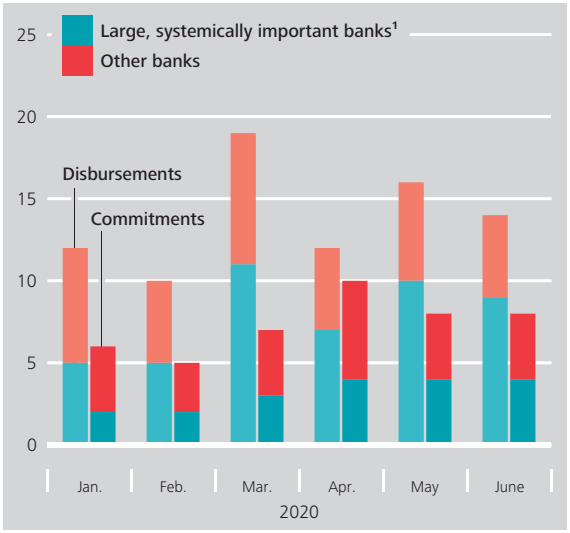
Banks suffer heavy market losses initially

The value of banks' financial assets initially fell sharply in the first quarter of 2020. As most German banks, especially savings banks and credit cooperatives, report in accordance with Germany's Commercial Code (*Handelsgesetzbuch* – HGB), the (less strict) lower of cost or market principle meant that

Credit lines* disbursed and newly committed by German banks to domestic non-financial corporations**

Chart 4.1

€ billion



Sources: AnaCredit and Bundesbank calculations. * Including credit lines from overdrafts and credit cards. ** Excluding sole proprietorships and households. 1 Comprises the 12 other systemically important institutions (O-SIIs).

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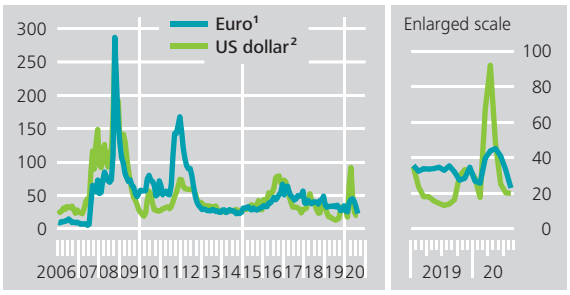
Funding premia in the interbank market

Chart 4.2

Basis points, monthly averages



Sources: Bloomberg and Bundesbank calculations. 1 Difference between six-month EURIBOR and the yield on Federal bonds with a residual maturity of six months. 2 Difference between six-month LIBOR and the yield on US Treasuries with a residual maturity of six months.

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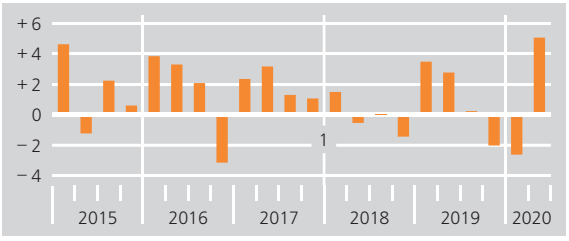
Gains or losses at large, systemically important German banks* resulting from changes in market prices Chart 4.3

€ billion



* Comprises the 12 other systemically important institutions (O-SIIs). Shown here are gains and losses on securities and derivatives recognised in profit or loss as well as remeasurement gains or losses thereon taken directly to equity through other comprehensive income (OCI). **1** Transition to IFRS 9 accounting standard.

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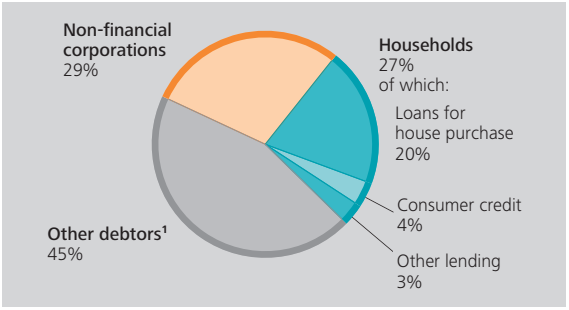
Worldwide credit claims of German banks broken down by debtor* Chart 4.4

As at Q2 2020



* Sample of 293 banks that account for roughly 87% of the aggregated total assets of the German banking system. **1** Credit institutions, other financial corporations, central banks and general government.

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the losses primarily reduced hidden reserves or increased hidden losses.[2] This is why only €5.9 billion of the €18 billion in losses in value at these banks was recorded in profit and loss. This was equivalent to 3% of their common equity tier 1 (CET1) capital. Financial markets recovered in the second quarter, with savings banks and credit cooperatives posting valuation gains of €4 billion.

By contrast, for larger banks, in particular, which report predominantly according to the International Financial Reporting Standards (IFRS), fair value changes generally impact more heavily on equity.[3] Changes in value affect not only securities held for trading, but also other securities that may be sold again before they mature. Some of the larger banks managed to avoid heavier losses or even make profits in trading, thanks in part to derivatives transactions. Losses resulting from changes in market prices totalled €2.6 billion for the large, systemically important banks in the first quarter of 2020 (see Chart 4.3). This equated to 1.5% of the tier 1 capital of these banks. The losses were thus lower than those of savings banks and credit cooperatives. In the second quarter, the large, systemically important banks posted remeasurement gains of €5.1 billion, which more than made up for the losses sustained in the first quarter.

Derivatives transactions helped larger banks to avoid heavier losses.

Credit risk in the banking system

While liquidity and market risks were the main risks to emerge at the onset of the coronavirus pandemic, credit risk has gained greater prominence of late. Overall, credit claims account for around 70% of the German banking sector's aggregated total assets.

2 Hidden reserves exist if securities are recognised at less than their market price. These securities need to be recognised at their lower market price if that market price is lower than their carrying amount (lower of cost or market principle). While limited, scope also exists for write-downs to be made and reserves to be recognised for risk provisioning purposes (Section 340f HGB contingency reserves). Unlike reserves held for reasons other than contingency purposes, income and expenses arising from the formation and release of such hidden reserves may be netted against certain other income and expense components and reported as a net amount in the valuation result in the profit and loss account, see Deutsche Bundesbank (2012).

3 IFRS 9 requires fair value changes resulting from price fluctuations in trading portfolios, most equity instruments and derivatives to be taken to profit and loss. For some debt and equity instruments, by contrast, fair value changes are directly netted against equity in other comprehensive income (OCI), depending on the holding purpose of the respective portfolio. In addition, IFRS 9 permits measurement at amortised cost for other portfolios of debt instruments, subject to certain conditions.

Of these claims, 55% are loans to enterprises and households (see Chart 4.4), rising to as much as 70% in the case of small and medium-sized banks. Payment defaults and loss allowances will probably have risen the most in sectors that were hardest hit by the economic downturn. The extensive support measures averted a looming liquidity crunch in the corporate sector in March and April 2020, thereby also shielding the banking system from mounting credit defaults. Nevertheless, in light of the economic slump, it is likely that more enterprises will fail to meet their interest and redemption payments in future and that credit losses will become more frequent as a result.

More corporate loans likely to default in future.

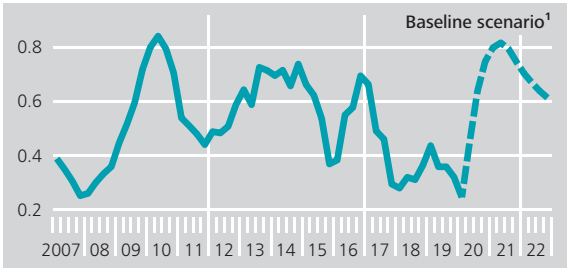
Loss allowances in credit business could rise significantly

If a borrower is past due on a payment, banks usually recognise a specific loss allowance. Loss allowances have an impact on equity via the profit and loss account (P&L).[4] The first half of 2020 did not see loss allowances rise significantly, despite the economic downturn, though they are likely to increase in the coming quarters, especially for loans to enterprises, and possibly also for loans to households as a result of rising unemployment. Enterprises usually only experience payment difficulties in larger numbers some time after an economic downturn. The support measures taken are probably another reason why payment difficulties at enterprises will not materialise until the next few quarters.

A procedure similar to the model used to estimate insolvencies (see the box entitled "Risk of rising insolvencies as a result of the coronavirus pandemic" on pp. 41 f.) was deployed to simulate the future development of loss allowances on banks' loans to enterprises. Under the assumptions of the model, which draw on past experience, loss allowances are likely to rise sharply in the coming quarters, peaking in the second quarter of 2021 (see Chart 4.5). This would put them roughly on a par with the levels seen during the global financial crisis. However, the model does not fully take into account the impact of the support measures for the corporate sector (see the section entitled "Solvency of many enterprises deteriorating" on pp. 37 ff.), partly because little is known about the effectiveness of these measures. In particular, the extent to which they merely delay recognition of impairment losses remains to be seen. Note here that impairment losses are not only recognised when a loan defaults. Impairment losses are often already recognised on loans when a past-due event or default appears probable. The IFRS accounting standards go so far as to require loss allowances to be recognised for the average expected credit loss (ECL) over a given horizon, even for loans to borrowers with good credit ratings. The riskier the loan, the higher the loss allowances have to be.

Loss allowances* on German banks' loans to domestic non-financial corporations Chart 4.5

% p.a.



***** Sum of newly recognised loss allowances (excluding collective loss allowances) in the past 12 months as a percentage of outstanding loans. **1** Scenario based on Bundesbank projections of developments in the real economy from June 2020; see Deutsche Bundesbank (2020), Monthly Report, June 2020, pp. 26 ff.

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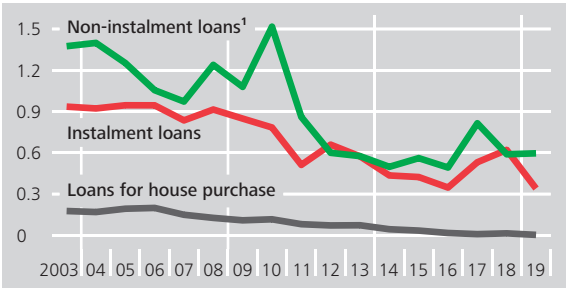
4 For an overview, see Deutsche Bundesbank (2018).

Loss allowances* on German banks' loans to households Chart 4.6

% p.a.



* Sum of newly recognised loss allowances (excluding collective loss allowances) in the past four quarters as a percentage of outstanding loans. **1** For example, lump-sum repayment loans, drawdowns of existing credit lines or non-agreed overdrafts on current accounts.

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Defaults on loans to households unchanged

Fiscal policy measures are propping up not only the corporate sector but also households. Substantial drops in income have so far been averted, not least by short-time working benefits. Although gross domestic product (GDP) fell by 9.7% on the quarter in the second quarter of 2020, households' disposable income decreased by only 0.8% in the same period. The income of lower-skilled, lower-income workers tended to decline more sharply. This was presumably due in part to the fact that they were required to work short-time hours or lost their jobs in greater numbers.[5] This interpretation is backed up by the results of a Bundesbank online panel survey, which found that more lower-income households than higher-income households expect to struggle to cover their expenses. Lower-income households also see a greater likelihood of losing their job within the next 12 months.

Households' income has thus far decreased only marginally.

Overall, the drop in income was significantly smaller than during the global financial crisis, when households' disposable income fell by more than 2% for a time.[6] Loss allowances on loans to households have remained broadly stable of late. The fact that households in Germany have comparatively moderate debt levels and have financial reserves to tap into is also likely to have played a role here. Some households also took up the option of taking a payment holiday. Responding to ad hoc surveys, savings banks, cooperative banks and significant institutions each reported that, up until June 2020, there were moratoria on less than 5% of their outstanding loans to households.

The majority of loans to households are residential real estate loans. This type of loan is generally secured by property, which the bank can sell in the event of a credit default (see the section entitled "Residential real estate market stable so far" on pp. 46 f.). In addition, real estate loans have tended to be granted to higher-income households.[7] These have so far been less affected by the crisis in the real economy. However, if the economic downturn drives up unemployment, credit defaults will presumably increase across all income categories.

Rising unemployment probably means more defaults on real estate loans.

By contrast, consumer credit is often granted to lower-income households and is less well collateralised. That is why these loans might currently be more at risk of default than residential real estate loans, all the more so given that the right to take instalment and rent payment holidays expired at the end of June. In addition, loss given default (LGD) and loss allowance ratios are higher for consumer credit, i.e. instalment and non-instalment loans, than for residential real estate loans (see Chart 4.6). That said, with a share of 4%, consumer credit accounts for a

5 See Adams-Prassl, Boneva, Golin and Rauh (2020); Grabka and Göbler (2020); Organisation for Economic Co-operation and Development (2020).
6 Relative to the annual change for the third quarter of 2009.
7 See Deutsche Bundesbank (2019b).

Scenario analysis assumptions for the solvency of German banks Table 4.1

Scenario	Risks considered	Loss allowance ratio for loans to non-financial corporations	RWA[1] effect for credit risk at IRB banks[2]
Baseline scenario	Credit risk - Loans to non-financial corporations	Increase of around 140% on the year assumed by year-end 2020 (see Chart 4.5)	As per assumed loss allowance ratios
Severe stress scenario	Credit risk - Loans to non-financial corporations	Per sector, maximum loss allowance ratio since 2003	As per assumed loss allowance ratios
Comprehensive stress scenario	Credit risk - Loans to non-financial corporations - Residential real estate loans Market risk	Per sector, maximum loss allowance ratio since 2003	Risk density[3] increases according to extreme values in the bank's history

1 Risk-weighted assets (RWAs). **2** Internal ratings-based (IRB) approach. Risk weights in the credit risk standardised approach remain unchanged. **3** Ratio of RWAs to the respective gross exposures.

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very small part of German banks' total exposure (see Chart 4.4 on p. 56).

Mounting credit risk could weigh on banks' capital ratios

The expected uptick in loss allowances, especially on loans to enterprises, could reduce banks' capital ratios. Risk-weighted assets (RWAs) could increase due to mounting credit risk, also putting pressure on the ratios.

This primarily affects systemically important institutions that set their risk weights using their own risk measurement models under the internal ratings-based (IRB) approach. Risk weights set using these models are intended to reflect a particular borrower's credit risk better than those computed by the alternative standardised approach. These risk weights are far more sensitive to risk than those derived from the standardised approach and, for example, increase more rapidly in the event of an economic downturn.

Scenario analyses are one way of estimating the potential impact of rising loss allowances and supervisory minimum capital requirements on banks' capital ratios. In the following, three scenarios with varying degrees of stress are considered (see Table 4.1).

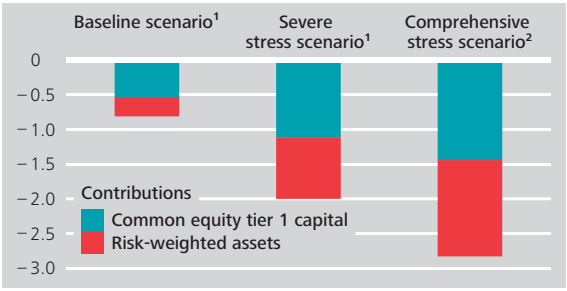
The baseline scenario maps out how loss allowance ratios in banks' credit portfolio are expected to develop going forward. This path is based on models and the Bundesbank's June 2020 macroeconomic projections (see Chart 4.5). The calculations are based on patterns observed in the past and are fraught with major uncertainty. For instance, it may be the case that loss allowances only increase with a time lag, as, inter alia, the analysis was unable to fully capture the support measures for the corporate sector. In addition, the baseline scenario and the severe stress scenario assume the absence of additional stress such as materialising market risk or defaults on real estate loans.

The assumptions simulate a substantial upturn in loss allowances in 2020 compared with 2019 (see Table 4.1), with around half of the impairment losses arising at the large, systemically important banks. At the same time, capital requirements increase significantly due to rising RWAs, diminishing the CET1 capital ratio of the German banking system by 0.8 percentage point in this scenario (see Chart 4.7). As some banks

Common equity tier 1 capital ratio of German banks in various scenarios*

Chart 4.7

Change in percentage points



* Common equity tier 1 capital in relation to risk-weighted assets. For the scenario assumptions, see Table 4.1. **1** Change in Q4 2020 compared with Q4 2019 simulated in the stress test. **2** Changes in the next one to two years compared with Q1 2020.

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have abundant surplus capital, the banking system is well placed to absorb the decline, just as it probably would be in a situation where loss allowance ratios rose far more steeply than in the baseline scenario. The severe stress scenario assumes that sector-specific loss allowance ratios for loans to enterprises climb to their highest levels since 2003. The CET1 capital ratio would then fall by 2 percentage points and a small number of banks would experience financial distress.

The banking system is well placed to absorb losses in the baseline scenario.

In a comprehensive stress scenario, it is also assumed that market risk materialises and that real estate prices drop by 30%. In this scenario, the banking system is likely to come under noticeable pressure as, besides the loss allowance ratios for loans to enterprises, losses increase in areas such as the real estate finance business as well. RWAs would then rise by around 11%. In this scenario, the aggregate capital ratio would fall by 2.8 percentage points. Although some banks might face financial distress in this highly adverse scenario, the overall impact on the functional viability of the banking system would remain limited.

A highly adverse scenario would have only a limited effect on the banking system's functional viability, …

Use of capital buffers can stabilise lending

However, this highly adverse scenario could potentially see banks significantly cut back on lending and thus slow the economic recovery or exacerbate an economic slump, with the capital ratios set by supervisors or demanded by market participants potentially acting as a straitjacket for the banks. One possible outcome of deleveraging is that creditworthy enterprises and households might no longer be adequately supplied with credit.

… but it could see banks cut back on lending.

How much lending would be curtailed depends largely on the extent to which the surplus capital and supervisory capital buffers in the banking system are used.[8] The capital buffers augment the minimum capital requirements, but unlike the minimum requirements, banks can temporarily fall below the relevant thresholds for capital buffers in periods of stress such as the current one. This means, for example, that the banks would be able to meet brisker customer demand for new loans at short notice, even if they are having to absorb losses at the same time. Buffer utilisation means that banks intentionally fall below the thresholds for capital buffers in the event of losses and do not attempt to stabilise their capital ratios by reducing their RWAs. Using capital buffers can thus stabilise lending.

However, banks might decide not to make full, or any, use of their buffers for lending if, for instance,

8 For an overview of capital buffers, see https://www.bundesbank.de/en/tasks/banking-supervision/individual-aspects/macroprudential-measures/macroprudential-measures-622910

they are unable to reliably assess future credit risk on account of substantial uncertainty. Banks might also opt not to use their buffers if they are concerned about being stigmatised in financial markets. A decline in a bank's capital ratio could be interpreted by market participants as a sign that it is experiencing financial difficulties compared with its competitors. It would then be a rational choice on the part of the individual bank to not use its buffers, even though it would make sense to do so from the perspective of the overall banking system. Clear communication from supervisory authorities combined with supervisory relief can help reduce these potential effects (see the section entitled "Supervisory measures and scope for lending" on pp. 63 ff.).

Banks might opt not to make use of their buffers for fear of a negative market response.

The scenario analysis presented above can be used to estimate how use of the capital buffers might affect lending capacity in the comprehensive stress scenario. In the analysis for the German banking system, banks can react to losses in one of two ways: they could either allow their CET1 capital ratio to fall at least in part, or they could scale back their RWAs by curtailing their supply of credit to the corporate sector.

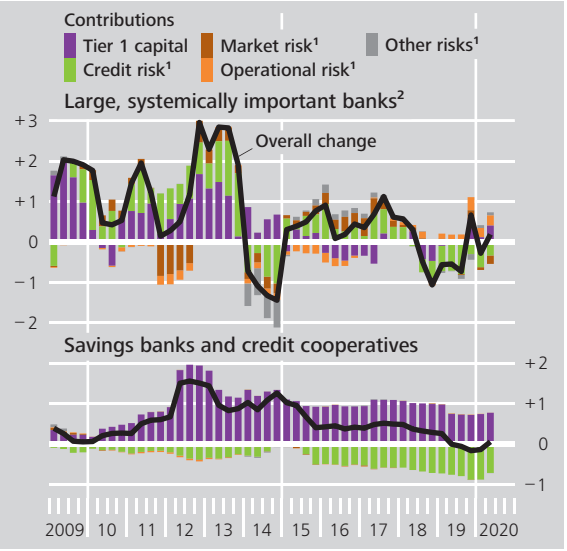
The analysis shows how important it is to use capital buffers in the banking system so as to prevent a sharp decline in lending. If the buffers were not used and it were assumed that lending could not shift between banks, the supply of credit would be reduced significantly in a hypothetical extreme scenario. In reality, though, banks will probably cover all their losses not only by scaling back their RWAs but also by reducing their voluntary surplus capital. If banks made use of their capital buffers on top of this, loans to non-financial corporations would fall by just under 5% in terms of outstanding loans. In addition, some banks would still have sufficient capital reserves – including capital buffers – and would even be able to expand their lending. Enterprises that have credit relationships with several banks would then be able to switch from weaker to better capitalised banks. Factoring this substitution effect into the analysis, the supply of credit to the non-financial corporate sector would shrink by only just under 1% if buffers were used, and by just shy of 8% if they were left unused. Note also that this analysis disregards fiscal policy measures that have a stabilising effect on the real economy.

Using buffers is vital to prevent a sharp decline in lending.

The decrease in lending in the banking system would be less likely and less severe, then, if banks made use of existing capital buffers to issue new loans. Buffers can perform their function and stabilise lending – just as intended by microprudential and macropru-

Decomposition of changes in the tier 1 capital ratio* of selected categories of bank in Germany Chart 4.8

Year-on-year change in percentage points



***** Tier 1 capital as a percentage of risk-weighted assets (RWAs). **1** Change in RWAs. **2** Comprises the 12 other systemically important institutions (O-SIIs).

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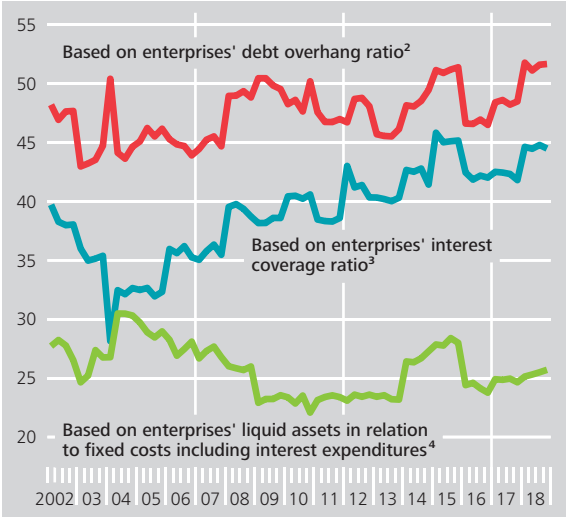
Allocation risk in the domestic loan portfolio of German banks Chart 4.9

Credit claims on relatively risky non-financial corporations[1] as a percentage of total credit claims



1 Enterprises whose risk measure is in the worst 30th percentile. **2** Ratio of total debt to EBITDA (earnings before interest, taxation, depreciation and amortisation). **3** Ratio of EBITDA to interest expenditures. **4** Balance sheet item "Cash and bank balances" in relation to the sum of "Staff costs", "Other expenses" and "Interest expenditures".

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dential supervisors – but only if they are actually put to use during periods of stress to issue new loans or roll over maturing facilities (see the section entitled "Supervisory measures and scope for lending" on pp. 63 ff.).

Well capitalised, but vulnerabilities persist

The prospects for the economy are currently fraught with uncertainty, which is why banks are probably finding it difficult to estimate future losses. As described above, the scale of these losses will determine the path ahead for the credit market. Another factor to consider here are the vulnerabilities that built up within the banking system during the prolonged period of economic expansion prior to the outbreak of the coronavirus pandemic. For example, there was growing evidence that credit risk was being underestimated.[9] These vulnerabilities could now increasingly come into play.

Amid major uncertainty, banks are probably finding it difficult to estimate future losses.

The potential underestimation of credit risk is one such vulnerability that prompted the German Financial Stability Committee to recommend activating the countercyclical capital buffer in May 2019. Several indicators were suggesting that credit risk was being underestimated. One was the ongoing decline in banks' risk provisioning, not least in response to the steady fall in corporate insolvency rates.[10] Another was the drop in risk weights used by large banks, in particular, to calculate their RWAs. This had played a major role in raising banks' risk-weighted capital ratios (see Chart 4.8). However, ratios were already trending lower again before the economic slump triggered by the coronavirus pandemic. For small and medium-sized banks, this is presumably due to the fact that credit growth was relatively strong. In the case of larger banks, adjustments to their risk assessments and increasing risk weights are likely to have played a major role. Another factor was that banks restructured their credit portfolio and stepped up lending to enterprises with comparatively low credit ratings. The economic downturn is likely to prompt an increase in risk provisioning and risk weights. Since these had been relatively low up until the outbreak of the coronavirus pandemic, the increase could be comparatively swift and strong.

The number of corporate insolvencies tends to rise for some time following a recession, with a sector's weaker enterprises being particularly hard hit. This could cause the allocation risk that has been mounting on German banks' balance sheets in recent years to materialise at enterprises with above-average lev-

9 See Deutsche Bundesbank (2019a).
10 See Deutsche Bundesbank (2018).

els of indebtedness.[11] At 57.5%, the debt of domestic non-financial corporations relative to GDP is moderate, especially by global and European standards. This also means that they are less at risk of becoming overindebted, should they need to borrow more in the wake of the coronavirus pandemic. However, loans have been increasingly granted to relatively risky enterprises in recent years (see Chart 4.9). This has shifted the distribution of loans to enterprises in banks' portfolio towards relatively risky loans. More than half of banks' credit portfolio now comprises loans to enterprises whose debt overhang ratio is higher than that of 70% of all enterprises. By contrast, the share of loans granted to relatively safe enterprises is only 15.6%.[12] Relatively safe enterprises are the 30% of enterprises with the lowest debt overhang ratio in banks' credit portfolios.[13] As more indebted enterprises tend to be more at risk of no longer being able to service their loans in an economic downturn, this asymmetry in banks' credit portfolio could give rise to higher loss allowances in the future.

Allocation risk might materialise.

However, the more indebted enterprises are not currently particularly affected by drops in sales (see the chapter entitled "Macroeconomic environment and effects of the coronavirus pandemic to date" on pp. 13 ff.), nor did banks step up their lending to enterprises that appear particularly vulnerable to drops in sales given their low liquidity.[14]

Supervisory measures and scope for lending

Thus far, German banks have largely been spared major losses in the wake of the pandemic, not least because monetary and fiscal policymakers took action. Measures by supervisors are helping cushion the effects of the pandemic and increase the scope for lending to the real economy (see Chart 4.10). They are temporary and will apply for the duration of the period of stress triggered by the coronavirus pandemic.

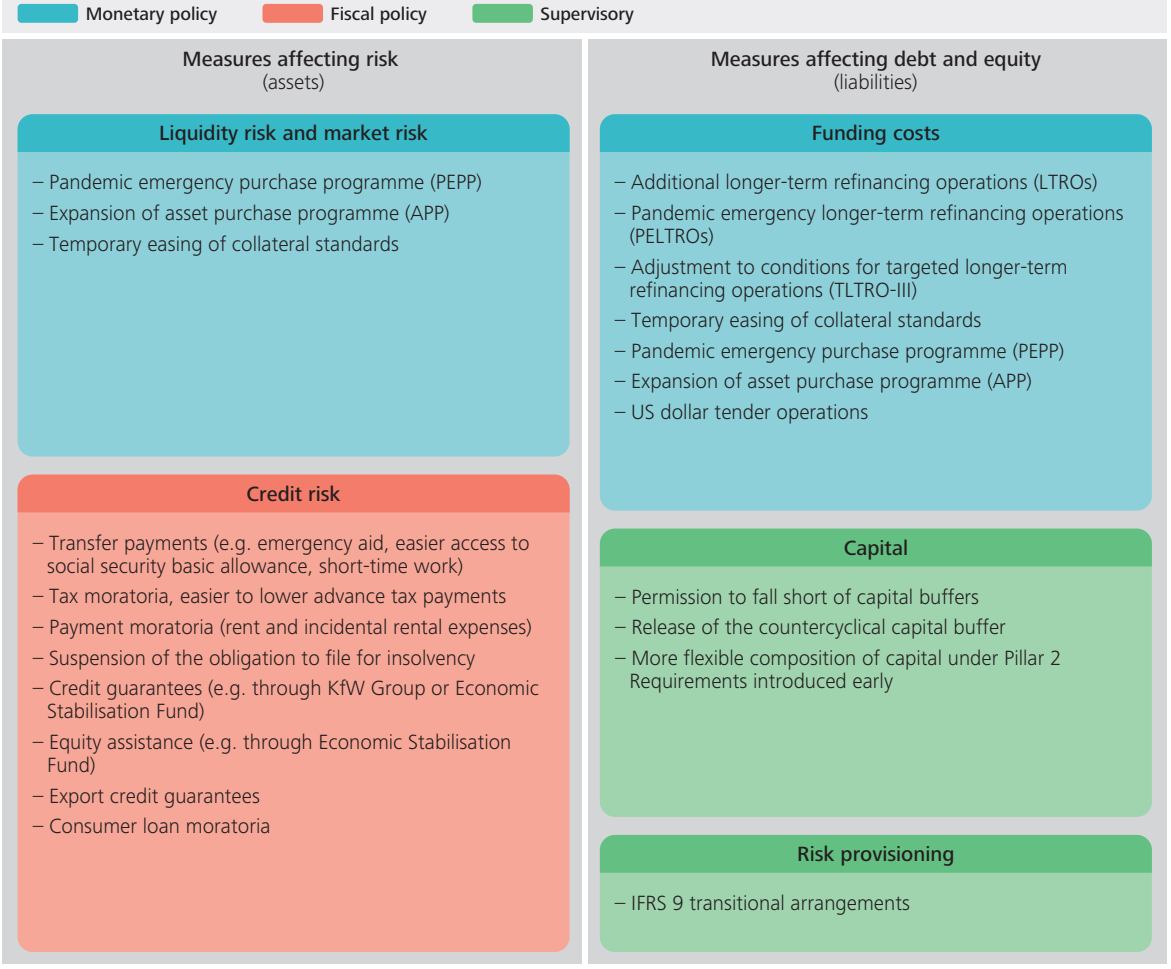
One important supervisory measure aims to ensure that banks use their capital buffers to continue supplying credit during periods of stress. Banks have supervisory capital buffers that they normally have to maintain over and above their minimum capital requirements. However, unlike the minimum capital requirements, banks are allowed to temporarily fall below the relevant thresholds for supervisory capital buffers in periods of stress. If they do so, though, the appropriation of profits, such as distributions of dividends or bonus payments, is limited until the capital buffers have been replenished. In addition, other supervisory measures are in place to ensure that capital buffers are restored in the foreseeable future. To that end, banks are required to draw up capital conservation plans.

In March 2020, the European Central Bank (ECB) and the Federal Financial Supervisory Authority (BaFin) announced that banks would be allowed to use two supervisory buffers in full with no obligation to rapidly replenish them: the capital conservation buffer and the Pillar 2 Guidance.[15] The capital conservation

11 See Deutsche Bundesbank (2019a). The assessment of allocation risk is based on data up to end-2018, as more recent data are not available.
12 If all enterprises with a debt overhang ratio above the median value are classified as relatively riskier, the share of loans to relatively riskier enterprises increases to 72%.
13 Outstanding loans to enterprises whose interest coverage ratio is below that of 70% of all enterprises in banks' credit portfolio account for a share of 44.5%. By contrast, the share of loans granted to relatively safe enterprises is only 9.4%. In this context, relatively safe enterprises are the 30% of enterprises with the highest interest coverage ratio in banks' credit portfolios.
14 Loans to enterprises whose liquidity is weaker than that of 70% of enterprises in banks' credit portfolio account for around 26% of loans to enterprises.
15 See Federal Financial Supervisory Authority (2020); European Central Bank (2020d).

Measures affecting the banking sector during the coronavirus pandemic

Chart 4.10



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buffer is intended to improve banks' general loss-absorbing capacity and amounts to 2.5% of a bank's RWAs. The Pillar 2 Guidance, meanwhile, is determined on a bank-by-bank basis as part of the Supervisory Review and Evaluation Process (SREP). It is designed to cover risks which are underestimated or not covered by the minimum capital requirements.

Supervisors communicated that buffers should be used.

Another supervisory buffer is the countercyclical capital buffer (CCyB), whose purpose is to strengthen resilience during an economic upswing, thereby supporting lending in periods of stress. Besides its positive impact on banks' total loss-absorbing capacity, the CCyB can also have a dampening effect on excessive credit growth and thus have a preventive function. Unlike other supervisory buffers, the CCyB can be lowered by the national designated authority in periods of stress in order to stabilise lending. Thus, the CCyB was reduced to 0% in Germany from March 2020 and in many other countries (see the box entitled "The countercyclical capital buffer in Germany: first increase and reduction" on p. 65).

The countercyclical capital buffer in Germany: first increase and reduction

The domestic countercyclical capital buffer (CCyB) was introduced in Germany in 2016. It was activated by the Federal Financial Supervisory Authority (BaFin), as the national designated authority, for the first time on 1 July 2019 and increased to 0.25%.[1] Banks were given 12 months to build up this buffer.[2]

With this increase, BaFin implemented a recommendation of the German Financial Stability Committee of May 2019. This recommendation was based on an assessment by the German Financial Stability Committee that the long spell of favourable economic activity and low interest rates had given rise to cyclical systemic risks in the German financial system. The underlying vulnerabilities comprised, first, a potential underestimation of credit risk; second, an overestimation of the recoverability of the collateral used in real estate financing as a result of many years of rising real estate prices; and third, interest rate risk.[3] The German Financial Stability Committee concluded that the CCyB should be activated in order to strengthen resilience to these risks.[4]

The Committee's recommendation is based on analyses prepared by the Bundesbank, which form the basis for the Committee's discussions on the risk situation.[5] The Bundesbank's analyses indicated that the banking system should build up more capital in what was then a good macroeconomic setting in order to be more resilient to an unexpected economic downturn. Based on the recommendation, BaFin decided to increase the CCyB rate in Germany.

The banks would have completed the process of building up the CCyB by 1 July 2020. In the light of the coronavirus pandemic, BaFin declared its intention on 18 March 2020 to lower the German CCyB rate to 0% with effect from 1 April 2020.[6] The German Financial Stability Committee welcomed this decision.[7] Discontinuing the build-up of the buffer created scope for maintaining the supply of credit. This helped the banking sector continue to provide the loans needed by the real economy.[8]

In many other countries, too, the CCyB was released or its further build-up was discontinued. The announced buffer rates or buffers that had already been built up ranged from 0.25% (e.g. in Germany) to 2.5% (e.g. in Sweden).

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1 See Federal Financial Supervisory Authority (2019).
2 As the build-up of the CCyB to the level of 0.25% was discontinued with effect from 1 April 2020, the buffer ultimately did not need to be met by the banks.
3 See Deutsche Bundesbank (2018).
4 See Deutsche Bundesbank (2019a).
5 For a detailed discussion of the risks, see German Financial Stability Committee (2019).
6 The three indicators used for the release of the buffer in accordance with the methodological framework for the German CCyB (financial stress indicator, EURIBOR-OIS spread, average CDS spread for German banks) signalled a significant increase in financial market stress during the period of the CCyB reduction. The indicators were therefore consistent with an immediate release of the buffer. For more information on the calculation of the CCyB in Germany, see Tente, Stein, Silbermann and Deckers (2015).
7 See https://www.bundesbank.de/en/tasks/topics/statement-on-the-countercyclical-capital-buffer-by-the-german-financial-stability-committee-828822
8 If the CCyB had been fully built up to 0.25%, releasing it in a stress scenario would have been able to increase the lending capacity of the German banking system by around €50 billion. This corresponds to around 1.7% of the loans granted by banks and money market funds to the private non-financial sector.

Overall, the measures taken by supervisors give banks considerable scope to maintain the supply of credit even if heavy losses stemming from credit defaults and loss allowances materialise. So far, however, banks have not had to resort to using their supervisory buffers, as credit defaults have not yet increased significantly and some banks have substantial holdings of voluntary surplus capital.

So far, banks have not had to use their buffers.

However, the effect of supervisory relief could be diminished by banks distributing profits. While such a distribution strategy might seem rational for an individual bank looking to send positive signals to market participants, behaviour of this kind can be detrimental to the banking system as a whole. This is why the ECB recommended that banks refrain from distributing profits or buying back shares.[16] Although this recommendation is not legally binding, it is likely to have an impact, being a communication from banking supervisors.

The supervisory measures provide only temporary relief. In the medium term, banks will have to replenish the capital buffers they have used so as to ensure their long-term stability and resilience.

Vulnerabilities that were already building up in the German financial system prior to the outbreak of the coronavirus pandemic could now come into play. One such vulnerability is that risks might be systematically underestimated because many market participants were simultaneously "gazing into the rear-view mirror", potentially being too optimistic in expecting positive past developments to continue and failing to sufficiently factor negative developments into their risk assessments. The upshot is a potential underestimation of future credit risk and an overestimation of the recoverability of loan collateral.[17] Credit risk could increase if the number of corporate insolvencies rises. Such an increase in risk should be reflected on banks' balance sheets in an appropriate and transparent manner.

If the number of insolvencies increases, credit risk could rise.

However, there is a risk of banks taking a blanket approach to applying certain accounting rules in the current situation, which would cause loss allowances to surge. This is why the European Banking Authority (EBA) informed banks of its assessment that the accounting requirements set forth in IFRS 9 should not result in the generalised and automatic classification of exposures in default, forborne or unlikeliness to pay. This would entail higher loss allowances in each case.[18] In addition, supervisors recommended that banks give greater weight to macroeconomic forecasts that are stable over the long term and based on past experience when making loss allowances and assessing a possible downgrade of credit claims.

Banks should ready themselves appropriately for increased risk

As a general rule, supervisory measures can only help cushion the blow of real economic adjustments and risks. These measures cannot hold up necessary structural adjustments in the real economy, which are reflected on banks' balance sheets. It is crucial for the functioning of the banking system, then, that banks can separate the

Banks should only supply loans to enterprises with a sustainable business model.

16 See European Central Bank (2020a, 2020b).
17 See Deutsche Bundesbank (2019a).
18 The IFRS 9 accounting standard for impairment, which has been in force since 2018, defines three stages for the accounting treatment of exposures: performing (stage 1: all instruments upon origination or purchase), underperforming (stage 2: instruments with a significant increase in credit risk) and non-performing (stage 3: credit-impaired). For instruments in stage 1, the new loss allowances are based on ECLs within the next 12 months; for instruments in stages 2 and 3, lifetime ECLs are recognised.

good risks from the bad and that only enterprises with a sustainable business model receive additional funding. The same can be said for the restructuring of corporate debt, which will be required as insolvency figures increase. Given the high level of uncertainty, banks may find it difficult to assess enterprises' long-term creditworthiness. Insolvencies at overindebted enterprises could be delayed unnecessarily if banks try to avoid realising losses by providing them with fresh credit.

It is important that stakeholders from all the relevant policy areas and supervisors continue to jointly monitor the dynamic situation as it evolves and work together to ready themselves for a possible escalation of the situation. Large stocks of non-performing loans (NPLs) can pose a threat to banks' funding and thus to their supply of credit. Institutions can help mitigate this threat by identifying nascent risks early on and devising strategies to provide appropriate support for enterprises which, though insolvent in the short term, are still running sustainable business models. This may necessitate hiving off loans granted to enterprises without a sustainable business model from the remainder of the credit portfolio and scaling back such holdings. IT systems will need to be modified accordingly and staffing capacities and expertise built up in good time.[19]

All relevant stakeholders need to ready themselves for an escalation of the situation.

The global financial crisis and subsequent euro area debt crisis left a rich body of experience in handling large stocks of NPLs and reducing them over a medium-term horizon. This experience can be tapped into, with options ranging from forms of in-house run-off units to the securitisation or sale of claims, all the way to interbank coordination in winding up distressed loans.[20] Handling the looming wave of insolvencies in an appropriate and efficient manner is a key prerequisite for a rapid economic recovery and thus ultimately for the ability of the financial system to fulfil its functions in the future.

19 See, inter alia, European Central Bank (2017).
20 See, inter alia, European Systemic Risk Board (2017).

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Glossary

APP	Asset purchase programme
BaFin	Federal Financial Supervisory Authority
BLS	Bank Lending Survey
CCP	Central counterparty
CCyB	Countercyclical capital buffer
CDS	Credit default swap
EBA	European Banking Authority
EBITDA	Earnings before interest, taxation, depreciation and amortisation
ECB	European Central Bank
ESFS	European System of Financial Supervision
ESRB	European Systemic Risk Board
ETF	Exchange-traded fund
EUREP	New Eurosystem repo facility to provide euro liquidity to non-euro area central banks
FRTB	Fundamental Review of the Trading Book
FSB	Financial Stability Board
GDP	Gross domestic product
G-FSC	German Financial Stability Committee
HGB	German Commercial Code (*Handelsgesetzbuch*)
HICP	Harmonised Index of Consumer Prices
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IRB	Internal ratings-based approach
KfW	Kreditanstalt für Wiederaufbau
LCR	Liquidity coverage ratio
NPL	Non-performing loan
OCI	Other comprehensive income
OECD	Organisation for Economic Co-operation and Development
O-SIIs	Other systemically important institutions
PELTRO	Pandemic emergency longer-term refinancing operation
PEPP	Pandemic emergency purchase programme
P&L	Profit and loss account
RWA	Risk-weighted asset
SME	Small and medium-sized enterprises
SRB	Single Resolution Board
SREP	Supervisory Review and Evaluation Process
SSM	Single Supervisory Mechanism
TLTRO	Targeted longer-term refinancing operation
VAR model	Vector autoregressive model

vdp	Association of German Pfandbrief Banks
WAI	Weekly activity index
WHO	World Health Organization

Bundesbank publications concerning financial stability

This overview lists selected recent Bundesbank publications on the subject of financial stability. The Financial Stability Review and the Monthly Report are available in both German and English, while most discussion papers are only published in English. The publications are provided in electronic format on our website (under Publications); printed copies can also be ordered or subscribed to free of charge via the Bundesbank's order portal.

A selection of underlying data may be found on our website as of the cut-off date (under Tasks > Financial and monetary system > Financial Stability Review). In addition, large volumes of continuously updated data are available for various Bundesbank statistics (under Statistics, in particular in the time series databases).

Financial Stability Reviews

Financial stability reviews for the period 2005 to 2019; usually published once a year in November.

Articles from the Monthly Report

September 2020	Global financial interconnectedness and spillovers between the G20 countries
September 2020	The performance of German credit institutions in 2019
August 2020	Monetary policy and banking business
May 2020	Monetary policy and banking business
April 2020	Sectoral portfolio adjustments in the euro area during the low interest rate period
March 2020	New benchmark rates, new challenges: introducing the €STR in the euro area
February 2020	Monetary policy and banking business
January 2020	The upswing in loans to enterprises in Germany between 2014 and 2019
December 2019	The relevance of surveys of expectations for the Deutsche Bundesbank
November 2019	Monetary policy and banking business

Discussion papers

48/2020	Connected funds	Daniel Fricke, Hannes Wilke
46/2020	Beta dispersion and market timing	Laura-Chloé Kuntz
45/2020	Backtesting macroprudential stress tests	Amanah Ramadiah, Daniel Fricke, Fabio Caccioli
43/2020	Interactions between bank levies and corporate taxes: How is bank leverage affected?	Franziska Bremus, Kirsten Schmidt, Lena Tonzer
40/2020	Does greater transparency discipline the loan loss provisioning of privately held banks?	Jannis Bischof, Daniel Foos, Jan Riepe
38/2020	Procyclical asset management and bond risk premia	Alexandru Barbu, Christoph Fricke, Emanuel Moench
37/2020	Negative monetary policy rates and systemic banks' risk-taking: Evidence from the euro area securities register	Johannes Bubeck, Angela Maddaloni, José-Luis Peydró
36/2020	Central bank funding and credit risk-taking	Peter Bednarek, Valeriya Dinger, Daniel Marcel te Kaat, Natalja von Westernhagen
35/2020	Fiscal sustainability during the COVID-19 pandemic	Patrick Hürtgen
33/2020	Identifying indicators of systemic risk	Benny Hartwig, Christoph Meinerding, Yves S. Schüler
31/2020	The fiscal footprint of macroprudential policy	Ricardo Reis
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26/2020	Stressed banks? Evidence from the largest-ever supervisory review	Puriya Abbassi, Rajkamal Iyer, José-Luis Peydró, Paul E. Soto
25/2020	Compilation of commercial property price indices for Germany tailored for policy use	Thomas A. Knetsch
23/2020	Interbank risk assessment – A simulation approach	Maximilian Jager, Thomas Siemsen, Johannes Vilsmeier
20/2020	The German housing market cycle: Answers to FAQs	Florian Kajuth
19/2020	Unconventional monetary policy shocks in the euro area and the sovereign-bank nexus	Nikolay Hristov, Oliver Hülsewig, Johann Scharler
18/2020	Doing more with less: The catalytic function of IMF lending and the role of program size	Tobias Krahnke
14/2020	The impact of uncertainty and certainty shocks	Yves S. Schüler
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06/2020	Partial pooling with cross-country priors: An application to house price shocks	Markus Roth

05/2020	Financial variables as predictors of real growth vulnerability	Lucrezia Reichlin, Giovanni Ricco, Thomas Hasenzagl
04/2020	Financial stability committees and the countercyclical capital buffer	Rochelle M. Edge, J. Nellie Liang
02/2020	Interest and credit risk management in German banks: Evidence from a quantitative survey	Vanessa Dräger, Lotta Heckmann-Draisbach, Christoph Memmel
49/2019	The transmission of bank capital requirements and monetary policy to bank lending	Björn Imbierowicz, Axel Löffler, Ursula Vogel
48/2019	Does the lack of financial stability impair the transmission of monetary policy?	Viral V. Acharya, Björn Imbierowicz, Sascha Steffen, Daniel Teichmann
45/2019	Capital flows, real estate, and local cycles: Evidence from German cities, banks, and firms	Peter Bednarek, Daniel Marcel te Kaat, Chang Ma, Alessandro Rebucci
43/2019	The fire-sale channels of universal banks in the European sovereign debt crisis	Giulio Bagattini, Falko Fecht, Patrick Weber