

Assessments and expectations of firms in the pandemic: findings from the Bundesbank Online Panel Firms

Short-term information on the current situation of firms in Germany is very valuable to economic and monetary policymakers. Particularly in the coronavirus pandemic, during which the environment is changing rapidly, it allows the economic consequences of the pandemic and the impact of the measures taken to contain it to be assessed and evaluated in a timely and reliable manner. The Bundesbank therefore used its new survey of firms to obtain relevant assessments from the enterprises' perspective. This article presents the Bundesbank Online Panel Firms, which aims to improve the general information base on assessments and expectations in the German business sector. It also discusses key findings from the first surveys with regard to the economic consequences of the pandemic.

The first four waves of the survey of firms show that a large proportion of firms across sectors have reported decreases in production or business activity. In December 2020, the average decrease in firms' activity (relative to the same month of the previous year) stood at almost one-fifth, although there are major differences depending on the sector. In addition, the collection of data on key enterprise metrics shows that the pandemic-induced effects have exhibited a wave-like development since the onset of the crisis. Whilst almost two-thirds of the surveyed firms reported falling turnover for the May-June 2020 period, this share decreased over the summer months to two-fifths in September-October 2020, before rising again to roughly one-half at the turn of the year in December-January. Finally, it was revealed that the coronavirus pandemic has also had an impact on the financial situation of firms and given rise to a temporary increase in the demand for credit.

Furthermore, the survey asked about firms' inflation expectations in autumn 2020. Over a horizon of one year, firms did not expect a rising inflation rate relative to the estimated inflation rate of the preceding 12 months. This suggests that enterprises' inflation expectations were firmly anchored, despite the economic slump. Moreover, collecting data on firms' and households' inflation expectations in parallel online surveys by the Bundesbank permits a direct comparison: firms expect lower inflation – in terms of both the realised and the expected inflation rate – than households.

Pandemic-induced increase in need for information on short-term developments in business sector

Advantages of the Bundesbank independently conducting the survey of firms

Survey focus on assessments of economic policy situation, financing situation and inflation expectations

■ Introduction

The coronavirus pandemic and the measures taken to contain it led to an abrupt and severe slump in Germany's economic activity in the spring of 2020, which was unprecedented in post-war history. In this exceptional situation, a major need arose for the most up-to-date and detailed information possible on the economic situation of enterprises in Germany. The Bundesbank therefore initiated its own survey of firms – the design of which was largely completed in spring 2020 – in order to obtain timely information, in particular, on the effects of the pandemic on general economic activity, on firms' financing situation and on future expectations in the business sector. The first wave of this internet-based pilot survey was conducted in June and July 2020.¹

There are three main reasons in favour of the Bundesbank conducting the survey of firms independently. First, the survey content, periods and survey intervals can be tailored directly to the Bundesbank's own needs, allowing the survey to be structured in as data-minimising and targeted a manner as possible for participating firms. Second, the anonymised microdata from the survey can be used swiftly and comprehensively for analyses and research within the Bundesbank, allowing differences between firms to be discovered and making their possible effects on monetary policy and financial stability identifiable. Lastly, the anonymised linking² of survey data with other Bundesbank datasets at the micro level opens up potential for synergies and provides valuable insights on sector-specific or regional phenomena and their significance for macroeconomic developments in Germany.

The objective of the survey of firms is to better depict the current situation of enterprises and their assessments and expectations in the current economic policy environment. For example, firms, through their decisions, have a major impact on the development of prices, the stability of which is the core objective of

the Eurosystem. In order to be able to gain a better understanding of enterprises and their behaviour, firms were asked about their inflation expectations in a degree of detail which was unprecedented for enterprises in Germany (see the table on p. 50). However, other questions – for example, on the past and expected development of key enterprise metrics, such as turnover or employment – also deliver indirect insights into inflation developments, as these expectations can have an impact on enterprises' own price setting. To complete the picture, firms are asked to name problem areas and assess how challenging each of these are. Examples include the competitive situation, the availability of skilled staff and the scale of government influence and regulation. Finally, particular importance is also attached to firms' financing situation and access to credit in order to be able to answer questions relating to financial stability.

This article provides information on the survey's methodology and presents selected findings from the first four survey waves, which were conducted between June 2020 and February 2021.³ First, it presents findings on the situation of firms in the coronavirus pandemic, particularly highlighting its effects on the economic situation and the development of economic expectations. Second, it reports on findings relating to firms' financing situation, with particular emphasis on the development of financing needs, access to bank loans and the use of public support measures. Third, a closer look is taken

¹ When designing the survey of firms, the Bundesbank was able to draw on expertise already gained from the study on household expectations established in April 2019, which has been conducted in the form of the Bundesbank Online Panel Households (BOP-HH) at regular monthly intervals since April 2020. See Deutsche Bundesbank (2019).

² Such linking only takes place with the express consent of the participating firms; the linked data are only analysed in anonymised form and only at the Bundesbank.

³ The fourth wave of the survey took place during the months of January, February and March 2021, with 99.2% of firms surveyed during January and February. The survey period for Wave 4 is therefore specified as "January-February 2021" below. In addition, a pre-test among just under 1,000 enterprises was conducted and evaluated before the survey of firms commenced. The data from this survey are not taken into account in this article.

Survey concept of the study on the expectations of firms in Germany

Between 9,150 and 16,241 firms have participated in each wave of the Bundesbank study on the expectations of firms online in the four consecutive survey periods to date. The analysis of the first four waves thus incorporates over 48,000 fully completed questionnaires from a total of over 30,000 different firms, with about 10,000 of these firms having participated in the study more than once. Conducting the survey online ensures short fieldwork periods,¹ quick data processing and therefore a timely insight into the current situation of firms in Germany.

The questionnaires in the Bundesbank study comprise a set of key questions and varying question modules drawn up by Bundesbank staff. One main focus of the first few survey waves has been the direct and indirect effects of the coronavirus pandemic. These include, for example, the impact of the temporary VAT cut as well as that of potential liquidity bottlenecks.

The participating firms make up a representative selection of Germany's corporate landscape. To ensure this, the sample for the study is drawn by means of a random selection process from all enterprises domiciled in Germany with at least one member of staff being subject to social security contributions or with turnover exceeding €17,500, and for which further information required for the sample is available.²

¹ In the context of a written survey, the fieldwork period is the benchmark used for the time needed to reach a sufficient response rate.

² The necessary information includes the name of the firm, its full address (street, house number, postal code, city/town) and data on turnover and employment, which are required to create size categories. Prior to use, the addresses are validated, their spelling standardised to match the directory of the German Federal Agency for Cartography and Geodesy (BKG), and georeferenced using these reference data.

Overview of methodological framework

Geographical reach	Germany
Target population	Enterprises domiciled in Germany
Surveying firm	forsa
Sampling frame	All enterprises domiciled in Germany with at least one member of staff subject to social security contributions or with turnover exceeding €17,500 in the previous year, excluding natural persons
Sample (realised)	48,564 observations in four waves to date – Wave 1: 10,711, Wave 2: 9,150, Wave 3: 12,462, Wave 4: 16,241
Panel design	A total of 31,359 enterprises participated in the survey: 2,333 enterprises participated in all four waves; 2,415 enterprises participated in three waves; 5,376 enterprises participated in two waves; 21,235 enterprises participated in only one wave.
Questionnaire	Developed by the Bundesbank to capture enterprises' perceptions and expectations; includes recurring key questions and a varying number of specific questions
Fieldwork duration	Wave 1: 18 June to 27 July 2020 Wave 2: 26 August to 30 September 2020 Wave 3: 9 October to 13 November 2020 Wave 4: 29 January to 2 March 2021
Contact strategy	Letter by post with additional reminder sent after approximately 14 days if the respondent has not yet answered; contact by email in the case of enterprises which are willing to participate in the panel and have provided an email address
Survey method	Computer-assisted web interviewing (CAWI): no possibility to go back and correct previous answers; soft prompt: answers "Don't know" and "No answer" are shown if the respondent has clicked "Continue" without answering the question; it is not possible to skip to the next question without having answered the previous one; "Does not apply to my enterprise" may be entered
Survey language	German
Response rate	Response rates as defined by the American Association for Public Opinion Research (AAPOR): Wave 1: 13.36%, Wave 2: 13.82%, Wave 3: 9.51%, Wave 4: 16.02%
Weighting	Weighting according to marginal distribution of the target variables region, economic sector, employment category and turnover size category within the reporting population
Linguistic revision and consistency checks	Consistency checks following survey completion

The firms in the sample receive a letter by post inviting them to participate in the voluntary survey. If a firm is willing to continue participating in the study, it is generally contacted for further survey rounds at the email address it has provided.

When the collected data are weighted, the chosen sampling method and potential distortions due to firms declining to participate are considered equally. The weights in the Bundesbank Online Panel Firms were selected such that the distribution of firms in terms of region, economic sector, employment category and turnover size category resulting from the survey is representative of the underlying reporting population in Germany.

The Bundesbank study differs from other corporate surveys conducted in Germany in that it is possible to link the data from this

survey with other administrative datasets of the Bundesbank, if certain conditions are fulfilled.³ In total, 22,825 (73%) of the 31,359 participating firms have given their informed consent for the linking of their data.

The table on p. 35 provides an overview of the methodological framework of the Bundesbank study.

³ This concerns, for example, individual accounts of German non-financial corporations (JANIS), which the Bundesbank receives when conducting credit assessments.

at the inflation expectations of enterprises, which are compared to those of households and professional forecasters in Germany. In this context, findings concerning firms' price changes in connection with the temporary VAT cut in 2020 are also discussed. The article concludes with an outlook for the further development of the Bundesbank Online Panel Firms (BOP-F).⁴

Findings on the situation of enterprises in the coronavirus pandemic

Coronavirus pandemic as a special shock that is encumbering supply and demand simultaneously and across numerous sectors

The coronavirus pandemic, the measures taken by policymakers to contain it and changes in the behaviour of enterprises and households resulted in one of the most severe economic slumps in post-war history, both in Germany and globally, in the spring of 2020. However, the economic effects of the coronavirus pandemic were characterised not only by their scale, but also by the speed of events. The dra-

matic slump occurred abruptly and posed a huge challenge for business cycle analysis.⁵ In this respect, the launch of the BOP-F in June 2020 took place at an equally unique and suitable point in time. At that time, up-to-date data, such as on the economic and financing situation of firms, were urgently needed in order to conceive adequate economic and monetary policy countermeasures in a swift and evidence-based manner. The data collected as part of the BOP-F were, therefore, of direct interest to the Bundesbank and also to other decision-makers, as well as to the public.

⁴ See also the information posted regularly on the website of the Bundesbank's Research Centre, available at <https://www.bundesbank.de/en/bundesbank/research/survey-on-firms>

⁵ This is reflected, amongst other things, in the collapse in prices of the DAX of roughly 39% over a period of less than one month. On account of the intensity and speed of the slump, it was technically challenging to adequately capture key real economic changes which, unlike financial market data, cannot be gauged on a daily basis. Large parts of business cycle analysis therefore did not record key developments in real economic data until a relatively late stage.

Decrease in business activity during the coronavirus pandemic

When asked to assess the economic consequences of the measures taken to contain the coronavirus pandemic, participating enterprises responded both qualitatively and quantitatively, thus enabling a differentiated picture of their situation to emerge. During the fourth survey period (January-February 2021), a total of 48% of firms reported a decrease, 38% reported no change and 14% reported an increase in business activity compared with the same month of the previous year (see the chart on p. 38).⁶ There were, however, major differences across the sectors. Significant increases in business activity were only identified in isolated sectors, such as in parts of retail or in the manufacture of food products, beverages and tobacco. In addition, the firms provided quantitative estimates of pandemic-induced changes relative to the “typical” level of business activity, with 2019 given as a reference year.⁷ At the individual firm level, the average change (compared with the respective same month of 2019) stood at -26% in May 2020, -16% in September 2020 and -19% in December 2020 (see the adjacent table).⁸ Broken down by sector, restaurants, transportation and warehousing and other ser-

⁶ This means that the values improved slightly compared with the first survey period June-July, when 58% of firms reported a decrease, 35% reported no change and 8% reported an increase in business activity as a result of the coronavirus pandemic. In the interim period, in October-November, the picture looked somewhat better, however, with 24% of enterprises reporting a decrease, 35% reporting no change and 41% reporting an increase.

⁷ In the first survey in June-July 2020, respondents were asked about business activity in May; in the third survey in October-November 2020, respondents were asked about business activity in September; and in the fourth survey in January-February 2021, respondents were asked about business activity in December.

⁸ The quantitative results contained in the adjacent table can only be applied to the overall economy to a limited extent, i.e. to the question of how large the decrease in overall economic activity was. This is because the weighting variables are dependent on four variables: region, economic sector, enterprise size category and turnover size category. The weighting factors are thus not necessarily proportional to the influence of the respective firm on the overall economy. Depending on how the weights are calibrated, it can therefore lead to an overestimation or underestimation of the influence of very large firms, which represent a correspondingly large part of the overall economy. By contrast, the quantitative changes in activity in the aforementioned table represent the average decrease in activity at the firm level and therefore allow comparisons to be drawn between the sectors.

Estimates of the change in activity*

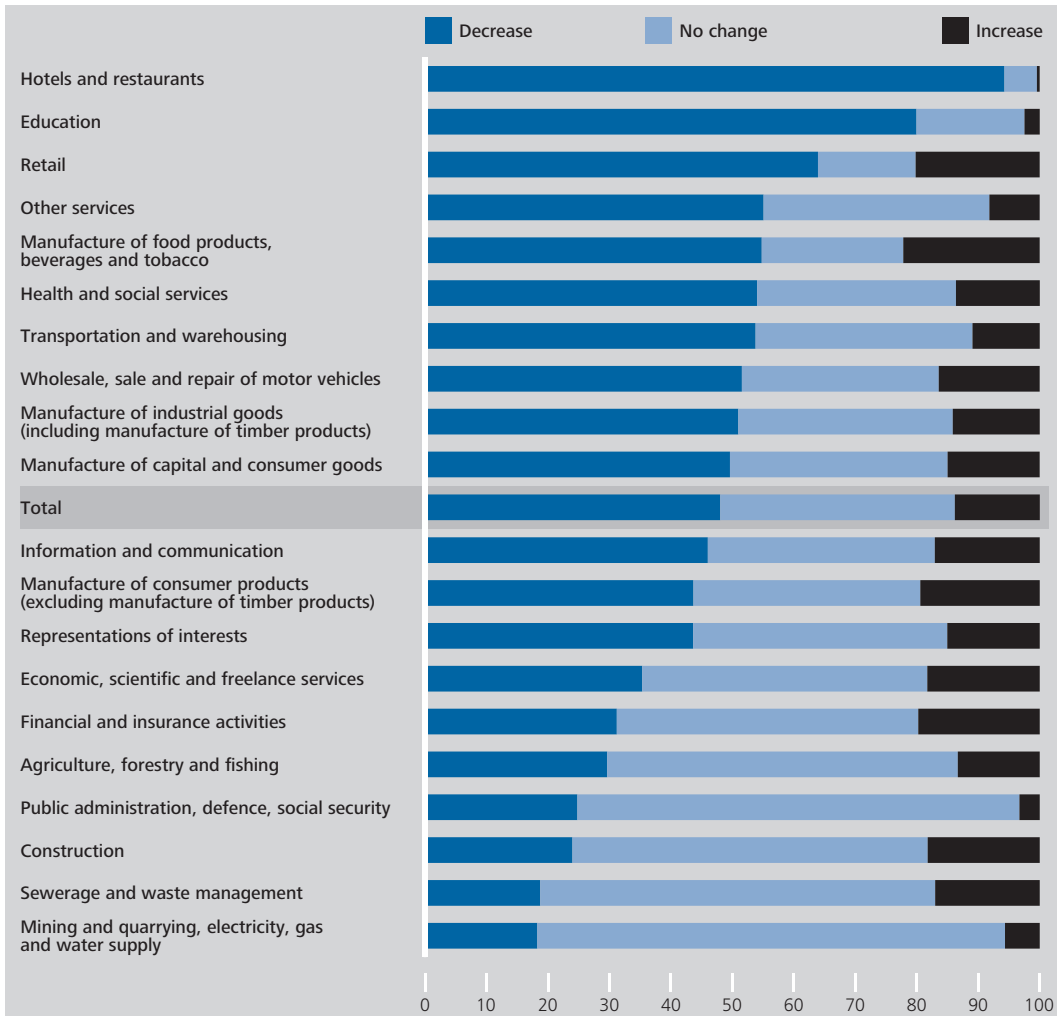
Average change in activity (%), weighted results

Sector	2020		
	May	Sep.	Dec.
Hotels and restaurants	- 69	- 40	- 79
Education	- 47	- 22	- 45
Other services	- 33	- 20	- 27
Retail	- 21	- 9	- 22
Transportation and warehousing	- 39	- 20	- 21
Representations of interests	3	- 12	- 20
Total	- 26	- 16	- 19
Manufacture of food products, beverages and tobacco	- 14	- 16	- 19
Health and social services	- 25	- 11	- 17
Information and communication	- 23	- 18	- 15
Manufacture of consumer products (excluding manufacture of timber products)	- 36	- 15	- 13
Manufacture of industrial goods (including manufacture of timber products)	- 27	- 21	- 13
Wholesale, sale and repair of motor vehicles	- 25	- 14	- 12
Economic, scientific and freelance services	- 21	- 16	- 12
Manufacture of capital and consumer goods	- 23	- 13	- 10
Financial and insurance activities	- 18	- 7	- 7
Public administration, defence, social security	- 29	- 4	- 7
Agriculture, forestry and fishing	- 14	- 9	- 5
Construction	- 14	- 7	- 4
Sewerage and waste management	- 22	- 3	- 3
Mining and quarrying, electricity, gas and water supply	- 1	- 1	- 3

Source: Bundesbank Online Panel Firms (BOP-F); survey period: January-February 2021. * Percentage decrease in activity relative to the same month of the previous year, arranged in order of the decrease in activity in December 2020. Enterprises which reported an increase or decrease in business activity in response to the qualitative question regarding changes in business activity were then asked how large this was. Enterprises which reported no change in business activity were incorporated using the value 0. This question was not asked in the second survey period August-September. The darker (lighter) the grey shade, the larger (smaller) the decrease in activity was. The sectoral classification is based on self-assessments by the surveyed firms.

Effects of the coronavirus pandemic on business activity*

Share of responses (%), weighted results



Source: Bundesbank Online Panel Firms (BOP-F); survey period: January-February 2021. * Respondents were asked how their business activity developed in December 2020 compared with the same month of the previous year. The sectoral classification is based on self-assessments by the surveyed firms.

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vices sectors were particularly hard hit by the effects of the pandemic.⁹ It also became clear that, for some economic sectors, the situation deteriorated again considerably towards the end of last year owing to the renewed tightening of restrictions at that time.

Besides evaluating the effects of the pandemic on business activity, firms were also asked to assess the development of other key enterprise metrics in the last month prior to the survey (see the chart on p. 39). In spring 2020, a large share of firms reported, alongside a drop in turnover (63%), decreases in employment (54%) and available liquid funds (46%), and re-

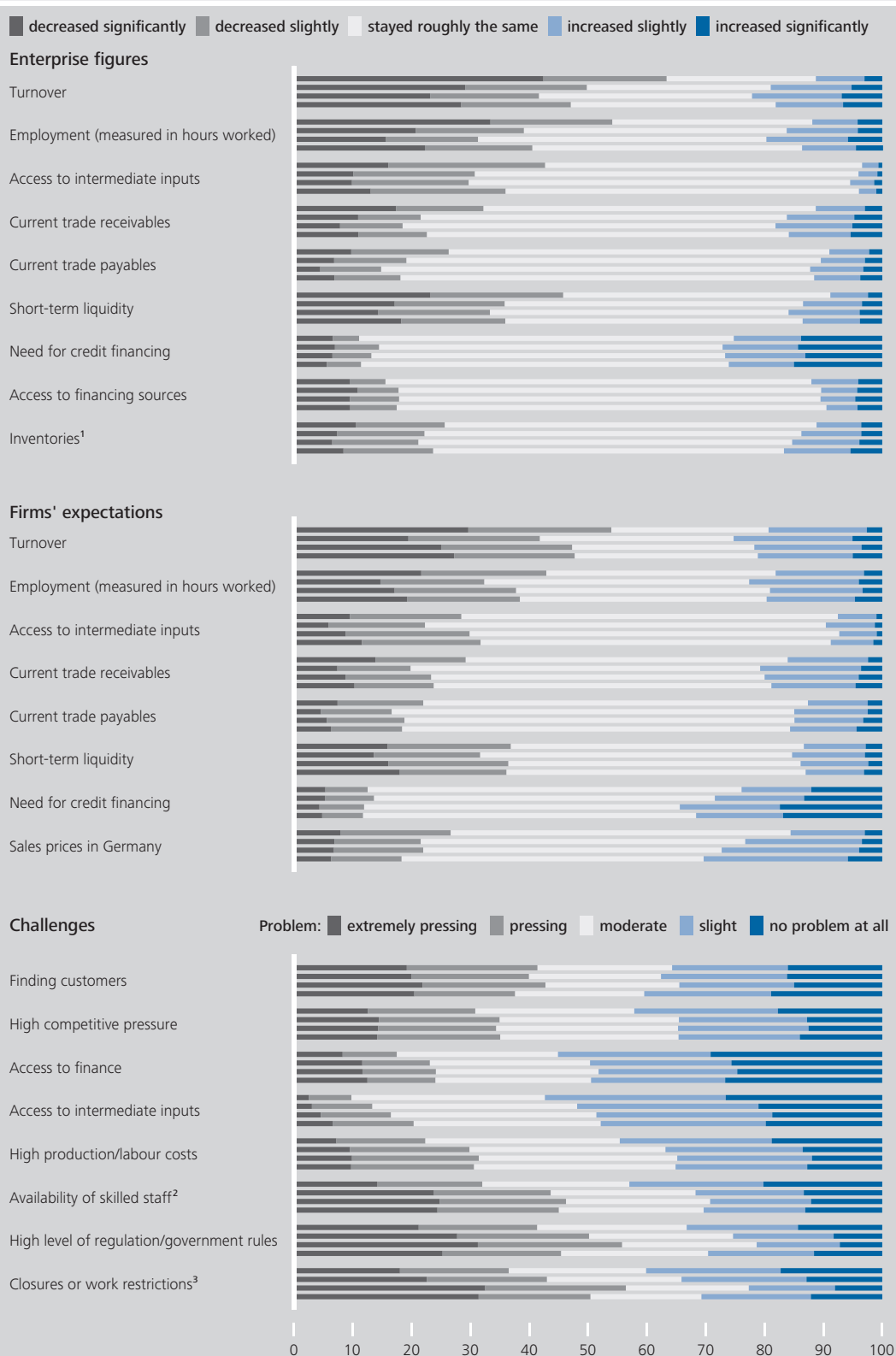
duced access to intermediate inputs (43%). In late summer and autumn, conversely, the share of firms reporting a deterioration in their financial and economic situation decreased. However, in the fourth quarter of 2020, firms' economic situation became somewhat gloomier once more, although the values did not reach

Share of firms reporting a deterioration in their economic or financial situation rose again in Q4 2020

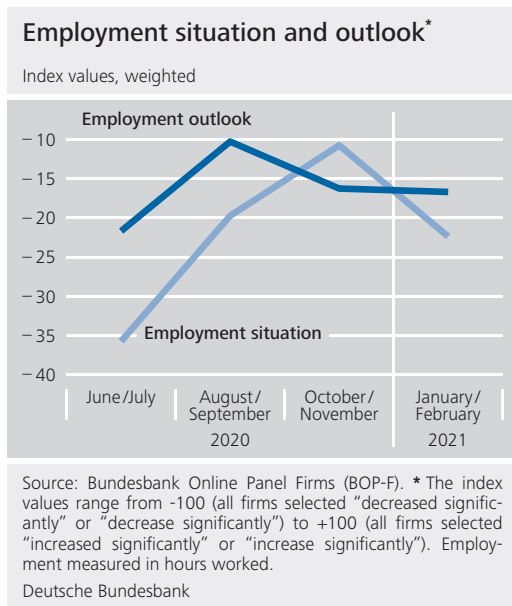
⁹ This is consistent with the findings of a study by the European Central Bank (see European Central Bank (2021)), in which a disaggregated approach was pursued in order to better understand inflation developments in connection with the coronavirus pandemic. The study determined that goods-producing sectors are not as severely affected by disinflationary tendencies as sectors which provide services. This is consistent with the subjective perception identified in the BOP-F that other service providers saw themselves as being particularly affected by the pandemic.

Development of key enterprise figures, firms' expectations and challenges*

Share of responses (%), weighted results



Source: Bundesbank Online Panel Firms (BOP-F). * The upper bar within a category refers to the survey in June-July 2020, the second bar to August-September 2020, the third bar to October-November 2020 and the bottom bar to January-February 2021. The enterprise figures refer to the past month, while firms' expectations and challenges refer to the next six months. Regarding the challenges, respondents were asked how problematic the listed aspects are anticipated to be over the next six months. ¹ Stock of intermediate products and finished goods. ² As well as experienced managers. ³ Due to the coronavirus pandemic.



the levels seen at the beginning of the pandemic (drop in turnover: 47%, decrease in employment: 41% and in available liquid funds: 36%, and reduced access to intermediate inputs: 36%).

After brief recovery in summer, firms’ expectations somewhat more pessimistic again

To gain an impression not only of the current situation, but also of firms’ outlook, enterprises were asked about their expectations for the next six months (see the chart on p. 39). As the pandemic progressed, firms initially estimated the medium-term development of their own key enterprise metrics more optimistically than at the onset of the coronavirus pandemic. For example, the share of firms that expected a decrease in turnover fell from 52% in June-July 2020 to 42% in August-September 2020. In October-November, expectations became somewhat more pessimistic once again: 47% of firms expected a decrease in turnover over the subsequent six months, while 34% expected increased financing needs (following on from 24% in June-July 2020 and 28% in August-September 2020). One logical explanation for this is the resurgence of coronavirus infections coupled with the renewed tightening of containment measures, which had already been announced at the time of the survey. Expectations then remained virtually unchanged after the turn of the year 2020-21.

In addition, firms were asked about the biggest challenges that they expected to face over the next six months. Firms were also asked to rate the relevance to them of eight problems on a scale from “extremely pressing” to “no problem at all” (see the chart¹⁰ on p. 39). At the beginning of the pandemic, firms considered the issues “high level of regulation/government rules”, “closures or work restrictions due to the coronavirus pandemic”, “availability of skilled staff”¹¹ and “finding customers” to be major challenges in particular. Around one-third or more of the firms surveyed in June-July anticipated pressing problems in these areas in the second half of the year. In late summer and autumn, almost all of the areas were viewed even more negatively. The perceived relevance of the problems largely persisted at this higher level in January-February 2021. On the whole it could be seen, however, that despite the prolonged restrictions due to the pandemic and the anticipated high level of funding required compared with that needed to overcome the other challenges they faced, only a small number of firms expected difficulties in gaining access to finance.

High regulation, pandemic-related closures, availability of skilled staff and finding customers the biggest challenges

The situation and outlook for employment were additional key variables that had already been directly affected by the coronavirus pandemic from its onset. Expectations regarding the employment rate are a particularly important economic indicator as they give an indication of a firm’s general expectations and may also influence inflation via wage developments. To assess the relevance of these expectations, the Bundesbank surveyed firms in the BOP-F about current employment developments over the last month and about their expectations regarding employment developments over the next six months.

¹⁰ The chart on p. 39 shows how the respondents who do not state that the described problem “does not apply to them” view the issue. This response option was not available in the first survey in June-July 2020, only appearing as of the second wave in August-September 2020.

¹¹ The “availability of skilled staff” does not refer specifically to the time period of the coronavirus pandemic.

Employment situation recovered in 2020 after outbreak of coronavirus pandemic

Initially, positive developments in the employment situation¹² could be observed from the summer months through to the autumn of 2020, but this did not continue into the winter months (see the chart on p. 40). With the exception of the fourth quarter, the employment outlook for the next six months was more positive than the assessment of the current employment situation. This signals a certain, albeit low level of optimism on the part of firms regarding employment growth. Some firms appear to have anticipated the sharp decline in employment in the winter months, as the data on the employment outlook were already declining in the autumn poll. It is also interesting to consider the breakdown of firms by size: in the first survey in June and July, larger¹³ enterprises reported sharper decreases in employment and were also more pessimistic with regard to expected employment growth than smaller firms. However, this correlation turned around over the autumn and winter, as larger firms then reported more positive employment developments and predicted more positive growth than smaller enterprises.

Simultaneous closures led to supply chain problems

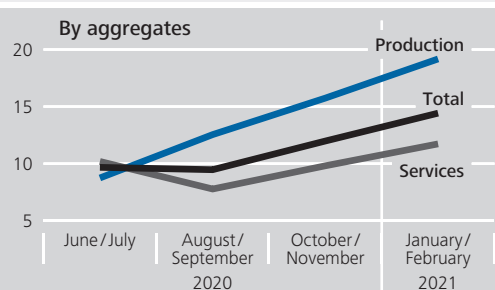
An unusual feature of the economic problems experienced during the pandemic is the fact that countless firms in Germany and abroad had to scale back their economic activity significantly or even shut down completely at the same time. This caused slumps in international trade, leading to disruptions in existing supply chains. The issue was exacerbated by border closures and travel restrictions. As a result, suppliers and purchasers of commodities were out of action throughout the supply chain for a large number of firms. In the survey, firms were asked to assess the severity of the impact of interrupted supply chains. Specifically, they were asked how problematic they thought “access to intermediate inputs” would be in the next six months.¹⁴

Supply chain problems persisting

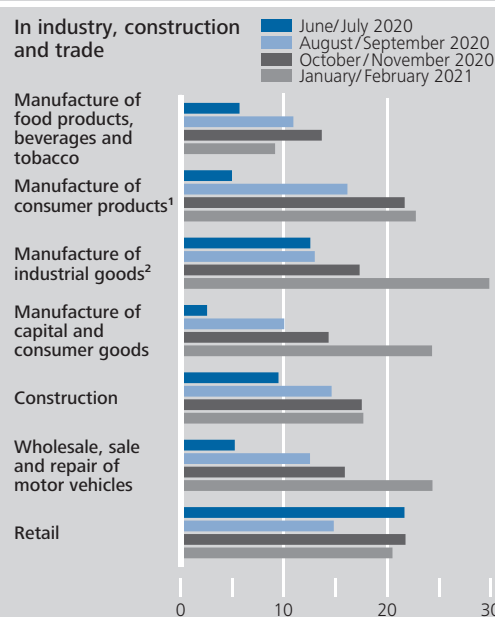
In the first survey round conducted in June-July 2020, 9.7% of the responding firms stated that they were facing serious supply chain problems.¹⁵ This value remained largely the same in

Share of firms with relevant supply chain problems*

Shares (%), weighted results



In industry, construction and trade



Source: Bundesbank Online Panel Firms (BOP-F). * Firms that selected a value of 4 or 5 on a five-point scale (1: no problem at all; 5: an extremely pressing problem) in response to a question on how problematic access to intermediate inputs will be over the next six months. ¹ Excluding manufacture of timber products. ² Including manufacture of timber products.

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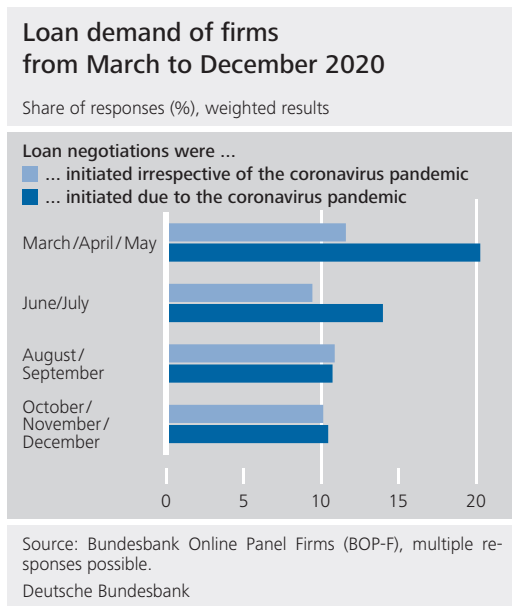
the second wave around July-August, at 9.5%. In the third wave (October-November), the share of firms with supply chain problems rose slightly to 12.9%, continuing to rise to 14.4% in the fourth wave (February 2021). This devel-

¹² Employment measured in hours worked.

¹³ Size measured by turnover.

¹⁴ Respondents were able to give a numerical value between 1 (“no problem at all”) and 5 (“an extremely pressing problem”).

¹⁵ This refers to firms that give a value of 4 or 5 when questioned about the severity of the expected problem. Unlike the chart on p. 39, this analysis takes all respondents into account, i.e. it includes those who stated in Waves 2, 3 or 4 that the issue did not concern their firm. By contrast, the chart only includes the firms that state that the issue concerns them and go on to indicate the extent to which they consider this to be the case.



opment is shown in the chart above, divided into production firms and service providers. Production firms experienced greater momentum, as expected.¹⁶

The fact that supply chain problems built up over time after firms' own stock levels or their suppliers' stocks were depleted might explain the slight rise from 9.7% in June-July 2020 to 14.4% in January-February 2021. However, both this moderate increase and the overall level should be viewed against the backdrop of the more dramatic collapse of supply chains in the second quarter, immediately after the outbreak of the coronavirus pandemic. This shock to supply chains, which was triggered by the global measures being put in place from March 2020 after the pandemic began, was not recorded by the BOP-F as it occurred before the start of the first survey wave. It can be assumed that a recovery from the prior breakdown in the supply chains was already taking place during the June-July survey, putting the figures above (and their increase over time) into perspective. For example, in a DIHK survey¹⁷ conducted in March 2020, every fourth company reported missing goods or services in its production, and every fifth reported logistical bottlenecks. The first shock was particularly severe for supply chains because firms were completely unprepared when it occurred. Regard-

ing the ongoing issues encountered in supply chains throughout 2020, it can be assumed that logistical adjustment processes and stand-by options were available and were also consciously employed.

Sector classification played a considerable role in the assessment of the problem, as supply chains are especially important in trade, the manufacture of intermediate goods, construction and the production of capital goods and consumer durables. As a result, these sectors were recently hit particularly hard by supply problems. The chart on p. 41 shows the developments in construction, wholesale and retail and the manufacturing sectors.

Industry, trade and construction hit particularly hard

Financial situation of firms in Germany

The survey on firms is also a major source of information for banking supervision and financial stability analysis. For example, questions about the liquidity position and the supply of credit to the firms surveyed provide an important indication of potential disruption to the functioning of the financial sector. As the chart on p. 39 illustrates, decreasing turnover at the start of the coronavirus crisis caused a temporary rise in financing needs in the business sector.

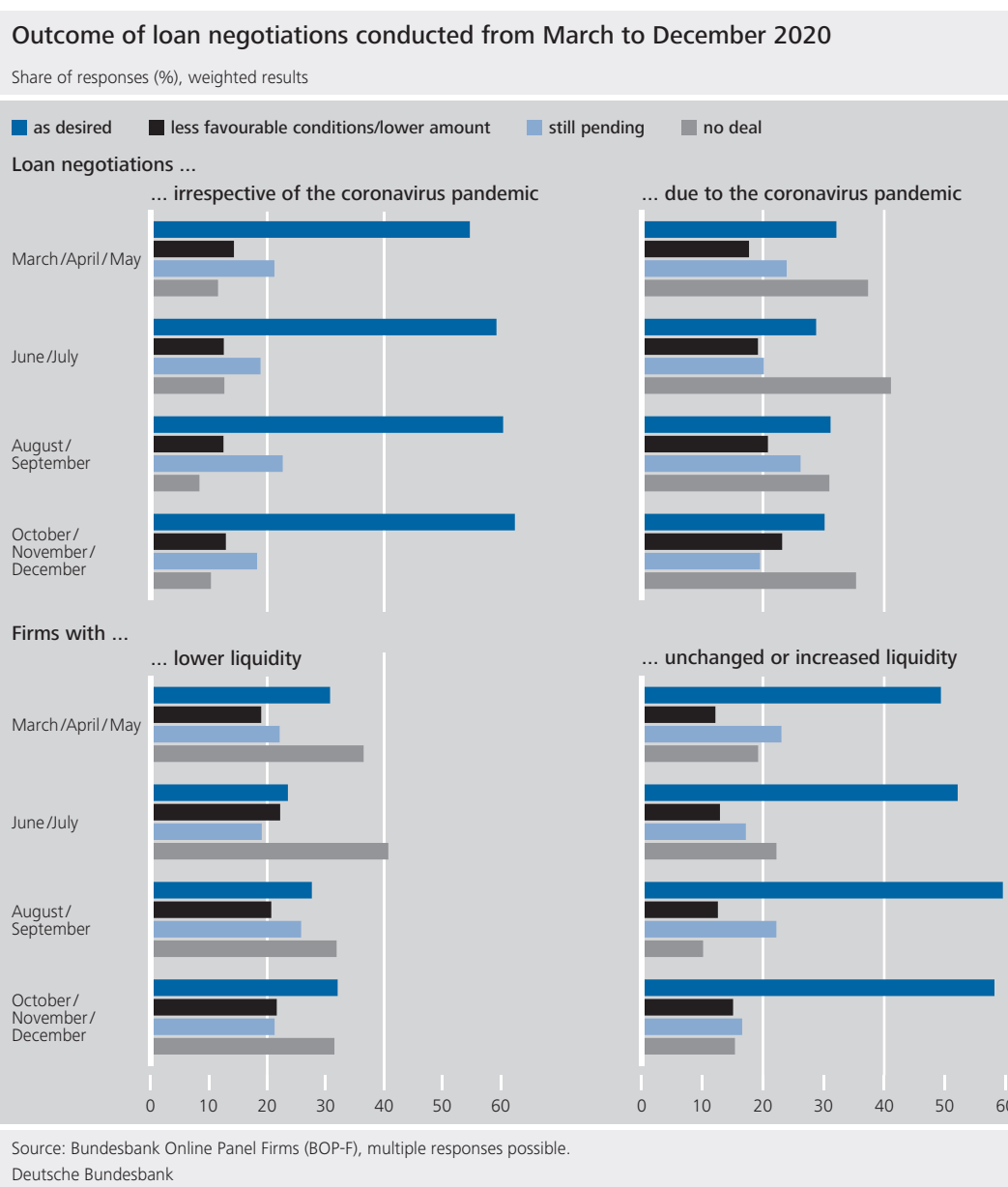
To assess the impact of the pandemic, firms were asked whether they had been involved in loan negotiations and whether any potential borrowing was attributable to the coronavirus pandemic. The share of firms conducting loan negotiations with banks¹⁸ irrespective of the

Credit demand of firms influenced by coronavirus pandemic

¹⁶ Starting from the second poll in August-September, firms were also able to answer "does not apply to my enterprise" in addition to the scale from 1 to 5. Whilst only 7% of the manufacturing firms stated that supply problems did not apply to them, 30% of the enterprises in the services sector selected this option. This, too, indicates considerable sectoral differences.

¹⁷ See DIHK (2020). The survey took place from 24 to 26 March 2020 and included around 15,000 firms.

¹⁸ Loan negotiations refer here to negotiations with banks with a view to taking out a loan or establishing a credit line, whilst all government-sponsored loans are excluded.



coronavirus crisis remained roughly constant at around 10% over the observation period between March and December 2020. By contrast, just over 20% of firms initiated loan negotiations at the start of the pandemic in the spring of 2020 due to the coronavirus crisis. This share fell over time to around 10% in the fourth quarter of 2020 (see the chart on p. 42). This is consistent with the assessments of other banking statistics which show that a significantly higher quantity of loans were granted to German firms in March and April 2020 than is usually the case (see Deutsche Bundesbank (2020b)). Although demand for borrowing or establishing a credit line declined again after

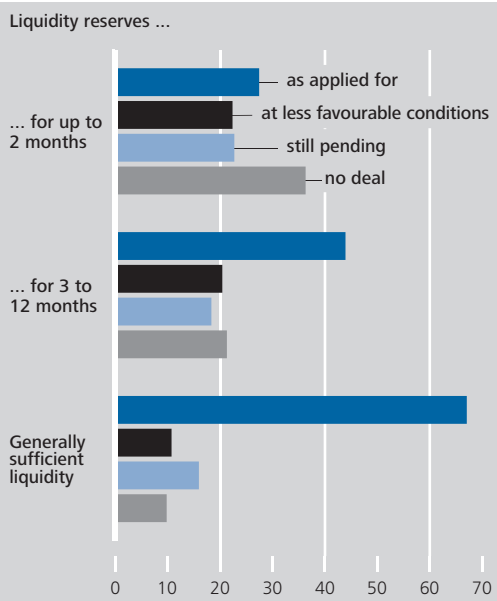
the initial months of the crisis, a large portion of the demand for credit is still attributable to the pandemic.

The outcome of the loan negotiations indicates whether the surveyed firms encountered difficulties in accessing bank loans in the wake of the pandemic. The survey results show that firms applying for bank loans irrespective of the pandemic saw an improvement in their access to credit in the period from March to December 2020. For instance, the share of loans granted at the desired amount and the desired conditions rose from 55% in the second quarter to 62% in the fourth quarter of 2020 (see

Loan applications submitted due to the coronavirus pandemic more frequently concluded with no deal

Outcome of loan negotiations in the fourth quarter of 2020 by liquidity reserves

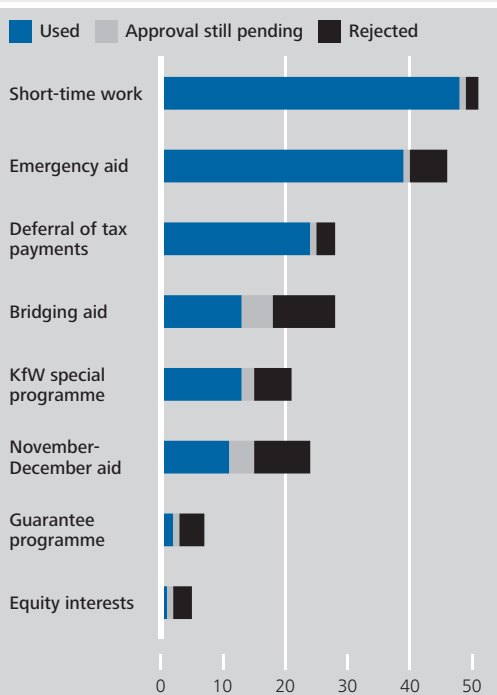
Share of responses (%), weighted results



Source: Bundesbank Online Panel Firms (BOP-F), question: "Based on the situation today and the most plausible scenario, for how long a period will your enterprise continue to have sufficient liquidity before having to discontinue or abandon its business activities?", survey period January-February 2021. Deutsche Bundesbank

Use of public support measures since the onset of the coronavirus pandemic

Share of responses (%), weighted results



Source: Bundesbank Online Panel Firms (BOP-F), survey period: January-February 2021. Deutsche Bundesbank

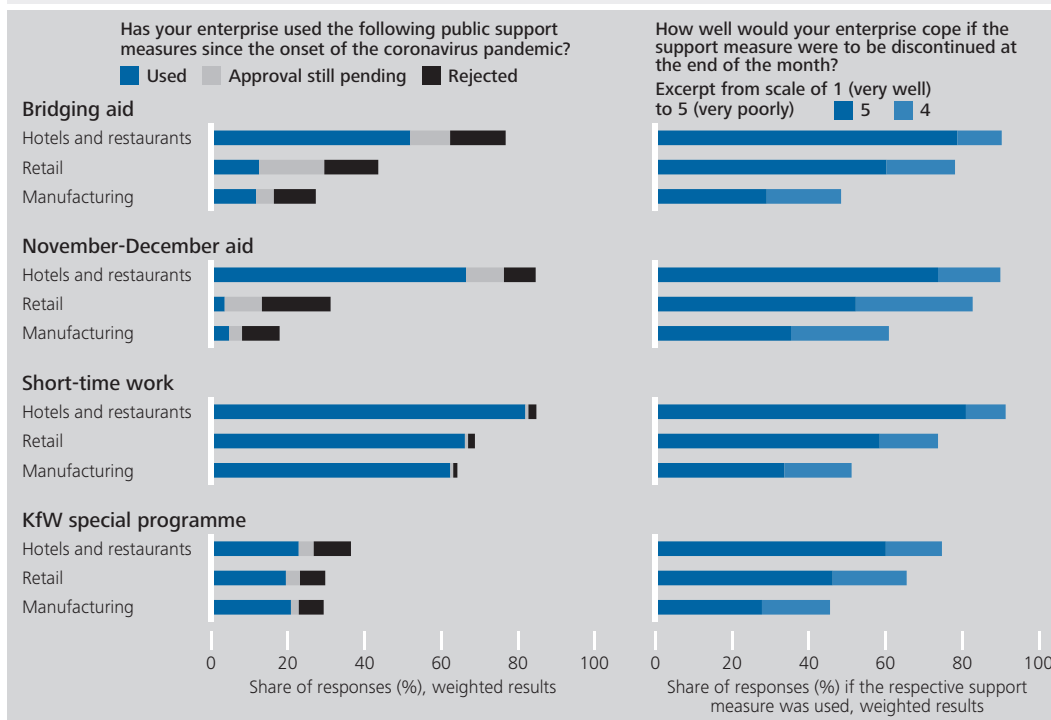
the chart on p. 43). By contrast, where loan negotiations were initiated and conducted due to the pandemic, the share of loans approved at the desired conditions has remained constant at around 30% since the start of the pandemic. On the other hand, the share of loan negotiations conducted due to the pandemic that were concluded without a deal was consistently higher than for loan negotiations initiated irrespective of the coronavirus pandemic, and the former reached its peak of 41% in the third quarter.

The chart on p. 43 shows the outcome of the loan negotiations according to how firms' liquidity positions have changed. For 37% of the firms that recorded liquidity losses in the second quarter of 2020, loan negotiations conducted between March and May of 2020 were concluded without a deal. After rising to 41% in the third quarter, the share of firms with declining liquidity that concluded loan applications without a deal fell to 32% in the autumn and winter months. The slight improvement in these firms' access to credit was also reflected in the share of loan negotiations that were approved as applied for. By contrast, firms that did not report a deterioration in their liquidity positions had much better outcomes in their loan negotiations. This suggests a link between a firm's liquidity difficulties and problems it experienced in accessing credit.

To assess the scale of potential financial bottlenecks for firms, they were polled on their available liquidity reserves in February 2021. Firms were asked to estimate for how long a period they would continue to have sufficient liquidity before having to discontinue or abandon their business activities. It is apparent that difficulties in accessing credit and available liquidity reserves can influence each other. One-quarter of respondents stated that they generally have sufficient liquidity. In February 2021, 36% (38%) of firms were facing a liquidity bottleneck within the next two months (in three to twelve months). Comparing the available liquidity reserves under this classification in Feb-

Connection between liquidity bottlenecks and difficulties in accessing credit

Use of public support measures in selected sectors and potential cliff effects in February 2021



Source: Bundesbank Online Panel Firms (BOP-F), survey period: January-February 2021.
 Deutsche Bundesbank

February 2021 with the results of the loan negotiations conducted in the fourth quarter of 2020 paints the following picture (see the upper chart on p. 44): firms that, according to their own assessment in February 2021, were facing liquidity shortfalls in March and April 2021 had much worse outcomes in their loan negotiations in the fourth quarter of 2020. 27% of the loan applications of these firms were approved as applied for, while the share of loan negotiations that concluded with no deal stood at 36%. By contrast, 67% of the firms that generally had sufficient liquidity in February 2021 received approval for their loan applications at the desired conditions in the fourth quarter of 2020 and 10% concluded without a deal.

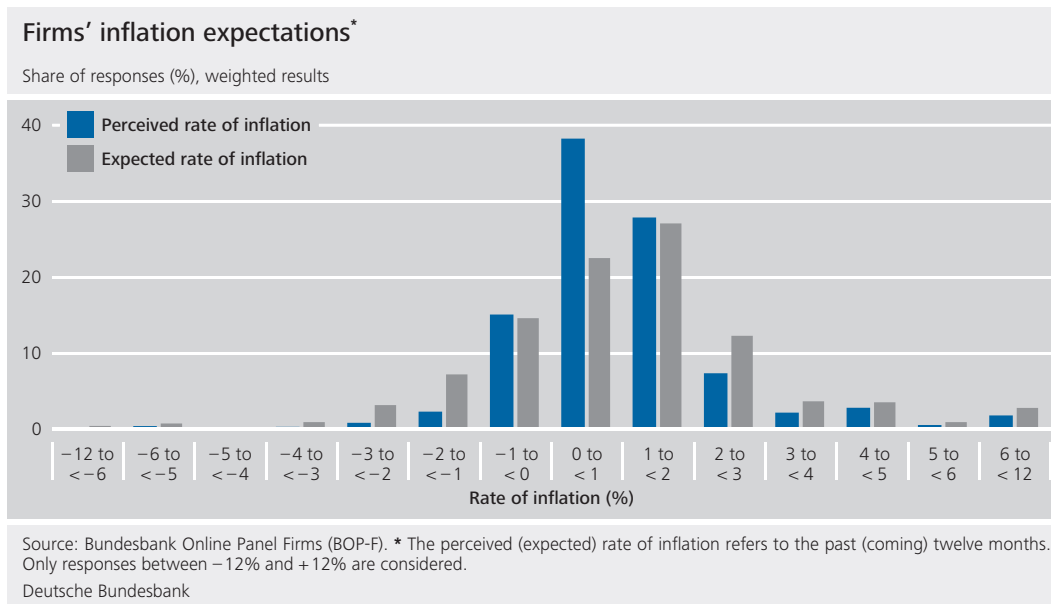
these support measures. Just under half of the firms surveyed indicated that they had made use of short-time working benefits during the pandemic (see the chart at the bottom of p. 44). Around 40% of firms were able to benefit from the emergency aid paid out at the onset of the pandemic. Tax deferral options (24%), the KfW special programme (12%), grants under bridging aid packages (12%) and the November-December aid (10%) saw lower uptake, whereas the guarantee programmes via guarantee banks and government equity interests were barely used at all. Furthermore, at the time of the survey in February 2021, the number of applications still pending for both bridging aid and the November-December aid was relatively high and the rejection rate was higher still.

Short-time working benefits most frequently used public support measure

In order to shield the business sector as far as possible from both the fallout from the pandemic and the impact of the measures taken to contain it, the government initiated various support measures. In the fourth wave of the survey, firms were asked about their use of

A breakdown by sector shows the extent to which each sector requested support from the government. Applications for such measures from firms in the hotel and restaurant

Firms in hotel and restaurant sector chiefly reliant on support



were particularly high (see the chart on p. 45): the corresponding shares of responses totalled around 80% for bridging aid, November-December aid and short-time working benefits. By contrast, demand for loans via the KfW special programme was lower but still amounted to 36% for firms in this sector.

An abrupt discontinuation of public support measures could potentially result in cliff effects. The February 2021 survey thus asked firms that had taken up the corresponding measures how well they would be able to cope if these were to be discontinued at the end of the month. In the hotel and restaurant sector, 80% of the firms using bridging aid, November-December aid and short-time working benefits stated that they would have difficulties if the programme in question were to be discontinued (see the chart on p. 45).

■ Firms' inflation expectations

Inflation expectations play a key role in economic decisions. Just as the expected rate of inflation is a central factor in individuals' and households' consumption-savings decisions,¹⁹ in the business sector it impacts on investment decisions as well as wage and price setting.²⁰ Information about inflation expectations is

therefore required in order to understand and forecast economic behaviour as well as to effectively influence it using targeted communication. Measuring inflation expectations is thus of particular importance for monetary policy.²¹

The VAT cut in the second half of 2020 presented a suitable opportunity to analyse inflation expectations, in particular to investigate the extent to which economic measures prompted firms to adjust their prices (see also the box on pp. 47 ff.).

Despite the relevance of the business sector's inflation expectations, most of the existing surveys on inflation expectations still focus on individuals or professional forecasters. This is be-

Lack of information on business sector's inflation expectations

Information about inflation expectations required to understand, forecast and effectively influence economic behaviour

¹⁹ See, for example, Vellekoop and Wiederholt (2019) as well as Andrade et al. (2020). These authors come to the conclusion that households with higher inflation expectations save less.

²⁰ Coibion et al. (2020b) present an interesting study in this regard that is also based on survey data. The experiment, based on Banca d'Italia's panel of firms, examines the impact of an exogenous increase in the expected rate of inflation. The authors find that higher inflation expectations lead firms to raise their prices, increase demand for credit and reduce employment. Furthermore, Grasso and Ropele (2018) identify a positive correlation between the amount of expected inflation and firms' willingness to invest.

²¹ See Coibion et al. (2020a) for an analysis of the question as to whether central banks could use the rate of inflation expected by economic agents as an explicit tool to control inflation.

Firms' price adjustments over the course of the temporary VAT cut in 2020

In June 2020, as part of its package of economic stimulus and crisis management measures, the Federal Government decided to lower the standard VAT rate ("turnover tax rate" according to tax law) from 19% to 16% and the reduced VAT rate from 7% to 5% for the period from 1 July 2020 to 31 December 2020.¹ Above all, the measure aimed to boost private consumption and strengthen the German economy.² A temporary VAT cut such as this can only have a positive demand effect if firms tend to lower their prices in response to the tax cut and customers expect that firms will tend to raise their prices following the reversal of the VAT cut. Whether, and to what extent, the reduction in VAT rates was actually passed on to consumers is an empirical question. Existing studies on the pass-through of the recent temporary VAT cut in Germany focus mainly on analysing individual firms or products.³ In addition, the impact on the Harmonised Index of Consumer Prices (HICP) was estimated using a disaggregated approach.⁴ To gain deeper insights into the price-setting behaviour of the German corporate sector beyond that, the Bundesbank asked firms, in the context of its Bundesbank Online Panel Firms, about the

price adjustments made over the course of the temporary VAT cut and the reasons behind them.

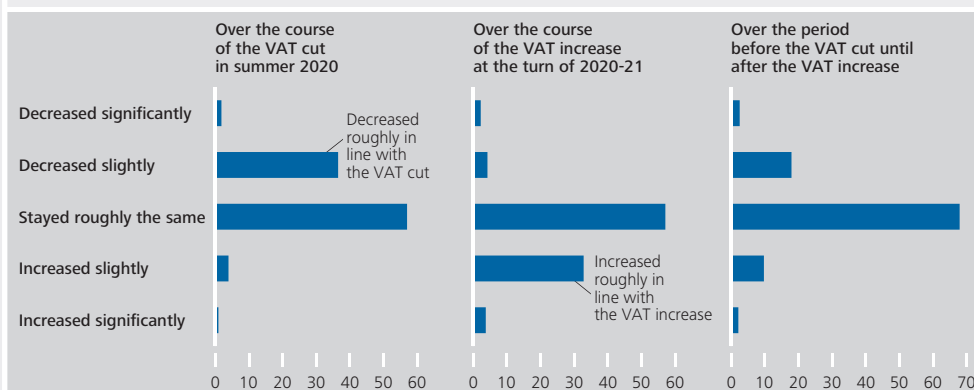
The Bundesbank's survey of firms covers all economic sectors and categories of goods. In terms of the evaluations relating to the temporary VAT change, this means that not only are prices of transactions between firms and households captured, but also those for business-to-business sales.

The survey results show that just over one-third of the firms lowered their prices (on average across all products or services) roughly in line with the VAT cut in July 2020

¹ The reduced tax rate applies in the special cases listed in Section 12(2) of the Turnover Tax Act (*Umsatzsteuergesetz*), which includes goods for everyday use.
² See the second Coronavirus Tax Assistance Act, Drucksache 19/20058, Deutscher Bundestag.
³ See Fuest et al. (2020) and Montag et al. (2020). For studies on (temporary) VAT adjustments in other countries, see also Blundell (2009), Crossley et al. (2009), Pike et al. (2009), Crossley et al. (2014), Benedek et al. (2020) and Benzarti et al. (2020).
⁴ See Deutsche Bundesbank (2020a).

Firms' price adjustments over the course of the temporary VAT cut in 2020*

Share of responses (%), weighted results



Source: Bundesbank Online Panel Firms (BOP-F), survey period: January-February 2021. * Gross prices (i.e. prices including VAT) on average across all of the enterprise's products or services and across all of its customers (including other enterprises).
 Deutsche Bundesbank

Most important reasons for price adjustments in July 2020

Share of responses (%), weighted results

Prices lowered in line with the VAT cut

We assumed our customers would expect this.

Our buyers are entitled to input tax deductions and would experience a loss otherwise.

We expected our competitors to do the same.

Prices left unchanged despite the VAT cut

Costs would be disproportionate given the short validity of the tax cut.

Too much profit lost as a result of the coronavirus pandemic to pass on the reduction.

Prices reviewed and left unchanged on balance.

Planned to raise prices before the tax cut and left them unchanged on balance.

The price that would correspond to the tax cut would have been too "odd".

0 10 20 30 40 50 60

Source: Bundesbank Online Panel Firms (BOP-F), survey period: August-September 2020.

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or shortly beforehand.⁵ By contrast, more than half of the firms kept their prices roughly the same, according to the survey results. Moreover, 5% of the firms responded that they had increased their prices despite the VAT cut. As a result, many firms did not pass on the lower tax rate to their customers.

Information on firms' motives can point to the factors that played a role in their price-setting behaviour. For firms whose price reduction matched the VAT cut exactly, the most important reason was to meet customer expectations (60%). In addition, some firms indicated that their buyers entitled to input tax deductions would experience a loss otherwise (36%). Another important reason given was competitors reducing their prices (30%).

Among firms that left their prices unchanged, many felt that the organisational effort was too great given the short period

of time in which the VAT cut would apply (42%). Furthermore, some firms apparently used the VAT cut to improve their profits which had contracted sharply during the coronavirus crisis (25%). Some also reported that they had reviewed their prices in response to the tax cut and ultimately left them unchanged (24%).

Further information from the Bundesbank's business survey supports the hypothesis that suffering a particularly sharp decline in sales due to the coronavirus pandemic played at least a partial role in the VAT cut not being passed on to the full extent. For example, a disproportionately large number of firms in the hotels and restaurants sector, which was hit especially hard by the crisis or the contain-

⁵ The data refer to all the firms that responded to the relevant questions on price changes. Firms whose products or services are exempt from VAT, whose prices are set (e.g. fixed book prices, official fee scale), or which did not conduct any new transactions in July or shortly beforehand are excluded.

ment measures, reported having left their prices unchanged. Additionally, a larger share of the respondents that had made no price adjustments reported sharp declines in production due to the coronavirus pandemic, staff in short-time work and deferred payment obligations. Thus, motives related to ensuring liquidity are likely to have also played a role in the incomplete pass-through.⁶

The VAT rates returned to their original levels as from 1 January 2021. The survey results for firms' price adjustments after the VAT change was rolled back resemble those after the VAT cut in July 2020. Roughly one-third of the firms raised their prices in line with the tax increase, according to the data they provided. More than half of the firms left their prices unchanged after the measure was reversed. At the same time, around one-quarter of the firms adjusted their prices in January 2021 across all response categories in a way that did not mirror the changes in July 2020, which could be down to changed demand or different costs. Prices decreased on balance for around one-fifth of firms over the period of the two VAT changes, while ultimately increasing for just one-tenth of them. Unlike in other countries which had previously lowered their VAT rates for a temporary period, the present survey results provide no indication that firms in Germany increased their prices even before the tax rates were raised again.⁷

The results of the present business survey cannot be translated directly to the HICP. The reasons for this are twofold: first, the results include firms which do not produce consumer goods. Second, the data do not contain detailed information on the various categories of consumption (according to the Classification of Individual Consumption by Purpose, or COICOP) of the relevant goods and services of firms; these would allow the results to be aggregated with the corresponding HICP weights. According to a regression-based disaggregated ap-

proach, around two-thirds of the VAT cut in July 2020 was passed on to consumers, though there were major differences between the goods and services included in the HICP.⁸ While pass-through was arguably almost complete for goods and the price reduction for some food products and industrial goods even exceeded the VAT cut, it was rather moderate for services.

An analysis of the pass-through of the increase in VAT rates in January 2021 using the same regression-based approach shows that it appears to have occurred more or less symmetrically. This applies to both headline HICP and the categories of goods and services it contains.⁹ This approach also shows that prices were raised again as early as December 2020 only in rare cases. By contrast, it seems a number of VAT-related price increases for food products and industrial goods were not made until February 2021. This may be partly because it was not possible to collect prices for some goods in January 2021 due to the restrictive measures put in place by government.

To summarise, it can be noted – both from the results of the survey of firms and the analyses conducted using disaggregated HICP data – that the temporary VAT cut was reflected less strongly in prices than would have been expected in the case of a full pass-through. Both analyses also indicate that the price adjustments made in July 2020 and January 2021 largely cancelled each other out, which implies that the temporary VAT cut has no long-lasting impact on the aggregate price level.

⁶ See also Gilchrist et al. (2017). For an alternative perspective, see Kim (2021).

⁷ See, for example, Pike et al. (2009) for the temporary reduction in VAT in the United Kingdom.

⁸ See Deutsche Bundesbank (2020a).

⁹ At the same time, it makes no difference that the VAT cut was extended for food and beverage service activities to the end of 2022, because this analytical approach, too, reveals that the VAT cut was barely passed on to consumers. Moreover, at 3%, this component makes up a fairly small share of headline HICP.

Overview of surveys of firms' inflation expectations

Survey, institution and starting year	Methodology, survey frequency and sample	Development of inflation expectations last year
NPB Quick Monitoring Survey, Narodowy Bank Polski, since 1997	Qualitative question on expected development of inflation in the coming twelve months; quarterly survey of around 2,000 firms	Over the course of the coronavirus pandemic, the index value of the qualitative inflation expectations fell from 58.9 in Q4 2019 to 47.9 in Q3 2020; it then rose to 51.2 in Q4 2020
Business Outlook Survey, Bank of Canada, since 1997	Quantitative question on expected development of inflation in the coming two years; quarterly survey of around 100 firms	Sharp drop in inflation expectations as at Q2 2020, whereby 25% of respondents expected inflation to be <1%; expectations stabilised slightly again in Q3 2020 and Q4 2020; inflation expectations clearly up again in Q1 2021, with the number of respondents expecting inflation to be 2% or more rising from 29% in Q4 2020 to 55% in Q1 2021
Survey on Inflation and Growth Expectations, Banca d'Italia, since 1999	Quantitative question on expected development of inflation over various periods (six months, one year, two years and on average in three to five years); quarterly survey of around 1,000 firms	Expected rate of inflation for the next twelve months remained constant between 0.5% and 1% between Q4 2019 and Q3 2020, but declined to close to 0% as at Q4 2020; rate of inflation also expected to be <1% for longer periods; inflation expectations for the coming twelve months stabilised again at 0.8% in Q1 2021
Survey of Professional Forecasters, European Central Bank, since 1999	Quantitative questions (point estimates and probabilistic estimates) on rate of inflation in current calendar year as well as in coming calendar years; quarterly survey of experts from (the finance) industry; 66 respondents in survey conducted in Q4 2020	In Q1 2021, inflation expectations stood at 0.9% for 2021, 1.3% for 2022 and 1.5% for 2023 and are thus the same as the expectations recorded in Q4 2020 for the years in question; a rate of 1.7% is expected for 2025
Business Inflation Expectations, Federal Reserve Bank of Atlanta, since 2011	Point estimate of future inflation for an expectations horizon of one year; monthly survey of around 300 firms	With the outbreak of the coronavirus pandemic, the expected rate of inflation fell from 1.9% in March 2020 to 1.4% in April 2020; expectations have since recovered and stood at 2.4% in March 2021
Decision Maker Panel, Bank of England, since 2016	Quantitative questions (point estimates and probabilistic estimates) on expected change in own prices over the next year; quarterly survey of around 3,000 firms	As the coronavirus progresses, the expected rates of price increase have risen continually from 1.5% in Q2 2020 to 2.0% in Q3 2020 and 2.5% in Q4 2020
Bundesbank Online Panel Firms, Deutsche Bundesbank, since 2020	Quantitative questions (point estimates and probabilistic estimates) on rate of inflation over the coming twelve months; between 9,000 and 16,000 firms for each survey wave	To date only one survey on inflation in October-November 2020; on average (median), firms expected a rate of inflation of 1.5% (1.5%) for the next twelve months

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cause it is easier to collect their expectations than to survey firms – be it on inflation expectations or other important issues – as this requires a great deal more time and effort.²² As it is just as important for central banks to have information about firms' inflation expectations,²³ the Bundesbank regularly collects this information in the BOP-F.²⁴

Existing surveys on firms' inflation expectations

The Bundesbank's activities to measure firms' inflation expectations join existing corporate surveys conducted by other central banks. However, the surveys differ somewhat, as is shown in the table above.

²² See Coibion et al. (2020b). The BOP-F thus generates data that cannot be simply extracted from the results of other surveys.

²³ In addition, the results from the BOP-F are not just of use to the Bundesbank but, thanks to comparability with data from other countries, can be used by the entire Euro-system. This enables heterogeneities in inflation expectations in the European business sector to be identified more readily. The Polish and Italian central banks, for instance, also conduct regular surveys of firms' inflation expectations.

²⁴ As a significant share of firms regularly participate in the survey, the data generated are also suitable for longitudinal studies.

Results of the Bundesbank Online Panel Firms on inflation expectations

Firms do not expect inflation to rise over one-year horizon

The first survey of firms' assessments of the perceived rate of inflation over the past twelve months as well as of the expected rate of inflation for the coming twelve months was conducted in October-November 2020.²⁵ The chart on p. 46 shows the rates of inflation expected by firms, whereby their point estimates²⁶ have been grouped in intervals. The data show that, over a one-year horizon, firms do not expect inflation to rise in relation to the estimated rate of inflation over the past twelve months; on average, firms assume that inflation stood at 1.5% over the past twelve months and forecast that it will stay at 1.5% for the coming twelve months.²⁷ The expectations are therefore on a par with the results from other surveys presented in the overview on p. 50. In addition, the fact that the realised inflation rate estimated by firms is identical to the expected inflation rate indicates that firms' inflation expectations are firmly anchored despite the economic downturn. The Bundesbank Online Panel Households (BOP-HH) arrived at similar results. In both the BOP-F and the BOP-HH, the heterogeneity²⁸ of inflation expectations relating to the past twelve months is lower than the heterogeneity of inflation expectations relating to the expectations horizon for the coming twelve months (for more information, see the box on pp. 52 ff.).

Outlook

The first four survey waves of the BOP-F, conducted between June 2020 and February 2021, have demonstrated that surveying firms directly

generates valuable information for the Bundesbank enabling it to carry out its core tasks, such as safeguarding monetary and financial stability. The rapid availability of the data and the fact that they can be tailored to meet the Bundesbank's needs make the survey particularly useful. In light of these findings, the Bundesbank will continue to use the BOP-F to survey firms on relevant topics. Going forward, it plans to conduct the survey at monthly intervals. After having made permanent improvements to the available information on households' assessments and expectations, the Bundesbank will now do the same for firms.

The data and findings obtained will be made public. The results of the Bundesbank's internet-based BOP-HH and BOP-F will be published on the Research Centre's internet portal. In addition to findings from the surveys, the portal also contains explanatory videos and notes, background information, working and discussion papers prepared using the data as well as notes on using the anonymised micro-data for research purposes.²⁹

Initial results of survey of firms prove very useful for Bundesbank

²⁵ Inflation expectations were not surveyed in the first two waves in June-July 2020 and August-September 2020 because questions relating to the real economy, in particular production and business activities, and to firms' financing situation were considered more pressing.

²⁶ Point estimates on the expected rate of inflation were collected in two stages. Participants were initially asked: "Do you expect there to be inflation or deflation in Germany over the next twelve months?" They were then asked for a precise figure: "Roughly what do you expect the rate of inflation/deflation in Germany to be over the next twelve months?"

²⁷ In line with the literature, for example, van der Klaauw et al. (2008), only responses between -12% and +12% were considered when assessing inflation expectations. For more information on the median and the standard deviation of inflation expectations, see the table on p. 53.

²⁸ Heterogeneity measured as standard deviation.

²⁹ Researchers can access the data via the Bundesbank's Research Data and Service Centre (RDSC).

A comparison of the inflation estimates of firms and households

In both of the Bundesbank's online surveys, Bundesbank Online Panel Firms (BOP-F) and Bundesbank Online Panel Households (BOP-HH), firms and households answered identical questions on inflation expectations. This allows a direct comparison which is shown in the chart below, depicting the perceived inflation rate of the past twelve months and the expected inflation rate for the next twelve months.¹ In both cases, firms tend to assume a lower level of inflation (see the table on p. 53). Furthermore, the standard deviation of individual estimates is lower for firms than for households. Firms' estimates are thus more similar to one another than household estimates.

It is worth looking at the disparity between the inflation estimates of firms and households more closely. Generally, it can be seen

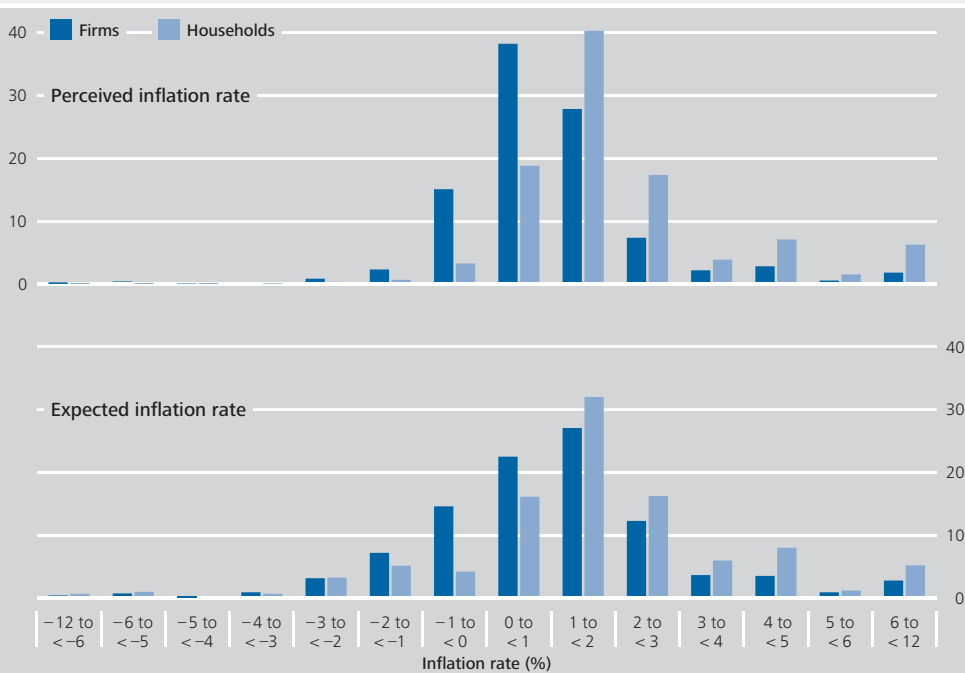
that the inflation estimates of firms are more accurate. First, firms' estimates of the actual inflation rate over the past twelve months are closer to the inflation rate actually realised² (although firms did overestimate this as well). Second, the estimate of the future inflation rate over the next twelve months is nearer to the average estimates

¹ The inflation estimates of firms were surveyed in October and November 2020. The survey period for households is slightly different owing to the structure of the surveys: households' perceived inflation rate was surveyed in September 2020, while their expected inflation rate was surveyed in October 2020.

² In October and November 2020, the Federal Statistical Office indicated that the actual inflation rate over the past twelve months stood at -0.2% and -0.3% respectively (consumer price index) or -0.5% and -0.7% respectively (Harmonised Index of Consumer Prices).

Inflation estimates of firms and households*

Share of responses (%), weighted results



Sources: Bundesbank Online Panel Firms (BOP-F) and Bundesbank Online Panel Households (BOP-HH). * The perceived (expected) inflation rate refers to the past (next) twelve months. Only responses between -12% and +12% are taken into account.
 Deutsche Bundesbank

of professional forecasters.³ Third, the heterogeneity of firms' estimates, measured by the standard deviation of all individual estimates, is lower than for households.

A similar pattern can be observed when the estimates of respondents in the BOP-HH are differentiated by income and level of education. The adjacent chart shows the expected inflation rates over a period of twelve months surveyed in the BOP-HH, and it illustrates that respondents with a higher level of education and with a higher income expect a lower inflation rate.⁴ This implies that the disparity between the estimates in the BOP-F and the BOP-HH might be explained by the fact that the respondents in the BOP-F represent a specific cross-section of the overall population surveyed in the BOP-HH. When surveyed for the first time, each firm in the BOP-F is asked about the area of the enterprise that the respondent works in and which job title best describes their role. It became evident that in each of the four waves almost 90% of the respondents were working in the "Management board" area and that in all four waves almost 90% of the respondents chose "Owner/executive director/member of the management board/holder of a general commercial power of attorney" as their job title. This suggests that the respondents in the BOP-F represent a cross-section of the overall population with potentially above average incomes and above average levels of education. If this is the case, the fact that

³ For example, the experts in the (financial) industry that responded to the European Central Bank's Survey of Professional Forecasters in the fourth quarter of 2020 predicted an inflation rate of 0.3% for 2020 and 0.9% for 2021.

⁴ This also applies to the estimates of the actual inflation rate over the past months that were surveyed in September 2020: households with lower levels of education or lower incomes assume a higher actual inflation rate. In addition, the standard deviation of the inflation estimates of households with a higher level of education or higher income is lower in each case.

Inflation estimates of firms and households

% , weighted results

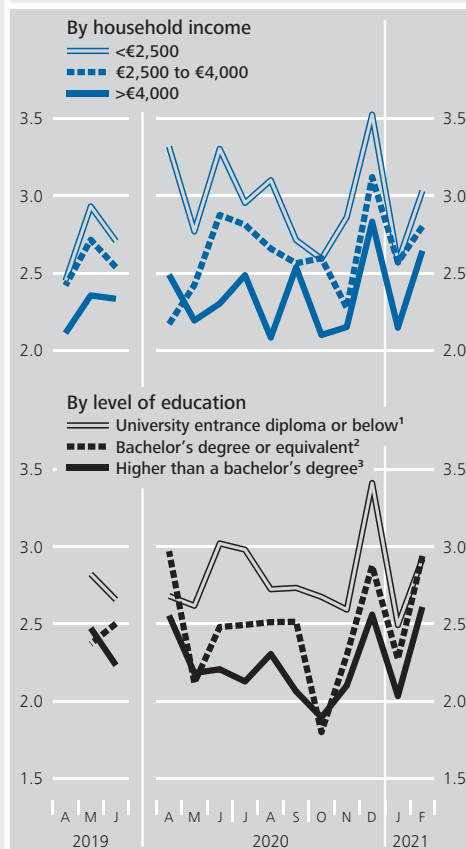
Item	Mean	Median	Standard deviation
Perceived inflation rate			
Firms	1.5	1.0	2.1
Households	2.7	2.0	2.5
Expected inflation rate			
Firms	1.5	1.5	2.6
Households	2.4	2.0	3.0

Sources: Bundesbank Online Panel Firms (BOP-F) and Bundesbank Online Panel Households (BOP-HH). Survey period for firms: October-November 2020. Survey period for households: September-October 2020.

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Average household expectations of the inflation rate*

% , weighted results

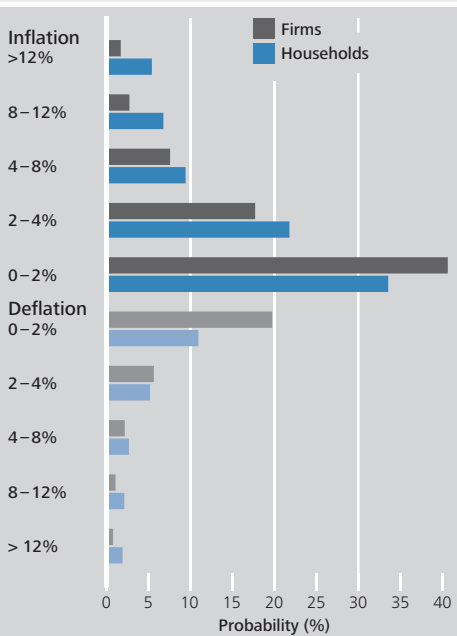


Source: Bundesbank Online Panel Households (BOP-HH). * The inflation expectations refer to the next twelve months. Only responses between -12% and +12% are taken into account. ¹ Individuals without a school-leaving certificate, school students and professional qualifications. ² Completed training at a university of cooperative education and bachelor's degree. ³ Diploma, master's degree, state examination and doctorate.

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Probabilistic inflation expectations

Weighted results



Sources: Bundesbank Online Panel Firms (BOP-F) and Bundesbank Online Panel Households (BOP-HH), question: "In your opinion, how likely is it that the rate of inflation will change as follows over the next twelve months?".

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the panel on firms was largely answered by people with a higher income and level of education than the average member of the public may explain the differences revealed between households and firms.

As the above-described survey of expectations as a point estimate is less nuanced, alternative methods have been developed that provide more information at the level of the individual participant. For instance, another established method of measuring inflation estimates is the elicitation of probabilistic expectations (Manski (2004)). In this approach, various intervals are specified and respondents state how likely they think it is that the future inflation rate will fall within the respective interval.⁵ This type of expectation measurement was used for both firms and households in the Bundesbank's online surveys and the results are compared below.

The adjacent chart shows that the interval that includes expected inflation rates between 0% and 2% accounts for the largest probability mass for both firms and households. The remaining probability mass is spread symmetrically across the other intervals, with the tail ends being rated as more unlikely. Comparing the estimates of firms and households allows two conclusions to be drawn that are consistent with the results of the point estimates in the chart on p. 52. First, households expect a higher inflation rate than firms, since a greater probability mass is assigned to inflation scenarios in each case (and less to scenarios involving deflation). Second, it can be seen that the distribution of the probability mass is flatter for households. Probabilistic expectations thus corroborate the finding that households are more uncertain than firms in probabilistic estimates, too.

⁵ Specifically, the participants were asked to distribute points amongst each of the scenarios, with 0 meaning completely unlikely and 100 absolutely certain. Collecting probabilistic values for individual intervals makes it possible, for example, to measure the uncertainty of the inflation expectation at the individual level. This method of determining probabilistic inflation expectations has become established in the literature; see, for example, Manski (2018) or Potter et al. (2017).

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