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Corporate credit conditions during the COVID-19 crisis in Belgium

by I. Samarin, M.D. Zachary

National Bank OF BELGIUM
Eurosystem

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I. Samarin
M.D. Zachary*

Introduction

The COVID-19 pandemic led to an economic crisis that had even a stronger negative impact on Belgium's GDP growth in 2020 than the financial crisis of 2008-2009 or the ensuing sovereign debt crisis. From experience, we know that banks tend to respond to a crisis by curbing credit supply to the real economy. But a credit crunch and tightening of credit conditions might become an impediment to sustaining business activities during the crisis and for the economic recovery afterwards.

However, the COVID crisis is very different from the preceding crises in its causes and consequences. Unlike before, the financial sector was healthier and stronger than ever when the pandemic started. During the COVID crisis, a large number of businesses were forced to either temporarily cease trading or significantly scale down their activities due to the actions taken by the government to prevent an uncontrollable spread of the virus and the collapse of the healthcare system. On top of that, unprecedented monetary, prudential, and fiscal measures were introduced to mitigate the detrimental impact of the pandemic and prevent deep scarring of the economy.

The Belgian corporate sector relies heavily on bank credit, which makes it vital to ensure access to finance during the crisis. And given the specific nature of the COVID crisis, it is important to monitor and study how access to finance and credit conditions evolved during the crisis. Therefore, the main goal of this article is to analyse the developments in corporate bank lending conditions before and during the pandemic.

Banks' response to all these crises has been heterogeneous according to the characteristics of different groups of borrowers and it is important to explore different dimensions of heterogeneity. For example, during the 2008-2009 financial crisis, liquidity shortages made banks tighten credit supply to firms. But small and medium firms (SMEs) were disproportionally affected and experienced an even more palpable credit crunch as abundant evidence suggests (e.g. Iyer *et al.*, 2014; Ongena, Peydró, van Horen, 2015; Liberti and Sturgess, 2018). SMEs tend to be more opaque and have limited access to alternative sources of funding and therefore, a credit crunch during an economic turmoil can be detrimental to this group of companies. For this reason, firm size becomes a natural first dimension of heterogeneity to explore in this article. Specifically, the objective of the analysis is to investigate whether SMEs experienced a significantly stronger change in credit conditions relative to large firms.

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More importantly, the COVID crisis disproportionally affected certain sectors (see Tielens, Piette, De Jonghe, 2021; Dhyne and Duprez, 2021, for further discussion) that had to limit their activities due to the restrictive measures. Therefore, the second attribute that this article focuses on is the sectoral heterogeneity of developments in corporate credit conditions during the COVID crisis. More specifically, the article compares changes in credit conditions across three groups of sectors based on the extent to which they were affected by the crisis.

Despite the variety of available data sources and indicators that help to track down changes in credit conditions, the task of reconciling the findings stemming from those data sources is not trivial. This article synthesises various qualitative survey data recorded in the NBB quarterly study of corporate credit conditions, the ECB's bank lending survey (BLS) and the survey on the access to finance of enterprises (SAFE) with granular loan-level data drawn from the new Belgian Corporate Credit Register. Qualitative data back up the quantitative analysis and enable a better understanding of demand and supply-side factors that might explain changes in borrowing conditions.

The article is arranged as follows. The first chapter discusses the differences between the COVID crisis and the preceding financial crises. It focuses in particular on the impact of the State interventions, the health of the Belgian financial sector, and the support measures introduced at European and Belgian levels to mitigate the impact of the crisis. The second chapter takes a first look at developments in corporate credit conditions. The same chapter further addresses the question of heterogeneity in changing credit conditions across different size groups and various economic sectors and presents the findings of the microeconometric analysis. The third chapter provides more insight into the mechanisms affecting lending conditions by looking into both demand- and supply-side developments. The last chapter concludes.

1. COVID-19 crisis: why it is different

The COVID-19 pandemic led to an economic crisis that had even a stronger negative impact on Belgium's GDP growth than the 2008-2009 financial crisis or the subsequent sovereign debt crisis. However, the nature of the COVID-induced crisis and the state of the real economy and financial sectors in Belgium differ considerably from those back in 2008. This chapter sheds some light on the difference between the COVID crisis and the preceding crises and explains how these differences might drive the heterogeneous response in corporate credit conditions set by banks.

1.1 Economic activity was impeded mostly by the policy responses

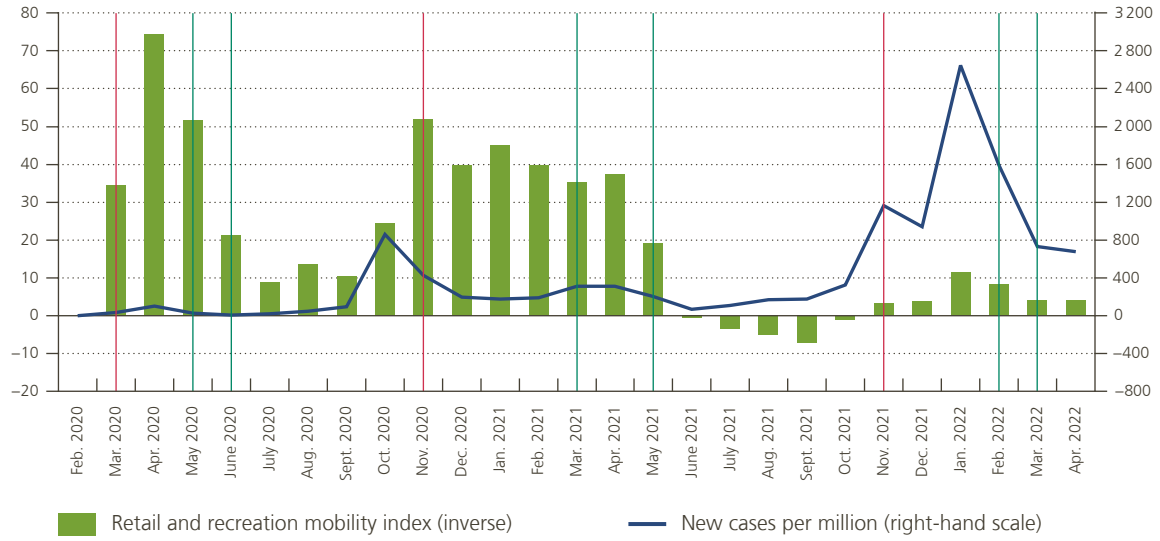
Unlike the previous crises when economic activity was impeded by disruptions in the interbank market and resulting deterioration of banks' access to funding[1], the COVID crisis was mainly caused by government interventions to curb the spread of the virus and prevent the healthcare system from collapsing.

The undertaken measures culminated in several "lockdowns", with the first one announced in March 2020. The lockdowns included three main elements[2]. First, an almost complete shut-down of certain economic activities. For example, all recreational activities and events (e.g. sports, museums, festivals) were suspended. The hospitality sector (hotels, restaurants) was forced to almost completely shut down, with only take-away services being permitted. Non-medical contact professionals (e.g. hairdressers, beauty salons, massage therapists) were no longer allowed to receive clients. Non-essential shops had to close their doors and could only

1 For more details regarding the impact of the financial crisis on credit conditions to firms, see Piette and Zachary (2015).
2 Except for the third, "soft" lockdown announced in November 2021.

Chart 1

COVID-19 cases and mobility index



Source: Google, Our World in Data.

Note: The mobility index and new COVID cases are computed as the monthly average of daily values. Vertical red (green) lines indicate the beginning (easing) of a lockdown. The Google mobility measure is reversed so that a larger positive value in the plot should be interpreted as a larger decrease in mobility, while a negative value means an increase in mobility relative to the pre-pandemic period.

operate online. Relatedly, travel and free movement were severely restricted. Second, working from home became mandatory unless impossible. Education activities also switched to the online mode. Finally, a social distancing mandate was introduced, requiring keeping a 1.5 m distance, which restricted the capacity of many businesses.

To visually inspect the impact of the pandemic on business activity, chart 1 presents the relationship between the number of positive COVID-19 cases in Belgium and the Google mobility index for retail and recreation. It also marks the months when the lockdowns were introduced and eased or lifted. The Google mobility index uses Google data to measure the number of visitors in certain areas in comparison with the 'normal' period from 3 January to 6 February 2020. The Google mobility index is correlated with traditional economic activities' indicators (e.g. Sampi J. and C. Jooste, 2020, use the index to nowcast industrial production), but it is available at a higher frequency than, for example, the GDP. We select the retail and recreation component of the index[1] as it has been more directly affected by the lockdown measures and its dynamic is correlated with the changes recorded in the PMI[2] surveys (Rharrab, 2020).

As intended by the State interventions, restrictions and lockdowns had a strong and negative impact on mobility and, therefore, on business activity too. April 2020 and November 2020 exhibit the largest drop in the mobility index followed by the announcement of the first and second strict lockdowns. As businesses in many industries were forced to close their doors, mobility dropped enormously compared to the "normal" period. On the other hand, when the restrictions were gradually lifted (May-June 2020 and March-May 2021), mobility was revived. Interestingly, the increase in mobility was much more prominent after the second lockdown in 2021 than after the first lockdown in 2020. In 2021, mobility even exceeded the pre-pandemic level, while that was not the case after the first lockdown. The stronger increase in mobility might be explained by the fact that the second

1 Which shows the change in visits to places like restaurants, cafes, shopping centers, theme parks, museums, libraries, and cinemas.

2 Purchasing Managers' Indices: economic indicators derived from monthly surveys of private sector companies.

lockdown was just as strict but lasted significantly longer than the first lockdown resulting in a stronger mechanic rebound in activity once the measures were lifted. Additionally, the vaccine roll-out in the spring and summer of 2021 also contributed to greater mobility.

Importantly, the chart shows only a limited impact of the pandemic and the restrictions on mobility during the third lockdown announced in November 2021. Despite the unprecedented number of new cases of coronavirus, mobility remained at a higher level than even in the post-lockdown summer of 2020. The third lockdown was not as strict as the previous two and allowed most sectors to remain open but operate with restrictions to limit the spread of the virus. While working from home was made mandatory, many businesses must have adapted their operations to the new way of working, thus, not being as negatively affected by the homework mandate as before. Additionally, the roll-out of the booster shots and the "milder" nature of the Omicron variant contributed to the positive business outlook and sustained business activity.

To sum up, the pandemic-induced drop in business activity was originally driven by the government restrictions. This led to the suspension of activities in many economic sectors while aiming to contain the COVID-19 virus and prevent the collapse of the healthcare sector. The Google mobility data shows the impact of the State interventions during the first two lockdowns. The third lockdown, however, affected business activities only moderately. These observations emphasise the difference between the COVID crisis and the 2008-2009 financial crisis, where the latter was triggered by the crunch in the financial sector and resulted in severe and long-lasting deterioration of the corporate credit conditions (Piette and Zachary, 2015).

1.2 The economic impact of the pandemic varied widely across economic sectors

As mentioned in the previous section, the Belgian State interventions had a strong negative impact on business activity. Importantly, the impact of the measures was highly unequally distributed across economic sectors. While certain measures directly hindered sectors such as hospitality or entertainment by mandating businesses to shut their doors, many other sectors were also impacted by, for example, the working from home requirement, which put many businesses at a disadvantage if they did not have the infrastructure or business processes in place to enable most or all of their employees to work from home. Besides, other sectors might feel the consequences of the drop in demand, shortages within their supply chain, or simply the reduction in their production capacity due to the virus spreading among their staff. To examine the impact of the pandemic on Belgian firms across different economic sectors, we follow the approach of Tielens, Piette, De Jonghe (2021) and Dhyne and Duprez (2021), who use the turnover figures reported in VAT returns to show how strongly the pandemic hit more vulnerable sectors.

Most sectors (chart 2) exhibited a significant drop in turnover growth in the second quarter of 2020, which was the result of the first lockdown when many activities were restricted. The extent of the drop varies widely across sectors and is especially prominent in the hospitality sector (NACE I), arts and recreation (R), and other services (S), which cover a lot of contact businesses, such as hairdressing salons, which were forced to close. The interquartile range is very wide, suggesting that the response to the crisis was highly heterogeneous within the sector.

Importantly, the figures show that most sectors exhibited higher growth in 2021 than in 2019, especially after the second quarter of the year when the most restrictive measures were lifted. Sectors I, R, S are the exceptions as they were still the main victims of the pandemic until the second half of 2021. In most sectors, the impact of the third, softer, lockdown was very limited (the last quarter of 2021).

Chart 2

Turnover growth per economic sector

(% ; solid blue line = median value, dotted red lines = interquartile range)

Chart 2 (continued)

Turnover growth per economic sector

(% ; solid blue line = median value, dotted red lines = interquartile range)

Source: Federal Public Service Finance (VAT declarations) and own calculations.

Note: Sectors are defined by the higher level of the NACE classification (1 digit). The series are computed using a universe of firms filing VAT returns monthly or quarterly.

Own calculations: Turnover growth in the years 2020 and 2021 is computed relative to the same quarter of 2019. In 2021, this mitigates the impact of the large drop in business activity in 2020, which resulted in abnormal growth in 2021. Turnover growth in 2019 is computed relative to the same quarter of 2018.

1.3 The financial sector was resilient and robust before the pandemic

The 2008-2009 financial crisis and the ensuing sovereign debt crisis first hit the financial sector and then propagated to the real economy. Yet, as Andrea Enria said: "Unlike in the 2008 financial crisis, banks are not the source of the problem this time". Even more importantly, the European financial sector was significantly more resilient and prepared to withstand a painful economic shock when the pandemic began. One of the key factors that ensured the robustness of the financial sector was the implementation of the Basel III framework

and rigorous micro- and macroprudential supervision that tackled important vulnerabilities of the financial sector. This section briefly discusses the most relevant aspects of the prudential regulation that contributed to better financial stability.

Stronger capital positions. The quality and the level of high-quality capital is the first pillar of the Basel III framework and it aims to ensure sufficient solvency and loss-absorbing capacity of banks. The minimum common equity tier 1 (CET1, the highest-quality, readily available own funds) capital ratio was raised to 4.5 %. However, the minimum requirement is accompanied by a compulsory capital conservation buffer of 2.5 %, in some countries : countercyclical capital buffer, as well as buffers imposed by regulators to systemically important institutions and Pillar 2 requirements applied to individual banks under the Supervisory Review and Evaluation Process (SREP). As a result, the euro area average CET1 ratio stood at an impressive 14.78 % in the fourth quarter of 2019[1]. Remarkably, Belgium scored much better than the EA average with the average CET1 ratio of 18.84 %. The capital ratio of 3 out of 7 of Belgium's significant institutions exceeded 20 %.

Related to the strong capital positions, the ratio of non-performing loans in the total loan portfolio in the euro area stood at a record-low level as of the last quarter of 2019. While the euro area average ratio was 3.22 %, the ratio in Belgium stood at 1.81 %, suggesting a higher asset quality.

Stronger liquidity and stable funding. Another important contribution of Basel III is addressing the liquidity and funding issues that actually triggered the problems in the financial sector in 2008-2009 when the interbank liquidity market dried up. Namely, Basel III introduces two requirements. First, the liquidity coverage ratio (LCR) of a minimum of 100 % ensures that banks have sufficient high-quality liquid assets and can withstand a 30-day liquidity outflow. Second, the net stable funding ratio (NSFR) of a minimum of 100 % is a long-term funding ratio and it addresses the issue of liquidity mismatch to ensure that banks have stable sources of funding.

As of the last quarter of 2019, significant institutions within the euro area had sufficient levels of LCR of 145.96 %. Belgian banks had a somewhat higher-than-average LCR of 154.05 %. Although the NSFR was not yet published in the supervisory statistics reports in 2019, one of the principal funding indicators, the loan-to-deposit ratio averaged 115.99 % within the euro area, and it was significantly lower in Belgium, 98.80 %, suggesting that Belgian banks were even better able to withstand deposit withdrawals[2].

1.4 Unprecedented support

To tackle the large negative impact of the pandemic and the restrictions on economic activity, a wide range of support measures were undertaken both at the European and national levels.

Monetary and prudential measures[3]. To prevent a credit crunch and stimulate bank lending, the ECB announced the pandemic emergency purchase program (PEPP) for a total of € 1 850 billion. The PEPP was an additional asset purchase program of private and public sector securities. On top of it, the ECB eased the collateral requirements for banks participating in the targeted longer-term refinancing operations. The aim of the PEPP and the easing of the collateral requirements was to ensure that banks could obtain enough funds to direct towards loans to households and NFCs.

Besides the monetary support measures, the ECB allowed banks to operate below the required capital and liquidity coverage ratios while national macroprudential authorities relaxed selected additional capital

1 ECB (2020) report on supervisory statistics of the fourth quarter of 2019 and the corresponding ECB (2020) press release.

2 The ECB started publishing the NSFR data as of 2021. The data shows that euro area and Belgian banks have complied with the stable funding requirements as their NSFR level has been well over 100 %. To access the data, go to the ECB's Statistical Data Warehouse and type "net stable funding" into the search engine.

3 For a full overview, see NBB Annual Report (2021), Chapter 3 "Monetary policy" and box 5 on "Macroprudential policy measures taken by Belgium in the context of the coronavirus crisis".

requirements. These measures would relieve the regulatory pressure and help prevent banks from reducing their risk-weighted assets (RWA), while also enabling them to finance credit solutions for borrowers facing (temporary) difficulties. Shrinkage of RWA was expected to be driven by the reduction in lending to the real economy (e.g. Gropp *et al.*, 2019), which would be an undesirable outcome given the ongoing crisis. Additionally, the ECB recommended that banks should not pay out dividends in an attempt to improve their capital positions and sustain lending to the real economy. ECB research finds evidence that the recommendation not to distribute dividends was effective in fostering credit growth (Dautovic *et al.*, 2021).

National measures in Belgium[1]. While the ECB's action was designed to support lending to the real economy through relieving pressure on the banking system, the national support measures primarily targeted economic sectors and firms. Tielens, Piette, De Jonghe (2021) provide a detailed overview of the support given by the Belgian government.

Most of the measures aimed to relieve the temporary liquidity problems that firms ran into due to the coronavirus restrictions. More specifically, one-off premia were granted to firms operating in sectors that were forced to shut due to the COVID-19 pandemic or firms that experienced a drop in turnover of at least 60 % as a result. Additionally, the furlough procedure was simplified so that firms could temporarily lay off their staff more easily. Fiscal measures included (i) a special carry-back regime that allowed firms to reduce taxable profits by the estimated losses due to COVID; (ii) an exemption of the withholding tax in industries that rely heavily on temporary staff, (iii) an additional tax deduction for investment.

Finally, two national support measures operated via the financial sector. First, the debt moratorium allowed firms, which would not have run into issues without COVID, to defer payment on their existing loans. This measure aimed to prevent healthy and viable firms from defaulting on their loans. Second, two State guarantee loan programmes, with a total budget of € 50 billion, were launched. The programmes were designed to encourage banks to issue new loans on favourable terms to viable corporate borrowers in need, limiting the maximum interest rate. The first programme covered loans with a maturity of up to 12 months and set a cap on the interest rate at 1.25 %. The second programme capped the interest rate at 2 % for loans with a maturity of up to 36 months, and at 2.5 % for loans with a maturity exceeding 36 months[2].

To sum up, the COVID crisis had an enormous negative impact on economic growth that exceeded the impact of the 2008-2009 financial crisis. However, the recent crisis did not originate in the financial sector. In fact, the financial sector was stronger than ever and was able to withstand the shock. On top of that, the monetary and prudential measures provided significant relief for the banks to prevent a crunch in lending or a tightening in credit conditions.

On the other hand, the crisis had a significantly stronger negative impact across different economic sectors and firm size groups. Tielens, Piette, De Jonghe (2021) developed a framework to analyse the impact of the crisis on Belgian firms' liquidity and solvency and they found that over 30 % of firms in the most affected sectors (recreation, hospitality, close-contact professions) would experience a liquidity shortage. They also evaluated the impact of the support measures and found they moderately helped to contain liquidity issues, resulting in over 20 % of firms in the most affected sectors to still not having sufficient liquidity even after support measures. Across size groups, they found that over 10 % of micro-sized firms (up to 10 FTE) would end up in a liquidity shortage even when taking the support measures into account. Furthermore, Dhyne and Duprez (2021) analysed the impact of the pandemic on turnover growth of a universe of Belgian NFCs across different size and sector groups. Their analysis confirms that sectors most affected by the State interventions experienced a higher drop in turnover. They also show greater variation in turnover growth among smaller firms. More variation is usually associated with higher (perceived) riskiness of a certain group of firms. Despite the resilient banking system and numerous support measures, it is still very relevant to explore whether the crisis negatively and unequally

1 For more details, see NBB Annual Report (2021), Chapter 4 "Fiscal policy and public finances".
2 More details about the loan guarantee programmes can be found in the NBB's Q&As here.

affected more vulnerable SME borrowers and firms in more affected sectors. Liquidity shortage and the increased turnover variation might largely affect the estimated probability of default computed by banks, which might, in turn, encourage banks to adjust credit terms accordingly.

2. Changing credit conditions

2.1 First signs of tightening: NBB quarterly survey

A first step in analysing changes in borrowing conditions for companies is to explore the results of the NBB quarterly survey of credit conditions. The survey questionnaire asks businesses from different size groups and from different sectors[1] to give their perception of any change (improved/ unchanged/ deteriorated) in lending conditions over the three months preceding the survey[2]. More specifically, firms were surveyed in April 2020 to give an idea of general conditions at the time of the survey and to assess changes in other components (interest rate, size of loan, collateral requirements, and other costs) over the first quarter of 2020. Therefore, the responses given by Belgian firms in this survey were among the first indicators of the impact of the crisis on enterprises. The fact that they are available by company size was also particularly valuable during the first months of the pandemic. Chart 3 shows how replies to the questionnaire developed during the crisis and compares them with the pre-pandemic year.

The survey replies suggest that general credit conditions deteriorated at the onset of the pandemic. An improvement began to appear in the second half of 2020, picking up more quickly among large firms. But the indicator has never recovered to its pre-pandemic level.

The next step is to look at the components of credit conditions. Both SMEs and large firms (net percentages) reported a deterioration in interest rates by the end of 2019 and this trend continued during the early months of the pandemic. In the second half of 2020, however, there was a slight improvement in the assessment of interest rates followed by a further deterioration as of 2021. The reported perception of interest rates remained at a much more unfavourable level than the 2019 average. Other costs (e.g. fees and commission) showed quite different trends between SMEs and large firms. While both groups had a rather negative perception of other costs throughout 2019, the pandemic had little impact on this factor in the first half of 2020 for either group, although large firms reported a somewhat better outlook. But from the second half of 2020 onwards, SMEs began to report a strong and persistent deterioration in this category of credit conditions that has never improved. By contrast, the deterioration was less persistent for large firms and there was a significant improvement in the reported level of other costs in the second and third quarters of 2021.

The data do not show any strong impact of the pandemic on the perceived loan sizes among large firms. While large firms reported some deterioration at the end of 2019, after that, a gradual increase in the net percentage of firms reporting an improvement in loan size has been observed. In the case of SMEs, conditions got a lot worse in the first half of 2020 and remained largely unchanged in the second half of the year. By 2021, SMEs reported an improvement in this category, although the percentage of firms doing so remained below the percentage reporting a deterioration. In the case of large companies, observations for this category remained stable throughout 2021.

Finally, large firms reported a sharp deterioration in collateral requirements at the beginning of the pandemic. This deterioration did not last and was followed by a significant improvement as of the last quarter of 2020. Yet, SMEs continued to report worsening collateral requirements until the end of 2020. Although the

1 We do not use the survey to explore the sector heterogeneity given the very high level of sector aggregation in the survey (manufacturing, construction, business services).

2 Firms are surveyed after the end of the quarter, e.g. in April-May for the lending conditions in the first quarter.

deterioration in this aspect of borrowing conditions among SMEs began back in 2019, the average level of perceived collateral requirements during the pandemic remained significantly lower than before the pandemic, suggesting a palpable deterioration. As of 2021, however, SMEs have reported an improvement in collateral requirements, albeit significantly lower than for large firms.

Chart 3

Change in the appreciation of firms regarding the credit conditions, according to the size

(net % of firms reporting an improvement or a deterioration regarding the item)

Source: NBB (quarterly survey on credit conditions for firms).

Note: The vertical line shows the beginning of the COVID crisis. We regroup the firms as follows: those originally reported as small and medium-sized firms go into the SMEs group (1-249 employees), and large and very large firms go into the large firm group (250 employees or more).

1 Regarding the assessment of the general conditions, firms are asked to evaluate loan conditions at the time of the survey (favourable, neutral, unfavourable).

2 Regarding the specific criteria, they are asked to evaluate each of them in the quarter prior to the survey (improvement, stabilisation, deterioration).

Overall, the quarterly business survey provides some indication of worsening credit conditions during the pandemic, both among SMEs and large firms, although the improvement in conditions among large firms was more prominent and rapid. As for the components of credit conditions, the deterioration is more prominent in interest rates and, primarily for SMEs, in loan size, collateral requirements as well as other costs.

Despite its merits, due to its purely qualitative nature, the survey has its limitations. Firms are only requested to indicate their qualitative perception of credit conditions on a three-point scale: improved, unchanged or deteriorated. Additionally, the sample of surveyed firms differs across periods. So, the magnitude of the changes in net percentages should be interpreted with care and therefore, we only describe the qualitative change.

2.2 Microeconomic evidence

The NBB survey provides tentative insights and points towards a certain tightening of credit conditions in Belgium. One advantage of the survey is that it directly addresses the relevant economic agents, and therefore makes it possible to look at the differential impact of the COVID crisis on credit conditions across firms. However, it provides little scope to explore the heterogeneity of the changes across different economic agents and industries. Additionally, borrower-targeted surveys cover a limited sample of firms, which makes it difficult to extrapolate the conclusions to the entire size or industry group. Publicly available macroeconomic data can only address these issues to a limited extent for several reasons. First, the set of relevant macroeconomic indicators is small. The Credit Observatory analyses the size and industry dimension but only focuses on changes in aggregate credit volumes[1]. It is not possible to study other credit terms and information at a more detailed level. The ECB's MIR database presents average loan interest rates, but it only allows for comparison between loans of different sizes or maturity, which makes it difficult to study how the interest rate picture varied across firms of different sizes and from different industries. Other credit conditions, such as collateral requirements or other costs, are not captured in any quantitative aggregate indicator. Besides, using survey or aggregated data makes it impossible to carry out a *ceteris paribus* analysis and to take into account additional firm-specific factors, such as the borrower's financial situation, loan-specific factors (e.g. maturity, size, type) or industry- and bank-specific factors that are crucial to disentangling the impact of the COVID crisis[2]. A complementary microeconomic analysis based on more granular data helps to address these issues and to explicitly incorporate the size and sector dimensions to study the heterogeneous movement in various credit conditions beyond loan volumes.

2.2.1 Data

The study draws data from the Belgian Extended Credit Risk Information System (BECRIS), which is the Belgian part of the euro area-wide credit register AnaCredit. Unlike AnaCredit, BECRIS also records smaller loans (instruments) of less than € 25 000, which is a big advantage enabling us to cover more micro-sized firms. For the purpose of this article, the scope is restricted to Belgian non-financial corporations (NFCs) borrowing from 14 banks operating under Belgian law. The analysis focuses on the most relevant loan types: *revolving credit*, non-revolving *credit lines*, and *other loans*, which are mostly made up of term loans. As the scope of the study is exploring the effect of the pandemic on credit conditions, we only consider *new* loan contracts that originated[3] during the observation period as terms and conditions for outstanding loans were largely predefined in the pre-pandemic period. Thus, we keep one loan observation for every newly originated loan in the month of origination and do not track changes in the loan over time.

1 You can find monthly and quarterly changes in credit volumes here.

2 The importance of the *ceteris paribus* analysis becomes especially acute in the context of the COVID crisis as Dhyne and Duprez (2021) point out that the variation of firms' performance among smaller Belgian firms increased significantly during the pandemic. Additionally, Piette and Tielens (2022) show that the impact of the crisis was highly heterogeneous even within sample of firms operating in the most affected economic sectors.

3 In AnaCredit terms, we use the inception date of a loan contract.

Additionally, the BECRIS credit data is combined with the annual balance sheet data for NFCs. Since it is important for this analysis to control for relevant firm-level characteristics that affect loan terms, borrowers that do not file annual financial reports are disregarded. Since we are interested in the impact on the real economy, firms operating in less relevant or regulated economic sectors are also excluded[1].

Finally, we restrict our sample to the period from one year prior to the pandemic (March 2019) until the end of the strict second lockdown (May 2021). The sample does not stretch beyond that point for the following reasons. First, chart 1 demonstrates that the impact of the third wave of COVID on economic activity was rather limited. This small effect is also visible in the producer survey data as well as in the improving sales growth in most economic sectors as depicted in chart 2. Secondly, the second half of the year 2021 is also contaminated by confounding events, such as supply chain bottlenecks and rapidly rising energy prices. The estimation sample covers 115 833 unique firms, 112 488 of which are SMEs. Importantly, the sample mostly covers the intensive margin of lending, as only 4.6 % of firms, which obtained a loan during the pandemic, did not have any credit relationship with any bank before the pandemic.

The sample is divided into quarters using February 2020 as a cut-off point given that the pandemic and lockdown started in March 2020 and therefore, the impact of the crisis was already palpable in March. In other words, the quarters are defined as follows: $Q_{t=0}$ corresponds to a period from December 2019 until February 2020; Q_{t+1} corresponds to a period from March 2020 until May 2020; Q_{t-1} corresponds to a period from September 2019 until November 2019; and so on.

2.2.2 Econometric specification and findings

a. Dependent variables

Every econometric specification considers three dependent variables that capture some of the most important loan terms. These are the interest rate, the committed loan amount, and the collateralisation indicator. Annex 1 discusses the variables in more detail.

b. Borrower size heterogeneity

To explore how the changes in credit conditions during the pandemic were distributed across firms of different size groups, we estimate the following econometric specification using the ordinary least squares (OLS) estimator:

$$y_{ifbt} = \alpha Size_f + \sum_{t\in[0;5]} \beta Quarter_t \times Size_f + \gamma X_{ft-1} + \delta Z_{it} + FE + \varepsilon_{ifbt}, \quad (1)$$

where y_{ifbt} is one of the three dependent variables, i.e., an attribute of a loan i issued to firm f by bank b in quarter t. $Size_f$ is an indicator equal to 1 if a loan is issued to a company defined as an SME and 0 if to a large company. We follow the Belgian size definition as described in the Credit Observatory[2]. $Quarter_t$ identifies the time. More specifically, $Quarter_t$ equals 0 for all periods before the pandemic until February 2020, equals 1 for the first COVID quarter of March 2020 until May 2020, and so on. In other words, the analysis compares every pandemic quarter to the average of the entire pre-COVID period.

The specifications include a large set of lagged firm-level X_{ft-1} and loan-level Z_{it} controls as well as various fixed effects (dummies) to account for observed and unobserved factors beyond the pandemic that can also affect loan terms, e.g., firm riskiness. The annex gives more details about the econometric models.

1 Namely, Electricity, gas, steam and air conditioning supply (NACE code D), Water supply; sewerage; waste management (E), Financial and insurance activities (K), Public administration and defence (O), Education (P), Human health and social work (Q), Activities of households as employers (T), Activities of extraterritorial organisations (U).

2 See footnote 5 in the latest Credit Observatory.

The coefficients of interest are the ones in front of the interaction term (β). They show whether there is a *difference* in loan conditions of SMEs *relative* to large firms during the pandemic period *relative* to the pre-COVID period. Large firms are used as an omitted base category. For the sake of brevity, the results are presented by plotting the estimated $\hat{b}$ coefficients of equation (1) as well as the 90 % confidence intervals[1] in chart 4. Each plot represents findings for a given dependent variable (interest rate, loan amount, collateralisation). The full list of the estimated coefficients is presented in table 3 in Annex 2.

Interest rates on new loans granted to SMEs were rising more rapidly than the rates on loans granted to large firms during the pandemic, with the effect being most pronounced after the first wave of COVID and at the onset of the second wave (the second and third quarters), both statistically and in terms of the magnitude. Given that on average, an SME is charged a 0.13 percentage point higher interest rate (the coefficient α in equation 1), the increase of 0.06 to 0.13 percentage point is palpable. By the end of the second strict lockdown, however, the difference in interest rate between the size groups had been wiped out.

As for the difference in the loan amounts, the gap in the committed loan amounts between SMEs and large firms actually decreased, compared to the pre-COVID period. The effect is strongest in the first and third quarters of the pandemic period, with some decrease during summer 2020, but it had completely dissipated by the middle of the second lockdown (the fourth quarter). Hence, in terms of the granted loan amounts, we do not observe a credit crunch among SMEs. The striking value of the coefficient in the first quarter is in line with the evidence observed in the aggregated data, namely in the credit register[2]. In the first quarter of 2020 (March), large companies drew on existing credit lines, which resulted in an unusually large increase in the "used" credit amount. On the other hand, the growth of "authorised" credit accelerated in the group of SMEs after March 2020, but this type of credit did not grow as much in the group of large firms. Together, these observations indicate that large firms might have had lower demand for *new* credit contracts after making use of their existing credit lines. SMEs, however, did not have the opportunity to draw on credit lines to the same extent and they had to apply for larger new loans.

Throughout the entire observation period, SMEs experienced a large and significant increase in the collateralisation probability relative to the large firms. Importantly, the increase in the collateralisation probability got stronger during the summer of 2020 and lasted and continued to rise until the fourth quarter of the pandemic. By the end of the second lockdown, the increase in the collateralisation probability had weakened in magnitude yet remained statistically significant. Given that, on average, the probability of loan collateralisation was only 1.1 percentage points higher among SMEs than large firms, an increase of over 6 percentage points in the collateralisation probability is economically meaningful.

Overall, using loan-level data, we find additional supporting evidence that conditions for loans granted to SMEs somewhat tightened during the pandemic. Specifically, the findings suggest that charged interest rates and the collateralisation probability increased relatively more for SMEs than for large firms. However, the effect of the higher interest rates was not long-lasting and had vanished by the end of the strict second lockdown. Interestingly, the results show that the average committed loan amount somewhat decreased in the group of large firms resulting in a narrow gap in loan amounts between the two size groups at the beginning of the pandemic, yet this effect did not last either.

Compared to the NBB survey on credit conditions[3], the econometric findings are in line with most of the patterns observed in the survey. We do find evidence that new loans to SMEs were disproportionally more expensive during the pandemic, while the higher probability of loan collateralisation corroborates SMEs' signalling of tougher collateral requirements. On the other hand, we do not find any evidence of deteriorating loan amounts

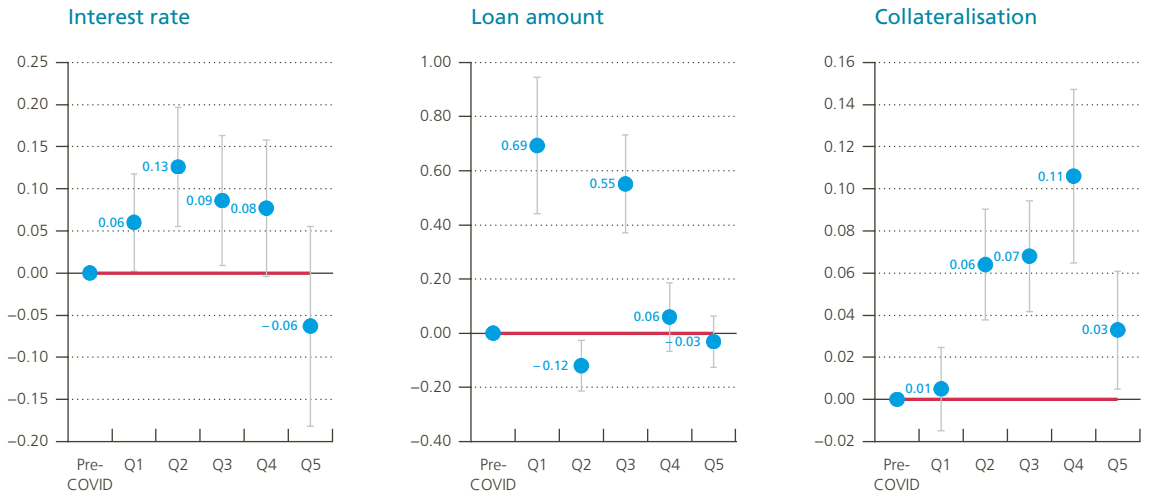
1 If one of the tails of the confidence interval crosses the zero line, it means that the coefficient is statistically insignificant at the 10 % level.

2 Aggregated figures derived from the Credit Register data are available on https://stat.nbb.be/ in the section "Other financial statistics", sub-section "Corporate credit observatory" : "CCCR : Credit granted to resident non-financial corporations"

3 This comparison is tentative as the firm size definition used in the survey does not fully coincide with the size definition used in the Credit Observatory and in the econometric analysis.

Chart 4

Relative difference in credit conditions of new loans between SMEs and large firms



Source: NBB and own computations.
Note: The figures plot the estimated coefficients in equation (1) and corresponding 90 % confidence intervals.
The interest rate is expressed in %. Hence, a coefficient of 0.01 means a 0.01 percentage point increase in the interest rate.
The loan amount is expressed as the natural logarithm. Hence, a coefficient of 0.01 means a 1 % increase in the amount.
Collateralisation takes values of 0 or 1. Hence, a coefficient of 0.01 means a 1 percentage point increase in the collateralisation probability.

offered to SMEs, which in itself does not contradict the survey. In the Credit Register, one only observes loans actually granted, while the survey also captures firms' perception of the available loan sizes. Besides, the survey includes borrower and non-borrower firms, whether or not they asked for a loan or had their application rejected. In fact, section 3 will show that the share of firms, in particular SMEs, that encountered an obstacle to bank financing increased during the crisis.

c. Borrower economic activity heterogeneity

To explore how changes in credit conditions during the pandemic were distributed across firms operating in different industries, we estimate the following econometric specification using the OLS estimator:

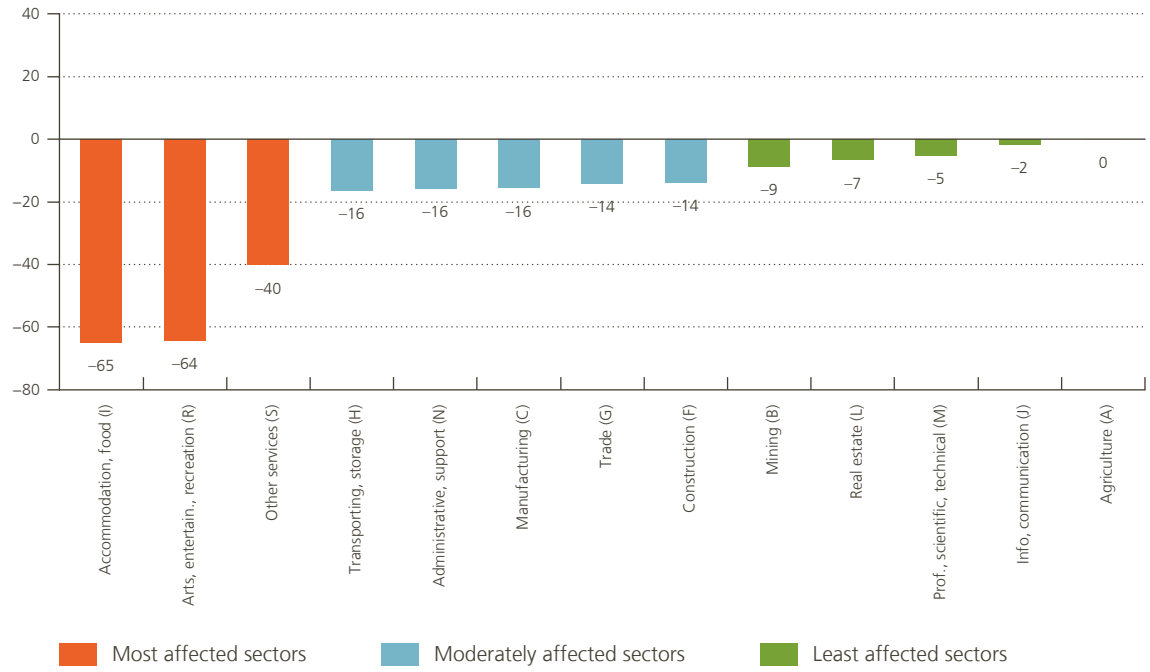
$$y_{ifbt} = \alpha Sector_f + \sum_{t\in\ 0;5} \beta Quarter_t \times Sector_f + \gamma X_{ft-1} + \delta Z_{it} + FE + \varepsilon_{ifbt}, \quad (2)$$

where the dependent and control variables are similar to the ones used in equation (1). $Sector_f$ is a categorical variable that identifies whether a firm belongs to one of the three groups of industries: Accommodation and food service activities, Arts and recreation, Other services (NACE codes I, R, S); Manufacturing, Construction, Trade, Transporting and storage, Administrative activities (NACE codes C, F, G, H, N); Agriculture, Mining, Information and communication, Real estate, Professional, scientific and technical activities (NACE codes A, B, J, L, M). The three groups are defined based on the extent to which the sectors were hit by the first wave of COVID. The extent to which the sector was affected is measured as median sector turnover growth in the second quarter of 2020 relative to the second quarter of 2019 using the data points presented in chart 2. Chart 5 presents the growth values and shows up three clusters of sectors. Thus, the I, R, S group represents the *most* negatively *affected* sectors, the C, F, G, H, N group identifies the *moderately affected* sectors, and the A, B, J, L, M group represents the *least affected* sectors.

Chart 5

Median turnover growth by sector in 2020 Q2

(in %)



Source: Federal Public Service Finance (VAT declarations) and own computations.
Note: Turnover growth is computed using turnover figures reported in 2020 Q2 relative to the turnover value reported in 2019 Q2 using a universe of NFCs filing VAT reports monthly or quarterly.

Likewise, the coefficients of interest are the ones in front of the interaction term (β). The coefficients show whether there is a *difference* in loan conditions of firms operating in either most or moderately affected sectors *relative* to firms operating in the least affected sectors during the pandemic period *relative* to the pre-COVID period. The least affected sectors are used as a base omitted category.

The evolution of conditions of new loans also varied substantially across the industry groups. Chart 6 gives the quarterly coefficients estimated using specification (2) and their 90 % confidence intervals. Each column within a row of plots represents a given dependent variable (interest rate, loan amount, collateralisation); a given row compares either the most affected with the least affected sectors or moderately affected with the least affected sectors. The full list of the estimated coefficients is presented in table 4 in Annex 2.

Surprisingly, interest rates on new loans in the most affected sectors were significantly lower relative to the least affected sectors during the first wave of the pandemic. The relative difference of –0.17 percentage point is meaningful given that (i) the sample-average interest rate on new loans granted to firms in these sectors in 2019 was 2.15 %; (ii) on average, over the entire sample period, firms in the most affected sectors were charged 0.18 percentage point higher interest rates (the value of the coefficient α in equation 2). The difference in interest rates between the two groups of sectors becomes less prominent and statistically insignificant in the following two quarters. Afterwards, in the middle of the second strict lockdown, we again observe a significant difference of 0.12 percentage point, which vanishes later on. This finding is surprising given that the most affected sector was the most vulnerable and exposed to the pandemic, yet banks did not disproportionally raise the prices of new loans for firms in those sectors.

In the case of the moderately affected sectors, the change in the interest rate difference looks similar. Relative to the least affected sectors, there was a decline in interest rates on new loans granted to the moderately affected sectors during the first wave of the pandemic. But the scale of the decrease of 0.1 percentage point is less prominent given that on average, firms in the moderately affected sectors are charged 0.08 of a percentage point more interest than the least affected sectors. After the first wave, the difference in rates vanished and even turned positive at the beginning of the second lockdown, yet it again became significantly negative after that, although the magnitude of the decrease became smaller than during the first wave of the pandemic. By the end of the second lockdown, the difference had faded away.

Next, we look at the difference in loan amounts. The most affected sectors experienced a 14 % drop in the committed loan amounts relative to the least affected sectors during the first lockdown. This is an economically meaningful drop given that firms in the most affected sectors get loans that are, on average, 13 % smaller than loans granted to the firms in the least affected sectors. After the first lockdown, however, the difference in the loan amounts dissipated, and by the end of the second lockdown, the firms in the most affected sectors enjoyed relatively larger loan amounts.

As for the firms operating in the moderately affected sectors, the difference in loan amounts relative to the least affected sectors was insignificant until the fourth quarter of the pandemic, when firms in the moderately affected sectors obtained 15 % lower loan amounts, although the difference shrinks later on.

Finally, firms in the least affected sectors experienced a large and significant increase of 7 percentage points relative to the least affected sectors in the first three months of the pandemic. The difference, however, vanished in the following periods. Given that, on average, the collateralisation probability of loans granted to firms in the least affected sectors during the observation period was 2.4 percentage points higher, this increase at the onset of the pandemic is striking.

In the case of the firms in the moderately affected sectors, the difference with the least affected sectors remained insignificant until the third quarter of the pandemic, when it rose to 3 and later to 4 percentage points. The scale is also quite striking given that, on average, during the observation period, the collateralisation probability of loans granted to the moderately affected sectors was 4.1 percentage points higher.

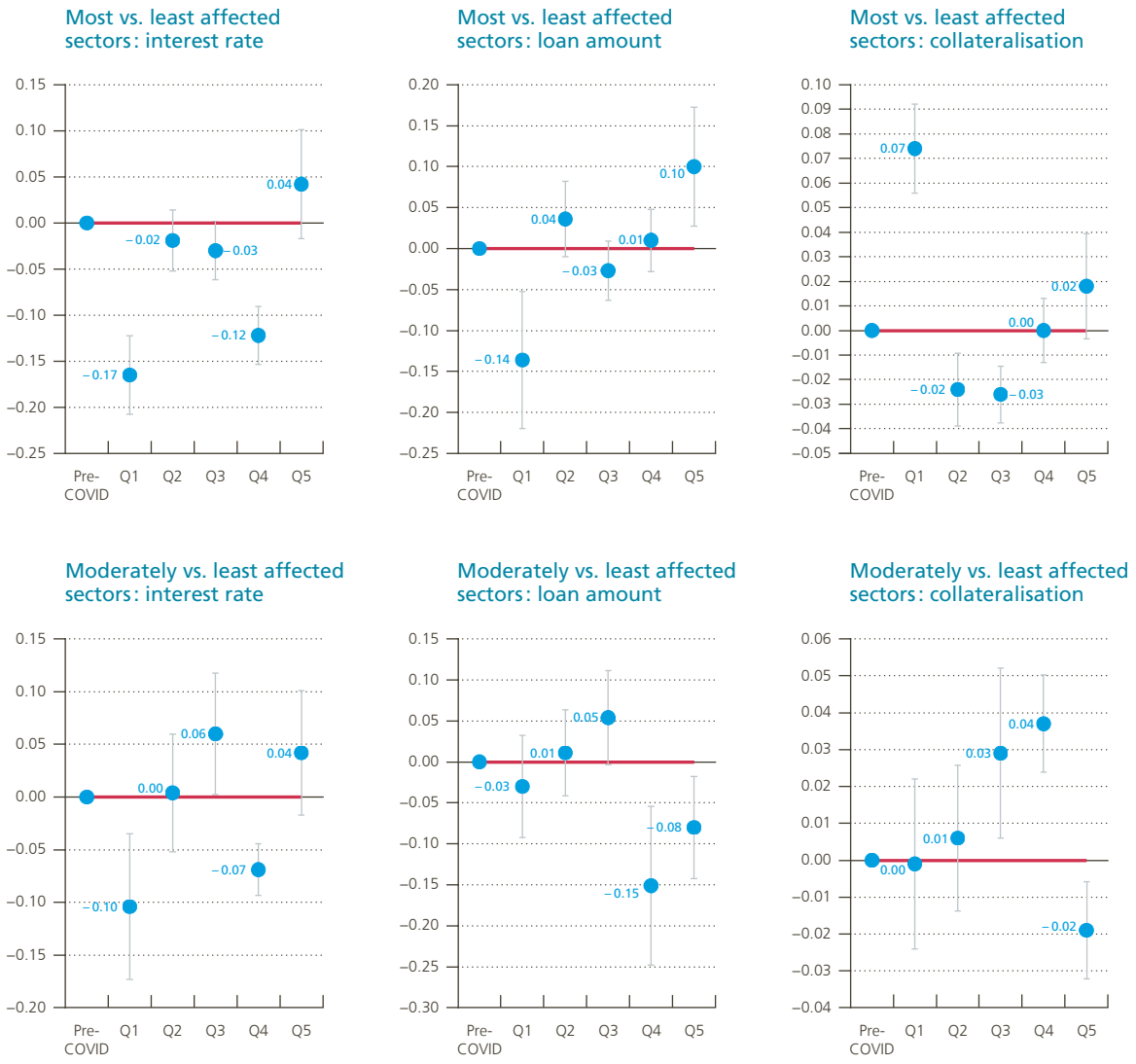
Overall, microeconometric analysis reveals that credit conditions differ substantially between sectors and across waves of the pandemic, but the differences did not last. There is no evidence of banks discriminating against vulnerable firms in the most or moderately affected sectors or charging them relatively higher interest rates on new loans. Yet, the analysis shows somewhat lower committed amounts granted to firms in the most affected sectors. But it is impossible to deduce from the presented analysis, whether the changes in loan amounts are supply or demand driven. So, the lower amounts might also reflect lower credit demand in the vulnerable sectors. Finally, the findings suggest that new loans granted to the most affected sectors during the first wave of the pandemic were significantly more likely to be collateralised, although this difference vanished later on. This result suggests that banks might have tightened the collateral requirements when the pandemic started and the uncertainty was at its highest, and they reconsidered the requirements afterwards. Overall, the impact of the pandemic on borrowing conditions does not seem to be persistent, and it had either weakened or vanished by the end of the second strict lockdown.

Although the loan guarantee programmes are not a primary focus of this article, the econometric specifications always take into account whether a loan was granted under the programmes, and it is worth briefly mentioning the related findings. Naturally, in both tables 3 and 4 in Annex 2, the coefficient of "Guaranteed loan" is negative and statistically significant given the cap on the interest rate of guaranteed loans. Among the estimated specifications, the values suggest that the interest rate charged on guaranteed loans was on average up to 0.3 percentage point lower than on other loans, holding all other variables constant. In the case of the loan amount, the coefficient is positive and statistically significant, indicating the guaranteed loans were on average up to 29 % larger than unguaranteed loans, holding all other variables constant. There seems to be

no significant difference in terms of collateralisation probability between guaranteed and unguaranteed loans. Overall, guaranteed loans tend to be cheaper (by design) and larger. However, the uptake of the guaranteed loans was rather low (see figures based on ad-hoc reporting in Piette and Tielens, 2022). In the estimation sample, guaranteed loans account for less than 4 % of all loans. Hence, the impact of the loan guarantee programmes on easing of credit conditions during the pandemic remained limited.

Chart 6

Relative difference in credit conditions of new loans across economic sectors



Source: NBB and own computations.

Note: The figures plot the estimated coefficients in equation (2) and corresponding 90 % confidence intervals.
The interest rate is expressed in %. Hence, a coefficient of 0.01 means a 0.01 percentage point increase in the interest rate.
The loan amount is expressed as the natural logarithm. Hence, a coefficient of 0.01 means a 1 % increase in the amount.
Collateralisation takes values of 0 or 1. Hence, a coefficient of 0.01 means a 1 percentage point increase in the collateralisation probability.

3. Channels

The econometric analysis based on quantitative data enables us to draw some conclusions regarding the conditions (loan amount, interest rate, collateral requirements) attached to bank loans granted to individual firms during the COVID period (March 2020 to May 2021), compared to the previous one (2019). As far as the size of firms is concerned (large companies versus SMEs), the study suggests that some of the lending conditions tightened more strongly for SMEs than for big firms (a relatively more pronounced rise in interest rates and increase in the probability of having a loan collateralised). But not all the criteria were tightened for SMEs: the committed loan amount was more favourable than in the pre-COVID period compared to large companies.

One disadvantage of the econometric approach is that it considers only loans granted, i.e. the intercept of credit demand and supply, but firms' credit demand or intention to apply for a loan is not observed, and neither is the stricter selectivity of banks in times of higher systemic or sectoral risks. Two qualitative surveys are available to get round this problem, although qualitative data are not directly comparable to the quantitative data. The first survey is the survey on the access to finance of enterprises (SAFE). It is conducted twice a year and provides information on developments in the financial situation of enterprises and documents trends in the need for and availability of external financing, in particular bank financing. In Belgium, only SMEs are investigated, but at the euro area level, a breakdown by size (SMEs and large firms) is available. The second survey is the bank lending survey (BLS), which provides information on bank lending conditions in the euro area on a quarterly basis. In Belgium, only the four major banks are surveyed[1]. These two surveys provide qualitative information about bank lending from the point of view of the demand side of credit (SAFE) on the one hand, and from the point of view of the supply side (BLS) on the other hand. They can bring some explanation regarding the determinants responsible for the developments in bank lending observed in the credit markets.

3.1 Supply side (banks' view)

In the first survey held during the pandemic (the first quarter of 2020), banks at both euro area and Belgian level reported an increase in risk aversion, which translated into a slight tightening in credit standards. Less favourable risk perceptions and the lowering of risk tolerance continued throughout 2020. On top of that, banks reported increased margins on average and especially on riskier loans. Tielens, Piette, De Jonghe (2021) showed that the smallest firms and firms in more affected sectors were more likely to end up with liquidity shortages. Moreover, unlike in other countries like France, Spain or Italy, Belgian banks did not report in the BLS that government loan guarantees played a significant role in keeping favourable credit standards for NFCs. Additionally, Dhyne and Duprez (2021) presented evidence of greater variation in sales growth among smaller firms in Belgium. These factors are likely to affect the way banks set credit conditions for those vulnerable firms given the higher risk perception.

At the same time, banks, and particularly those in Belgium, reported that their funding costs and balance sheet constraints alleviated the tightening impact of the greater risk (chart 7, the second half of 2020 in Belgium). This confirms banks' sound financial situation at the onset of the crisis. At the beginning of 2020, the financial sector was healthy not only according to supervisory data but also based on the banks' own perception. Therefore, bank health was not a factor affecting credit conditions.

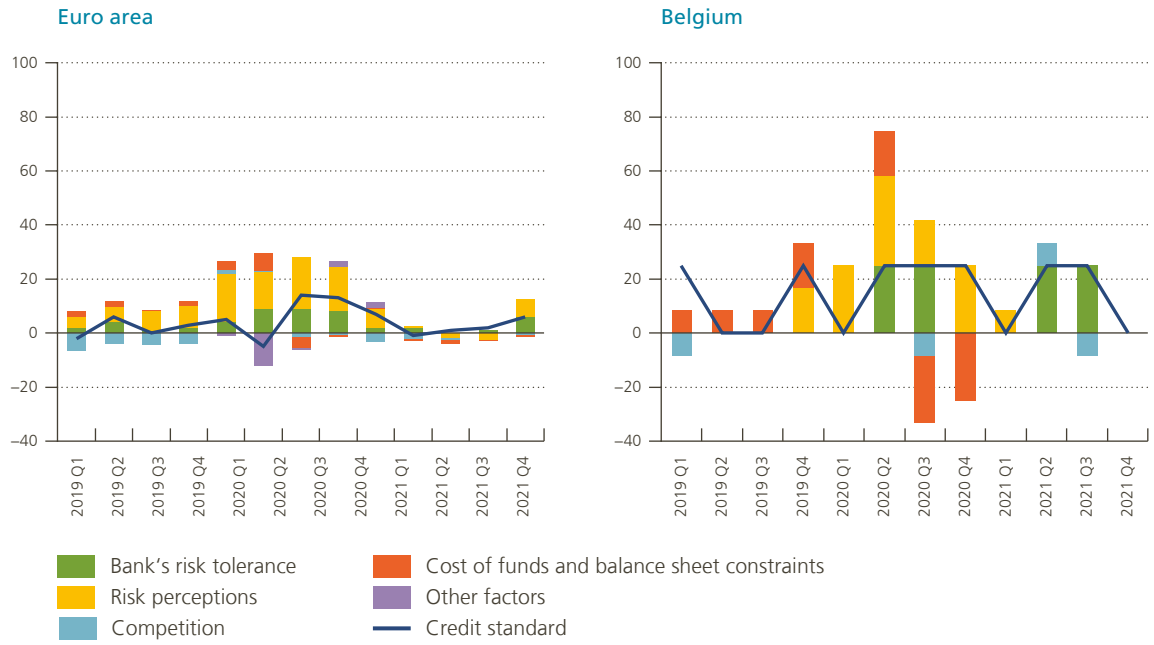
These observations from the BLS survey based on increased risk perceptions and lower tolerance towards risks are compatible with the econometric findings, which show a tightening of interest rate and collateral requirements for SMEs: banks respond by protecting themselves against these higher risks by increasing margins and asking

1 These four banks account for over 80 % of the corporate credit market.

Chart 7

Changes in credit standards for loans supplied to NFCs and contributing factors

(net % of banks reporting a tightening of credit standards)



Source: ECB (bank lending survey).

Note: Net percentages are defined as the difference between the percentages of banks reporting an increase (contribution to an increase) and the percentages of banks reporting a decrease (contribution to a decrease). Positive figures indicate a tightening, negative figures indicate an easing.

for bigger guarantees. Even if there is not such a close match with the conclusions regarding the sector of activity (i.e. more affected sectors saw a relative drop in interest rates compared to less affected sectors), this could be due to the fact that the size of the firm weighed more than the branch of activity in (upwardly) adjusting the interest rate on a loan depending on (increased) risk perception. Nonetheless, some slight deterioration was observed in the most affected sectors in terms of loan amounts and collateralisation probability, so it might be that tightening of credit conditions translated into different loan terms for different categories of firms.

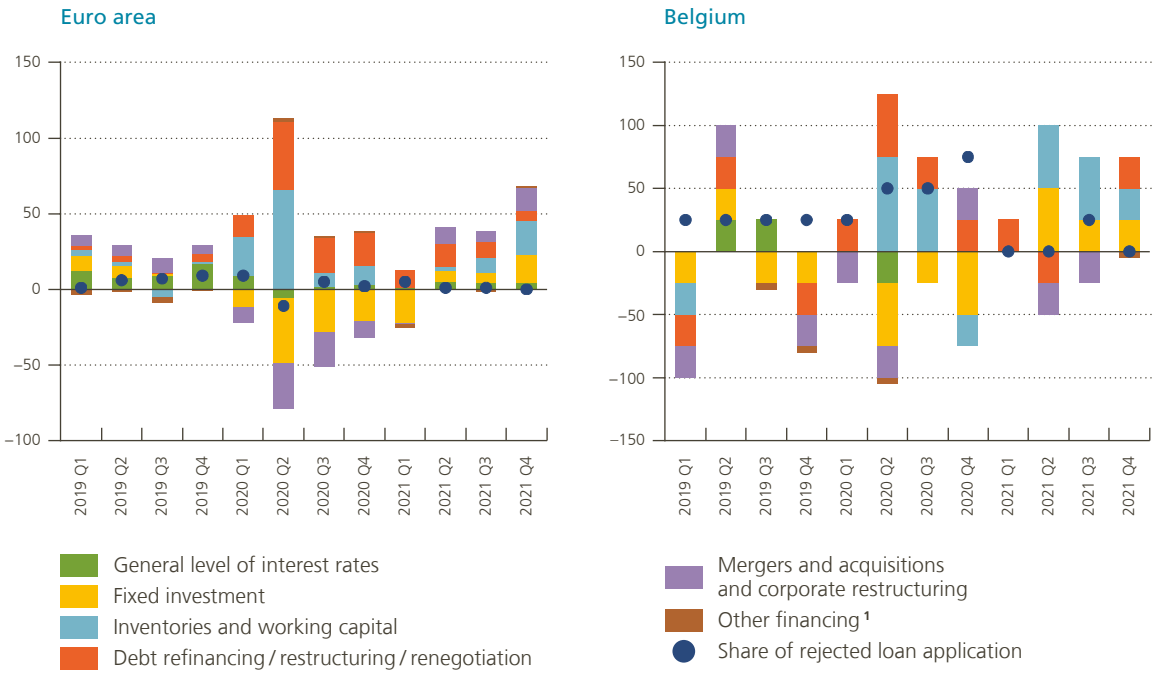
Importantly, the risk perception softened and became a less important factor in 2021. This corroborates the microeconomic analysis, which suggests that the tightening of credit conditions was rather short-lived and weakened considerably in the second half of 2021. Moreover, in a recent analysis, Piette and Tielens (2022) use the most recent firm-level data and show that the pandemic had rather a limited impact on the insolvency of Belgian firms, even in the most affected sectors, despite deteriorating profits. Additionally, the anticipated wave of bankruptcies at the time did not materialise, largely thanks to the support measures and the ability of firms, even in the most affected sectors, to use alternative sources of funding beyond bank credit. The confluence of these factors might have contributed to reducing banks' risk perception and relaxing credit standards.

When it comes to business loan demand, bank responses to the BLS indicated that several factors were at play, some of them weighing in the direction of higher demand, others in the opposite direction. Anyway, the change in the answers is significant relative to the pre-COVID period. Banks reported that they had to face rising demand for inventories and working capital, as well as for debt refinancing or restructuring, while demand for fixed investment financing fell. These financing needs are connected to emergency liquidity needs and possibly precautionary build-up of liquidity buffers at the time of lockdowns.

Chart 8

Changes in NFCs demand for loans and explanatory factors

(net % of banks reporting an increase in contributing factors)



Source: ECB (bank lending survey).

Note: The net percentages are the difference between the percentage of banks reporting a contribution to an increase for a given factor and the percentage reporting a contribution to a decrease. For example, a net percentage of 75 % in the case of the share of rejected loan applications means that 75 % of the responding banks reported an increase in the share of rejected loan applications.

1 Average of several items (internal financing, loans from other banks, loans from non-banks, issuance/redemption of debt securities, and issuance/redemption of equity).

One interesting point is the development in the share of rejected loan applications. Whereas this factor did not change much at euro area level, it underwent a significant increase in Belgium, according to the banks. In the second and third quarters of 2020, half of the banks surveyed in Belgium reported an increase in the share of rejected loan applications; in the fourth quarter of 2020, they were three banks out of four. The econometric analysis does not enable us to take into account the loan applications that did not result in a contract or companies that did not submit an application for fear of being rejected. We can assume that these firms were among the most vulnerable and that they probably had to find another solution to meet their financing needs to get through the crisis.

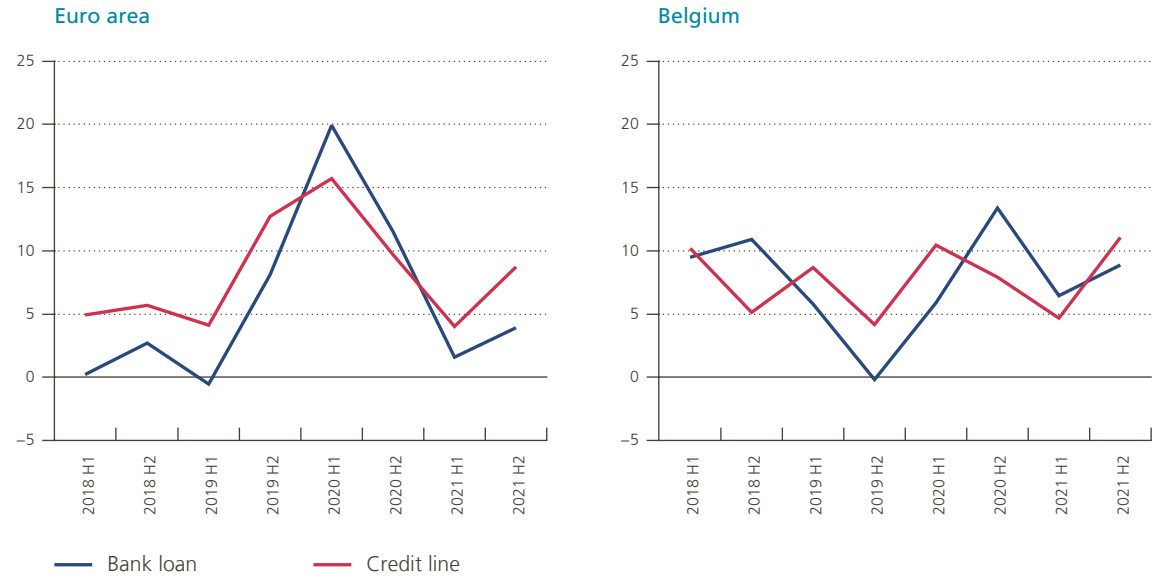
3.2 Demand side (firms' view)

According to the SAFE survey, Belgian SMEs' need for bank financing (loans and credit lines) rose considerably at the onset of the COVID crisis compared to the preceding period (chart 9). This trend lasted until the beginning of 2021. According to firms questioned, external financing was primarily used for inventory and working capital at that time, which is consistent with banks' replies in the BLS (see chart 8). An increasing percentage of SMEs indicated higher needs for refinancing or paying off obligations during the first wave of 2020 (March-September), indicating possible liquidity problems during the lockdown periods.

Chart 9

Financing needs reported by firms

(net % of responding firms, indicating increased (+) or decreased (–) financing needs)

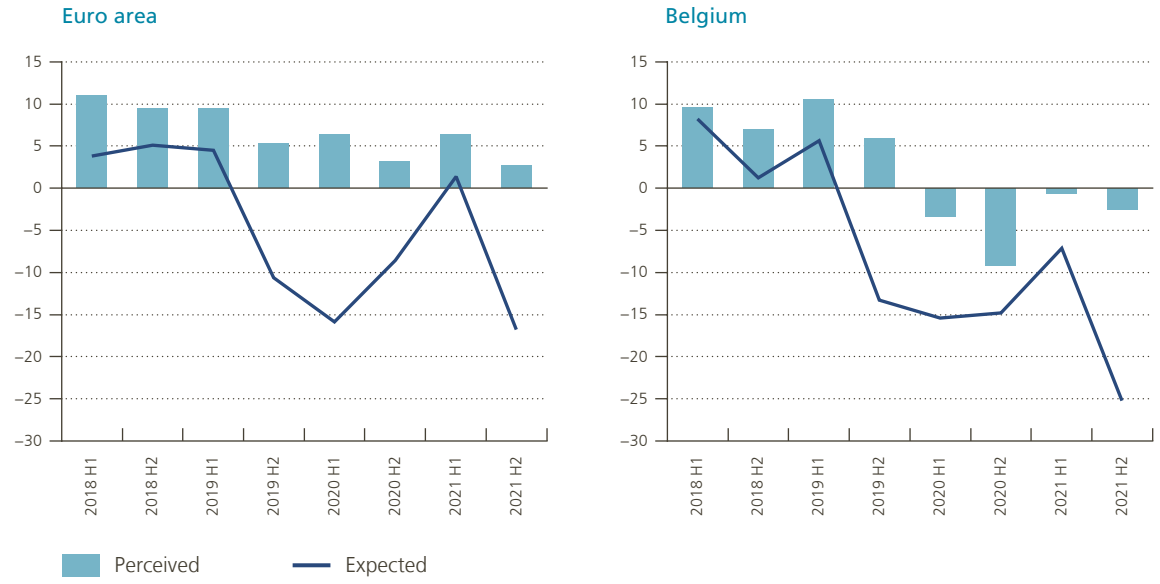


Source: ECB (SAFE survey).

Chart 10

Changes in the perceived and expected availability of bank loans[1], according to SMEs

(net % of firms reporting an improvement (+) or a deterioration (–))



Source: ECB (SAFE survey).

1 A positive (negative) percentage indicates an improvement (deterioration).

At the same time, Belgian SMEs signalled a negative impact of the pandemic on the perceived availability of bank loans (negative net percentage, chart 10), amid growing concerns over macroeconomic factors, but also over the financial position of enterprises. This is particularly relevant for that category of firms for which bank financing is one of the most important sources of funding. Both effects combined: during the second and third quarters of 2020, SMEs perceived the availability of bank funds to be insufficient to cover their corresponding financing needs, resulting in a deteriorating financing gap. Besides, the expected availability deteriorates as well during the two waves of the survey covering 2020. In Belgium, this effect is stronger than on average in the euro area.

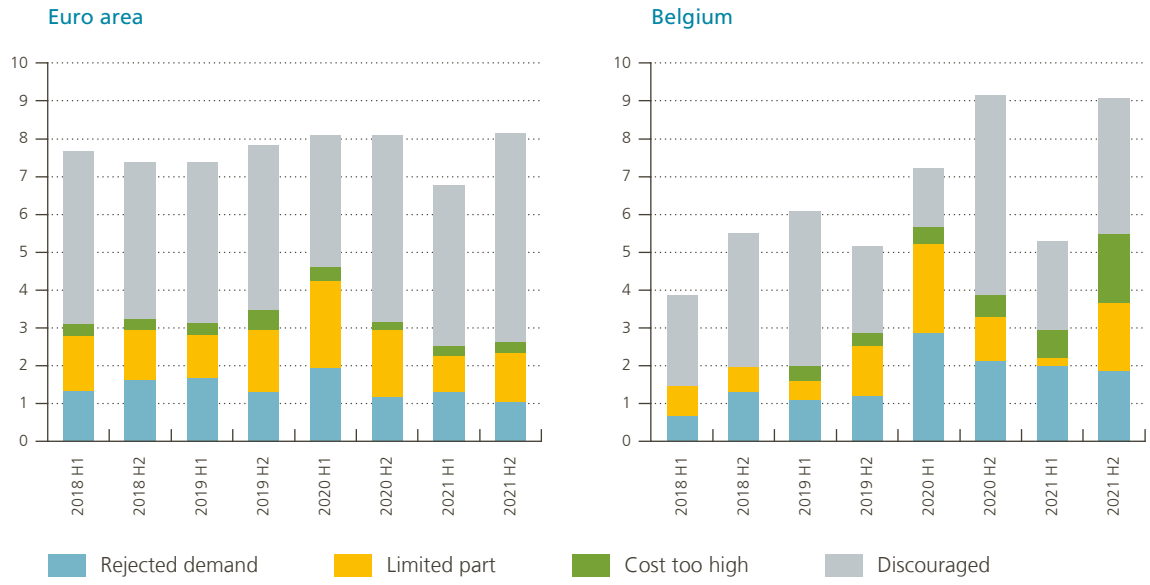
Importantly, there is a substantial change in SMEs' replies regarding obstacles impeding access to bank financing (chart 11). More Belgian SMEs reported rejection of their loan applications in the first half of 2020 as well as obtaining only a limited part of the desired loan, which in the second half of 2020 led to the highest reported fraction of discouraged borrowers (those who do not apply for fear of being rejected) in the past few years. The increase in rejected applications corroborates the banks' replies in the BLS, but it also significantly exceeded the euro area average and remained at an elevated level for a longer period of time. Interestingly, the fraction of Belgian SMEs reporting higher cost of loans as an obstacle has been rising since the onset of the pandemic.

Regarding bank lending conditions, more Belgian SMEs report an increase in the cost of the loans (chart 12). The level of interest rate is reported to be rising from the first wave of the survey following the outbreak of the crisis. At the same time, the level of other costs (charges, fees, and commission) remains high, while a growing percentage of SMEs report a deterioration in the other terms and conditions (required guarantees, information requirements, procedures, the time required for loan approval, loan covenants, etc.). No worsening regarding the size or the maturity of the loan was pointed up, but more firms said the requirements of the banks in terms of collateral got tougher in 2020 than in 2019.

Chart 11

SMEs reporting obstacles impeding access to bank financing

(% of firms)



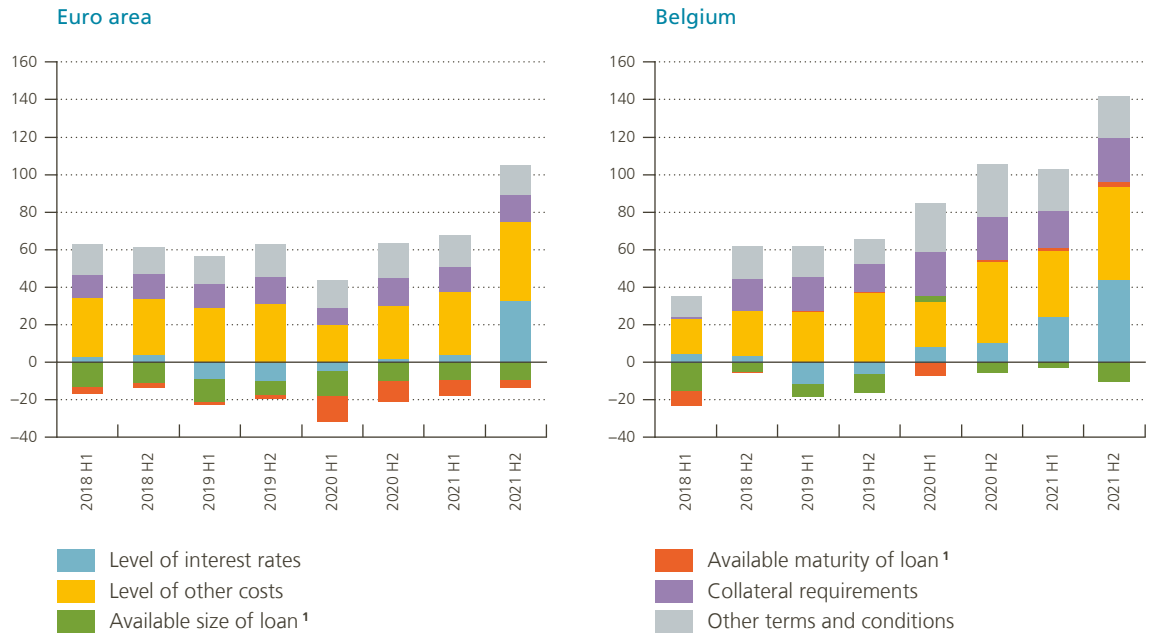
Source: ECB (SAFE survey).

The proportion of SMEs not applying for bank credit because of possible rejection or applying for a loan but only receiving a limited part of the amount requested, refusing credit because the cost was too high, or having their application rejected.

Chart 12

Changes in conditions on bank loans, according to SMEs

(net % of firms reporting an improvement (+) or a deterioration (–) in the relevant factor)



Source: ECB (SAFE survey).

1 Inverted scale: a positive (negative) percentage indicates a deterioration (improvement) of this condition.

Although not directly comparable, the replies to the SAFE study help to shed some light on the findings of the NBB quarterly survey and the microeconomic analysis. During the pandemic, Belgian SMEs reported higher demand for bank credit (largely driven by the increased need for inventories and working capital credit as well as loan renegotiations as suggested by the banks' replies in BLS). At the same time, however, SMEs signalled a deterioration in the perceived availability of bank credit and reported a higher incidence of loan application rejections, obtaining smaller-than-desired loans, and discouragement to apply. This strong signal of unfulfilled demand points towards a certain degree of friction in the credit market and credit rationing (Stiglitz and Weiss, 1981). Credit rationing can materialise in either loan application rejections or obtaining a loan on less attractive (for a borrower) terms.

Signs of credit rationing are also detectible in the NBB quarterly survey and the microeconomic data. The former showed that more Belgian firms have been reporting a deterioration in many dimensions of credit conditions, with SMEs being more negative about their perception of bank lending conditions. The microeconomic analysis pointed out that there was an increase in the collateralisation probability as well as either a relatively stronger rise in interest rates among more vulnerable firms (in the case of SMEs), or a relatively stronger reduction in the loan amounts (for more affected economic sectors). Although the data on loans granted shows rather a temporary change in the credit conditions, which is in line with the temporary increase in banks' risk perception according to the BLS, the borrower-targeted survey shows that the deterioration in credit conditions persisted, especially the cost of credit (both interest rates and other costs).

Conclusion

The COVID crisis had an unprecedented impact on the Belgian economy and affected different firms and different economic sectors in varying ways. From the experience of the 2008-2009 and 2011-2012 financial crises, we know that banks respond to a crisis by reducing lending to the corporate sector, often with a disproportionally negative effect on more vulnerable groups of firms, such as SMEs. Unlike before, however, this latest crisis was met by a very sound and robust Belgian financial sector and by an array of extensive monetary and fiscal support measures. Given the importance of bank lending in Belgium's economy, the goal of this article was to investigate how corporate credit conditions changed during the pandemic using a variety of qualitative survey data in combination with an econometric analysis of the new Corporate Credit Register data.

The NBB survey of corporate credit conditions presents the first signs of bank loan conditions being tightened in Belgium during the pandemic compared to the preceding year. Firms from all size groups report that general borrowing conditions deteriorated when the pandemic began, followed by an improvement, more prominent among large firms, in the perception of credit constraint. At a more detailed level, the deterioration in the perception of credit conditions is more pronounced for interest rates and collateral requirements, although the latter improved somewhat after the first few months of the pandemic. SMEs also show a more negative view of the level of other borrowing costs and the loan size.

After documenting any signs of perceived credit tightening, the research uses the Credit Register and firm balance sheet data to quantitatively analyse the terms and conditions of new loan contracts and further explore the heterogeneity of the changes in credit conditions across firm size and economic activity groups. When it comes to firm size, the analysis shows that the interest rates offered on new loans to SMEs rose more than for large firms during the pandemic compared to the year before. The gap had nevertheless narrowed by the end of the second lockdown. Interestingly, the difference in loan size between SMEs and large firms significantly decreased during the pandemic period, yet this difference, too, had vanished by the end of the observation period. Finally, the analysis shows a relatively higher probability of an SME loan being collateralised than for a large firm during the pandemic. The difference gets smaller yet remains significant. In the case of economic activities, relative to the least affected sectors, loans granted to firms in the most affected sectors were cheaper yet smaller in size, but the differences had dissipated by the end of the second lockdown. The increase in the collateralisation probability was also stronger for sectors that were more affected by the pandemic but it was only pronounced during the first lockdown. Overall, the econometric analysis shows a rather short-lived tightening of certain credit conditions for new loans (interest rates and collateralisation in the case of the SMEs versus large firms comparison, and loan amounts and collateralisation in the case of the most affected sectors).

Finally, the analysis extends to the SAFE and BLS surveys which help to gain an understanding of the supply- and demand-side drivers of the observed signals of temporary tightening of credit conditions. Banks reported an increase in risk perception and in margins on average and riskier loans, which might explain the observed tightening of some lending conditions. The risk perception, however, softened in 2021 when the level of uncertainty about the pandemic came down, which corroborates the results of the econometric analysis suggesting the temporary nature of tightening. On the demand side, SMEs reported an elevated demand for bank credit but at the same time, a deterioration in the perceived availability of bank loans, an increase in rejections of loan applications, a higher incidence of insufficient amounts being offered or of firms even being discouraged to apply for a loan. These findings together suggest a presence of credit rationing during the pandemic, which was likely to drive a moderate tightening in borrowing conditions.

Additionally, this study demonstrates the complementarity of the qualitative and quantitative analysis and shows how surveys can help to better understand the results of an econometric approach and uncover patterns that cannot be observed in the microdata. The advantages of the econometric analysis are that it enables us to reveal the changes in credit conditions by looking at a large sample of newly issued loans and exploring different dimensions of borrowers' heterogeneity. It also makes it possible to perform the *ceteris paribus* analysis

and control for a variety of confounding factors. On the other hand, an issued loan is a product of demand and supply and it makes it impossible to take into account the intention to apply, the adequacy of obtained loans, or the perceived change in credit conditions compared to the preceding period. Although the qualitative surveys are subjective, difficult to compare between firms, and therefore require a certain degree of caution when interpreting their findings, they do allow for a deeper look into the supply and demand sides. Even if a firm agreed to the borrowing conditions of an issued loan, the surveys help to identify the situation when the firm is dissatisfied with these conditions given the better terms and conditions it was able to obtain in the past.

From the policy perspective, the analysis shows that survey results, although qualitative, are reliable indicators of the overall dynamics and trends at work at the beginning of a crisis when the relevant data is not (yet) available. Additionally, surveys can be easily complemented by a series of targeted questions aimed at exploring how different agents assess the economic situation. When information is needed quickly in times of crisis, survey results can provide the first insight into the problems and guide policymakers in their decisions. Given that surveys aim at helping to better understand the drivers of bank loan supply and demand, they provide valuable data for designing mechanisms and support measures that aim at preventing or alleviating problems. Importantly, once we have enough microdata, the ex-post quantitative analysis can be used to validate the information coming from qualitative surveys and to evaluate the performance of the measures taken during the crisis.

Annex 1 Details of the microeconomic analysis

This section provides more details on the specifications (1) and (2). First, table 1 explains the computation of the dependent variables.

Table 1

Dependent variables

	Measure	Definition
Interest rate	The contractual interest rate in %	Annualised agreed rate or narrowly defined interest rate
Loan amount	Ln (1 + commitment amount at inception)	Bank's maximum exposure to credit risk on the inception date of a loan, without taking into account any collateral. If the commitment amount is missing, the sum of the outstanding and off-balance sheet amounts is used.
Collateralisation	= 1 if the allocated collateral amount exceeds zero, = 0 otherwise	The allocated collateral amount is the maximum amount of the collateral value that can be considered as being credit protection for a loan.

Source: NBB and own computations.

Additional remarks on the dependent variables.

- The value of the interest rate at the moment of loan origination is used regardless of whether the rate is flexible or fixed.
- The committed amount captures the maximum commitment amount that a bank is willing to grant under a given loan contract, hence, it better captures the bank's supply decision than the used loan amount which would more closely reflect the demand side.
- The collateralisation indicator captures the probability of a loan being collateralised.

To account for other factors that might affect credit conditions during the pandemic, both specifications include an array of firm-level X_{ft-1} and loan-level Z_{it} control variables.

Firm-level controls are important as they capture a firm's riskiness and the financial health that banks take into account when defining a loan contract. Table 2 below presents an overview of the firm-level control variables. To limit the issue of reverse causality, firm controls are lagged by 1 year. Equation (1) does not control for total assets additionally, as it explicitly includes an indicator for whether a firm is an SME or a large enterprise. Additionally, the specifications take into account the soft information that banks learn about their borrowers by including an indicator of whether a firm was already borrowing from a given bank before the pandemic.

Additionally, the specifications include controls for important loan variables that affect credit terms and credit demand. Loan controls include loan amount (in logarithm), interest rate (in %), a dummy equal to 1 if a loan is collateralised[1], loan maturity (up to 1 year, between 1 and 5 years, above 5 years), as well as a dummy equal to 1 if a loan is granted under one of the two loan guarantee programmes.

More importantly, the specifications include a wide range of fixed effects (dummies) to control for unobserved credit supply and demand effects. Namely, they include bank-by-quarter fixed effects to control for the role of banks' health. They also include loan-type fixed effects and location-by-quarter fixed effects. Additionally,

1 Only 2 out of these 3 variables are included in a given regression as we obviously do not use a dependent variable as a control.

in equation (1), they include sector-by-quarter fixed effects to control for the sector-time-specific unobserved demand effects and to absorb the heterogeneous impact of the crisis on the sectors.

Finally, all continuous variables are winsorised to mitigate the impact of outliers. OLS standard errors are clustered at the firm level to account for the correlation in loan characteristics granted to the same company.

Table 2

Control variables

Ln assets	The logarithm of the firm's total assets
Ln age	The logarithm of 1 + firm's age (in years)
RoA	Return on assets: ratio of earnings before interest and taxes (EBIT) to total assets
Equity/Assets	The ratio of a firm's equity to total assets
Tangibility	The ratio of a firm's tangible assets to total assets.
Relationship	A dummy that is equal to 1 if a firm was borrowing from a given bank before March 2020, and 0 otherwise.

Source: NBB and own computations.

Annex 2 Empirical results in details

Tables 3 and 4 present the full list of the regression coefficients obtained by estimating equations (1) and (2), respectively. Cluster-robust standard errors are presented in the parentheses. ***, **, * mean that the coefficients are statistically significant at the 1, 5, or 10 %-level, respectively.

Table 3

Estimation coefficients of specification (1): heterogeneity across firm size groups

	Interest rate	Loan amount	Collateralisation
Size	0.133*** (0.034)	–1.107*** (0.037)	0.019* (0.011)
Q1 # Size	0.060* (0.035)	0.693*** (0.153)	0.005 (0.012)
Q2 # Size	0.126*** (0.043)	–0.120** (0.057)	0.064*** (0.016)
Q3 # Size	0.086* (0.047)	0.551*** (0.110)	0.068*** (0.016)
Q4 # Size	0.077 (0.049)	0.060 (0.077)	0.106*** (0.025)
Q5 # Size	–0.063 (0.072)	–0.031 (0.057)	0.033** (0.017)
Controls			
Ln age	–0.086*** (0.007)	0.123*** (0.012)	0.007*** (0.003)
RoA	–0.496*** (0.026)	–0.013 (0.040)	–0.184*** (0.010)
Equity/Assets	–0.107*** (0.017)	–0.241*** (0.024)	–0.118*** (0.006)
Tangibility	–0.103*** (0.017)	–0.140*** (0.029)	0.184*** (0.007)
Relationship	–0.034** (0.016)	–0.259*** (0.020)	0.060*** (0.005)
Maturity	–0.069*** (0.005)	0.365*** (0.010)	0.026*** (0.002)
Ln loan amount	–0.112*** (0.003)		0.041*** (0.001)
Collateralised	0.121*** (0.009)	0.635*** (0.015)	
Interest rate		–0.282*** (0.006)	0.020*** (0.001)
Guaranteed loan	–0.264*** (0.011)	0.214*** (0.018)	–0.008 (0.005)
Observations	351 838	351 838	351 838
R-squared	0.340	0.330	0.300
Number of firms	115 833	115 833	115 833
Bank#Quarter FE	Yes	Yes	Yes
Loan Type FE	Yes	Yes	Yes
Location#Quarter FE	Yes	Yes	Yes
NACE#Quarter FE	Yes	Yes	Yes

Source: NBB and own computations.

Table 4

Estimation coefficients of specification (2): heterogeneity across economic sectors

	Interest rate	Loan amount	Collateralisation
IRS	0.181*** (0.018)	–0.133*** (0.023)	0.024*** (0.008)
CFGHN	0.079*** (0.013)	–0.113*** (0.017)	0.041*** (0.005)
Q1 # IRS	–0.165*** (0.026)	–0.136*** (0.051)	0.074*** (0.011)
Q2 # IRS	–0.019 (0.020)	0.036 (0.028)	–0.024** (0.009)
Q3 # IRS	–0.030 (0.019)	–0.027 (0.022)	–0.026*** (0.007)
Q4 # IRS	–0.122*** (0.019)	0.010 (0.023)	–0.000 (0.008)
Q5 # IRS	0.042 (0.036)	0.100** (0.044)	0.018 (0.013)
Q1 # CFGHN	–0.104** (0.042)	–0.030 (0.038)	–0.001 (0.014)
Q2 # CFGHN	0.004 (0.034)	0.011 (0.032)	0.006 (0.012)
Q3 # CFGHN	0.060* (0.035)	0.054 (0.035)	0.029** (0.014)
Q4 # CFGHN	–0.069*** (0.015)	–0.151** (0.059)	0.037*** (0.008)
Q5 # CFGHN	–0.009 (0.019)	–0.080** (0.038)	–0.019** (0.008)
Controls			
Ln Assets	–0.151*** (0.004)	0.431*** (0.008)	0.001 (0.002)
Ln age	0.003 (0.007)	–0.094*** (0.012)	0.006** (0.003)
RoA	–0.617*** (0.026)	0.325*** (0.038)	–0.192*** (0.011)
Equity/Assets	–0.141*** (0.018)	–0.142*** (0.023)	–0.118*** (0.006)
Tangibility	–0.084*** (0.017)	–0.197*** (0.031)	0.194*** (0.007)
Relationship	0.042*** (0.016)	–0.454*** (0.021)	0.055*** (0.005)
Maturity	–0.104*** (0.005)	0.431*** (0.010)	0.028*** (0.002)
Ln loan amount	–0.070*** (0.003)		0.040*** (0.001)
Collateralised	0.121*** (0.009)	0.562*** (0.015)	
Interest rate		–0.168*** (0.006)	0.020*** (0.002)
Guaranteed loan	–0.297*** (0.011)	0.292*** (0.015)	–0.007 (0.005)
Observations	351 838	351 838	351 838
R-squared	0.360	0.390	0.300
Number of firms	115 833	115 833	115 833
Bank#Quarter FE	Yes	Yes	Yes
Loan Type FE	Yes	Yes	Yes
Location#Quarter FE	Yes	Yes	Yes

Source: NBB and own computations.

Robustness test: probability of default

We also perform an additional robustness test by adding the firm's probability of default (PD) as a control variable to specifications (1) and (2). PD reflects a bank's knowledge of the actual state of a company's finances and is therefore an important factor that might determine credit conditions and which is not fully captured by using a selection of firms' lagged financial ratios. However, PD is only estimated by banks that use an internal ratings-based approach (IRB) to compute risk weights. Consequently, the sample used for the robustness tests is reduced to 332 094 observations and includes only eight larger banks and 108 171 unique firms. So, the results of the robustness test cannot be directly compared with the main results as the latter are based on a sample of 14 banks. Nonetheless and quite importantly, the coefficients $\hat{\beta}$ of the interaction terms remain largely unchanged when estimating equations (1) and (2) using the reduced sample and controlling for the probability of default[1].

1 The estimation results are available upon request.

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Conventional signs

%	percent
e.g.	*exempli gratia* (for example)
i.e.	*id est* (that is)

List of abbreviations

Countries or regions

EA	Euro area

Abbreviations

BECRIS	Belgian Extended Credit Risk Information System
BLS	Bank lending survey
CET1	Common equity tier 1
COVID-19	Coronavirus disease-19
EBIT	Earnings before interest and taxes
ECB	European Central Bank
FTE	Full-time equivalent
GDP	Gross domestic product
IRB	Internal ratings-based approach
LCR	Liquidity coverage ratio
Ln	Natural logarithm
MFI	Monetary financial institutions
MIR	MFI Interest Rate Statistics
NACE	Nomenclature of economic activities of the European Community
NBB	National Bank of Belgium
NFC	Non-financial corporation
NSFR	Net stable funding ratio
OLS	Ordinary least squares regression
PD	Probability of default
PEPP	Pandemic Emergency Purchase Programme
PMI	Purchasing Managers' Index
RoA	Return on assets
RWA	Risk-weighted asset

SAFE	Survey on the access to finance of enterprises
SME	Small and medium-sized enterprise
SREP	Supervisory Review and Evaluation Process
VAT	Value added tax

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