

Bank financing for SMEs from 2014 to 2019: effect of changes in the law on lending

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Introduction

The Law of 21 December 2013, amended by the Law of 21 December 2017, aims to facilitate access to bank finance for small and medium-sized enterprises (SMEs). To that end, it comprises a range of provisions intended to correct any information asymmetries which could affect the commercial relationship between lenders and borrowers by specifying the transparency obligations incumbent on both parties. Thus, firms applying for credit have to supply sufficiently exhaustive data on their financial statements, among other things. For their part, lenders must make available to applicants standard documents corresponding to the various forms of credit which they offer¹. In addition, a proposed credit agreement has to be accompanied by a brief information document setting out all the characteristics of the contract. The lender must also ascertain the most suitable type of credit, taking account of the firm's financial position at the time of conclusion of the contract and the purpose of the credit. These provisions aim in particular to stimulate competition between credit institutions by making it easier for firms to compare the various options available to them. In the event of a refusal to grant credit, the lender must inform the firm of the essential reasons for that refusal or the factors influencing the risk assessment, and that information must be transparent and comprehensible for the firm. The law also includes an article on the rules for fixing the prepayment penalty which the lender is entitled to demand from any borrowers who decide to repay their loan early. The loan agreement must explicitly mention the amount of the penalty. The latter is determined by a standardised procedure according to a method of calculation defined in a code of conduct, revised in 2018 following changes to the law and agreed between employers' organisations representing the interests of self-employed workers (the SNI) and SMEs (Unizo and the UCM), on the one hand, and Febelfin on the other. For loans for an initial sum of no more than € 2 million, the penalty must not exceed six months' interest. At the time, the financial sector had expressed certain reservations on this last provision, raising concerns of a relative increase in the interest rate on loans to SMEs.

The law also states that its own effects must be reviewed every two years. In that connection, the National Bank is asked to give a "preliminary opinion"². The Royal Decree of 10 April 2016, which lays down the review procedures, also specifies that the Bank shall provide statistical data on the loans concerned by the law.

1 Since 2018, this requirement no longer applies to loans of less than € 25,000, provided they do not comprise a penalty clause and are not covered by collateral or guarantees.

2 An opinion is also requested from the FSMA, the financial dispute mediator OMBUDSFIN, and the organisations representing small businesses.

The aim of this article is to summarise and comment on the various data considered relevant for monitoring lending to SMEs by resident banks, namely data on the volume of such loans, the interest rates applied and the conditions for granting loans. However, the examination of these data is not sufficient in itself to determine whether structural effects emerged following the law's entry into force; it is therefore supplemented by an econometric analysis, which is summed up in the second part of the article. Finally, the conclusion discusses any effects of the law on the dynamics of lending to SMEs.

When this article was written, the data taken into account for the analysis were available up to the end of 2019 for some variables and up to February 2020 for others, i.e. before the eruption of the Covid-19 crisis. That crisis is liable to result in fundamental changes in the situation from the point of view of both credit institutions and firms. The conclusions drawn at the end of this study will therefore need to be reassessed in a few months' time. Meanwhile, we refer interested readers to the specific monitoring by the Bank conducts published on its website as part of the Observatory for Credit to Non-financial Corporations¹.

1. Recent developments in business credit

1.1 Volume of bank loans

Lending by resident credit institutions to resident non-financial corporations is usually monitored via two statistical sources, namely the data obtained from bank balance sheets and those obtained from the Central Corporate Credit Register. In principle, the first of these two sources is exhaustive, but it has the disadvantage of only providing information at an aggregate level. This defect is overcome by the second source, which permits a breakdown of the stock of business loans according to the firms' size and their branch of activity. These statistics are compiled using separate collection methods and are based on different definitions²: naturally, that gives rise to some statistical variations. It should also be pointed out that the analysis concerns credit used by firms taken into account in the Central Credit Register³ and focuses on non-financial corporations, thus excluding firms classified in the financial services branch⁴.

Nonetheless, these two sources⁵ provide a picture which tallies overall with developments in outstanding bank loans to firms located in Belgium. As illustrated in chart 1, those developments clearly bear the marks of crisis episodes: first, the great recession of 2008 and 2009, and then the sovereign debt crisis which affected the euro area in 2011 and 2012. These two events had a negative impact on both demand for loans and the supply of credit. Lagging somewhat behind the trend in economic activity, the volume of credit used by firms has thus contracted on two occasions in the past ten years: first, between mid-2009 and mid-2010, and then in 2013 or 2014, depending on the data source considered. After that, it began rising again towards the end of 2014, and that expansion accelerated from 2015 to mid-2018, before slowing down up to February 2020.

However, the movements in the total volume of loans mask highly heterogeneous variations according to firm size. In reality, the procyclical character of the trend in credit primarily concerns lending to large firms. The reduction in the total volume of loans during the two crisis periods is almost entirely attributable to them. The

1 https://www.nbb.be/doc/dq/kredobs/fr/ko_home.htm.

2 First, the Central Corporate Credit Register is constantly updated by credit institutions, but the data may be revised retrospectively during the twelve months following their submission. That implies that the existing statistics for the period from March 2019 to February 2020 may yet be amended. Next, some transactions regarded as loans under Scheme A are excluded from the Central Corporate Credit Register's statistics: that applies, for instance, to claims resulting from repo transactions in securities. Finally, the criteria for granting loans via an association or syndicate to a counterparty within the association are not the same, as the banks have direct information which is not currently passed on to the Central Corporate Credit Register; that sometimes leads to differences in geographical and/or sectoral classification.

3 Credit used is different from credit authorised, which concerns credit lines made available to firms but not necessarily used in full.

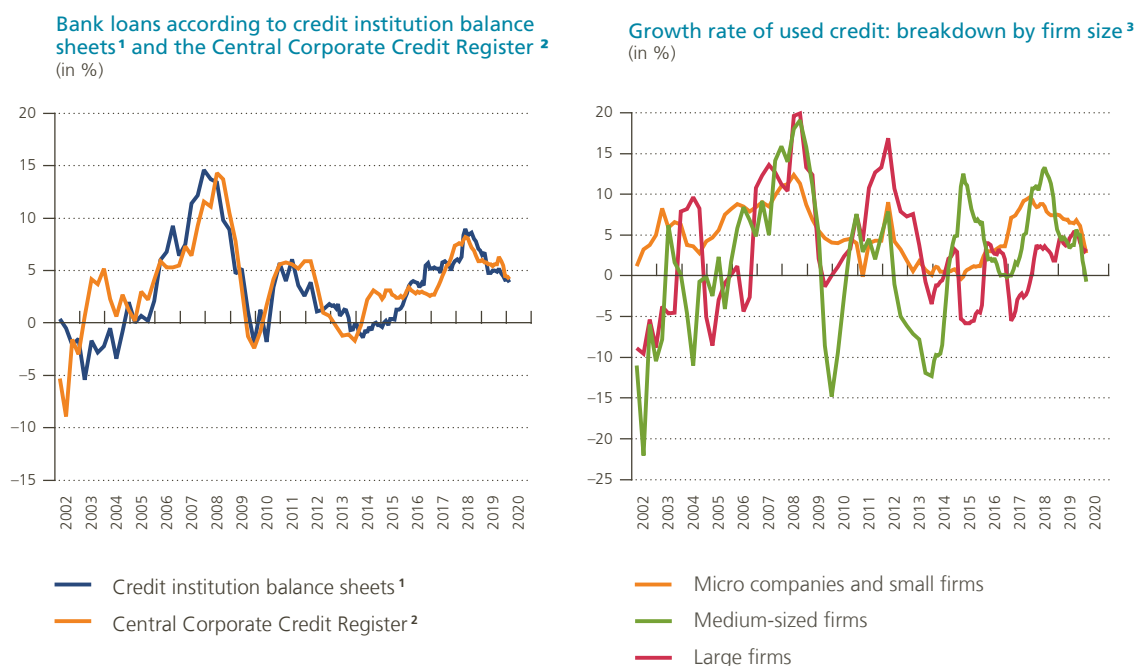
4 More specifically, this concerns the branches under NACE code "K".

5 The period covered ends in February 2020 owing to the availability of data at the time of concluding this analysis.

volume of bank loans contracted by small firms¹ shows much more stable growth. There have been two distinct phases in recent years: (1) an acceleration in the credit expansion rate from 2015 to the end of 2017, (2) followed by a deceleration which persisted up to February 2020 (latest available data). During that same period, the volume of loans to medium-sized firms declined for 12 consecutive months, between December 2016 and November 2017, while lending to large firms remained positive almost throughout the period from 2015 to February 2020.

Chart 1

Growth rate of bank lending to firms



Source: NBB (Central Corporate Credit Register and credit institution balance sheets).

- Sum of flows over 12 months in relation to the outstanding total recorded a year earlier.
- Moving average over 4 quarters of the growth rate over three months, which is then annualised. No account was taken of credit used by firms classified in the financial services sector.
- Firms using micro models for their annual accounts are considered to be micro companies and firms submitting an abbreviated model are considered to be small firms. Firms submitting full-format accounts are regarded as large or medium-sized according to whether they exceed one or more of the thresholds defined in terms of the number of workers (50 FTE), turnover (€ 9 000 000) and balance sheet total (€ 4 500 000). For more details, see https://www.nbb.be/doc/ba/infomail/mail_f_50.pdf.

Overall, since the beginning of 2014 – i.e. since the entry into force of the Law of 21 December 2013 on SME financing – the volume of credit used by micro companies and small firms taken as a whole has risen by an annual average of 4.6% (similar to the rise during 2008-2013 when annual growth averaged 4.8% for this category of firms), while lending to medium-sized firms expanded by 0.6% (see chart 2). Although lending to medium-sized firms did increase, the growth rate was much lower than in the six preceding years (2008-2013), when it averaged 7.6%. Lending to large firms expanded by an average of 4.2% between 2014 and February 2020², following a 1.3% rise between 2008 and 2013.

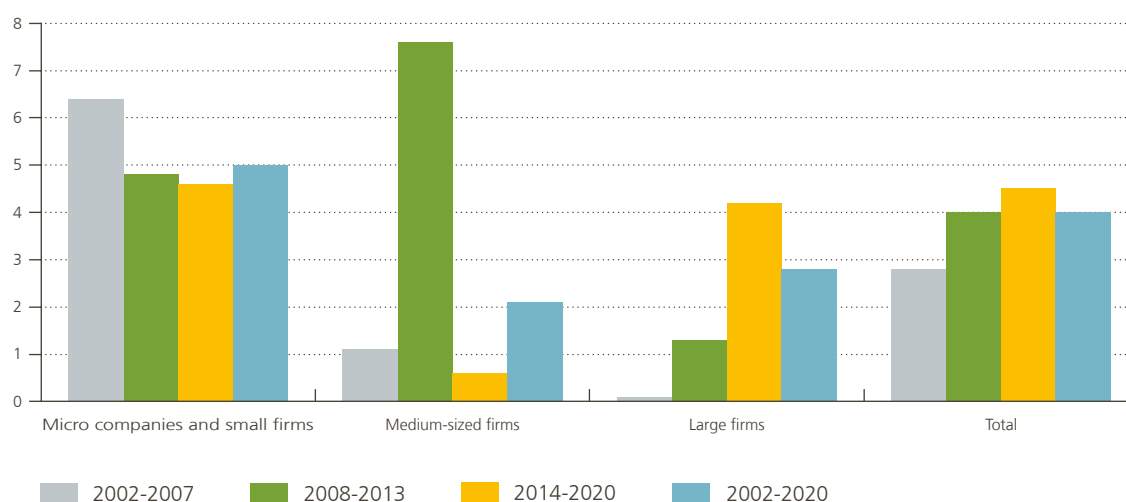
- In this study, the term “small firms” includes both micro companies (using the micro model for annual accounts) and small firms (filing accounts in the abbreviated format).
- In addition, credit developments may vary greatly from one branch of activity to another (see annex 2). For example, in the case of small firms, bank lending expanded faster between 2014 and 2020 in the energy sector, real estate activities and the construction industry. Conversely, growth was slower in the wholesale and retail trade sector. Annexes 1 and 2 provide detailed statistics on credit developments in the various branches of activity and for the different firm size categories.

However, it should be noted that, in view of the procyclicality of the statistical series described here, and more specifically those concerning large firms, descriptive data cannot be used on their own to interpret these developments as being genuinely specific to the period in which the law has applied. For that purpose, we conducted a more detailed analysis using an econometric method which enables us to distinguish between the effects specific to this period and those relating to the changes in the economic environment and borrowing rates. The details are set out in the second part of this article.

Chart 2

Annualised growth rate of used credit: breakdown by firm size^{1,2,3}

(in %)



Source: NBB (Central Corporate Credit Register).

1 No account was taken of credit used by firms classified under financial services.

2 The annualised growth rate is determined as follows: an average is calculated on the basis of the quarterly growth rates/over a three-month period (from January 2013, the date from which monthly data are available). ($\text{Encours}_t / \text{Encours}_{t-1}$), disregarding the quarters affected by a break in the series (namely the second quarter of 2012, and the fourth quarter of 2014). This average is then annualised.

3 Firms using micro models for their annual accounts are considered to be micro companies and firms submitting an abbreviated model are considered to be small firms. Firms submitting full-format accounts are regarded as large or medium-sized according to whether they exceed one or more of the thresholds defined in terms of the number of workers (50 FTE), turnover (€ 9 000 000) and balance sheet total (€ 4 500 000).

For more details, see https://www.nbb.be/doc/ba/infomail/mail_f_50.pdf.

1.2 Interest rates charged by credit institutions

The interest rates charged by banks granting credit to non-financial corporations can be tracked via the results of the MIR (Monetary financial institution Interest Rate) survey. Chart 3 presents the four main series established on the basis of that survey. They are calculated as weighted averages of various types of interest rates¹, namely variable or short-term rates – for loans of less than or more than € 1 million (i.e. loans with an initial fixed-rate period of less than one year), medium-term interest rates initially fixed for a period of between one and five years, and finally, long-term rates initially fixed for more than five years. In Belgium, the medium- and long-term weighted average interest rates are only established for sums of less than € 1 million (because the volume of these maturities is too small for amounts in excess of € 1 million).

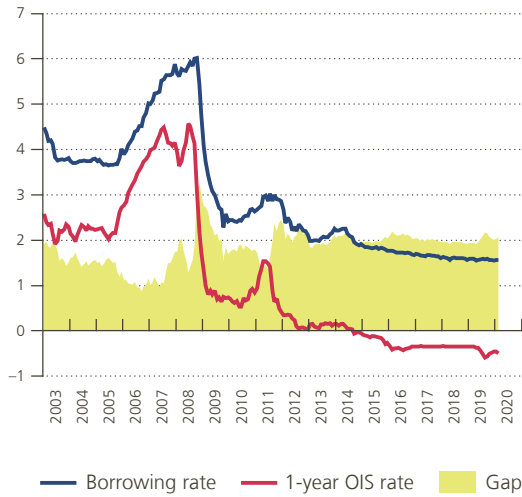
1 For more details on the methodology, go to https://www.nbb.be/doc/dq/mir/pdf/facteurs_en.pdf.

Chart 3

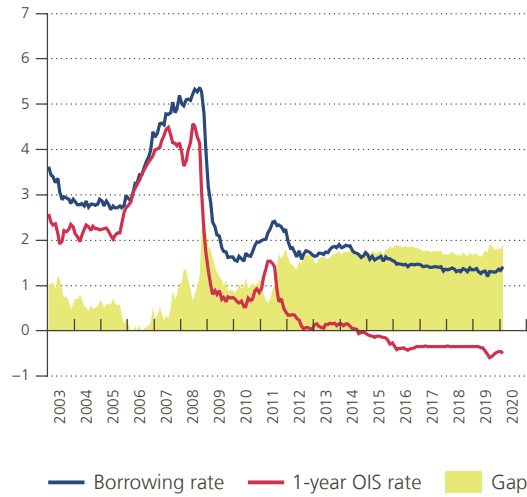
MIR rates and OIS rates¹: breakdown according to the initial fixation period

(in %)

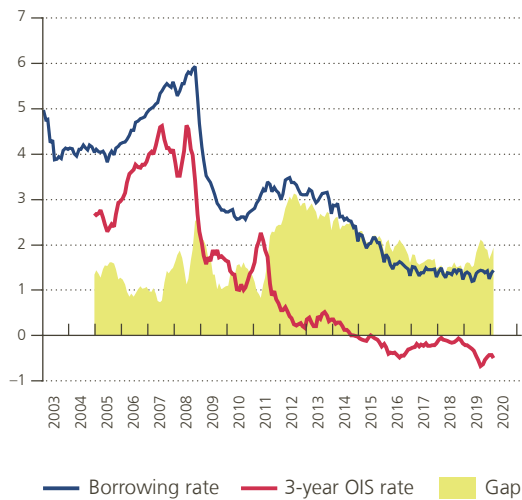
Loans of less than €1 million, at variable interest rates, with an initial fixation period of less than 1 year



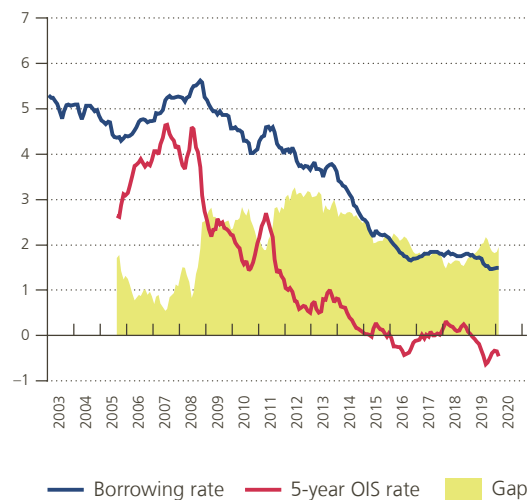
Loans of more than €1 million, at variable interest rates, with an initial fixation period of less than 1 year



Loans of less than €1 million, at fixed interest rates, with an initial fixation period of between 1 and 5 years



Loans of less than €1 million, at fixed interest rates, with an initial fixation period of more than 5 years



Sources: NBB (MIR survey), Eikon.

¹ Overnight index swap – OIS: the interest rates on loans to prime banks, and consequently an approximation of the rates at which banks can raise finance. Interest rates on short-term loans were compared with the 1-year OIS, rates on medium-term loans were compared with the 3-year OIS and rates on long-term loans were compared with the 5-year OIS.

The movement in these interest rates largely reflects the various monetary policy measures adopted in the Eurosystem. In accordance with the tasks entrusted to it by the Treaty on the Functioning of the European Union, the Eurosystem's primary aim is to maintain price stability. The policy interest rates set by the ECB Governing Council therefore generally mirror inflation expectations. These were revised downwards following the eruption of the economic and financial crisis in 2008, as was the outlook for demand. The Governing Council therefore made substantial cuts in the policy interest rates from then on. Moreover, in setting its deposit facility interest rates at a negative level from June 2014, and establishing its extended securities purchase programme at the beginning of 2015, the Eurosystem tried to encourage portfolio rebalancing in favour of lending and, ultimately, the financing of the real economy. Although the asset purchase programme was suspended in December 2018, it was resumed in November 2019 in order to reinforce the accommodative effects of the interest rates. In addition, the targeted longer-term refinancing operations (TLTRO) also helped to boost bank lending to businesses (and consumers) in the euro area, and similarly in Belgium. These measures maintained favourable credit conditions in the euro area. The first series of targeted longer-term refinancing operations, intended to stimulate lending to euro area credit institutions, was announced in June 2014 and extended over a 2-year period. The second series of operations (TLTRO II) began in March 2016, and the third series (TLTRO III) in March 2019.

These various measures considerably reduced the funding costs of credit institutions in Belgium and in the euro area as a whole. Chart 3 shows these costs according to the OIS rates¹ for maturities similar to those of the weighted average interest rates obtained from the MIR survey. The decline in funding costs, which occurred mainly from the second half of 2008, was not entirely reflected in the borrowing rates that Belgian banks offered to resident enterprises. The gap between these two types of interest rates widened a little further following the new cuts in key interest rates introduced from 2011. However, in the case of loans at variable interest rates (with an initial fixation period of less than one year), that gap stabilised from 2012 at a level close to 2%. Furthermore, the gap is hardly any greater for loans of less than € 1 million compared to loans of more than € 1 million, which suggests that loans for smaller amounts – typically sought by SMEs – were not affected by a higher interest rate owing to the limit on prepayment penalty.

Medium- and long-term fixed interest rates declined by more than the interbank rates in 2012 and 2013, causing a similar reduction in the gap in relation to the corresponding OIS rate. Spread with respect to the OIS continued to fall, reaching a low point in 2017 before edging back up in 2018 and 2019. During 2019, medium- and long-term interest rates fell to historically low levels, respectively declining to 1.20% (in April) and 1.46% (in October), indicating particularly favourable credit conditions for businesses.

1.3 Credit conditions

Apart from the accommodative monetary policy, other factors also contributed to the cuts in interest rates charged by banks, and more generally, the easing of the conditions to be met by firms seeking to borrow. As well as interest rates and commercial margins, these conditions include maximum loan amounts/loan periods, as well as the collateral required and non-interest rate charges.

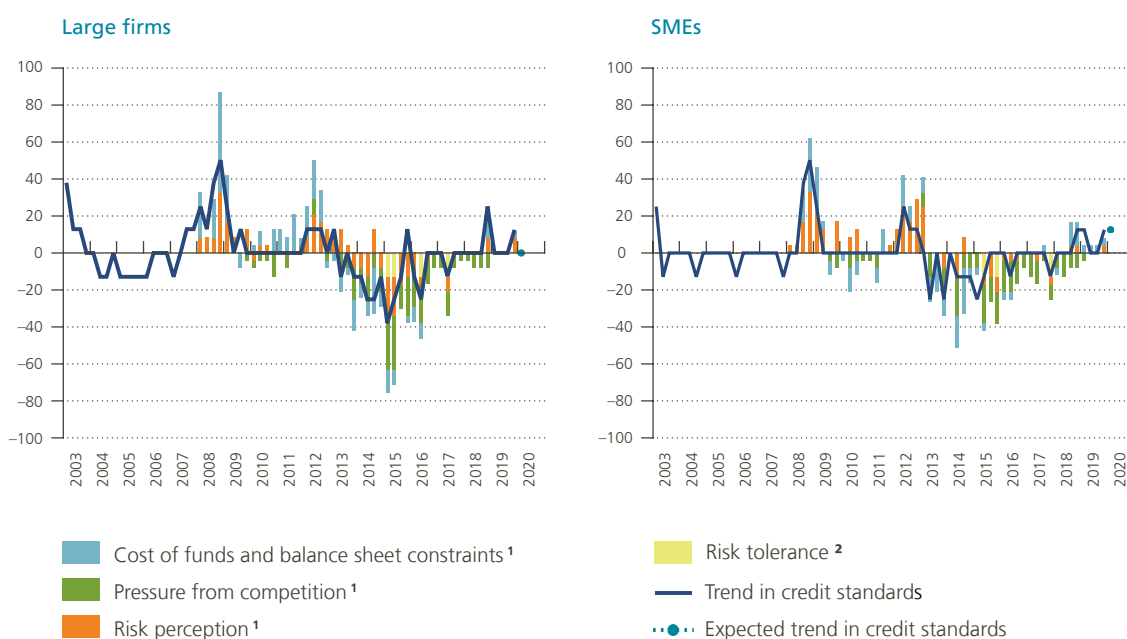
These conditions were tightened initially in 2008, when the economic and financial crisis erupted, and again in 2011-2012 at the time of the sovereign debt crisis; this applied to both SMEs and large firms. According to the results of the Bank Lending Survey covering the four largest credit institutions operating in Belgium, their supply of loans became more limited in 2008 owing to the risks (which they saw as having increased considerably), higher funding costs and tighter balance sheet constraints. This last aspect was connected with the process of balance sheet consolidation and size reduction on which the banks had embarked after the start of the crisis.

1 Overnight index swap (OIS). This is the interest rate on loans to prime banks.

Chart 4

Credit standards applied to non-financial corporations: breakdown by firm size

(weighted net percentages¹)



Source: NBB (Bank lending survey).

1 A positive (negative) percentage corresponds to tightening (easing) of credit conditions or a factor contributing to the tightening (easing) of those conditions.

2 Factor included for the first time in the survey in the first quarter of 2015.

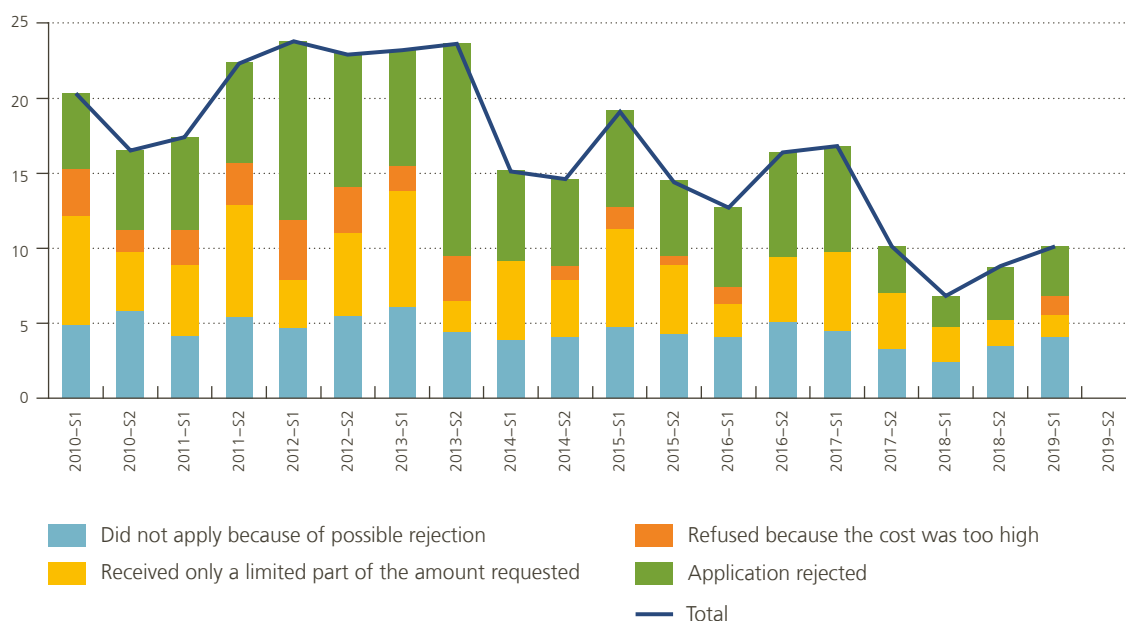
Between the end of 2013 and mid-2018, the successive key interest rate cuts and other monetary policy measures did much to encourage banks to ease their loan criteria. Furthermore, the upturn in economic activity in 2014 and 2015 led to a downward revision of the assessment of credit risk. Finally, the results of the bank surveys primarily reveal an increase in the pressure from competition between 2015 and 2018, prompting the banks to offer more favourable credit conditions for borrowers. These developments are not specific to the Belgian market; a similar picture also emerged in other euro area countries. In 2019, the banks began to tighten their credit conditions for both large firms and SMEs, mainly owing to the deteriorating risk perception in the wake of the slowdown in economic activity.

The generally favourable character of credit conditions for SMEs in recent years is confirmed by surveys among entrepreneurs, such as the Survey on the Access to Finance of Enterprises (SAFE) conducted every six months in the euro area countries. The results of that survey (presented in chart 5) in fact suggest a marked reduction in the obstacles to access to bank loans between the first half of 2017 and in limited approvals the first half of 2018, initially reflected in a decline in rejection rates accompanied, from 2017, by a reduction in limited approvals of loan applications. According to the latest data, the obstacles are still relatively low in historical terms, although they have increased since mid-2018.

Chart 5

Obstacles impeding access to bank financing for SMEs 1,2

(percentages of respondents)



Source: ECB (SAFE).

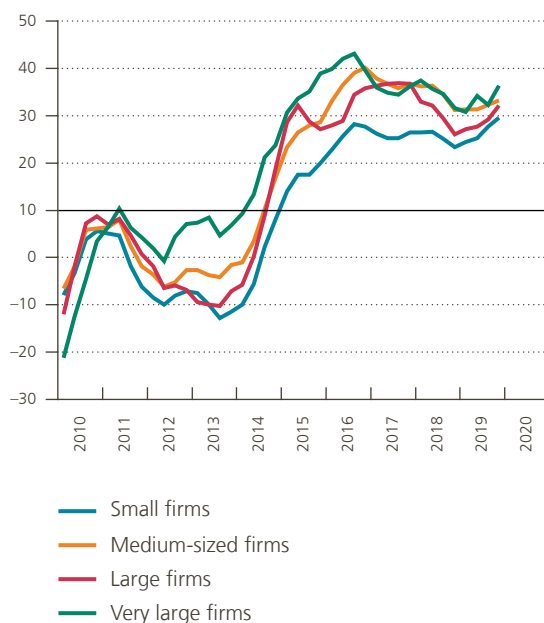
1 Fewer than 250 workers.

2 Proportion of firms 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 6

Firms' assessment of conditions governing access to credit: breakdown by firm size 1

(balance of the percentages of favourable (+) and unfavourable (-) responses, 4-quarter moving average)



Source: NBB (Quarterly survey of corporate credit conditions).

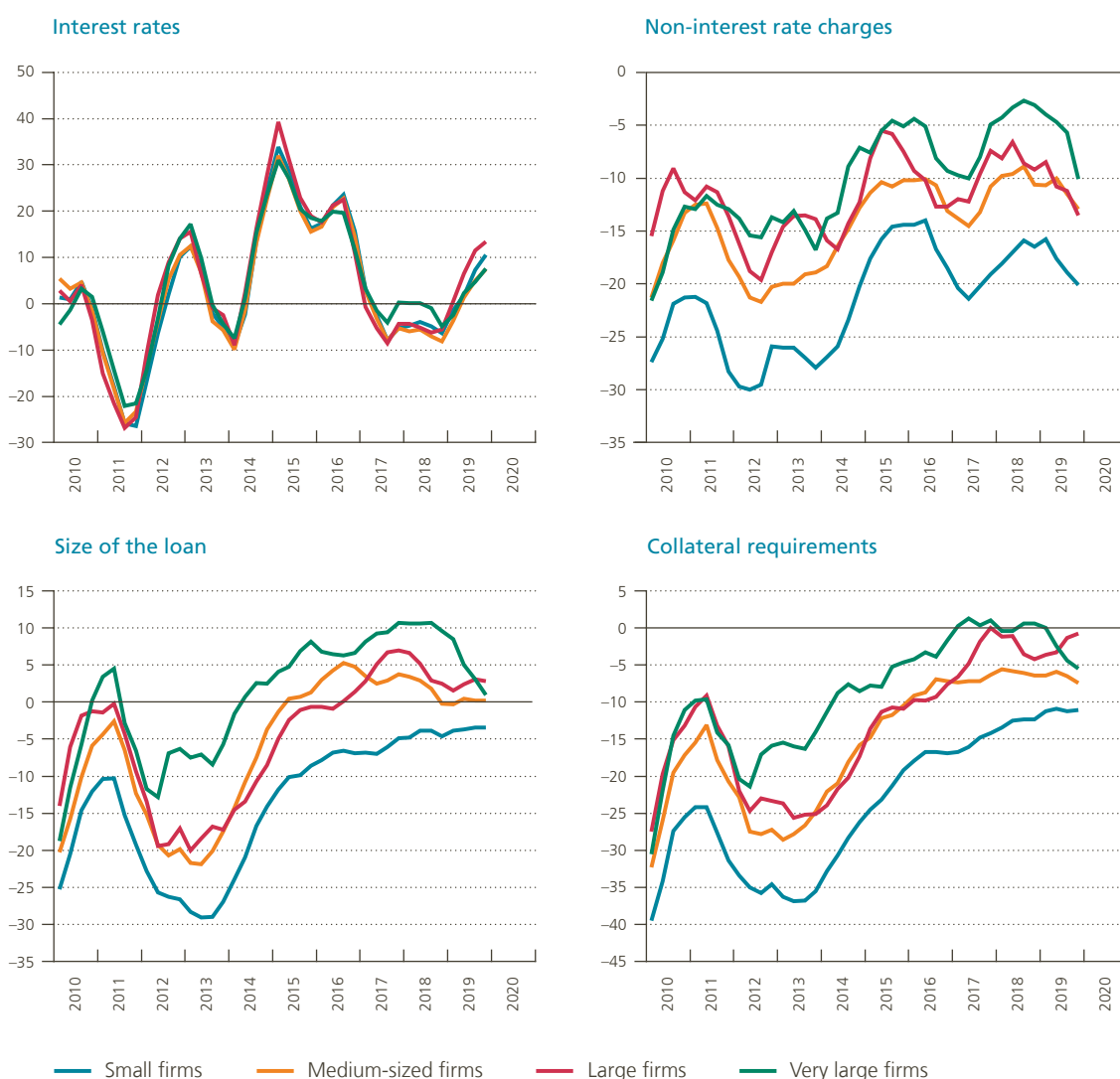
1 Small = 1-49 workers; medium = 50-249 workers; large = 250-499 workers; very large = 500 workers or more.

The improvement in credit conditions is likewise borne out by the quarterly survey which the National Bank conducts on a sample of Belgian entrepreneurs (see chart 6). The results of that survey show that the improvement which began in 2013 and persisted up to 2016 (since when, entrepreneurs' satisfaction has generally stabilised at historically high levels) concerned both SMEs and large firms. That improvement was also apparent in the various aspects of loan agreements, be it in terms of interest rates, non-interest rate charges, loan volumes and collateral required from borrowers (see chart 7). SMEs therefore do not seem to have been penalised in any way as regards lending conditions compared to the terms applied to large firms between 2016 and 2019.

Chart 7

Firms' assessment of credit criteria: breakdown by size¹

(balance of percentages of responses reporting improvement (+) or deterioration (-), 4-quarter moving average)



Source: NBB (Quarterly survey of corporate credit conditions).

¹ Small = 1-49 workers; medium = 50-249 workers; large = 250-499 workers; very large = 500 workers or more.

2. Econometric analysis

The developments described in the previous section are attributable to a combination of various factors. In particular, the expansion of corporate credit is naturally influenced partly by the movement in interest rates charged by banks. As the descriptive statistics suggest, it may also be greatly influenced by the economic climate via both demand effects and supply effects. Demand effects arise in particular because firms invest more (less) in periods of strong (weak) activity, and because of the procyclicality of their liquidity needs, as purchases of intermediate goods and wage payments move in line with economic activity and employment. In addition, as a deteriorating economic situation is accompanied by an increased credit risk concerning some firms, banks tend to tighten restrictions on those which are struggling, e.g. by imposing higher risk premiums. Regarding interest rate levels and trends, we have seen earlier that they closely track the movement in banks' funding costs, which are themselves determined mainly by the interest rates prevailing on the money market.

As already pointed out, identifying how the Law of 21 December 2013 has affected lending volumes and interest rate levels entails isolating its impact, if any, from that of the other factors mentioned above. However, such an exercise is not easy since that law may influence business credit in various ways: both positively, by strengthening competition between credit institutions, prompting them to adapt their tariff strategies to make them more favourable to borrowers, and negatively, by regulating the fixing of the prepayment penalty, perhaps causing banks to include an excess risk premium in borrowing rates. But these opposing effects are not directly quantifiable on the basis of the data available to the National Bank. The chosen approach therefore consisted in examining developments in business credit and interest rates and identifying divergences compared to what might normally be expected in view of the economic environment and banks' funding costs.

This meant conducting an econometric analysis enabling us to separate any structural changes after the beginning of 2014 – when the law came into force – from cyclical effects measured on the basis of the Bank's overall synthetic indicator and changes connected with the movement in funding costs on the interbank markets, examined by means of the swap rates. Divergences specific to the period beginning in 2014 were assessed with the aid of a binary variable introduced into each model. The various equations take the form of autoregressive distributed lag models. However, the ones relating to interest rates were converted into error correction models in order to take account of any long-term link between the interest rates charged by banks on loans to businesses and the cost of funds assessed according to the swap rates.

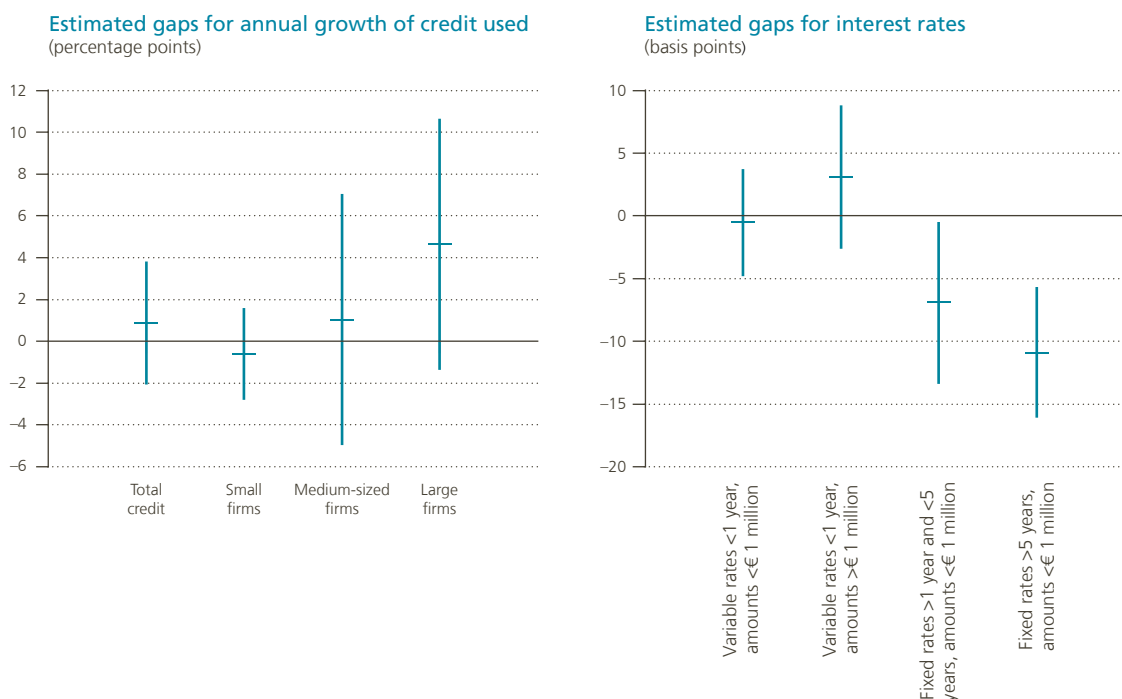
The specifications of the various models are shown in an annex (Annex 3), as are the detailed results of the estimations (Annexes 4 and 5). The model concerning (year-on-year) growth of lending to non-financial corporations is declined in four versions: one for all lending and three others for the various size categories, namely micro and small firms, grouped in a single category, and medium-sized and large firms. The model concerning interest rates was estimated for the four weighted average rates represented in chart 3.

The results obtained (chart 8) do not show any significant structural change in the credit situation that could potentially be linked to the entry into force of the law. In general, the outstanding amount of loans to businesses follows a relatively stable trend although it is actually influenced by cyclical developments to some extent, and after a time lag. As already shown by the descriptive statistics in the first section, the credit used by micro- and small firms is less sensitive to the economic environment than loans granted to larger firms. Moreover, bank loans to large firms seem to be the only ones influenced by interest rate changes, but the impact is not very significant. Part of the reason may be that, unlike most SMEs, some large firms are able to access market financing when the interest rates charged by credit institutions are deemed too high.

Chart 8

Average gaps between loans and interest rates compared to their “expected” trend at the beginning of 2014

(effects specific to the period 2014-2020, estimated by means of econometric models and 95% confidence intervals)



Source: NBB.

Note: The dashes in these charts represent the effects specific to the period from the beginning of 2014 to the final quarter of 2019 (for loans) or to February 2020 (for interest rates). These effects are interpreted as deviations from what the model predicts solely on the basis of the fundamental factors taken into account in the models. The vertical lines represent the confidence intervals. If the value “0” on the y-axis is included in the interval, the associated effect is considered insignificant at a 5% level.

According to the estimates obtained for models relating to the interest rates applied by banks, those rates are determined mainly by the cost of funds. The results in fact confirm that in most cases these interest rates mirror the trend in the key interest rates and money market rates, except for medium-term interest rates. Moreover, the economic climate does not appear to have a significant effect on most interest rates, at least not during the period covered by the data. However, they did deviate from the trend in money market rates after eruption of the crisis in the second half of 2008.

While borrowing rates continued to fall between the end of 2014 and the end of February 2020, there is no significantly negative effect except in the case of interest rates at more than one year. That change probably reflects a reduction in intermediation margins due to increased pressure from competition, as was also revealed by the Bank Lending Survey (see above), rather than being due to the Law of 21 December 2013.

Finally, an analysis of the gaps between the values predicted by the various models and the observed values (not reported here) also failed to show any temporary effects, as the error terms of the models relating to credit and interest rates for the period commencing in 2014 remained within the usual margins.

Conclusions

This article reviewed the dynamics of the volume of loans granted by banking institutions operating in Belgium to resident enterprises, and the interest rates and other credit conditions, since the entry into force of the Law of 21 December 2013 on SME financing.

Loans to SMEs – generally less procyclical than the volume of credit used by large firms – increased between 2014 and the beginning of 2020. During that period, the growth of lending to micro-companies and small firms averaged 4.6 % year-on-year, compared to 0.6 % for medium-sized firms. This situation is due partly to the credit supply, which expanded throughout the period, supported by the various measures taken by the Eurosystem to stimulate economic activity. Up to the end of 2018, the expansion of credit was also propelled by rising demand from both SMEs and large firms.

Interest rates on business loans are determined mainly by interbank market rates, which are themselves strongly influenced by monetary policy. For some years now, the Eurosystem's monetary policy has indirectly done much to facilitate access to bank finance for businesses (and households). The measures implemented since 2014 have cut the cost of funds for credit institutions. The latter also have access to loans at advantageous rates via the targeted longer-term refinancing operations. Furthermore, the asset purchase programme made it easier for them to free up liquidity which could be allocated to new loans. Finally, as a result of competition, the reduction in banks' funding costs led to firms being offered lower medium-term and long-term borrowing rates, and caused short-term rates to stabilise at a low level.

According to various surveys, firms have in fact reported that their credit conditions have improved since 2014, and were particularly favourable between 2016 and 2019. However, owing to the increased risks, these conditions were tightened slightly at the end of the period, and that affected all categories of firms regardless of size.

Annex 1

Outstanding total of credit used by size and branch of activity

(in € billion, end-of-year data)

	2002	2008	2013	2016	2019
All firms^{1,2}	68.4	98.4	109.7	117.0	138.9
Small firms (including micro companies)¹	29.3	45.8	54.1	59.2	70.7
of which:					
Manufacturing industry	2.9	3.5	3.4	3.5	4.4
Electricity, gas, steam and air conditioning supply	0.0	0.1	0.2	0.4	0.6
Water supply; sewerage, waste management and remediation activities	0.1	0.2	0.2	0.2	0.3
Construction	3.1	5.4	6.5	7.3	9.0
Wholesale and retail trade; repair of motor vehicles and motor cycles	7.7	10.3	10.8	11.1	12.1
Transportation and storage	1.3	1.6	1.5	1.5	2.0
Accommodation and food service activities	1.4	1.8	2.2	2.3	2.7
Information and communication	0.5	0.8	1.1	1.2	1.4
Real estate activities	5.5	9.3	11.5	13.8	16.6
Medium-sized firms¹	13.1	18.4	24.4	22.2	24.9
of which:					
Manufacturing industry	3.5	3.1	2.8	2.8	3.1
Electricity, gas, steam and air conditioning supply	0.1	0.3	0.7	0.5	0.8
Water supply; sewerage, waste management and remediation activities	0.5	0.5	0.4	0.3	0.3
Construction	1.2	1.9	3.1	2.5	2.9
Wholesale and retail trade; repair of motor vehicles and motor cycles	3.4	3.6	4.5	4.4	4.3
Transportation and storage	1.0	1.3	1.4	1.3	1.5
Accommodation and food service activities	0.2	0.2	0.3	0.4	0.3
Information and communication	0.3	0.2	0.3	0.3	0.4
Real estate activities	1.3	2.7	4.1	3.9	4.6
Large firms¹	19.8	28.1	24.2	27.3	31.5
of which:					
Manufacturing industry	7.4	5.1	4.0	4.3	6.0
Electricity, gas, steam and air conditioning supply	2.1	3.9	5.2	4.0	4.6
Water supply; sewerage, waste management and remediation activities	1.0	1.9	2.4	2.2	2.2
Construction	0.8	1.1	1.3	1.3	1.5
Wholesale and retail trade; repair of motor vehicles and motor cycles	4.8	6.3	5.7	5.9	5.1
Transportation and storage	1.0	1.3	1.6	2.3	2.0
Accommodation and food service activities	0.1	0.1	0.1	0.1	0.1
Information and communication	0.8	0.4	0.3	0.4	0.7
Real estate activities	0.3	0.2	0.2	0.5	0.5

Source: NBB (Central Corporate Credit Register).

1 No account was taken of credit used by firms classified under financial services.

2 The sum of the loans to small, medium and large firms is less than the total credit recorded because some of the loans are made to firms for which no size information is available (because they have not yet filed a balance sheet or are not required to do so).

Annex 2

Annualised growth rate¹ of used credit, by size and branch of activity

(in %)

	2002-2007	2008-2013	2014-2020 ³	2002-2020 ³
All firms²	4.0	3.1	4.4	4.1
Small firms (including micro companies)²	6.4	4.8	4.6	5.0
of which:				
Manufacturing industry	1.9	0.6	3.8	2.8
Electricity, gas, steam and air conditioning supply	18.3	37.5	16.1	20.7
Water supply; sewerage, waste management and remediation activities	2.7	6.9	5.1	5.0
Construction	7.6	6.1	5.6	6.1
Wholesale and retail trade; repair of motor vehicles and motor cycles	3.9	2.3	1.7	2.3
Transportation and storage	1.8	1.3	5.1	3.7
Accommodation and food service activities	5.0	3.9	3.7	4.0
Information and communication	7.9	7.6	4.9	6.0
Real estate activities	8.4	6.0	6.3	6.7
Medium-sized firms²	1.1	7.6	0.6	2.1
of which:				
Manufacturing industry	-4.9	1.1	0.8	-0.2
Electricity, gas, steam and air conditioning supply	21.7	57.0	1.9	16.7
Water supply; sewerage, waste management and remediation activities	4.4	0.7	-5.5	-2.3
Construction	1.4	8.9	0.7	2.4
Wholesale and retail trade; repair of motor vehicles and motor cycles	-1.1	5.7	-0.1	0.8
Transportation and storage	4.6	10.3	-0.3	2.8
Accommodation and food service activities	1.3	9.5	2.9	3.9
Information and communication	3.8	6.0	3.6	4.1
Real estate activities	8.5	9.4	2.7	5.2
Large firms²	0.1	1.3	4.2	2.8
of which:				
Manufacturing industry	-6.5	-4.4	8.3	2.9
Electricity, gas, steam and air conditioning supply	41.6	14.1	-0.8	10.5
Water supply; sewerage, waste management and remediation activities	8.7	9.1	0.0	3.5
Construction	4.7	8.9	5.7	6.1
Wholesale and retail trade; repair of motor vehicles and motor cycles	0.2	2.6	-1.7	-0.5
Transportation and storage	3.1	11.2	5.5	6.2
Accommodation and food service activities	22.9	6.1	17.6	16.4
Information and communication	2.2	-2.7	15.1	9.1
Real estate activities	-7.8	79.5	31.9	33.5

Source: NBB (Central Corporate Credit Register).

1 The annualised growth rate is determined as follows: a 12-month moving average is calculated on the basis of the quarterly growth rates ($\text{Encours}_t / \text{Encours}_{t-1} - 1$), disregarding the quarters affected by a break in the series (namely the second quarter of 2012, and the fourth quarter of 2014). This average is then annualised.

2 No account was taken of credit used by firms classified under financial services.

3 Data taken into account up to February 2020.

Annex 3

Description of the econometric models and detailed results

The autoregressive distributed lag models describing the relationship between credit growth on the one hand, and bank interest rates and the business cycle on the other, are defined by the following equation:

$$\Delta_4 Cred_t = \mu + \lambda \Delta_4 Cred_{t-1} + \beta i_{t-1} + \sum_{j=0}^3 \gamma_j Conj_{t-j} + \delta_1 D_{2008T3-2019T4} + \delta_2 D_{2014T1-2019T4} + \delta_3 D_{2012T2-2013T1} + \delta_4 D_{2014T4-2015T3}$$

where $\Delta_4 Cred_t$ represents the growth of used credit compared to the corresponding quarter of the previous year for a category of firms (micro/small, medium or large), i_{t-1} is the long-term interest rate (corresponding to loans of less than € 1 million with the rate initially fixed for more than five years) and $Conj_t$ is the state of economic activity measured according to the quarterly average of the Bank's overall synthetic indicator. $D_{2008T3-2019T4}$ is a binary variable intended to capture structural changes in that relationship which, if negative, could be attributed to the crisis which began in the third quarter of 2008. The second binary variable, $D_{2014T1-2019T4}$, is used to assess any structural changes specific to the period following the entry into force of the law on SME financing. The last two binary variables, $D_{2012T2-2013T1}$ and $D_{2014T4-2015T4}$ have no economic interpretation. They serve only to absorb statistical breaks due to methodological changes in the compilation of the Central Credit Register's statistics.

In essence, the models used to identify the factors determining changes in interest rates are also autoregressive distributed lag models:

$$i_t = \mu + \lambda i_{t-1} + \beta_0 s_t + \beta_1 s_{t-1} + \sum_{j=0}^9 \gamma_j Conj_{t-j} + \delta_1 D_{2008M6-2020M2} + \delta_2 D_{2014M1-2020M2}$$

Where i_t now symbolises one of the four interest rates illustrated in chart 3, and s_t stands for the swap interest rates used as the reference for each of them in that same chart. The other variables are defined in the same way as in the models relating to used credit. Unlike those models, which are based on quarterly data, the model relating to interest rates is estimated on the basis of monthly data. However, it is not estimated as such; it was reformulated as a generalised error correction model in order to take account of the possible existence of a trend link between bank interest rates on loans to businesses and swap interest rates:

$$\Delta i_t = \mu + \lambda^* (i_{t-1} - s_{t-1}) + \beta_0 \Delta s_t + \pi s_{t-1} + \sum_{j=0}^9 \gamma_j Conj_{t-j} + \delta_1 D_{2008M6-2020M2} + \delta_2 D_{2014M1-2020M2}$$

Where $\lambda^* = (\lambda - 1)$ and $\pi = (\lambda + \beta_0 + \beta_1 - 1)$.

The estimates obtained for these two types of models on the basis of the ordinary least squares method are set out in the following tables.

Annex 4

Estimated parameters for equations relating to the annual growth of credit used by firms

(ordinary least squares estimates over a period from the second quarter of 2003 to the final quarter of 2019)

Dependent variable: Δ_4Cred_t	All firms	Micro- and small firms	Medium-sized firms	Large firms
μ	-0.713	3.228	-7.243	-7.837
Δ_4Cred_{t-1}	0.619***	0.761***	0.560***	0.422***
i_{t-1}	0.772	-0.240	2.112	2.445*
$Conj_t$	0.047	0.029	0.270	-0.018
$Conj_{t-1}$	0.065	-0.031	-0.080	0.263
$Conj_{t-2}$	-0.016	0.045	0.005	-0.133
$Conj_{t-3}$	0.161*	0.038	0.215	0.475**
$D_{2008T3-2019T4}$	0.696	-0.540	4.017*	2.119
$D_{2014T1-2019T4}$	0.886	-0.605	1.037	4.645
$D_{2012T2-2013T1}$	0.413	-1.033	3.603	1.254
$D_{2014T4-2015T3}$	-1.081	-0.818	-4.788**	4.217*
Sum of long-term elasticities of cyclical effects ($\sum_{j=0}^3 \gamma_j / (1 - \lambda)$)	0.673***	0.341*	0.931***	1.015***
R^2	0.810	0.825	0.714	0.753
Standard error of the regression	1.915	1.427	3.967	3.934
Observations	67	67	67	67

Source: NBB (Central Corporate Credit Register).

* Coefficient significant at a level of 10 %.

** Coefficient significant at a level of 5 %.

*** Coefficient significant at a level of 1 %.

Annex 5

Estimated parameters for equations relating to interest rates on loans to non-financial corporations

(ordinary least squares estimates over a period from February 2003 to February 2020)

Dependent variable: Δi_t	Variable interest rates initially fixed for less than 1 year	Variable interest rates initially fixed for less than 1 year	Rate initially fixed for more than 1 year but less than 5 years	Rate initially fixed for more than 5 years
	(amount \leq € 1 million)	(amount $>$ € 1 million)	(amount \leq € 1 million)	(amount \leq € 1 million)
μ	0.446***	0.158***	0.109	0.214***
$i_{t-1} - s_{t-1}$	-0.258***	-0.151***	-0.027	-0.104***
Δs_t	0.184***	0.245***	0.237***	0.137***
s_{t-1}	-0.019**	-0.015	-0.017	-0.023**
$Conj_t$	-0.003	-0.001	0.000	-0.001
$Conj_{t-1}$	0.007	0.009	0.011*	0.004
$Conj_{t-2}$	0.000	0.001	0.003	0.000
$Conj_{t-3}$	-0.001	0.002	-0.003	0.002
$Conj_{t-4}$	-0.007	-0.010*	-0.005	-0.006*
$Conj_{t-5}$	0.002	0.004	-0.007	0.001
$Conj_{t-6}$	0.002	0.000	0.003	-0.003
$Conj_{t-7}$	0.000	-0.002	0.007	0.002
$Conj_{t-8}$	0.004	0.006	-0.003	0.002
$Conj_{t-9}$	-0.002	-0.002	0.001	0.000
$D_{2008M7-2020M2}$	0.063***	0.086***	0.022	0.085***
$D_{2014M1-2020M2}$	0.005	0.031	-0.069**	-0.109***
Sum of long-term elasticities of cyclical effects ($\sum_{j=0}^9 \gamma_j / (1 - \lambda)$)	0.008	0.041***	0.304	0.009
R ²	0.608	0.516	0.382	0.433
Standard error of the regression	0.079	0.097	0.110	0.063
Observations	205	205	182	174

Source: NBB (Central Corporate Credit Register).

* Coefficient significant at a level of 10%.

** Coefficient significant at a level of 5%.

*** Coefficient significant at a level of 1%.