

# Are bank loans being granted to the best-performing firms ?

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## Introduction

One of the key roles of the banking system is to channel savings into productive investment projects. But in recent years, the inefficient allocation of loans granted by banks has raised concern. It is even one of the factors now being cited to explain the slowdown in productivity (Duval *et al.*, 2017; Besley *et al.*, 2017). Research studies have also pointed up the growing number of 'zombie' firms since the beginning of the 2000s, which the banks seem to continue (re)financing so as to avoid marking up losses on their balance sheets. Yet, the increase in survival rates among these low-productivity companies, many of which are close to ceasing trading or to bankruptcy, just adds to market congestion and hinders the growth of more productive firms (McGowan *et al.*, 2017). In this regard, the accommodative monetary policy and low interest rate environment have actually facilitated the funding of less performing projects. Other factors have also been put forward, such as the high degree of economic uncertainty, which may have constrained companies' willingness to carry out growth- and employment-generating investment projects (Adler *et al.*, 2017).

While it is of course desirable for banks to give priority to granting loans for projects with high potential, it is nevertheless not the only criterion that they take into account when deciding whether to grant a loan or not. The principle of prudence can actually lead them to turn down finance for innovative and growth-promoting projects that are still highly, uncertain ventures. Projects of this kind effectively lay them open to default risks. It is precisely the objective of prudential

regulation to limit these risks. It imposes capital requirements on banks in proportion to risks inherent in the components of the assets side of their balance sheets, including loans to businesses. The notion of risk can therefore act as a hindrance to funding some high-potential projects.

Apart from the banks' own appraisal of the quality and the degree of risk involved in the projects they are to finance, the allocation of credit in an economy is also influenced by demand-related aspects. Thus, a successful company may well opt for alternative sources of funding, for example by turning to internal liquidity reserves or through a bond issue, and therefore not having to ask a bank for a loan. So, the allocation of bank loans observed in the data is always the result of a balance determined by both supply and demand factors, which is not always easy to distinguish.

The objective of this article is to highlight the link between loans allocated to firms and their characteristics, in particular their economic performance. In order to do so, we base our research on data for Belgian firms over the period 2005-2015. Our approach involves using a multivariate analysis that takes account of a maximum of observable variables, so as to best identify the role of each one of them considered individually.

The article is structured as follows. The first part gives a portrait of what makes a successful company. The second part gives an overview of loans granted to them and reviews the main factors affecting the allocation of loans (access to alternative sources of finance, productivity, profitability and solvency, age of the firm and investment). The third part broaches the relationship between bank

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lending and firms' survival. The conclusion sums up the main lessons to be drawn from the analysis.

## 1. Portrait of the best-performing firms in Belgium

The performance of firms<sup>(1)</sup> established in Belgium, which is our key variable, is estimated on the basis of total factor productivity (TFP). TFP is an indicator that can determine the level of value added generated by a firm in comparison to the average for its sector, taking account of its level of employment and capital stock. High TFP is a sign that a company is generating a lot of value added with the factors of production it has at its disposal. On the contrary, low TFP points to relatively weak creation of value added. Even though TFP is not a variable that is directly available from the annual accounts of companies, it generally tends to reflect the virtuous characteristics of a firm, like the quality of the management, its ability to produce efficiently or any competitive advantages it has on the markets it serves<sup>(2)</sup>.

TFP cannot be estimated for all companies, because for that it is necessary to have observations for different variables, such as value added, employment, capital

stock, intermediate consumption and the sector of activity. This constraint rules out of our analysis sample small businesses that do not have salaried employees and self-employed people who have not established themselves as a company. It should be noted that, for ease of reading, we use the more simple term productivity, rather than TFP, in the rest of the article.

Although, by definition, productive firms can be distinguished by more efficient use of the resources they have, they also have other favourable characteristics that underline their importance for the development of the economy (see table 1).

One of the salient features of the most productive firms, namely those in the fifth quintile of productivity distribution, is that they are more likely to have intangible assets. These capital assets include notably research and development (R&D) expenses, as well as patents, licences and software held by firms. There is a causal link between these intangible assets and firms' economic performance. When a company's spending on R&D leads to the manufacture of innovative products, this enables it to widen its production base by tapping new market outlets. Intangible capital assets can also be built up through efficient production processes.

A link may also be established between the high productivity levels of some firms and their belonging to a group, whether of Belgian or foreign origin. Affiliation with a group effectively enables a company to benefit not only

(1) Our sample only includes non-financial corporations.

(2) Estimated using the Wooldridge (2009) method, our TFP measurement is expressed in euros, and not in physical units. It may therefore also reflect the fact that the company sells its production at a relatively high price. Capacity for generating added value thus comes from technological endowment or from market power. But in the context of our analysis of the link between productivity and bank lending, that is not a handicap at all.

**TABLE 1** FIRMS' CHARACTERISTICS BY PRODUCTIVITY LEVEL  
(data for 2012; in %, unless otherwise stated)

	Productivity quintiles				
	I	II	III	IV	V
Share of firms with intangible assets <sup>(1)</sup> .....	18.0	21.1	25.0	29.5	35.4
Share of firms belonging to a group <sup>(2)</sup> .....	10.3	13.3	20.6	32.0	50.1
Profitability <sup>(3)</sup> .....	-0.5	4.3	6.0	7.7	10.2
Solvency <sup>(4)</sup> .....	20.5	26.1	29.1	32.1	35.7
Exit rate <sup>(5)</sup> .....	3.7	1.9	1.6	1.2	1.2
Growth in employment (change between 2013 and 2015) .....	-16.1	-6.8	-2.1	0.2	2.1
Average employment (full-time equivalents) .....	2.4	3.6	6.1	12.5	42.4

Source : NBB.

(1) Refers to intangible assets, comprising research and development expenses, concessions, patents, licences, trade marks, goodwill, software, etc.

(2) Firms owning other Belgian or foreign companies, or owned by them, with holdings of at least 10 % of the share capital.

(3) Median ratio of earnings before interest and taxes to total assets.

(4) Median share of equity capital in the balance sheet total.

(5) Firms active in 2012 that ceased trading or went bankrupt in the following three years.

from shared intangible assets but also from productivity gains stemming from economies of scale.

The profitability of firms is also closely correlated to their productivity levels. The most productive firms post a profitability ratio with a median value of more than 10%, while the companies in the first productivity quintile, that is, the less efficient ones, frequently suffer losses. However, it should be noted that there is no one-to-one connection between productivity and profitability, and for different reasons too. For instance, at a given performance level, a company whose return on production is distributed more widely among workers than equity holders registers a lower profitability rate. Apart from profitability, the better financial health of the most productive firms is also reflected in higher solvency ratios, thanks to retained earnings and accumulated reserves.

Lastly, the fact that they manage to generate profits naturally enables the more productive businesses to guarantee their future and to grow. That is largely reflected in lower rates of bankruptcy or cessation of activities, as well as much stronger employment growth than that for low-performing firms<sup>(1)</sup>. These differences in terms of exit rates and employment trends are in a way a reflection of a process of creative destruction and efficient reallocation of factors of production, where less productive and less profitable firms go out of business, while the higher performers expand. Hence, the weight of successful firms in the total economy, whether measured on the basis of employment, capital stock or value added, is relatively high.

## 2. Allocation of bank loans to companies

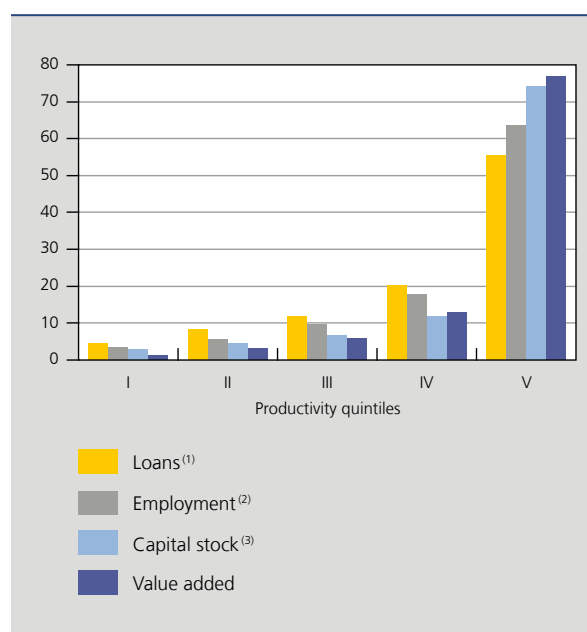
### 2.1 Overview

Generally speaking, the most productive firms take up the lion's share of all loans granted by resident banks. As chart 1 shows, 55% of outstanding loans are concentrated in the hands of companies in the fifth productivity quintile, compared with barely 20, 12, 8 and 4% respectively for the lower quintiles. However, this observation can be qualified. In fact, the best-performing firms account for 59% of employment, hold 62% of the capital stock and generate 69% of value

(1) It is worth noting that the period 2013-2015, for which growth in employment has been calculated in table 1, was rather unfavourable in terms of labour market developments. The year 2013, in particular, was marked by heavy job losses. As can be seen from the data presented in table 1, it was above all the firms with the weakest performance that were affected by these job losses.

**CHART 1** BREAKDOWN OF BANK LOANS PER PRODUCTIVITY QUINTILE

(data for 2015, in % of the total)



Source: NBB.

(1) Outstanding total of long-term loans authorised.

(2) Expressed as full-time equivalents.

(3) Non-financial fixed assets.

added. Productive firms have admittedly contracted more loans, but not proportionately to their weight in the economy.

### 2.2 Factors affecting the allocation of credit

#### *Alternative sources of finance*

The reason why bank loans to productive firms are not in proportion to their weight in the economy is partly because these companies are more often likely to have access to alternative means of finance, such as bond issues for example. Moreover, the best-performing firms belong to a group more often than not (see above). So, they can count on privileged sources of funding, like equity stakes or inter-company loans. So, it is hardly surprising that they generally tend to be better capitalised during their first few years of existence and benefit more often from non-bank loans (see chart 2). Of course, the least productive firms fund their business even more from their own capital. However, that is more a question of need, because their low profitability and the resultant scale of losses carried over limit their access to bank loans.

**CHART 2** RECOURSE TO ALTERNATIVE MEANS OF FINANCE BY YOUNG FIRMS<sup>(1)</sup>

(percentage of long-term funding requirements<sup>(2)</sup>, data for 2015)



Source: NBB.

(1) Firms that have been active for at least five years.

(2) Long-term funding requirements are approximated by the sum of fixed assets and working capital requirements.

(3) Includes both bond issues and other non-bank loans, such as intra-group financing and loans extended by private individuals.

which may come from business angels, specialised financing companies or crowdfunding platforms, for instance. However, the data at our disposal do not enable any systematic identification of firms that have benefited from these sources of finance.

**Productivity**

As mentioned before, the most productive firms generally tend to be more profitable and bigger than the others, just as they have easier access to other sources of finance. This combination of characteristics specific to successful companies makes it hard to assess the precise role played by productivity in the allocation of bank loans. A descriptive approach, like that followed in section 2.1, can actually lead to this factor being wrongly attributed to an effect that in fact results from other features of these firms, like their size or profitability.

To make up for this inherent shortcoming of the descriptive analysis, we resort to a multivariate approach, described in the box below. This method has the advantage of accurately pinpointing the link between new loans<sup>(1)</sup> and each factor considered in isolation. Moreover, we focus on the determinants of obtaining a loan rather than on the amount borrowed. This is mostly influenced by the scale of the funding requirements. Under our analysis, we are nevertheless not trying to establish whether firms are

It is also quite likely that the higher capitalisation of young and very productive enterprises partly reflects the fact that they turn more frequently to funding from venture capital,

(1) New loans refer to new lender-borrower relationships between a bank and a company and additional loans.

**Box – Methodology**

In order to determine the characteristics of firms that manage to get loans from banks, we have put data from the Central Balance Sheet Office (CBSO) together with information from the Central Corporate Credit Register (CCCR). The CBSO provides information on the features of each firm, such as employment, capital stock, value added, sector of activity, etc. Its data also enables an estimate of TFP. Data from the CCCR give the amount borrowed, per bank and per borrowing enterprise. The term ‘loans’ refers to the type of loan that banks typically grant companies to meet their long-term funding requirements, that is, mainly fixed-term loans and instalment loans<sup>(1)</sup>. Our sample of data covers the period 2005-2015.

The econometric approach selected is based on a probit-type regression analysis, which measures the impact of each factor on a binary variable that equals 1 in the case of a new bank loan and 0 in the other cases. Among the explanatory factors, we have included productivity, profitability, solvency<sup>(2)</sup>, liquidity requirements<sup>(3)</sup>, size, age,

(1) This definition excludes short-term credit facilities. They are nevertheless taken into account in the third part of this article.

(2) Share of equity capital in the balance sheet total.

(3) Liquidity requirements are estimated on the basis of the difference between the working capital requirement and actual working capital. A firm is deemed to be facing liquidity needs once this difference is positive.

sector of activity, legal form, whether the company invests or not, whether it belongs to a group or not<sup>(1)</sup>, as well as cyclical effects or those induced by developments in the macrofinancial environment, which are captured by annual binary variables. In order to counter endogeneity risks, our probit model relates any new loans obtained during a given accounting year to characteristics of firms as observed when closing the previous year's annual accounts<sup>(2)</sup>. The results of this regression are given in table A.1 of the annex.

For each variable, like productivity for example, the probit model makes it possible to estimate a predicted probability. This provides an average response, calculated for the whole sample, for different given values for the variable considered, while keeping the other variables unchanged. The predicted probability has the big advantage of not being skewed by any possible correlations between the various explanatory variables. As the sample contains almost 100 000 observations, our estimates for each factor considered separately are robust.

Apart from the binary approach, we have also carried out an analysis focusing on the amounts of loans authorised, the results of which are also given in table A.1. It shows that the variables determining whether a firm has a loan or not also affect the authorised amounts. Overall, the results of this exercise are very similar to the findings of the binary approach. This is why this article only discusses the findings using this approach.

(1) The group may be purely domestic, international with a Belgian parent company or international with a foreign parent company.

(2) The objective here is to determine the influence of each factor on bank loans, and not the other way round. Yet, bank loans themselves directly affect certain factors, like solvency for instance. In fact, they automatically reduce the share of equity capital in the balance sheet total. In order to limit the influence of bank loans on solvency, bank loans granted during the year  $t$  are considered in relation to solvency in  $t-1$ .

getting appropriate funding, but rather to profile those firms that get a loan and of those that are turned down.

To begin with, we take a look at the results obtained for productivity. The predicted probability<sup>(1)</sup> of a new loan works out at 19% for firms in the first productivity quintile and respectively 21, 22, 22 and 20% for those in the subsequent quintiles (see upper left-hand panel of chart 3). Expressed as a percentage change when the predicted probability for the first quintile is taken as a benchmark, the probabilities of a new loan for the following quintiles are respectively 11, 16, 15 and 5% higher than it.

This result leads us to pinpoint two elements. On the one hand, the banks take companies' economic performance into consideration when it comes to granting them loans. Low-performing firms are actually having difficulty in getting a loan from a bank. However, the allocation of loans is relatively insensitive to productivity. The predicted probability of getting a new bank loan is virtually identical for the second, third and fourth productivity quintiles. On the other hand, the fact that probability is lower for the last quintile indicates that access to new credit is relatively limited for the most productive companies. Even if we control for a certain number of demand factors, such as membership of a group or its legal form (and thus its possible recourse to equity finance, as is the case with limited companies for example), the list cannot be exhaustive. So, we cannot

measure the ease with which a company can turn to other forms of alternative funding, like venture capital. The result for high-performing firms is therefore difficult to interpret. On the whole, these estimates are still enough to point up the highly ambiguous connection between new loans and firms' productivity levels.

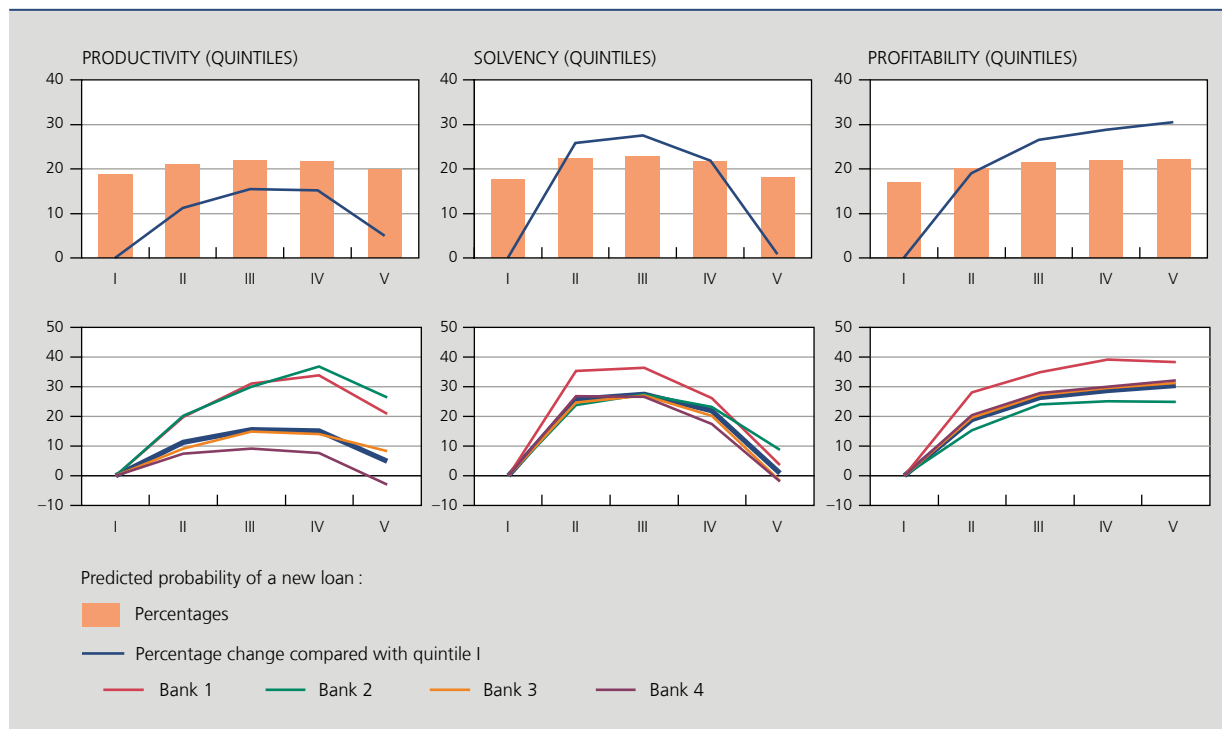
The exercise carried out so far on a global level can also be broken down individually for each of the big four commercial banks active in Belgium<sup>(2)</sup>. We can then see that the relationship between new loans and firms' productivity varies significantly from one large bank to another. For banks 1 and 2, the connection between new loans granted and companies' productivity is a lot more pronounced. For instance, in the case of bank 2, firms in the fourth and fifth productivity quintiles have respectively 37 and 25% more chance of being given a new loan than those in the first quintile. By contrast, banks 3 and 4 are a lot less sensitive to productivity. In the case of bank 4, the predicted probability of enterprises in the fourth quintile rose by only 9%, while the more productive companies have less chance of getting a new loan than low-performing firms.

(1) The average predicted probability gives the average response for the whole sample if the productivity of all the firms takes a given value (successively the average level of the first quintile, the second quintile, etc.), while keeping all the other firm characteristics unchanged. The predicted probability has the big advantage of not being skewed by any correlations between the characteristics.

(2) For confidentiality reasons, the big four banks are not identified and have randomly been attributed a number between 1 and 4.

**CHART 3** LINKS BETWEEN PRODUCTIVITY, SOLVENCY, PROFITABILITY AND NEW LOANS

(estimates for the period 2006-2015)



Source : NBB.

### Solvency and profitability

A similar exercise to that carried out for productivity can be performed for solvency and for profitability, two elements that the banks generally tend to take into account when they are assessing default risks, notably by reference to their internal models.

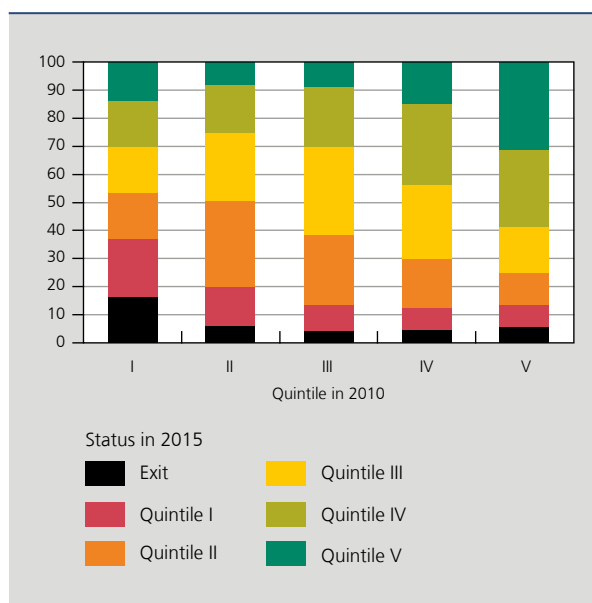
The relationship between firms' solvency, that is, the share of equity – which includes reserves and reinvested earnings – in their balance sheet total, and the predicted probability of a new loan is non-linear. As the centre panel of chart 3 shows, it takes the shape of an upside down "U". The probability is lower for both the least solvent and the most solvent companies. The first finding is of course to do with credit institutions' lack of confidence in enterprises with excessive debt levels in relation to their equity capital and/or an accumulation of losses carried over. The second most probably comes from a demand effect. The more highly capitalised firms or those that have built up substantial reserves that have been added to over the years are in fact the most likely to fund themselves, by using their available cash as a substitute for bank credit.

The result for profitability – which we measure by the ratio of earnings before interest and taxes to total assets – is clear. The most profitable enterprises post much higher probabilities of getting a new loan. The interpretation of this relationship is fairly intuitive: sufficiently high operating results send a very strong signal to banks because they are a kind of guarantee of a firm's ability to service its debt.

The sensitivity of new lending to solvency or productivity varies from one large bank to another, although to a much lesser extent than for productivity (see below-centre and right panels of chart 3). The sensitivity of banks 3 and 4 is identical to that applying on average to all banks. It is interesting to note that the relationship between new loans and profitability is strongest for bank 1, which is already highly sensitive to productivity.

Generally speaking, the importance that credit institutions attach to accounting ratios for the financial health of borrowers is largely based on the assumption that they serve as good predictors of the sustainability of firms and their future ability to honour their financial obligations. In fact, 16% of firms from the first profitability quintile in 2010 had ceased

**CHART 4** MOVEMENTS OF FIRMS ACROSS THE PROFITABILITY DISTRIBUTION<sup>(1)</sup>  
(percentages)



Source: NBB.

(1) Measured on the basis of the ratio of earnings before interest and taxes to total assets.

trading or been declared bankrupt five years later<sup>(1)</sup>, while this proportion dropped to just 5% for the most profitable companies (see chart 4).

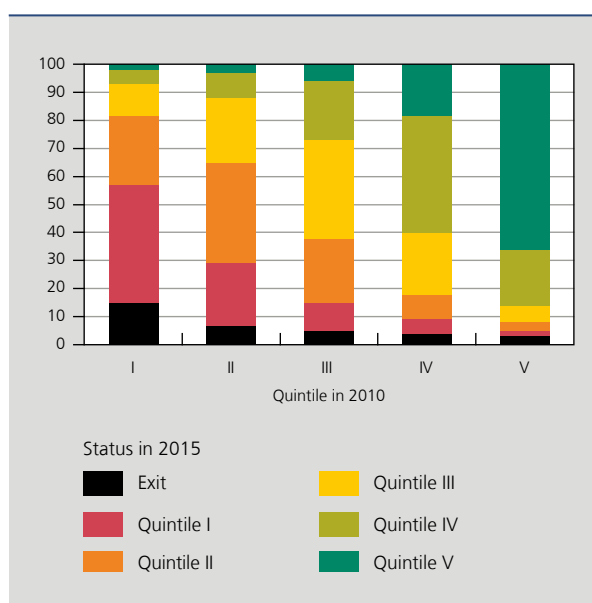
While unfavourable ratios really do reflect a risk of default at a given moment in time, this risk can nevertheless evolve over time, and the risk assessment may therefore be surrounded by uncertainty. Earnings generated by a firm over one accounting year are not necessarily representative of its future profits. The observable trend here is that just 21% of enterprises belonging to the first profitability quintile in 2010 were still there in 2015, while 14% moved into the fifth quintile.

By way of comparison, the other indicators studied, notably productivity, do not show any such instability over time (see chart 5). These findings suggest that a discriminating indicator for bank lending, in this case profitability, is relatively unstable over time.

### Age of the firms

A firm's age may have significant influence on the probability of having loans from the bank. Among the population of firms that had a bank loan in 2015, there is a higher proportion of older businesses (see left-hand panel of chart 6). So, young enterprises seem to encounter some difficulty in getting a bank loan. This fact is backed up by the obvious difficulty in getting a loan for the first time (see right-hand panel of chart 6). Compared with firms that have not yet taken out any loans, those which have already had at least one are twice as likely to be able to contract a new loan or obtain an additional loan.

**CHART 5** MOVEMENTS OF FIRMS ACROSS THE PRODUCTIVITY DISTRIBUTION  
(percentages)



Source: NBB.

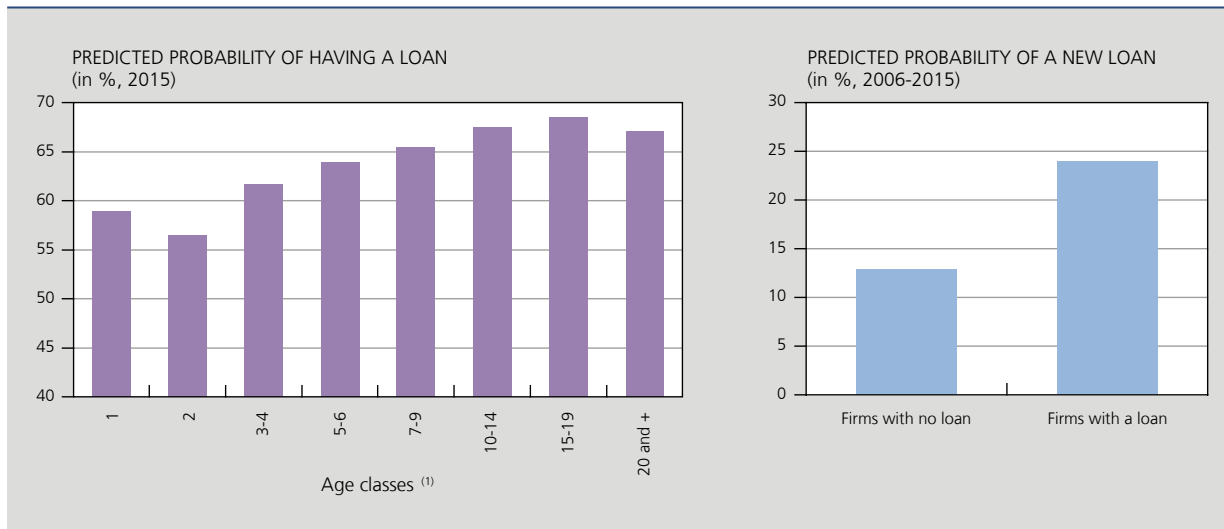
### Investment

Bank loans are naturally used for meeting financing requirements. They are more often granted to enterprises that invest. The predicted probability of getting a new loan is only 12% when the firm does not invest, but is much higher when the firm does invest (see chart 7). A big difference depending on the type of investment is nevertheless observed.

The predicted probability goes up sharply in the case of investment in tangible assets: rising to 37%, even to as much as 45% for investment in tangible and intangible assets at the same time. On the other hand, investing

(1) This exit rate does not take account of company exits following mergers or acquisitions.

**CHART 6** DIFFICULTY IN OBTAINING A FIRST BANK LOAN



Source : NBB.  
 (1) Number of years since the firm was established.

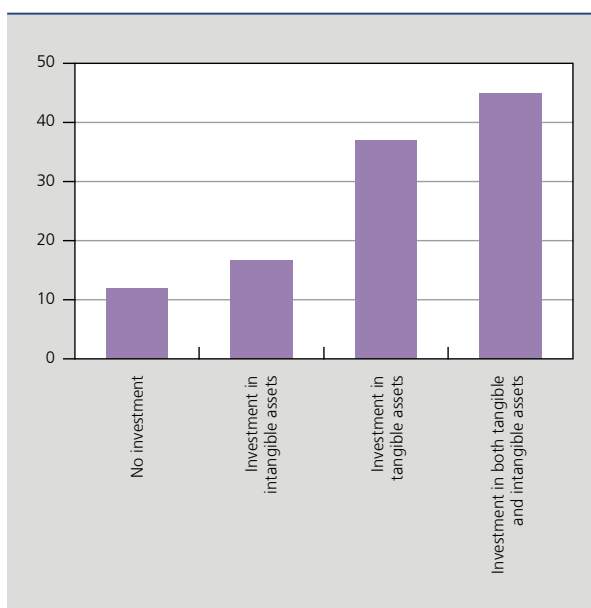
solely in intangible assets has a lot less influence on the probability of getting a new loan, because it only scores 17 %. This finding is probably to do with the fact that, unlike investment in tangible assets, intangible assets can rarely be used as collateral with the banks.

### 3. Bank loans and firms' survival

The link between business credit and investment takes us back to the essential role that the banking system plays in economic development. By granting loans to firms, banks are notably giving them the possibility of putting in place the production capacity needed to implement their projects. Apart from funding investment projects, bank loans can also cover working capital requirements. Businesses must have sufficient cash reserves to ensure their day-to-day operations, especially for paying wages or suppliers' invoices. Without these liquid assets, firms run the risk of defaulting.

**CHART 7** LOANS USED MOSTLY TO FINANCE INVESTMENT IN TANGIBLE CAPITAL, LESS SO IN INTANGIBLE ASSETS

(predicted probability of a new loan in %, estimates for the period 2006-2015)



Source : NBB.

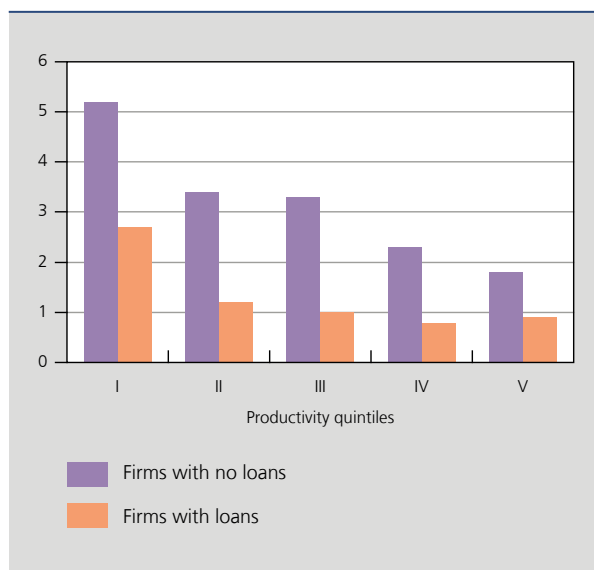
Bank credit can therefore contribute to the viability and sustainability of business enterprises. As chart 8 illustrates, firms that have already obtained a loan run less risk of going out of business than those that have not benefited from this source of funding, regardless of their productivity level. This emphasises the fact that, even in the case of the best-performing companies, having a bank loan – and, more generally, long-term sources of funding – proves to be a crucial factor of survival.

Of course, the causal link between getting credit and a firm's probability of survival is not one-sided. Productive enterprises may see their loan applications turned down because they present characteristics with signs of imminent failure, such as low profitability. However, the favourable effect that bank lending exerts on the sustainability of firms is statistically significant, even when



**CHART 8****EXIT RATE FOR COMPANIES ACCORDING TO THEIR PRODUCTIVITY LEVEL**

(percentages of firms active in 2012 that had ceased trading or gone into bankruptcy within the next three years)



Source: NBB.

isolated from the influence of other factors likely to affect their survival.

Our estimates<sup>(1)</sup>, presented in table A.2 in the Annex, effectively confirm that, *ceteris paribus*, bank loans are systematically associated with a greater probability of survival. This effect is all the more important for the more productive enterprises, which suggests that, on average, bank loans have a more direct bearing on these firms' chances of survival than is the case for less productive firms. By contrast, short-term credit facilities are not associated with higher chances of survival. They even have a significant influence on the exit probability of low-performers, reflecting the risk of bankruptcy related to an excessively heavy degree of short-term indebtedness that they carry<sup>(2)</sup>.

## Conclusion

Bank loans are often a crucial ingredient for the success of projects carried out by businesses. They enable companies, notably the best-performing ones, to have a sufficiently solid financial base to ensure their development. And in lending funds, the banks themselves make a significant contribution to economic growth and job creation.

The findings presented in this article nevertheless suggest that the most productive firms are taking up a smaller

proportion of bank loans than expected given their weight in the economy. That is partly because the best-performing companies benefit more extensively from alternative sources of funding, such as intra-group financing, and therefore do not resort systematically to bank loans to finance their projects. Nevertheless, our analysis points to certain factors that might hinder bank-managed funds from being channelled towards the best-performing firms. More specifically, a high risk profile makes it harder to get access to bank loans, even if the firm's production model or its positioning on the market are enabling it to perform well, or at least give it the potential to become a successful business.

In this respect, the various determinants of bank lending highlighted in this article make it possible to profile the firm that is doing well, but still likely to encounter difficulties in getting a loan. This is typically a newly established firm and which does not belong to a group. It is still not in a position to put forward any convincing guarantees of its project's viability on the basis of its first accounting results, even though these results may improve considerably in the next few years. Nor does it have any credit history proving its ability to repay its debts. Besides, when its project is largely based on the use of intangible assets, such as a patent for example, it can offer the banks very little in the way of tangible guarantees when applying for a loan.

This attitude towards risk being taken by banks is justified from the financial stability point of view. It is even encouraged by prudential regulations subjecting banks to capital requirements proportional to the risky nature of the components on the assets side of their balance sheets, including corporate loans. That being said, the mere fact that some young firms with great potential can see their access to bank lending restricted owing to the uncertainty surrounding their viability stresses the importance of alternative sources of funding, and in particular venture capital finance.

By strengthening the equity capital invested by entrepreneurs, funding through venture capital gives firms just starting out a chance to have a large enough capital

(1) These estimates are based on a discrete choice model, which includes among the explanatory variables taken into consideration the amounts granted as bank loans, whose perimeter is determined in the same way as in the previous part, that is, by incorporating the types of loans normally used for long-term funding. Also included in the specification, via an additional variable, are loans obtained through short-term instruments, such as authorised overdrafts on bank accounts. The respective effects of these two categories of loans on a firm's exit probability have been estimated on the basis of a complementary log-log (cloglog) type model (see Tsoukas, 2011), after controlling for the effects of several control variables.

(2) This is also the reason why these short-term credit instruments have not been incorporated into the analysis presented in the second part.

buffer to absorb any losses incurred during their start-up phase. Some initiatives have recently been taken in Belgium, including at regional level, to promote or support this funding method<sup>(1)</sup>. Through its Capital Markets Union project, the European Commission is also planning to take a number of measures to this end. If they really do help channel funds into entrepreneurial ventures

that generate the most value added, these initiatives will certainly be relevant.

(1) This mainly involves the 'tax shelter', a tax incentive offered to private individuals who invest in young enterprises, and the establishment of a regulatory framework tailor-made for crowdfunding platforms, which aims in particular to verify the professional skills of crowdfund managers and to protect investors. This regulatory approval framework was laid down by the Law of 18 December 2016. Public funding initiatives have also been taken at regional level. Among these are most notably Seed & Early Stage in Flanders, investment aid in Brussels and action taken by SOWALFIN and SRIW in Wallonia.

## Annexes

**TABLE A.1** PROBABILITY OF A NEW LOAN AND AMOUNTS AUTHORISED

(data for the period 2006-2015)

Explanatory variables	Binary approach (loan=1, no loan=0)		Amounts authorised
	(Predicted probability)	(Average marginal effect <sup>(1)</sup> )	(Marginal effect)
<b>Productivity (TFP) in <math>t-1</math></b>			
Quintile I	18.9***	–	–
Quintile II	21.0***	11.2***	1.1***
Quintile III	21.9***	15.5***	1.5***
Quintile IV	21.8***	15.3***	1.4***
Quintile V	19.9***	5.0	0.5
<b>Profitability in <math>t-1</math></b>			
Quintile I	17.0***	–	–
Quintile II	20.2***	19.1***	1.8***
Quintile III	21.5***	26.5***	2.4***
Quintile IV	21.9***	28.8***	2.6***
Quintile V	22.2***	30.5***	2.7***
<b>Solvency in <math>t-1</math></b>			
Quintile I	17.8***	–	–
Quintile II	22.4***	25.8***	2.3***
Quintile III	22.8***	27.6***	2.4***
Quintile IV	21.8***	22.0***	1.9***
Quintile V	18.0***	0.9	-0.1
<b>Investment<sup>(2)</sup></b>			
None	11.9***	–	–
In tangible assets	37.0***	209.6***	1.2***
In intangible assets	16.6***	39.0***	0.3***
In both tangible and intangible assets	45.0***	276.6***	–
<b>Size category (number of employees)</b>			
0	18.4***	–	–
1-9	20.4***	10.9***	1.1***
10-49	23.1***	25.8***	2.2***
50-249	19.0***	3.6	-0.4
250 or more	13.6***	-25.9***	-4.9***
<b>Age category (number of years)</b>			
1 year	25.8***	–	–
2 years	22.8***	-11.6***	-1.4***
3-4 years	22.0***	-14.8***	-1.9***
5-6 years	21.1***	-18.0***	-2.4***
7-9 years	21.1***	-18.1***	-2.4***
10-14 years	21.0***	-18.4***	-2.4***
15-19 years	20.9***	-18.9***	-2.4***
20 years or more	20.1***	-22.1***	-2.9***
<b>Already has a loan?</b>			
No	12.9***	–	–
Yes	24.0***	86.2***	5.9***
<b>Liquidity requirement in <math>t-1</math><sup>(3)</sup></b>			
No	19.2***	–	–
Yes	23.1***	20.4***	2.0***
<b>Part of a group</b>			
No	21.2***	–	–
Yes	19.5***	-8.0***	-0.8***
<b>Fixed effects: industry (2-digit NACE)</b>			
Yes	Yes	Yes	Yes
<b>Fixed effects: legal form</b>			
Yes	Yes	Yes	Yes
<b>Fixed effects: years</b>			
Yes	Yes	Yes	Yes
Number of observations	942 496	942 496	942 496

Source: NBB.

(1) The average marginal effect corresponds to the (percentage) change in the probability of a new loan in comparison with the reference group.

(2) For the binary approach (see the first two columns), investment is a binary variable that takes a value of 1 if there is any investment and 0 if otherwise. For the authorised amount approach (see the last column), investment is a sum expressed in logs.

(3) Liquidity requirements estimated on the basis of the difference between the working capital requirement and actual working capital. A firm is deemed to be facing liquidity needs once this difference is positive.

\* significant at 10 % ; \*\* significant at 5 % ; \*\*\* significant at 1 %.

**TABLE A.2 DETERMINANTS OF A FIRM'S PROBABILITY OF EXIT**  
(marginal effects<sup>(1)</sup> estimated using a complementary log-log model, data for the period 2006-2015)

Explanatory variables	Productivity quintiles				
	I	II	III	IV	V
Credit used (in % of balance sheet total) . . . . .	-0.58***	-1.26***	-2.40***	-2.42***	-3.61***
Credit lines used (in % of balance sheet total) . . . . .	0.26**	-0.40	-0.22	-1.00*	-0.19
Employment in full-time equivalents (logarithm) . . . . .	-0.08***	-0.18***	-0.17***	-0.24***	-0.21***
Non-financial fixed assets (logarithm) . . . . .	-0.16***	-0.23***	-0.27***	-0.27***	-0.25***
Earnings before interest and taxes (in % of balance sheet total) . . . . .	-0.92***	-1.14***	-0.47***	-0.36**	-0.07
Part of a group . . . . .	-0.04	-0.33***	-0.32***	-0.36***	-0.50***
<b>Age category (base: 10-14 years)</b>					
Less than a year . . . . .	-0.32	-0.27	0.04	-0.53	-0.13
1 year . . . . .	0.22**	-0.21	-0.27	-0.75**	-0.13
2 years . . . . .	0.15**	0.60	-0.05	-0.31***	-0.26
3-4 years . . . . .	0.16***	0.08	-0.19	-0.34***	-0.25
5-6 years . . . . .	0.14**	-0.34	-0.10	-0.54***	-0.05
7-9 years . . . . .	0.18***	-0.25	0.00	-0.28***	-0.14
15-19 years . . . . .	0.17***	0.17**	0.26***	-0.06	-0.06
20 years or more . . . . .	0.43***	0.37***	0.32***	0.02	-0.13
<b>Fixed effects: years</b> . . . . .	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Number of observations . . . . .	184 024	185 732	185 878	185 515	183 076

Source: NBB.

(1) A marginal effect corresponds to the impact of the change in one unit of an explanatory variable on the logarithm of the exit probability.  
\* significant at 10 %; \*\* significant at 5 %; \*\*\* significant at 1 %.

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