

Long-term debt maturity and financing constraints of SMEs during the Global Financial Crisis

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Abstract We use the recent financial crisis to investigate financing constraints of private small and medium-sized enterprises (SMEs) in Belgium. We hypothesize that SMEs with a large proportion of long-term debt maturing at the start of the crisis had difficulties to renew their loans due to the negative credit supply shock, and hence could invest less. We find a substantial variation in the maturity structure of long-term debt. Firms which at the start of the crisis had a larger part of their long-term debt maturing within the next year experienced a significantly larger drop in investments in 2009. This effect is driven by firms which are ex ante more likely to be financially constrained. Consistent with a causal effect of a credit supply shock to corporate investments, we find no effect in “placebo” periods without a negative credit supply shock.

Keywords Privately held SMEs · Financing constraints · Long-term debt maturity · Global Financial Crisis · Belgium

JEL Classifications G01 · G31 · G32

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1 Introduction

In a theoretical world with perfect capital markets, a firm will always be able to obtain the necessary funds at a fair price (Modigliani and Miller 1958). However, the real world is “imperfect,” and some of these “imperfections,” such as adverse selection, moral hazard, and agency conflicts, may restrict access to external finance (e.g., Holmstrom and Tirole 1997; Jaffee and Russell 1976; Jensen and Meckling 1976; Myers and Majluf 1984; Stiglitz and Weiss 1981). As a result, corporate investment decisions may be constrained by the availability of external finance. Privately held SMEs are more likely to be affected by financing constraints than large, listed firms, since adverse selection, moral hazard, and credit rationing problems tend to be more pronounced for private SMEs than for large, listed firms (e.g., Beck et al. 2008; Stiglitz and Weiss 1981; Berger and Udell 1998; Hyttinen and Väänänen 2006).

In this study, we investigate how the availability of external finance affected investments by privately held SMEs in Belgium during the recent Global Financial Crisis. The advantage of focusing on this crisis is that it allows us to separate the effect of financing constraints on investments from the effect of investment opportunities. This is because the financial crisis constituted an exogenous credit supply shock for Belgian SMEs: it originally was not caused by a weakening of firm business fundamentals in Belgium but by the subprime mortgage crisis which started in

the USA. The bank lending survey of the European Central Bank (ECB)¹ confirms that the financial crisis substantially reduced the provision of credit by banks to SMEs in the Euro area (which includes Belgium). According to this survey, the costs related to the capital position of banks, the ability of the banks to access market financing, and the liquidity position of the banks were important factors contributing to the tightening of credit standards. Furthermore, in a survey on the access to finance of SMEs in the Euro area² which was conducted in the summer of 2009 by the ECB and the European Commission, 17.4 % of SMEs named access to finance as the most pressing problem they faced. Of SMEs applying for a bank loan, 43 % also reported a deterioration in the availability of bank loans in the first half of 2009, while only 10 % reported an improvement.

While other studies have investigated the effect of an exogenous credit supply shock on investments by large, listed firms (e.g., Almeida et al. 2012; Chava and Purnanandam 2011; Duchin et al. 2010; Lemmon and Roberts 2010; Peek and Rosengren 2000; Khwaja and Mian 2008), to the best of our knowledge we are the first to use this approach for investigating financing constraints of SMEs. This is remarkable: since privately held SME tend to have financing patterns which are very different from those of large listed firms (e.g., Beck et al. 2008), an exogenous credit supply shock such as the financial crisis may affect SMEs and large firms in different ways. Because SMEs are more vulnerable to information problems, they will be more bank dependent than large firms, which can rely more on market finance. A reduction in the availability of bank finance is therefore likely to have a bigger impact on SMEs than on large firms. However, the ECB bank lending survey indicates that the crisis had a bigger impact on the provision of bank loans to large firms than bank loans to SMEs. In the first quarter of 2008 a net percentage of 54 % of banks reported a tightening of the credit standards they applied for loans and credit lines to large firms because

of the situation on the financial markets, while only a net percentage of 34 % of banks reported a tightening of credit standards for SMEs.³ It is therefore a priori not clear to what extent the Global Financial Crisis has reduced access to finance more for SMEs than for large firms.

Following Almeida et al. (2012), who investigate large listed firms in the USA, we hypothesize that privately owned SMEs with a large proportion of long-term debt maturing at the start of the crisis had difficulties to renew their loans due to the negative credit supply shock, and hence could invest less than other SMEs. Furthermore, we expect that this effect is stronger for SMEs which are *ex ante* more likely to be financially constrained: smaller SMEs and SMEs that pay no dividend, have fewer liquid reserves, and/or have higher leverage (Fazzari et al. 1988; Duchin et al. 2010). We investigate SME investments during the period 2006–2009, which includes two precrisis years (2006 and 2007) and two crisis years (2008 and 2009). We find a statistically and economically significant decline in investments in 2009, which is stronger for SMEs that had to renew a larger proportion of their long-term debt in 2008. We also find that this effect is driven by firms which are more likely to be financially constrained. To ascertain that our results are caused by a negative credit supply shock and not by unobservable firm characteristics, we consider three placebo periods in which there was no credit supply shock: 1998–2001, 1999–2002, and 2003–2006. For these placebo periods we expect *not* to find an effect of the long-term debt maturity structure on investments. This is indeed what we find, confirming the causal relationship of our findings for the period 2006–2009. To further check the robustness of our results we run a battery of additional tests. We consider the proportion of long-term debt maturing within the next year at the start of each crisis year rather than at the start of 2008, long-term debt maturing within the next year divided by total assets instead of total long-term debt, and we also include firms with little or no long-term debt which are otherwise left out of our sample. Furthermore, we consider new investments in tangible fixed assets rather

¹ This survey is addressed to senior loan officers of a representative sample of Euro area banks and is conducted four times a year. Detailed information on the survey and its results are available at: <http://www.ecb.int/stats/money/surveys/lend/html/index.en.html>.

² Detailed information on the survey and its results are available at: <http://www.ecb.int/stats/money/surveys/sme/html/index.en.html>.

³ The net percentage of tightening of credit standards is the percentage of banks reporting a tightening minus the percentage of banks who reported they eased credit standards. See <http://www.ecb.int/stats/money/surveys/lend/html/index.en.html> for a further discussion of this issue.

than new investments in all fixed assets, we extend our sample to four precrisis years rather than two precrisis years, and we measure long-term debt maturity at the start of 2007 rather than at the start of 2008. All the robustness tests confirm our basic findings.

Our study contributes to the literature in several ways. We are not aware of any other study that investigates the impact of a negative credit supply shock on financing constraints of SMEs. Studying SMEs is important, since SMEs worldwide are a key driver for economic growth, innovation, and employment. In Belgium, they account for 99.8 % of the total number of firms, 66.9 % of total employment, and 57.7 % of total value added⁴ (European Commission 2009). The role of SMEs in Belgium is representative of the role of SMEs in other European countries: European SMEs account for 99.8 % of all firms, 67.4 % of total employment, and 57.9 % of total value added in Europe (European Commission 2009). Furthermore, studying SMEs in Belgium allows us to use a unique database with detailed accounting data of all privately owned Belgium SMEs, and it allows us to study a creditor-oriented financial system rather than a market-oriented financial system such as in the USA or UK.

Our study also contributes to the finance literature by shedding light on the long-term debt maturity structure of SMEs. As Almeida et al. (2012) note, the maturity structure of long-term debt is an understudied topic in finance. Ideally, firms should have a well-diversified maturity structure of long-term debt, so that the refinancing or repayment of long-term debt is spread over time. However, consistent with results of Almeida et al. (2012) for large listed firms in the USA, we find a wide variation in long-term debt maturity across the SMEs in our sample. Furthermore, we find that long-term debt maturity affects access to external finance for SMEs.

The remainder of the paper is organized as follows. In the next section, we briefly discuss the Belgian banking sector and review the origins of the recent financial crisis. In Sect. 3, we discuss the literature on the effect of financial factors on corporate investments and the literature on financing patterns of SMEs. Sample and variables are discussed in Sect. 4. In Sect. 5, we discuss empirical design and results and we also take into account the influence of ex ante

financing constraints and we run the same regressions during placebo periods to further check causality of our results. We draw conclusions in the last section.

2 The Belgian banking sector and the Global Financial Crisis

At the start of the Global Financial Crisis, the Belgian banking sector was dominated by three banks: Fortis, KBC, and Dexia. Based on the total book value of all 110 active banks in Belgium, in 2007 Fortis had market share of 43 %, KBC of 17 %, and Dexia of 15 % (Febelfin 2008). These three banks, which provided nearly 70 % of total outstanding credit in Belgium, were strongly affected by the Global Financial Crisis. By April 2008, combined they had to write down 2.4 billion Euro of their equity capital due to the credit crisis (TNL/Belga 2008). This led to speculations about the solvency and liquidity of Belgian financial institutions. Corporate credit supply started to slow down, and credit conditions were tightened in the second and third quarter of 2008 (Nationale Bank van België 2009; Kenniscentrum voor Financiering van KMO 2009). After the collapse of Lehman Brothers in September 2008, Fortis had to be bailed out by the Belgian, Luxembourg, and Dutch governments: the Belgian entity of Fortis was sold by the Belgian government (which was by then owner of Fortis in Belgium) to the French bank BNP Paribas (Mooijman 2008), the Dutch government became the sole owner of the Dutch entity of Fortis, and the Luxembourg government got 49.9 % of the shares of Fortis Bank Luxembourg. Dexia had to be bailed out by the Belgian, Luxembourg, and French government, and KBC was bailed out by the Belgian government (Dendooven 2008). The return on equity (ROE) of the Belgian banking sector dropped from +6.79 % in 2007 to -33.69 % in 2008, and the average profit margin decreased from 0.25 % in 2007 to -1.31 % in 2008 (Febelfin 2008, 2009).

3 The effect of financing constraints on SME investments

Several studies have investigated the effect of financing constraints on corporate investments of listed firms. Establishing a causal link between financing constraints and investments is challenging because

⁴ Data refer to the nonfinancial business economy (NACE C-I, K) and represent estimates for 2008.

measures of the availability of finance are often correlated with available investment opportunities. Different methodologies have been used to separate the effects of the availability of finance and investment opportunities on investments. Two important papers in this field are those by Fazzari et al. (1988), who were the first to incorporate ex ante measures of external financing constraints in the q-model of investment, and Whited (1992), who uses the Euler equation methodology to identify the role of financing constraints in the investment process. A number of authors have considered an exogenous change in the supply of external credit to study the effect of financial factors on corporate behavior; For example, Peek and Rosengren (2000) use the Japanese banking crisis in the early 1990s to study the impact of an exogenous loan supply shock to the real economy in the USA through the Japanese bank penetration in the US real estate market. Chava and Purnanandam (2011) study the credit contraction in the USA in 1998 that originated in Russia. Lemmon and Roberts (2010) consider regulatory changes as an exogenous negative shock to the supply of below-investment-grade credit after 1989 for listed firms in the USA. Sufi (2009) uses the introduction of syndicated bank loan ratings in 1995 to study financial and investment policies. Khwaja and Mian (2008) investigate a credit supply shock caused by unexpected nuclear tests in Pakistan in 1998.

Recently, some studies have focused on financing constraints during the Global Financial Crisis to study the effect on investments. Campello et al. (2010) investigate the effects of the crisis on employment and capital spending by surveying chief financial officers (CFOs) of listed firms in the USA, Europe, and Asia. Duchin et al. (2010) and Almeida et al. (2012) focus on the impact of the crisis on investments of listed firms in the USA. Duchin et al. use cash holdings and short-term debt to identify firms that are more or less affected by the crisis. They find that investments of firms with low cash reserves or high short-term debt decline more during the crisis than firms with high cash reserves and low short-term debt. Almeida et al. (2012) consider long-term debt maturing in the short run as a measure of financing constraints and find that the decline in investments is larger for firms that need to refinance a large proportion of their long-term debt at the onset of the crisis.

To the best of our knowledge, no study has yet considered the effect of an exogenous credit supply

shock on investments of privately owned SMEs, although it has been found that the financing patterns of SMEs tend to be very different from those of large firms. Information asymmetries are generally higher for SMEs, as they have less information disclosure requirements. Therefore, problems of adverse selection, moral hazard, and credit rationing are more pronounced for SMEs than for large firms (e.g., Beck et al. 2008; Berger and Udell 1998; Hyytinen and Väänänen 2006). As a result, SMEs use less external finance than large firms, and they rely more on bank credit than large firms because they are typically unable to access public capital markets. SMEs are therefore more likely to be financially constrained than large firms because they have fewer finance options. Consistent with this hypothesis, Hadlock and Pierce (2010) find that firm size is a good predictor of financing constraints. Based on a study of 48 countries worldwide, Beck et al. (2008) find that small firms are less able to expand external financing as they become more financially constrained than large firms. Audretsch and Elston (1997) and Khwaja and Mian (2008) find that liquidity constraints are greater for smaller firms in Germany and Pakistan, respectively.

Since Almeida et al. (2012) and Duchin et al. (2010) find evidence that the Global Financial Crisis substantially constrained the finance of investments by large firms, we expect that this crisis also led to a reduction of investments by financially constrained SMEs. Following Almeida et al., we hypothesize that SMEs with a large proportion of long-term debt maturing at the start of the crisis had difficulties to renew their loans due to the negative credit supply shock, and hence could invest less than other firms. Additionally, we expect that this effect is stronger for firms which are ex ante more likely to be financially constrained: smaller SMEs and SMEs that pay no dividend, have less liquid reserves, and/or have higher leverage (e.g., Duchin et al. 2010).

The advantage of focusing on the maturity of long-term debt is that this measure of financing constraints is unlikely to be correlated with investment opportunities or any other factors which may affect investment decisions during a financial crisis. As Almeida et al. note, the long-term debt maturity is plausibly exogenous because the decisions affecting the maturity of a firm's long-term debt were made several years prior to the crisis. By additionally considering ex ante measures of financing constraints we further minimize the

risk that we are picking up any other effect than financing constraints. Long-term debt maturity may even be a better measure of financing constraints during a credit supply shock for SMEs than for large firms, for at least two reasons. Firstly, long-term debt is a more important source of financing for SMEs than for large firms. In Belgium, the average long-term debt to total assets ratio of nonfinancial firms was 23.54 % for SMEs and 16.23 % for large firms at the end of 2007.⁵ For the sample of this study the mean long-term debt ratio in 2007 is 25.03 %, while Duchin et al. (2010) find a mean ratio of 16.9 % for their sample of large US firms. Secondly, while large firms typically have their long-term debt spread over a large number of individual loans, SMEs tend to have only a handful of long-term loans. This makes it more difficult for an SME to spread the maturity dates, and may actually make the fact that it has to renew a large part of its long-term debt during a crisis more a case of bad luck than of bad management.⁶

We have already noted in the introduction that it cannot be ruled out that the impact of the crisis on the availability of external finance was smaller for SMEs than for large firms. The ECB bank survey suggests that banks in the Euro zone tightened their credit standards in the wake of the crisis more for large firms than for SMEs. A likely explanation is that banks found it harder themselves to obtain market finance for the provision of loans to large firms, which are larger than loans to SMEs. Since large firms are also directly more dependent on market finance than SMEs, the large firms may have suffered more from a reduction in the availability of finance.

4 Sample and variables

4.1 Sample

The data used for this study come from the Belfirst database of Bureau Van Dijk. This database contains the financial statements of all Belgian and Luxembourg firms, both listed firms and privately held firms. We select privately held Belgian firms with

nonconsolidated statements and we exclude financial firms, not-for-profit organizations, and governmental enterprises⁷ defined as firms with US SIC codes in the interval 6000–6999 and the interval 8000–9999. In Belgium, small firms can choose to deposit their financial statements in an abbreviated format.⁸ We exclude firms that use the abbreviated format because these firms are not obliged to report turnover, which is one of our control variables. We also exclude firms with negative equity⁹ and firms for which the financial year is different from the calendar year. This is important as we want to measure the effect of the crisis in the same way for all firms. Following Almeida et al. (2012) and Duchin et al. (2010), firms for which total assets double in one of the years of the sample period are excluded, to exclude mergers or other significant restructurings.

We use the European definition to select SMEs. This definition is based on three criteria (European Commission 2003). First, the headcount (annual work unit, AWU) must be less than 250. Second, the annual turnover may not exceed 50 million Euro *or* the annual balance sheet total may not exceed 43 million Euro. Third, firms must be independent. More specifically, firms may not have a shareholder with an equity stake of at least 25 % (except for equity stakes of families, employees or directors) (European Commission 2003). We also exclude microenterprises from our sample, i.e., firms which employ fewer than 10 persons and whose annual turnover or annual balance sheet total does not exceed 2 million Euro. Most of these firms fall out of our sample anyway because they typically submit their financial accounts in the abbreviated format. Finally, following Almeida et al. (2012) we exclude firm–year observations in which their debt maturing beyond 1 year represents less than

⁵ Own calculations based on the Belfirst database used for this study (see Sect. 4.1 for more information). Firms in financial and public sectors are excluded.

⁶ We thank an anonymous reviewer for this insight.

⁷ Managers of not-for-profit organizations and governmental enterprises may be influenced by government regulation and may have less discretion concerning investments (Smith 1986).

⁸ A firm has to deposit the complete format if it has more than 100 employees or if it satisfies at least two of the following criteria: number of employees (yearly average) of at least 50, turnover (value-added tax excluded) of at least 7,300,000 Euro and total assets of at least 3,650,000 Euro (article 15 from *Wetboek van Venmoetschappen*).

⁹ Firms with negative equity which have continuous reported losses are likely to be financially distressed. While this will significantly impact their access to external finance, it is not the focus of our study.

5 % of total assets, to exclude possible “bad” firms that are obliged to rely on short-term debt. This reduces the sample from 1,432 firms to 643 firms. Of the 789 firms left out, 489 firms had no long-term debt at all. Our final sample consists of 2,354 yearly observations in the 4-year period 2006–2009.

4.2 Variables

The dependent variable in our analysis is yearly investments in intangible, tangible, and financial fixed assets divided by total assets. To test our hypothesis that a credit supply shock has an influence on investments that depends on financial contracting, we consider the variable “% LT debt <1 year,” which is the proportion of long-term debt at the start of 2008 (i.e., at the onset of the Global Financial Crisis) that matures within the next year. This measure is based on all financial long-term debt, which consists primarily of bank debt: 66 % of all financial long-term debt of the firms in our sample is bank debt. We examine whether firms with more long-term debt maturing at the onset of the crisis invested less than firms that did not have to refinance a large proportion of their long-term debt (Almeida et al. 2012).

Following Almeida et al. (2012), we prefer to use long-term debt maturing within the next year rather than short-term debt as our identification variable because the choice between short- versus long-term debt is correlated with firm characteristics such as size, credit rating, and growth opportunities, and can therefore not be considered exogenous (e.g., Barclay and Smith 1995; Berger et al. 2005; Guedes and Opler 1996; Ortiz-Molina and Penas 2008). Heyman et al. (2008) also find for privately held Belgian firms that firm size and credit risk are positively correlated with short-term debt.

In order for maturing long-term debt to be a useful variable, there needs to be substantial variation in debt maturity across firms. It is plausible that firms generally diversify their long-term debt so that a similar proportion of long-term debt matures in every year (Almeida et al. 2012). If this were the case, we would not be able to distinguish between firms that have a large proportion and firms that have a small proportion of long-term debt maturing within the next year. All firms would have a similar proportion of their long-term debt maturing in each year. However, Almeida et al. (2012) and Greenwood et al. (2010)

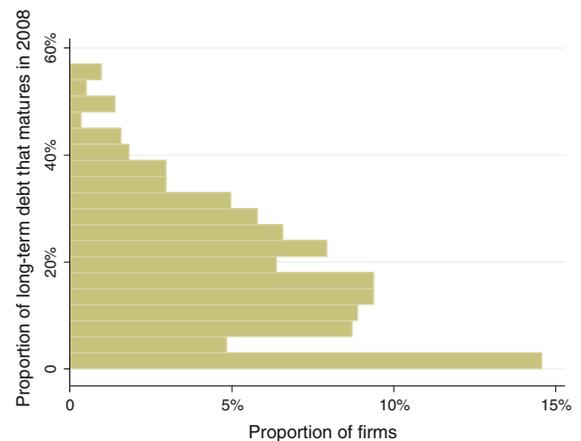


Fig. 1 Long-term debt at the start of 2008 that matures within the next year. This figure shows the proportion of firms in our sample with respect to the proportion of long-term debt outstanding at the start of 2008 that matures within the next year

do find a considerable diversity in debt maturity in the USA. Figure 1 shows the distribution of firms in our sample according to the proportion of long-term debt at the start of 2008 that matures within the next year. The figure makes clear that there is a considerable variation in the maturity structure of long-term debt: the proportion of long-term debt maturing within the next year ranges between 0 % and 57 %.

In the regressions, we also include cash flow and turnover in year t and in year $t - 1$, scaled by total assets, and year dummies. Cash flow is defined as operating income before depreciation and amortization. Tobin’s Q cannot be included, since the firms in our sample are not listed. All these variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers.

We also consider four proxies for ex ante financing constraints of SMEs at the start of the crisis in 2008: size measured by total assets, a dummy equal to 1 if the firm pays a dividend and 0 otherwise, liquidity measured by liquid reserves over total assets, and leverage measured by total financial debt over total assets. All four proxies are measured at the start of the crisis (i.e., the start of 2008).

Table 1 presents summary statistics. The average yearly investment in fixed assets for the full period is 7.9 % of total assets. This is in line with findings of Heyman et al. (2008) for Belgian SMEs in the period 1996–2000. They find a yearly average investment rate of 7.6 % for a sample of 1,132 privately owned SMEs. In 2009, the average investment of the firms in

Table 1 Descriptive statistics

Variable	Obs	Mean	Median	SD	Min	Max
Investments/assets	2,354	0.079	0.051	0.082	0	0.509
% LT debt <1 year (*)	643	0.176	0.160	0.129	0	0.566
LT debt <1 year/assets (*)	643	0.040	0.028	0.036	0	0.170
Cash flow/assets	2,354	0.091	0.107	0.253	-1.900	0.506
Turnover/assets	2,354	1.867	1.699	1.213	0.071	6.741
Turnover/assets $t - 1$	2,354	1.882	1.718	1.213	0.071	6.741
Size (*)	€ 643	€ 23.1 mio	€ 8.8 mio	€ 49.0 mio	€ 2.2 mio	€ 470.0 mio
Dividend payout (*)	643	0.235				
Liquidity (*)	643	0.055	0.035	0.064	0.000	0.495
Leverage (*)	643	0.338	0.317	0.174	0.0585	0.761

Investments/assets is capital expenditures in intangible, tangible, and financial fixed assets over total assets. *% LT debt <1 year* is the proportion of long-term debt outstanding at the start of 2008 that matures within the next year. *LT debt <1 year/assets* is long-term debt outstanding at the start of 2008 that matures within the next year over total assets. *Cash flow/assets* is operating income before depreciation and amortization over total assets. *Turnover/assets* is turnover over total assets. *Size* is measured by total assets. *Dividend payout* is a dummy that equals 1 if a firm pays out a dividend and 0 otherwise. *Liquidity* is cash holdings over total assets, and *leverage* is total debt over total assets. Variables marked with an asterisk (*) are measured at the start of 2008

our sample was 6.5 % of total assets, which is comparable to the overall investment rate of Belgian SMEs. For all Belgian SMEs in the industries included in our sample, investments were on average 6 % of total assets in 2009 (own calculations based on the Belfirst database). This suggests that the investment policy of the SMEs in our sample is representative for the overall investment policy of Belgian SMEs in the period considered. Table 1 also shows that on average 18 % of long-term debt outstanding at the start of 2008 matured in the next year. Interestingly, Almeida et al. (2012) find that only 8 % of their sample firms have more than 20 % of their long-term debt expiring within the next year. They consider large firms which typically will have their long-term debt spread over a large number of individual loans, while the SMEs in our sample typically will have only a handful long-term loans. As noted in Sect. 3, this makes it more difficult for the SMEs to spread the maturity dates of their loans.

Table 1 also reports descriptive statistics on our measures of financing constraints at the start of the crisis. Twenty-four percent of the firms in our sample paid a dividend, 6 % of total assets were cash holdings, and the average leverage ratio was 34 %.

Table 2 presents the industry distribution of the firms in our sample. The largest part (36 %) of our sample consists of wholesale and retail trading firms. There is also a substantial number of firms in mining and construction (16 %), transportation,

communications, electric, gas and sanitary services (15 %), light manufacturing (15 %), and heavy manufacturing (9 %).

Table 3 reports Pearson correlation coefficients between the variables included in the analysis. This table shows that firms which invest more tend to generate higher cash flows, hold less cash, have higher leverage, and are less likely to pay a dividend. They also tend to have more long-term debt maturing within the next year. The proportion of long-term debt maturing within the next year is negatively related to size and leverage, but it is not significantly related to liquidity.

5 Results

5.1 Crisis investments and long-term debt maturity

Table 4 presents regression results for the relation between investments and long-term debt maturity in the period 2006–2009. In all regressions, the dependent variable is the level of investments in fixed assets scaled by total assets. We use the fixed-effects model, which controls for all time-invariant differences between the firms in our sample.¹⁰ Standard errors

¹⁰ We used the Hausman test to determine whether to use fixed-effects or random-effects model.

Table 2 Industry distribution of sample firms (based on one-digit US SIC codes)

		No. of firms	Percentage of firms
0	Agriculture, forestry, fishing	8	1.2
1	Mining and construction	100	15.6
2	Light manufacturing	95	14.8
3	Heavy manufacturing	60	9.3
4	Transportation, communications, electric, gas, and sanitary services	99	15.4
5	Wholesale/retail trade	232	36.1
7	Services	49	7.6
	Total	643	100

Table 3 Correlation table ($n = 2,354$)

Variables	1	2	3	4	5	6	7	8	9	10
1 Investments/assets	1									
2 % LT debt <1 year	0.163*	1								
3 LT debt <1 year/assets	0.329*	0.711*	1							
4 Cash flow/assets	0.187*	0.237*	0.218*	1						
5 Turnover t /assets	-0.082*	0.183*	-0.038*	-0.004*	1					
6 Turnover $t - 1$ /assets	-0.016*	0.171*	-0.051*	-0.019*	0.949*	1				
7 Size	0.023	-0.250*	-0.161*	-0.013	-0.336*	-0.334*	1			
8 Dividend payout	-0.039*	0.024*	-0.012	0.105*	-0.058*	-0.060*	0.114*	1		
9 Liquidity	-0.072*	-0.005	-0.086*	0.043*	0.133*	0.137*	-0.066*	0.044*	1	
10 Leverage	0.164*	-0.207*	0.198*	-0.102*	-0.293*	-0.289*	0.197*	-0.035*	-0.326*	1

This table shows Pearson correlation coefficients. All variables are defined as before

* Significance at the 5 % level

are heteroskedasticity consistent and clustered at firm level. We include the ratio of cash flow to assets, turnover in year t and turnover in year $t - 1$ divided by assets, and year dummies as control variables. First, we investigate whether the SMEs in our sample reduced their investments in 2008 and/or in 2009. Regression (1) shows that, while investments were not significantly lower in 2008 compared with the two previous years, in 2009 there was a statistically significant decrease in investments over total assets of 2.7 %, *ceteris paribus*. All control variables are significant at the 1 % level. As expected, cash flow and turnover in year $t - 1$ have a positive influence on investments, but remarkably turnover in year t has a negative effect. A tentative explanation for this result is that the coefficient of turnover in year t picks up a

negative effect of operating costs, i.e., the difference between turnover and cash flow, on investments.

Next, we investigate whether the investments of SMEs during the financial crisis depended on debt maturity. In regression (2), we add an interaction term between the 2008 and 2009 year dummies and the proportion of long-term debt at the start of 2008 maturing within the next year. For 2009, the interaction term is negative and statistically significant at the 5 % level, which suggests that the decrease in investments in 2009 was larger for firms with more long-term debt maturing in the next year. While investments to total assets of firms without long-term debt maturing within 1 year decreased by 1.5 % in 2009, the investments to total assets ratio of the typical firm in our sample with respect to long-term debt

Table 4 Investments and long-term debt maturity

Sample:	Basis (1)	Basis (2)	Basis (3)	Basis (4)	Extended (5)	Extended (6)
2007	0.002 (0.611)	0.002 (0.594)	0.002 (0.593)	0.001 (0.779)	0.004 (0.036)**	0.004 (0.035)**
2008	-0.005 (0.193)	-0.007 (0.203)	-0.002 (0.703)	-0.011 (0.075)*	0.005 (0.028)**	0.008 (0.001)***
2009	-0.027 (0.000)***	-0.015 (0.020)**	-0.011 (0.057)*	-0.017 (0.015)**	-0.008 (0.001)***	0.001 (0.624)
2008 * % LT debt <1 year	-	0.015 (0.561)	-	0.027 (0.349)	-	-
2009 * % LT debt <1 year	-	-0.065 (0.033)**	-	-	-	-
2008 * LT debt <1 year/assets	-	-	-0.074 (0.436)	-	-	-0.153 (0.031)**
2009 * LT debt <1 year/assets	-	-	-0.391 (0.002)***	-	-	-0.416 (0.000)***
2009 * % LT debt <1year 2009	-	-	-	-0.060 (0.067)*	-	-
Cash flow/assets	0.049 (0.000)***	0.046 (0.000)***	0.045 (0.000)***	0.049 (0.000)***	0.036 (0.000)***	0.034 (0.000)***
Turnover/assets	-0.043 (0.000)***	-0.043 (0.000)***	-0.041 (0.000)***	-0.047 (0.000)***	-0.024 (0.000)***	-0.023 (0.000)***
Turnover/assets $t - 1$	0.050 (0.000)***	0.051 (0.000)***	0.051 (0.000)***	0.055 (0.000)***	0.022 (0.000)***	0.023 (0.000)***
Observations	2354	2354	2354	2148	5194	5194
R^2	0.112	0.117	0.122	0.127	0.048	0.059

This table presents fixed-effects regression results for the period 2006–2009. The dependent variable is investments/assets; 2007, 2008, and 2009 are year dummies; *LT debt <1 year/assets* is long-term debt outstanding at the start of 2008 that matures within the next year over total assets; *% LT debt <1 year 2009* is the proportion of long-term debt outstanding at the start of 2009 that matures within the next year. All other variables are defined as before. *P*-values (in parenthesis) are heteroskedasticity consistent and clustered at firm level

***, **, and * Significance at the 1, 5, and 10 % levels, respectively

maturing within the year decreased by an additional $-0.065 * 16 \% = \text{approx. } 1 \%$. This reduction in the investments/assets ratio is economically significant, when compared with the median (mean) investment/assets ratio for our sample of 5.1 % (7.9 %). The finding that long-term debt maturity affected investments in 2009 but not in 2008 is consistent with the fact that the crisis affected global Belgian investments only from 2009 onwards: while gross fixed capital formation by all Belgian enterprises in 2008 still increased by 3.4 %, in 2009 it decreased by 7.5 %.¹¹

The results for our long-term debt maturity measure may be biased because this measure depends on the total level of long-term debt in the denominator: the proportion of long-term debt maturing within the next year will be less relevant for firms with lower levels of long-term debt than for firms with high levels of long-term debt. Therefore, in regression (3) we relate long-term debt maturing in the next year to total assets instead of total long-term debt. Again we find a substantial negative effect of long-term debt maturity

¹¹ Percentages on gross capital formation reported in the annual reports of the National Bank of Belgium, available at

Footnote 11 continued
http://www.nbb.be/pub/06_00_00_00_00/06_02_00_00_00/06_02_06_00_00/06_02_06_2001.htm?l=en.

on investments in 2009, which is now statistically significant at the 1 % level.

So far we have considered the long-term debt maturity structure at the start of 2008, i.e., before the crisis affected Belgian banks, in order to make sure that long-term maturity structure is exogenous to the crisis. A disadvantage of this approach is that the interaction terms for 2008 and 2009 do not capture the same effect. The interaction term for 2008 measures whether long-term debt maturing in 2008 has an effect upon investments in the same year, while the interaction term for 2009 measures whether long-term debt maturing in 2008 has a *delayed* effect upon investments in the next year. Therefore, in regression (4) we interact the 2009 year dummy with long-term debt maturing in 2009 instead of 2008. Again we find a significantly negative coefficient for the 2009 interaction term.

Following Almeida et al. (2012), we have restricted the sample to firms for which debt maturing beyond 1 year represents at least 5 % of total assets. The purpose of this restriction is to ensure that the results do not come from a comparison between high-quality firms that can issue long-term debt and low-quality firms that are not able to do so. However, as noted in Sect. 4.1, this restriction reduces the number of firms in our sample by more than half, and many of the firms left out may actually not be finance constrained at all. In order to check how this restriction affects our results, we re-estimated the base regressions for a sample which also includes firms with little or no debt maturing in more than 1 year. Since many of these firms have only a small amount of long-term debt, we relate long-term debt maturing in the next year to total assets rather than to long-term debt, as we did in regression (3). The results of regression (5) confirm those of regression (1), and the results of regression (6) are even stronger than our base results: if we take into account all firms, long-term debt maturing in 2008 not only significantly reduces investments in 2009 but also already in 2008.

A problem with interpreting the (LT debt<1/assets) coefficient as a measure of financing constraints in regression model (6) is that this interpretation rests on the assumption that firms with little or no long-term debt are less financially constrained. Indeed, the (LT debt<1/assets) variable is equal to: ($\% \text{ LT debt} < 1 \text{ year}$) \times (LT debt/assets). Therefore, the coefficient of (LT debt< 1/assets) in regression (6) simultaneously

tests whether firms with a higher proportion of long-term debt maturing within the year ($\% \text{ LT debt} < 1 \text{ year}$) and firms with a higher proportion of long-term debt over total assets (LT debt/assets) are more financially constrained. While we do hypothesize that long-term debt maturity (as measured by $\% \text{ LT-debt} < 1 \text{ year}$) increased financing constraints during the crisis, there is no theoretical (or empirical) basis for assuming that SMEs were less financially constrained if they had little or no long-term debt outstanding (as measured by LT debt/assets). It could even be argued that firms without LT debt are *more* financially constrained because they are not able to obtain such debt.¹² Table 5 compares ex ante financing constraints measures at the start of 2008 between the firms in the basis sample and the firms added in the extended sample, i.e., firms with little or no long-term debt at the start of the crisis. Firms with little or no long-term debt were more likely to pay a dividend, held more cash, and had lower leverage. This indicates lower financing constraints, but these firms also tended to be significantly smaller, which points to higher financing constraints. It cannot be ruled out that firms in our sample with little or no long-term debt pursued conservative financing policies for reasons unrelated to financing constraints. Since the focus of this paper is on the effect of long-term debt maturity ($\% \text{ LT debt} < 1 \text{ year}$) anyway, in the remainder of the paper we will consider the basis sample of firms with a substantial amount of long-term debt outstanding.

5.2 Crisis investments and ex ante financing constraints

We next consider the effect of ex ante financing constraints. The literature provides evidence that fluctuations in the supply of external finance will have a more pronounced effect on firms that are ex ante more financially constrained (e.g., Duchin et al. 2010). As a first measure of ex ante financing constraints, we use firm size. We calculate the median value of total assets measured at the start of 2008 to distinguish between smaller and larger SMEs. The smaller SMEs are a priori expected to be more financially constrained than the larger SMEs (e.g.,

¹² See Heyman et al. (2008) for an analysis of the determinants of the debt ratio and debt maturity for a sample of Belgian SMEs.

Table 5 Ex ante financing constraints

	Basis sample (643 obs.)		Other firms (789 obs.)	
	Mean	Median	Mean	Median
Size (mio)	23.1	8.8	16.3***	7.3
Dividend payout	0.235		0.306***	
Liquidity	0.055	0.035	0.100***	0.057
Leverage	0.338	0.317	0.081***	0.010

All variables are defined as before and are measured at the start of 2008

*** Significance at the 1 % level, based on a *t* test

Duchin et al. 2010).¹³ Table 6 reports the results. Regressions (7) and (8) show that investments of both smaller and larger SMEs decrease in 2009. However, if we take into account long-term debt maturity in regressions (9) and (10), we find that long-term debt maturity only affects investments of the smaller SMEs, which are more likely to be financially constrained than the larger SMEs. Thus, the effect of long-term debt maturity seems to be conditional upon being financially constrained.

As a second measure of financing constraints we consider dividend payouts, since financially constrained firms are expected to pay less or no dividends (e.g., Fazzari et al. 1988; Duchin et al. 2010). We distinguish between firms that pay a dividend and firms that do not pay a dividend at the start of the crisis (e.g., Rommens et al. forthcoming). Out of the 643 firms in our sample, only 151 firms paid a dividend. Regressions (11) and (12) from Table 6 show that both dividend payers and nonpayers decreased their investments in 2009. However, if we take into account long-term debt maturity in regression (13) and (14), only investments of the nonpayers depend on long-term debt maturity.

In Table 7 we additionally consider firm liquidity and leverage at the start of the crisis as measures of financing constraints. We expect that long-term debt maturity is more likely to matter for investments if the firm has low (below median) liquidity and/or high (above median) leverage. First, we find that firms with low liquidity (regression (15)) and high leverage (regression (20)) already significantly

reduced their investments in 2008, while the high-liquidity/low-leverage firms did not have a significantly lower investment rate as compared with 2006 (i.e., the base year in our sample). All firms significantly reduce their investments in 2009, but the reduction seems to have been stronger for firms with low liquidity and/or high leverage. When we consider long-term debt maturity, the hypothesis of financing constraints due to a negative credit supply shock is again confirmed. We find that a higher proportion of long-term debt maturing in 2008 significantly reduces investments of firms with low liquidity [regression (17)] and high leverage [regression (22)], while it does not significantly affect investments of firms with high liquidity [regression (18)] and low leverage [regression (21)].

5.3 Placebo periods

Our results show a relationship between a negative credit supply shock and a decline in investments during the crisis of 2008–2009 that is conditional upon the firms' long-term debt maturity structure. To confirm that our results are not due to unobserved firm characteristics but rather to a causal relationship, we run the same regressions as before, but in periods without a negative credit supply shock. Following Duchin et al. (2010), we do *not* expect to find any effect of maturity structure on investments for the placebo periods. To replicate our baseline tests, we consider three placebo periods: 1998–2001, 1999–2002, and 2003–2006. The period 1998–2001 incorporates the end of the dot.com boom in 2000, which constitutes a negative demand shock. The decrease in investments following this shock should not be conditional upon the portion of maturing debt at the start of the crisis as credit was still readily

¹³ Young firms also tend to be more financially constrained than older firms (Hadlock and Pierce 2010). However, since most of the firms in our sample are fairly mature firms, age is not a useful measure for financing constraints in this research.

Table 6 Investments, LT debt maturity, firm size, and dividend payout

Sample:	Size < median (7)	Size ≥ median (8)	Size < median (9)	Size ≥ median (10)	No dividend (11)	Dividend (12)	No dividend (13)	Dividend (14)
2007	0.005 (0.265)	−0.002 (0.736)	0.006 (0.236)	−0.002 (0.736)	0.001 (0.793)	0.004 (0.608)	0.001 (0.774)	0.004 (0.604)
2008	−0.001 (0.916)	−0.010 (0.066)*	−0.002 (0.764)	−0.011 (0.206)	−0.006 (0.171)	−0.002 (0.788)	−0.009 (0.162)	−0.003 (0.813)
2009	−0.028 (0.000)***	−0.028 (0.000)***	−0.006 (0.537)	−0.025 (0.003)***	−0.027 (0.000)***	−0.026 (0.003)***	−0.016 (0.036)**	−0.014 (0.335)
2008 * % LT debt < 1 year	–	–	0.013 (0.686)	0.006 (0.903)	–	–	0.019 (0.518)	0.007 (0.916)
2009 * % LT debt < 1 year	–	–	−0.101 (0.019)**	−0.019 (0.656)	–	–	−0.064 (0.069)*	−0.065 (0.277)
Cash flow/assets	0.052 (0.000)***	−0.037 (0.491)	0.046 (0.000)***	−0.036 (0.498)	0.043 (0.000)***	0.100 (0.000)***	0.040 (0.000)***	0.098 (0.000)***
Turnover/assets	−0.047 (0.000)***	−0.034 (0.006)***	−0.046 (0.000)***	−0.034 (0.006)***	−0.042 (0.000)***	−0.046 (0.005)***	−0.041 (0.000)***	−0.046 (0.004)***
Turnover/assets $t - 1$	0.045 (0.000)***	0.060 (0.000)***	0.044 (0.000)***	0.060 (0.000)***	0.053 (0.000)***	0.043 (0.009)***	0.053 (0.000)***	0.045 (0.006)***
Observations	1164	1190	1164	1190	1786	568	1786	568
R^2	0.148	0.088	0.159	0.089	0.121	0.094	0.126	0.098

This table presents fixed-effects regression results for the period 2006–2009. The dependent variable is investments/assets. All variables are defined as before. P -values (in parenthesis) are heteroskedasticity consistent and clustered at firm level

***, **, and * Significance at the 1, 5, and 10 % levels, respectively

available. The period 1999–2002 is interesting to compare with the period 2006–2009, because the pattern of gross fixed capital formation by Belgian enterprises is similar for both periods. In the 1999–2002 period gross fixed capital formation by Belgian enterprises increased by 2.9 % in the first placebo crisis year 2001 but decreased by 3.8 % in the second placebo crisis year 2002, while in the 2006–2009 period, gross fixed capital formation increased by 3.8 % in 2008 and decreased by 7.5 % in 2009. To further exclude unobserved firm characteristics from our baseline results, we also use the period 2003–2006 without any crises. In the absence of a refinance constraint, the maturity structure of long-term debt should again be irrelevant for investments. We use the same specifications and the same variables as before. Table 8 presents the results. We find no statistically significant effect of long-term debt maturity on corporate investments during any of the placebo periods. This finding is consistent with our previous results that long-term debt maturity affected

investments in 2009 because of an external credit supply shock.

5.4 Robustness checks

We did a number of additional tests to check the robustness of our results. The results of these tests, which are not reported in the paper, are available from the authors upon request. We used the proportion of long-term debt that matures within the next year at the start of 2007 instead of 2008, to further ascertain that our results are not driven by an endogenous effect of the financial crisis on the long-term debt maturity structure. Indeed, it could be argued that, because the financial crisis already started in the USA in 2007, this may have affected long-term debt maturity structure of Belgian SMEs at the start of 2008. We also considered capital expenditures in tangible fixed assets rather than capital expenditures in all fixed assets as a measure of investments. As an additional robustness check, we enlarged our precrisis period by 2 years, considering

Table 7 Investments, LT debt maturity, liquidity, and leverage

Sample:	Liquidity < median (15)	Liquidity \geq median (16)	Liquidity < median (17)	Liquidity \geq median (18)	Leverage < median (19)	Leverage \geq median (20)	Leverage < median (21)	Leverage \geq median (22)
2007	-0.003 (0.571)	0.007 (0.149)	-0.003 (0.604)	0.007 (0.145)	0.004 (0.319)	-0.000 (0.974)	0.004 (0.315)	0.000 (0.995)
2008	-0.014 (0.010)***	0.004 (0.493)	-0.010 (0.180)	-0.003 (0.728)	0.004 (0.402)	-0.014 (0.008)***	-0.003 (0.750)	-0.011 (0.130)
2009	-0.038 (0.000)***	-0.017 (0.003)***	-0.020 (0.042)**	-0.009 (0.349)	-0.015 (0.005)***	-0.039 (0.000)***	-0.007 (0.442)	-0.023 (0.024)**
2008 * % LT debt <1 year	-	-	-0.016 (0.612)	0.035 (0.373)	-	-	0.036 (0.363)	-0.017 (0.615)
2009 * % LT debt <1 year	-	-	-0.106 (0.028)**	-0.042 (0.280)	-	-	-0.040 (0.216)	-0.097 (0.079)*
Cash flow/assets	0.056 (0.000)***	0.043 (0.000)***	0.050 (0.000)***	0.041 (0.000)***	0.067 (0.000)***	0.071 (0.000)***	0.065 (0.000)***	0.065 (0.000)***
Turnover/assets	-0.042 (0.000)***	-0.042 (0.000)***	-0.042 (0.000)***	-0.041 (0.000)***	-0.040 (0.000)***	-0.046 (0.000)***	-0.039 (0.000)***	-0.047 (0.000)***
Turnover/assets $t - 1$	0.055 (0.000)***	0.045 (0.000)***	0.057 (0.000)***	0.045 (0.000)***	0.035 (0.000)***	0.065 (0.000)***	0.035 (0.000)***	0.067 (0.000)***
Observations	1152	1202	1152	1202	1194	1160	1194	1160
R^2	0.138	0.095	0.146	0.099	0.093	0.164	0.097	0.169

This table presents fixed-effects regression results for the period 2006–2009. The dependent variable is investments/assets. All variables are defined as before. P -values (in parenthesis) are heteroskedasticity consistent and clustered at firm level
 ***, **, and * Significance at the 1, 5, and 10 % levels, respectively

Table 8 Investments and long-term debt maturity during placebo periods

Placebo period:	1998–2001	1998–2001	1999–2002	1999–2002	2003–2006	2003–2006
Year <i>t</i> :	2000	2000	2001	2001	2005	2005
	(23)	(24)	(25)	(26)	(27)	(28)
Year <i>t</i> – 1	–0.012 (0.133)	–0.012 (0.133)	–0.014 (0.051)*	–0.014 (0.050)**	0.007 (0.069)*	0.007 (0.071)*
Year <i>t</i>	–0.028 (0.001)***	–0.030 (0.007)***	–0.012 (0.112)	–0.020 (0.085)*	–0.004 (0.382)	–0.006 (0.353)
Year <i>t</i> + 1	–0.029 (0.001)***	–0.025 (0.069)*	–0.025 (0.002)***	–0.017 (0.172)	–0.008 (0.029)**	–0.013 (0.038)**
Year <i>t</i> * % LT debt <1 year	–	0.009 (0.845)	–	0.038 (0.315)	–	0.012 (0.667)
Year <i>t</i> + 1 * % LT debt <1 year	–	–0.019 (0.730)	–	–0.040 (0.334)	–	0.023 (0.375)
Cash flow/assets	0.013 (0.752)	0.013 (0.748)	0.053 (0.001)***	0.050 (0.001)***	0.035 (0.000)***	0.036 (0.000)***
Turnover/assets	–0.046 (0.001)***	–0.046 (0.001)***	–0.033 (0.002)***	–0.033 (0.001)***	–0.056 (0.000)***	–0.056 (0.000)***
Turnover/assets lagged	0.054 (0.000)***	0.054 (0.000)***	0.040 (0.000)***	0.040 (0.000)***	0.053 (0.000)***	0.053 (0.000)***
Observations	824	824	1723	1723	2534	2534
<i>R</i> ²	0.112	0.113	0.075	0.084	0.107	0.108

This table presents fixed-effects regression results for three different placebo periods. The dependent variable is investments/assets. *Year t* – 1, *year t* and *year t* + 1 are year dummies, with *year t* given in the second row of each column. All other variables are defined as before. *P*-values (in parenthesis) are heteroskedasticity consistent and clustered at firm level

***, **, and * Significance at the 1, 5, and 10 % levels, respectively

four precrisis years 2004–2007. All these analyses confirm the results reported in the paper.

6 Conclusions

The Global Financial Crisis induced a negative credit supply shock which led to a significant reduction in investments by large firms in the USA (Almeida et al. 2012; Duchin et al. 2010). This raises the question of how this crisis affected investments of SMEs, which are worldwide a key driver for economic growth, innovation, and employment. While SMEs are more likely to be financially constrained than large firms, the bank lending surveys of the ECB indicate that the Global Financial Crisis had a bigger impact on access to external finance for large European firms than for European SMEs. It is therefore possible that the credit supply effect of the crisis did not matter very much for the investments of SMEs. In this study, we find a statistically and economically significant decrease in

investments of Belgian SMEs in 2009. Our results suggest that this decrease is to a large extent caused by a reduction in the supply of credit which was induced by the Global Financial Crisis. SMEs invested significantly less when they had a larger proportion of long-term debt that needed to be renewed in the short run. Furthermore, the effect of the long-term debt maturity structure only mattered for SMEs which were more likely to be financially constrained: smaller firms, firms which did not pay a dividend, highly leveraged firms, and firms with low liquidity. Consistent with the hypothesis that there is a causal effect of a credit supply shock on corporate investments, we find no effect of long-term debt maturity in periods without a negative credit supply shock.

Our findings confirm that the supply of credit significantly affects corporate behavior of privately held SMEs. A negative credit supply shock such as the Global Financial Crisis seriously hampers the ability of SMEs to finance new investments, because it reduces their access to external (bank) finance. Our

findings also highlight the role of long-term debt maturity in the financing of SMEs, a topic which so far has been largely neglected in the SME literature and in the finance literature. Many firms do not have a diversified long-term debt maturity structure. The results of this study show that, while this may not matter in “normal” economic times, it may severely restrict their ability to finance value-creating investments when there is a negative credit supply shock.

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References

- Almeida, H., Campello, M., Laranjeira, B., & Weisbenner, S. (2012). Corporate debt maturity and the real effects of the 2007 credit crisis. *Critical Finance Review*, 1(1), 3–58.
- Audretsch, D. B., & Elston, J. A. (1997). Financing the German Mittelstand. *Small Business Economics*, 9(2), 97–110.
- Barclay, M. J., & Smith, C. W. J. (1995). The maturity structure of corporate debt. *Journal of Finance*, 50(2), 609–631.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89, 467–487.
- Berger, A. N., Espinosa-Vega, M. A., Frame, W. S., & Miller, N. H. (2005). Debt maturity, risk, and asymmetric information. *Journal of Finance*, 60, 2895–2923.
- Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance*, 22, 613–673.
- Campello, M., Graham, J. R., & Harvey, C. R. (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics*, 97(3), 470–487.
- Chava, S., & Purnanandam, A. (2011). The effect of banking crisis on bank-dependent borrowers. *Journal of Financial Economics*, 99(1), 116–135.
- Dendooven, P. (2008, 24 November). Een gewoon weekend van 3,5 miljard. *De Standaard*.
- Duchin, R., Ozbas, O., & Sensoy, B. A. (2010). Costly external finance, corporate investment, and the subprime mortgage credit crisis. *Journal of Financial Economics*, 97(3), 418–435.
- European Commission. (2003). Commission Recommendation concerning the definition of micro, small and medium-sized enterprises. *Official Journal of the European Union*, 203/361/EC.
- European Commission—Enterprise and Industry. (2009). Small Business Act (SBA) Fact Sheet Belgium. http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/pdf/final/sba_fact_sheet_belgium_en.pdf. Accessed February 2011.
- Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity*, 19(1), 141–195.
- Febelfin. (2008). Statistisch vademecum van de banksector 2007. <http://www.febelfin.be/export/sites/default/febelfin/pdf/nl/publicaties/vademecum/VM2007NL.pdf>. Accessed July 2011.
- Febelfin (2009). Statistisch vademecum van de banksector 2008. <http://www.febelfin.be/export/sites/default/febelfin/pdf/nl/publicaties/vademecum/VM2008NL.pdf>. Accessed July 2011.
- Greenwood, R., Hanson, S., & Stein, J. C. (2010). A gap-filling theory of corporate debt maturity choice. *Journal of Finance*, 65(3), 993–1028.
- Guedes, J., & Opler, T. (1996). The determinants of the maturity of corporate debt issues. *Journal of Finance*, 51(5), 1809–1833.
- Hadlock, C. J., & Pierce, J. R. (2010). New evidence on measuring financial constraints: moving beyond the KZ Index. *Review of Financial Studies*, 23(5), 1909–1940.
- Heyman, D., Deloof, M., & Ooghe, H. (2008). The financial structure of private held Belgian firms. *Small Business Economics*, 30, 301–313.
- Holmstrom, B., & Tirole, J. (1997). Financial intermediation, loanable funds, and the real sector. *Quarterly Journal of Economics*, 112(3), 663–691.
- Hyttinen, A., & Väänänen, L. (2006). Where do financial constraints originate from? An Empirical analysis of adverse selection and moral hazard in capital markets. *Small Business Economics*, 27, 323–348.
- Jaffee, D., & Russell, T. (1976). Imperfect information, uncertainty, and credit rationing. *Quarterly Journal of Economics*, 90(4), 651–666.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Kenniscentrum voor Financiering van KMO. (2009). Rapport Kredietverlening: 4e kwartaal 2008. http://www.cefip.be/files/Documenten/NL/2008%20Q4_NL.pdf. Accessed May 2011.
- Khwaja, A. I., & Mian, A. (2008). Tracing the impact of bank liquidity shocks: Evidence from an emerging market. *American Economic Review*, 98, 1413–1442.
- Lemmon, M., & Roberts, M. R. (2010). The response of corporate financing and investment to changes in the supply of credit. *Journal of Financial & Quantitative Analysis*, 45(3), 555–587.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 48, 261–297.
- Mooyiman, R. (2008, 28 October). 31,2 miljard euro. *De Standaard*.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187–221.
- Nationale Bank van België. (2009). Verslag 2008, Economische en financiële ontwikkeling. <http://www.nbb.be/doc/ts/>

- [Publications/NBBreport/2008/NL/T1/verslag2008_T1.pdf](#). Accessed June 2011.
- Ortiz-Molina, H., & Penas, M. F. (2008). Lending to small businesses: The role of loan maturity in addressing information problems. *Small Business Economics*, 30, 361–383.
- Peek, J., & Rosengren, E. S. (2000). Collateral damage: Effects of the Japanese bank crisis on real activity in the United States. *American Economic Review*, 90(1), 30–45.
- Rommens, A., Cuyvers, L., & Deloof, M. (forthcoming). Dividend policies of privately held companies: Stand-alone and group companies in Belgium. *European Financial Management*. doi:10.1111/j.1468-036X.2010.00554.x
- Smith, C. W. J. (1986). Investment banking and the capital acquisition process. *Journal of Financial Economics*, 15, 3–29.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71, 393–410.
- Sufi, A. (2009). The real effects of debt certification: Evidence from the introduction of bank loan ratings. *Review of Financial Studies*, 22(4), 1659–1691.
- TNL/Belga. (2008, 15 April). Ratinghuis Fitch somber over Belgische banken. *De Standaard*.
- Whited, T. M. (1992). Debt, liquidity constraints, and corporate investment: Evidence from Panel data. *Journal of Finance*, 47, 1425–1460.