

Bank loan application success by SMEs: the role of ownership structure and innovation

Peter van der Zwan

Zoetermeer, April 2014

This research has been partly financed by SCALES, Scientific Analysis of Entrepreneurship and SMEs (www.entrepreneurship-sme.eu).

Research Reports

Reference number	H201404
Publication	April 2014
number of pages	18
email address corresponding author	vanderzwan@ese.eur.nl
Address	Panteia Bredewater 26 P.O. box 7001 2701 AA Zoetermeer The Netherlands Phone: +31(0)79 322 22 00

All the research reports are available on the website www.entrepreneurship-sme.eu.

The responsibility for the contents of this report lies with Panteia/EIM. Quoting numbers or text in papers, essays and books is permitted only when the source is clearly mentioned. No part of this publication may be copied and/or published in any form or by any means, or stored in a retrieval system, without the prior written permission of Panteia/EIM. Panteia/EIM does not accept responsibility for printing errors and/or other imperfections.

Bank loan application success by SMEs: the role of ownership structure and innovation

Peter van der Zwan

Erasmus School of Economics, Erasmus University Rotterdam

Abstract:

This paper focuses on SMEs – firms with 250 employees at most – and the proportion of their requested loan that is granted by the bank. Financial data for SMEs in 38 European countries for 2011 are used (SMEs' Access to Finance survey) to test the relationship between ownership structure and innovation on the one hand and loan application success on the other hand. The set of control variables includes firm age, firm size, past firm growth, expected firm growth, and sector orientation. Focusing on the determinants of access to finance is important because restricted access could hinder firm growth. It turns out that SMEs that are part of a business group and SMEs with a multiple ownership structure have higher probabilities of receiving the requested bank loan than SMEs with a single owner. There is some evidence that female owned business have more success regarding their loan applications than male owned businesses. Furthermore, SMEs that adopt product or process innovations are less likely to receive the requested loan than SMEs that do not display innovative behavior. The robustness of these findings across several model specifications is shown and the implications of the findings are discussed.

Version: April 2014

Keywords: bank loans, credit rationing, SMEs, female entrepreneurship, ownership, innovation, Euro-barometer

Contact: Peter van der Zwan, vanderzwan@ese.eur.nl

Acknowledgments: The data have been requested from the European Central Bank for the present purpose. The author would like to thank Erik Canton. At the time of writing this report Peter van der Zwan was employed at Panteia/EIM. This report has been written in the framework of the research program SCALES, carried out by Panteia/EIM and financed by the Dutch Ministry of Economic Affairs. The views expressed here are those of the author and should not be attributed to the European Central Bank/European Commission.

1. Introduction and aim

This paper attempts to clarify which small- and medium-sized enterprises (SMEs) are successful when applying for a bank loan. SMEs are defined as enterprises with 250 employees at most. Specific attention is devoted to the roles that an SME's ownership structure and its innovative behavior play in relation to bank loan accessibility. Focusing on such determining factors of access to finance is important because restricted access could hinder firm growth or firm performance (Beck et al., 2006; 2008; Parker and Van Praag, 2006). It is known that SMEs are particularly vulnerable to restricted provision of external capital such as bank loans because of their smallness and opaqueness which increases information asymmetries between lenders (banks) and borrowers (SMEs).

The present paper's key concept is bank loan application success and follows the pool of articles focusing on the percentage of requested funding that is actually granted and the underlying determinants (Freel, 2007). A related, larger, set of studies investigate "turndown rates", i.e. firms not obtaining the funding at all for which they applied (Levenson and Willard, 2000; Storey, 2004; Kim, 2006; Orser et al., 2006).

For the present purpose a dataset of the European Commission and the European Central Bank from 2011 is used, i.e. during times of economic recession. It has been argued that banks hold tighter lending conditions during times of economic crisis as compared to periods of economic prosperity. The dataset contains objective information on loan application success and additional financial information for about 15,000 SMEs in the 28 EU countries and 10 other countries. While combining the information for these 38 countries the set of explanatory variables is firm-specific. Particular attention is devoted to the ownership structure and the innovative behavior of an SME. Relevant control variables are included: firm age, firm size, past firm growth, firm growth expectations, and sector orientation.

The present manuscript is structured as follows. Sections 1.1 and 1.2 formulate expectations regarding the influences of the main variables of interest, i.e. ownership structure and innovative behavior. Section 2 describes the data whereas section 3 presents the methodology and the results. Section 4 discusses several extensions of the analysis. Section 5 concludes.

1.1. Ownership structure

Restricted access to bank loans can arise because of information asymmetries between lender and borrower if a bank cannot determine the quality of the projects undertaken by the borrowing SME. Whereas firm age and firm size are usually linked to the concept of information asymmetries (Gertler, 1988, Canton et al., 2013) the *ownership structure* of a firm may become a relevant aspect to be taken into account as well when explaining loan application success.

When a firm has public shareholders listing and reporting requirements come into place. Hence, the credit history and track record of a firm are publicly available and information asymmetries between listed firms and lender are smaller than between non-listed firms and lender (Oliner and Rudebusch, 1992). Similar arguments may also hold for firms that belong to a business group. Schiantarelli and Sembenelli (2000) argue that firms that belong to larger

organizations or business groups profit from the close relationships with banks of their “parent organization”. Indeed, on basis of a sample of Japanese firms Hoshi et al. (1991) find that firms that are affiliated with industrial groups have closer relationships with banks than independent firms. There are additional advantages of belonging to business groups such as the “(...) financial strength, reputation, geographical and (often) product diversification of the parent company” (Schiantarelli and Sembenelli, 2000, p. 176) which reduce information asymmetries between lender and borrower.

In sum, we expect that SMEs with ownership by external shareholders are more likely to receive the requested bank loan than SMEs with “management ownership”. External shareholders being distinguished are public shareholders and business associates or other firms that own an SME. Management ownership is at place when an SME is run by a member of the founding family, a team of entrepreneurs, or a single owner.

Regarding management ownership, a team of owners can be contrasted with single proprietorship. In case of single ownership, the lending process hinges heavily on the characteristics of the owner. Entrepreneurs vary considerably in their honesty and ability, which can be assumed to be two non-observable characteristics, leading to higher chances of information asymmetries between lender and borrower. Using a Dutch sample of new business owners Blumberg and Letterie (2008) find that single ownership increases the probability of bank loan denial as compared to multiple ownership.

We therefore expect that SMEs with multiple owners are more likely to receive the requested bank loan than SMEs with a single owner.

An even further disentangling refers to the gender of the owner. It is known that males and females differ in terms of work or business experience, their management styles, and the characteristics of the firms they own such as firm size or sector of activity (Brush, 1992; Mukhtar, 2002; Fairlie and Robb, 2009). These and other demand-side factors may explain gender differences regarding loan application success. Indeed, when a range of relevant variables is controlled for, Orser et al. (2006) do not find statistically different turndown rates for loan applications between female and male owners of Canadian SMEs. Comparable results regarding equal approval rates have been found in more studies including Coleman (2002) and Treichel and Scott (2006) for US samples.

Verheul and Thurik (2001) investigate differences in the proportion of bank loans in the total amount of start-up capital between Dutch female and male entrepreneurs. Although these authors find that the total start-up capital of female entrepreneurs is lower than that of male entrepreneurs (see also Coleman and Robb, 2009), the proportion of bank loans in the amount of start-up capital is actually higher among women.

Taken together, mixed evidence has been found regarding the role of gender in the area of access to finance. It is therefore difficult to formulate an expectation regarding the relationship between gender of the owner and loan application success.

1.2. Innovative behavior

In addition to the SME's ownership structure a second factor of interest refers to the *innovative behavior* of SMEs. Because innovations entail risky projects banks may be reluctant to lend money. In addition, SMEs that display innovative behavior have relatively low asset tangibility which increases information asymmetries (Ortiz-Molina and Penas, 2008). Hence, it is expected that innovative SMEs are less likely to receive the requested bank loan than non-innovative SMEs (Hellman and Puri, 2000; Freel, 2007).

The present paper distinguishes between product and process innovations. The riskiness of projects to be undertaken is expected to be lower for process innovations than for product innovations. We therefore expect the negative influence of innovative behavior on loan application success to be smaller in absolute sense for process innovation than for product innovation.

There is limited evidence on the relationship between SMEs' innovative behavior and access to bank loans. Freel (2007) uses a sample of 256 small UK firms that applied for bank loans. For these firms, the success percentage of bank loans application is known, comparable to the information in the present paper. Using several proxies for innovative behavior the author finds that the most innovative firms are less successful in lending than the least innovative firms. There is some evidence, however, that "a little innovation may be a good thing" (Freel, 2007, p. 32).

2. Data

To test the relationships between ownership structure and innovative behavior on the one hand and loan application success on the other hand, information from the "SMEs' Access to Finance (SAFE) survey 2011" is used. In total 15,216 interviews were conducted across 38 countries, including 13,959 interviews in the EU 28 countries and 1,257 interviews in selected non-EU countries. These non-EU countries are Albania, Iceland, Israel, Liechtenstein, Macedonia, Montenegro, Norway, Serbia, Switzerland, and Turkey. In the latter set of countries interviews with companies employing more than 250 employees were not conducted. As a consequence, we will restrict our analyses to micro (1-9 employees), small (10-49 employees), and medium-sized firms (50-249 employees) and exclude firms with more than 250 employees from our analyses. Furthermore, we exclude countries in which fewer than 200 interviews were conducted which results in a final sample of 12,726 SMEs.

The interviews were conducted between August 22, 2011 and October 7, 2011. One individual with responsibilities for the firm's financial decisions was interviewed such as the managing director, CEO or financial director. Dun & Bradstreet provided the sampling list of eligible firms. The survey excludes firms that are active in agriculture, public administration, and financial services. Post-sampling weights are used for our descriptive analysis.

2.1. Dependent and independent variables

First of all, it is known whether SMEs have applied for a bank loan during the past six months before the interview took place. Bank loans refer to new applications or renewals, and exclude overdrafts and credit lines. For SMEs that have applied for a bank loan the application success is known. That is, SMEs indicate whether they have received all the financing they requested (dependent variable *application success* receives value 3), most of the financing (between 75% and 99%; value 2), some of the financing (between 1% and 74%; value 1), none of the financing (0%; value 0), or refused to proceed because of unacceptable costs or terms and conditions (also value 0).

Our two independent variables are measured as follows. In terms of a SME's *ownership structure* the interviewees were asked about the majority holder of the SME. The following five options are distinguished: 1) public shareholders; 2) business associates or other firms; 3) family or entrepreneurs, i.e. multiple ownership; 4) a single owner; 5) another ownership structure. Furthermore, the gender of the owner/director/CEO is known.

Product innovation equals 1 if the SME has introduced a new or significantly improved product or service to the market during the past 12 months prior to the interview, and 0 otherwise. *Process innovation* equals 1 if the SME has introduced a new or significantly improved production process or method, and/or a new way of selling their goods or services during the past 12 months, and 0 otherwise.

An overview of the dependent variable *application success*, the independent variables *ownership structure* and *innovative behavior*, and the control variables is provided in table 1. The set of control variables includes firm age, firm size, past firm growth, firm growth expectations, and sector orientation.

Dummy variables will be included for the countries to control for country-specific influences. The relevant coefficients are not shown in the output tables but are available upon request.

3. Results

3.1. Univariate analysis

It turns out that 2,469 SMEs have applied for a bank loan during the six months prior to the interview. This number corresponds to 20.1% of all SMEs.

A substantial amount of SMEs received all funding they requested, i.e. 65.1%. Furthermore, 8.1% received most financing (75%-99%), 12.3% received some financing (1%-74%), and 14.5% was turned down or refused the bank offer.

An overview of application rates for each country is provided in figure 1. The fraction of SMEs that received *all* requested funding is also shown. Note that the countries are sorted on basis of the percentage of SMEs that applied for a bank loan. It appears from figure 1 that there exists much less heterogeneity across countries for the application rates than for the success rates of these bank loan applications.

Table 2 shows the distributions of the application and acceptance rates for our two independent variables, together with the prevalence rates of the various categories. Regarding ownership structure, the category of public shareholders has considerably lower success rates than the other ownership categories, which is against our expectations. The differences between single ownership (female or male), multiple ownership, and ownership by business groups are marginal. Although the application rates are higher for SMEs that adopt innovations they have lower success rates in applying than SMEs that do not display innovative behavior.

3.2. Multivariate analysis

We run ordered probit regressions to take account of the ordered nature of the dependent variable *application success*. The estimated coefficients and corresponding standard errors are shown in table 3.

Model 1 of table 3 zooms in on the ownership structure of an SME, and includes the ownership categories as displayed in table 1. Male single ownership acts as the reference category. First of all, SMEs that are affiliated with business associates (p -value <0.01) and SMEs owned by families or teams of entrepreneurs (multiple ownership; $p<0.01$) have higher probabilities of receiving the requested bank loan than SMEs owned by men.¹ Second, there is no significant difference between female and male ownership ($p>0.10$).

Model 2 takes female and male ownership together into one category representing single ownership (the reference category). Significantly higher probabilities of receiving a bank loan are found for business associates ($p<0.05$) and multiple ownership ($p<0.01$) vis-à-vis single ownership. Note that model 2 adds the gender of the owner/director/CEO. Interestingly, SMEs with a male owner are less likely to receive the requested bank loan than SMEs with a female owner, although the coefficient is marginally significant ($p<0.10$).

A distinction between ownership by external shareholders and management ownership in model 3 does not lead to significantly different coefficients ($p>0.10$) between both groups. As noted earlier external shareholders are public shareholders and business associates or other firms that own the SME. The SME is run by a member of the founding family, a team of entrepreneurs, or a single owner in case of management ownership.

Model 4 adds the product innovation variable whereas model 5 adds process innovation. It turns out that SMEs involved in product innovation have a lower probability of receiving the bank loan than SMEs that are not involved in product innovation ($p<0.10$). A negative coefficient is also found for process innovation in model 5 ($p<0.001$). The influence of process innovation seems larger in absolute sense than product innovation, which is contrary to our expectations.

The results for the control variables are robust across the model specifications. It turns out that firm age plays a minor role. Rather firm size is an important predictor of loan application success, i.e. larger firms are more likely to receive the requested bank loan than smaller firms. Furthermore, past growth and expected growth are significantly positively

¹ An additional test shows that the coefficients of *business associates/other firms* and *family/entrepreneurs* are not statistically different from each other ($p>0.10$).

related to the dependent variable. Regarding sector orientation SMEs active in trade have significantly higher probabilities of receiving the requested bank loan than SMEs active in services or construction.

4. Extensions of analysis

The following elaborates on several extensions to the previous analysis.

4.1. Size effects

Average marginal effects are calculated to assess the magnitudes of the relationships that are found in table 3.² While marginal effects can be calculated for every category of the dependent variable we focus on SMEs that receive all funding they requested for the sake of brevity. First, we assess the magnitudes of the coefficients of ownership structure in model 2 of table 3. The predicted (baseline) probability of belonging to the highest category – receiving all requested funding – is 66.7% in this model specification. It turns out that belonging to a business group increases this probability by 8.3 percentage points while a multiple ownership structure establishes an increase by 6.5 percentage points (vis-à-vis single ownership). Clearly these differences are substantial. Furthermore, the probability of receiving all requested funding is 5.2 percentage points higher for female owned SMEs than for male owned SMEs. Second, we have a closer look at the coefficients of product innovation in model 4 and process innovation in model 5. In model 4 the predicted probability is 66.9% while product innovation reduces this probability by 3.2 percentage points. In model 5 the predicted probability is 67.0%; the probability of receiving all requested funding is 6.9 percentage points lower for SMEs that adopt process innovations than for SMEs that do not adopt process innovations.

4.2. Selection model

In econometric modeling one must not discard the selection process that lies behind outcomes of interest. Inferences that are based on such conditioned processes lead to incorrect conclusions. In our case, the outcome of interest – loan application success – is a conditioned process and is observed only for SMEs that have applied for a loan. Ideally, one should take account of the selection mechanism by applying a selection model.

As a robustness check we employ an ordered probit model with sample selection consisting of an outcome equation and a selection equation. First, there is the ordinal outcome of interest referring to the dependent variable under investigation, i.e. loan application success. This is the outcome equation. Second, there is a binary variable that indicates whether a firm is selected or not, i.e. whether a firm applied for a bank loan. This is the selection equation. The sample selection problem is taken care of by modeling the outcome equation and the selection equation jointly. For the outcome equation an ordered probit model is used while a binary probit model is applied for the selection equation.³

² Marginal effects contain information about the increase or decrease of the probability of belonging to a certain category of the dependent variable as the result of a one-unit increase of an independent variable while keeping all other variables constant.

³ The command `heckprobit` in Stata 13.1 is used for these calculations.

Parameter identification in selection models is established by means of incorporating exclusion restrictions. That is, the selection equation must contain at least one variable that is not included in the outcome equation. In our application we use variables that indicate whether the SME has used other sources of financing than bank loans in the past six months. We include three sources: internal funds, trade credit, and leasing. It is expected that these variables are related to an SME's behavior in terms of applying for a bank loan but that they are unrelated to the success of these bank loan applications.

The results for the ordered probit regression with sample selection are qualitatively similar to those presented in table 3. The results are not shown here but are available from the author. Interestingly the results do not provide evidence of sample selection bias. The correlation coefficient between (the underlying disturbance terms of) both equations is estimated at between 0.014 and 0.035 for the five model specifications (p -value always >0.10). The three "identification variables" have significant coefficients ($p < 0.01$) in each selection equation.

4.3. Scope of the analysis

This paper focused on one supply-side factor behind bank lending. Such an analysis provides relevant policy insights because the findings reveal the extent to which banks decide to provide less external financing during times of economic recession. Interestingly, firms may also abstain from borrowing money because they are discouraged and fear they will be rejected. Although an explicit focus on this group is not included in the present paper, the pool of discouraged borrowers can be included by means of the selection equation in the selection model in the previous paragraph. Earlier research stressed the relevance of this group of discouraged borrowers and investigated the probability of being discouraged from borrowing money (Han et al., 2009; Canton and Van der Zwan, 2013). The focus on bank loan accessibility has been further expanded by Canton et al. (2013) who zoom in SMEs' perceptions of access to bank loans rather than objective application rates. The advantage of such an analysis is that indeed discouraged borrowers are taken into account when assessing the determinants of bank loan accessibility.

Canton and Van der Zwan (2013) broaden the present analysis in a number of interesting ways. First of all, the number of supply-side and demand-side factors behind bank lending is extended. In this way, a more complete picture along a variety of dimensions in terms of supply-side and demand-side factors is acquired. A second extension refers to a more detailed analysis of country differences. The present report takes account of firm-level characteristics and merely includes country dummies, whereas Canton and Van der Zwan (2013) explain the cross-country variation along several dimensions of bank lending. A distinction is made between three indicators of the structure of the banking sector and four indicators of the financial health of the banking sector. A third extension refers to a more recent time frame. Whereas the main analysis in the present paper uses data from 2011, Canton and Van der Zwan (2013) compare more recent information about access to bank loans (October 2012-March 2013). This information is, however, known for a selection of countries only.

5. Concluding remarks

The present paper investigated the determinants of SMEs' access to bank loans in a set of European countries using information from the SMEs' Access to Finance (SAFE) survey 2011. Specific attention was devoted to two firm-specific independent variables: ownership structure and innovative behavior. The ordered probit regressions showed that both variables play important roles regarding an SME's access to bank loans. First, SMEs that are affiliated with a business group and SMEs with a multiple ownership structure have higher probabilities of receiving the requested bank loan than SMEs with single ownership. Second, SMEs that adopt product or process innovations are less likely to receive the requested bank loan than SMEs without such innovative behavior.

It must be noted that the current analysis is based on data from 2011. Lending conditions may therefore differ from the conditions in periods where economic prosperity prevails. Although it may be cumbersome to compare the present results with earlier studies in different time periods some interesting remarks can be made. For example, there is a clear and consistent advantage for multiple ownership relative to single ownership in terms of receiving the requested bank loan. Higher probabilities of (re)payment to banks in case of multiple ownership, in combination with fewer information asymmetries, may play a role here. Unfortunately, it has not been possible – due to data limitations – to investigate the relationship between multiple ownership and application success further. An interesting research avenue in this area would be to distinguish between family ownership and team ownership. Furthermore, the current analysis revealed some evidence of higher probabilities of receiving the bank loan for (the small amount of) female owned SMEs than for male owned SMEs, after controlling for a set of relevant firm-specific factors. The mixed evidence found in previous studies together with the lack of strong statistical evidence in the current study justifies a more detailed investigation of this gender effect and for which SMEs it exists. This was, however, beyond the scope of the present research.

The relationship between loan accessibility and innovative behavior has been rarely tested in previous work. The results in the present paper therefore provide interesting information in that innovation plays against SMEs when attempting to acquire bank loans even though innovative SMEs apply for bank loans more frequently than non-innovative SMEs. This result corroborates the findings from Freel (2007). The exact mechanism behind the underlying dynamics is not investigated here but one can expect that the riskiness of the projects undertaken and the higher information asymmetries between banks and innovative firms play a role here. Innovative SMEs may need to compensate in other areas to diminish the information asymmetries and to convince banks of the feasibility and profitability of their (innovative) projects.

Table 1. Names and definitions dependent, independent, and control variables

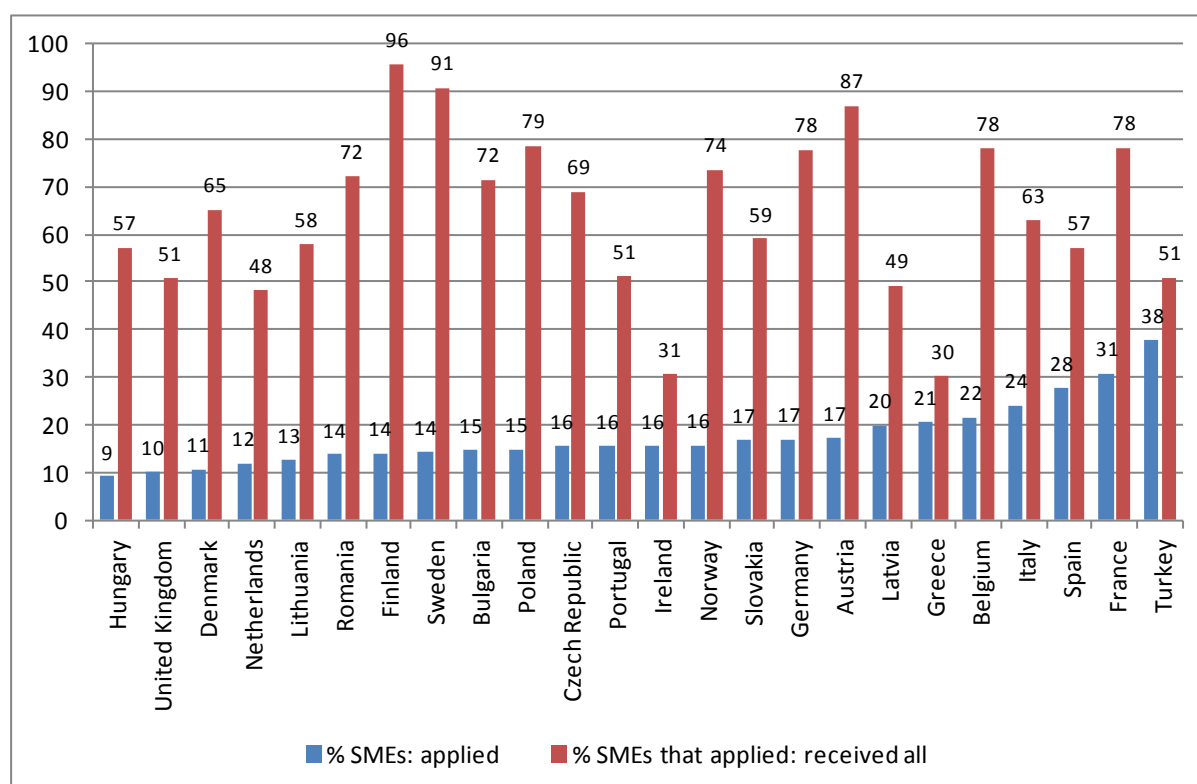
Variable name	Categories
<u>Dependent variable</u>	
Application success	Received all financing (100%, value 3) Received most financing (75%-99%, value 2) Received some financing (1%-74%, value 1) No financing received/refused (0%, value 0)
<u>Independent variables</u>	
Ownership structure ^a	Public shareholders Business associates/ other firms Family/entrepreneurs Single owner: male Single owner: female Other
Product innovation	1 if introduction of new/significantly improved product/service during the past 12 months, 0 otherwise
Process innovation	1 if introduction of new/significantly improved production process or method, and/or new way of selling goods/services during the past 12 months, 0 otherwise
<u>Control variables</u>	
Firm age	Less than 2 years (reference) 2-5 years 5-10 years More than 10 years
Firm size	1-9 employees (reference) 10-49 employees 50-249 employees
Growth past 3 years ^b	Decrease of turnover Turnover remained unchanged (reference) Increase of turnover
Expected growth next 3 years	Decrease of turnover Turnover will remain unchanged (reference) Increase of turnover
Sector	Industry Construction Trade Services (reference)

^a The gender of the owner/director/CEO is known for the entire sample of SMEs. Furthermore, the reference category of the ownership structure variable depends on the model specification.

^b For firms that are in existence for less than 3 years, the dynamics in turnover over the past 6 months have been taken instead.

Source: SMEs' Access to Finance (SAFE) Survey 2011

Figure 1. Application and success rates (received 100%) for each country



Source: SMEs' Access to Finance (SAFE) Survey 2011

Table 2. Application and success rates (received 100%) for ownership structure and innovative behavior

	% SMEs: applied	% SMEs that applied: received all	Prevalence rate (%)
<u>Ownership structure</u>			
Public shareholders	15	55	3
Other firms/business associates	22	67	12
Family/entrepreneurs	21	64	57
Single owner: male	19	67	20
Single owner: female	16	66	4
Other	15	78	4
<u>Innovative behavior</u>			
Product innovation	23	62	33
No product innovation	19	67	67
Process innovation	24	60	38
No process innovation	18	69	62

Source: SMEs' Access to Finance (SAFE) Survey 2011

Table 3. Ordered probit estimation results with *application success* as the dependent variable

	Model 1		Model 2		Model 3		Model 4		Model 5	
<u>Ownership structure</u>										
Public shareholders	0.04	(0.14)	0.06	(0.14)						
Bus. associates/other firms	0.28**	(0.11)	0.25*	(0.11)						
Family/entrepreneurs	0.22**	(0.08)	0.20**	(0.07)						
Single owner: male		(ref.)		(n.i.)						
Single owner: female	0.21	(0.18)		(n.i.)						
Other	0.25	(0.18)	0.15	(0.18)						
Single ownership		(n.i.)		(ref.)						
Female versus male CEO			0.16 [†]	(0.09)	0.17 [†]	(0.09)				
Management ownership					-0.05	(0.08)				
External ownership						(ref.)				
Other					-0.04	(0.18)				
<u>Innovative behavior</u>										
Product innovation							-0.10 [†]	(0.06)		
Process innovation									-0.21***	(0.06)
<u>Control variables</u>										
Firm age: <2 years		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)
Firm age: 2-5 years	-0.57*	(0.25)	-0.54*	(0.25)	-0.52*	(0.25)	-0.55*	(0.25)	-0.55*	(0.25)
Firm age: 5-10 years	-0.10	(0.24)	-0.08	(0.25)	-0.07	(0.25)	-0.11	(0.24)	-0.09	(0.24)
Firm age: >10 years	0.05	(0.23)	0.07	(0.24)	0.08	(0.24)	0.03	(0.23)	0.04	(0.23)
Firm size: 1-9 empl.		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)
Firm size: 10-49 empl.	0.18*	(0.07)	0.16*	(0.07)	0.18*	(0.07)	0.19**	(0.07)	0.18*	(0.07)
Firm size: 50-249 empl.	0.31***	(0.08)	0.30***	(0.08)	0.34***	(0.08)	0.34***	(0.08)	0.34***	(0.08)
Past growth: decrease	-0.07	(0.09)	-0.06	(0.09)	-0.06	(0.09)	-0.08	(0.08)	-0.09	(0.09)
Past growth: unchanged		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)
Past growth: increase	0.17*	(0.08)	0.17*	(0.08)	0.17*	(0.08)	0.17*	(0.08)	0.16*	(0.08)
Exp. growth: decrease	-0.04	(0.10)	-0.07	(0.10)	-0.07	(0.10)	-0.05	(0.10)	-0.05	(0.10)
Exp. growth: unchanged		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)
Exp. growth: increase	0.12 [†]	(0.07)	0.12 [†]	(0.07)	0.12 [†]	(0.07)	0.14*	(0.07)	0.16*	(0.07)
Sector: Industry	0.09	(0.08)	0.10	(0.08)	0.11	(0.08)	0.11	(0.08)	0.11	(0.08)
Sector: Construction	-0.07	(0.10)	-0.08	(0.10)	-0.07	(0.10)	-0.09	(0.10)	-0.08	(0.10)
Sector: Trade	0.17*	(0.08)	0.18*	(0.08)	0.19*	(0.08)	0.19*	(0.08)	0.19*	(0.08)
Sector: Services		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)
Country dummies		YES		YES		YES		YES		YES
Observations		2,168		2,110		2,110		2,163		2,171
R ²		0.07		0.08		0.07		0.07		0.07

Coefficient estimates are shown, together with standard errors between parentheses. Estimates of the threshold parameters are not shown.

[†] denotes significance at 10%; * at 5%; ** at 1%; *** at 0.1%

n.i.=category not included; ref.=reference/base category

References

- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89(3), 467-487.
- Beck, T., Demirgüç-Kunt, A., Laeven, L., & Maksimovic, V. (2006). The determinants of financing obstacles. *Journal of International Money and Finance*, 25(6), 932-952.
- Blumberg, B.F., & Letterie, W.A. (2008). Business starters and credit rationing. *Small Business Economics*, 30(2), 187-200.
- Brush, C.G. (1992). Research on women business owners: Past trends, future directions, and a new perspective. *Entrepreneurship Theory and Practice*, 16(4), 5-30.
- Canton, E., & Van der Zwan, P. (2013). Financing the real economy: Perceived access to bank loans for EU firms in times of crisis. In: European Commission, Product Market Review 2013 – Financing the real economy, European Economy Series (pp. 94-116, Chapter 4). See: http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee8_en.pdf (accessed: December, 2013).
- Canton, E., Grilo, I., Monteagudo, J., & Van der Zwan, P. (2013). Perceived credit constraints in the European Union. *Small Business Economics*, 41(3), 701-715.
- Coleman, S. (2002). Characteristics and borrowing behavior of small, women-owned firms: Evidence from the 1998 Survey of Small Business Finances. *Journal of Business and Entrepreneurship*, 14(2), 151-166.
- Coleman, S., & Robb, A. (2009). A comparison of new firm financing by gender: Evidence from the Kauffman Firm Survey data. *Small Business Economics*, 33(4), 397-411.
- Fairlie, R.W., & Robb, A.M. (2009). Gender differences in business performance: Evidence from the Characteristics of Business Owners survey. *Small Business Economics*, 33(4), 375-395.
- Freel, M.S. (2007). Are small innovators credit rationed? *Small Business Economics*, 28(1), 23-35.
- Gertler, M. (1988). Financial structure and aggregate economic activity: An overview. *Journal of Money, Credit, and Banking*, 20(3), 559-596.
- Han, L., Fraser, S., & Storey, D.J. (2009). Are good or bad borrowers discouraged from applying for loans? Evidence from US small business credit markets. *Journal of Banking & Finance*, 33(2), 415-424.
- Hellman, T., & Puri, M. (2000). The interaction between product market and financing strategy: The role of venture capital. *Review of Financial Studies*, 13(4), 959-984.
- Hoshi, T., Kashyap, A., & Scharfstein, D. (1991). Corporate structure, liquidity, and investment: Evidence from Japanese industrial groups. *The Quarterly Journal of Economics*, 106(1), 33-60.
- Kim, G.O. (2006). Do equally owned small businesses have equal access to credit? *Small Business Economics*, 27(4-5), 369-386.
- Levenson, A.R., & Willard, K.K. (2000). Do firms get the financing they want? Measuring credit rationing experienced by small businesses in the U.S. *Small Business Economics*, 14(2), 83-94.
- Mukhtar, S.M. (2002). Differences in male and female management characteristics: A study of owner-manager businesses. *Small Business Economics*, 18(4), 289-310.
- Oliner, S.D., & Rudebusch, G.D. (1992). Sources of the financing hierarchy for business investment. *The Review of Economics and Statistics*, 74(4), 643-654.
- Orser, B.J., Riding, A.L., & Manley, K. (2006). Women entrepreneurs and financial capital. *Entrepreneurship Theory and Practice*, 30(5), 643-665.
- Ortiz-Molina, H., & Penas, M.F. (2008). Lending to small businesses: The role of loan maturity in addressing information problems. *Small Business Economics*, 30(4), 361-383.
- Parker, S.C., & Van Praag, C.M. (2006). Schooling, capital constraints, and entrepreneurial performance: The endogenous triangle. *Journal of Business & Economic Statistics*, 24(4), 416-431.
- Schiantarelli, F., & Sembenelli, A. (2000). Form of ownership and financial constraints: Panel data evidence from flow of funds and investment equations. *Empirica*, 27(2), 175-192.
- Storey, D.J. (2004). Racial and gender discrimination in the micro firms credit market? Evidence from Trinidad and Tobago. *Small Business Economics*, 23(5), 401-422.

- Treichel, M.Z., & Scott, J.A. (2006). Women-owned businesses and access to bank credit: Evidence from three surveys since 1987. *Venture Capital*, 8(1), 51-67.
- Verheul, I., & Thurik, R. (2001). Start-up capital: Does gender matter? *Small Business Economics*, 16(4), 329-346.

The results of Panteia/EIM's Research Programme on SMEs and Entrepreneurship are published in the following series: Research Reports and Publieksrapportages. The most recent publications of both series may be downloaded at: www.entrepreneurship-sme.eu.

Recent Research Reports and Scales Papers

H201402	03-04-2014	Scale effects in workplace innovations
H201401	20-03-2014	Verklaringen van de overlevingskans van bedrijven, gestart door allochtone ondernemers
H201314	27-11-2013	Global Entrepreneurship Monitor The Netherlands 2012
H201313	25-10-2013	Emerging industries! Challenges in alternative dance, tracking devices and fast casual dining
H201312	25-10-2013	FAMOS 2013 a Size-Class based Financial Analysis Model
H201311	7-08-2013	A Cumulative Production Structure Matrix for Dutch SMEs
H201310	4-07-2013	Belemmeringen, informele samenwerking en MKB-bedrijfs groei
H201309	4-06-2013	Start-up motivation and (in) voluntary exit
H201308	30-05-2013	Explaining entrepreneurial performance of solo self-employed from a motivational perspective
H201307	23-04-2013	Entrepreneurial activity, industry orientation, and economic growth
H201306	18-04-2013	Self-employment and Job Generation in Metropolitan Areas, 1969-2009
H201305	7-03-2013	The impact of the economic crisis on European SMEs
H201304	4-03-2013	Learning from Entrepreneurial Projects: A Typology
H201303	3-04-2013	Wat drijft ondernemers om maatschappelijke vraagstukken op te pakken? (Nederlandse samenvatting)
H201302	21-03-2013	Unraveling the relationship between the business cycle and the own-account worker's decision to hire employees
H201301	01-02-2013	Entrepreneurship education and self-employment: the role of perceived barriers
H201219	14-01-2013	Firm resources, dynamic capabilities, and the early growth of firms
H201217	17-12-2012	The Environmental Regulation Paradox for Clean Tech Ventures
H201216	17-12-2012	How does employment protection legislation influence hiring and firing decisions by the smallest firms?
H201215	22-11-2012	The Production Structure of Small, Medium-sized and Large enterprises in Dutch Private Enterprise - Analysis by economic sector
H201214	22-11-2012	The Production Structure of Small, Medium-sized and Large enterprises in Dutch Private Enterprise - Analysis at the aggregate level

H201213	11-02-2013	Institutions and the allocation of entrepreneurship across new and established organizations
H201212	11-10-2012	Solo self-employed versus employer entrepreneurs: prevalence, determinants and macro-economic impact
H201211	11-10-2012	Disentangling the effects of organizational capabilities, innovation and firm size on SME sales growth
H201210	1-10-2012	Do firm size and firm age affect employee remuneration in Dutch SMEs?
H201209	1-10-2012	The risk of growing fast: Does fast growth have a negative impact on the survival rates of firms?
H201208	13-09-2012	Investigating the impact of the technological environment on survival chances of employer entrepreneurs
H201207	10-06-2013	Start-Up Size Strategy and Risk Management: Impact on New Venture Performance
H201206	21-06-2012	Ageing and entrepreneurship
H201205	21-06-2012	Innoveren in het consumentgerichte bedrijfsleven
H201204	16-02-2012	Time series for main variables on the performance of Dutch SMEs
H201203	09-04-2013	Do small business create more jobs? New evidence for Europe
H201202	19-01-2012	Trends in entrepreneurial Activity in Central and East European Transition Economies
H201201	9-01-2012	Globalization, entrepreneurship and the region
H201119	2-01-2012	The risk of growing fast
H201118	22-12-2011	Beyond Size: Predicting engagement in environmental management practices of Dutch SMEs
H201117	22-12-2011	A Policy Theory Evaluation of the Dutch SME and Entrepreneurship Policy Program between 1982 and 2003
H201116	20-12-2011	Entrepreneurial exits, ability and engagement across countries in different stages of development
H201115	20-12-2011	Innovation barriers for small biotech, ICT and clean tech firms: Coping with knowledge leakage and legitimacy deficits
H201114	20-12-2011	A conceptual overview of what we know about social entrepreneurship
H201113	20-12-2011	Unraveling the Shift to the Entrepreneurial Economy
H201112	24-11-2011	Bedrijfscriminaliteit
H201111	25-08-2011	The networks of the solo self-employed and their success
H201110	23-06-2011	Social and commercial entrepreneurship: Exploring individual and organizational characteristics
H201109	27-07-2012	Unraveling the relationship between firm size and economic development: The roles of embodied and disembodied technological progress
H201108	22-03-2011	Corporate Entrepreneurship at the Individual Level: Measurement and Determinants
H201107	30-01-2011	Determinants of high-growth firms