Determinants of the Perceived Difficulty in Paying off Bank Loans: Evidence from Turkish SMEs

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Abstract
Financing constraints are thought to be one of the most important aspects that hinder the development of SMEs in almost all economies in the world. To add to the growing literature on the financing constraints encountered by SMEs, this paper embarks to study the firm level determinants of the perceived difficulty of SMEs in paying off loans. The cross-sectional data set comes from a survey conducted with the financial affairs executives of 573 Turkish SMEs. We find that larger firms and high growth firms face difficulty in discharging their debt obligations less frequently. Firms that make a profit and firms that break even encounter difficulty in paying off bank loans less frequently than firms that make a loss. The results imply the importance of availability and stability of cash flows on the capability of firms to discharge their debt obligations.

1. Introduction

SMEs are critical for all economies in the world because of their contribution to economic growth, entrepreneurial activity, job creation and innovation. Access to bank financing is essential for SMEs to develop and thrive. Nonetheless, barriers to bank financing are ranked as one of most important constraints confronted by SMEs (Hughes, 2009; Mason and Kwok, 2010; Shen et al., 2009). The literature contends that SMEs encounter greater barriers in accessing bank financing than large firms (Beck et al., 2006; Beck et al., 2008; Pissarides, 1999).

The challenges faced in accessing bank financing are more intense for emerging market SMEs (Hanedar et al., 2014; Menkhoff et al., 2012; Menkhoff et al., 2006). The additional challenges are brought about by the preference of firms to operate outside the formal system (OECD, 2006).

Banks are reluctant to lend to SMEs because of the information asymmetry that emanates from the lack of adequate accounting records and financial statements (UNCTAD, 2001). The high risks involved as a result of high failure rates, inadequate collateral, low capitalization and susceptibility to market fluctuations are other reasons for the reluctance. The inability of banks to assess whether the SMEs can generate sufficient cash flows to pay off the loans exacerbates the reluctance (Badulescu, 2010).

In the literature, there are a number of studies that analyze the determinants of loan default of SMEs with the aim to identify warning signals for default risk (e.g. Altman and Sabato, 2007; Fidrmuc and Hainz, 2010; MCCann and McIndoe-Calder, 2012). These studies use financial statement information for prediction. To add to the literature on SME financing, this paper analyzes the firm level determinants of perceived difficulty SMEs face in paying off bank loans. The analysis uses the cross-sectional data set of 573 Turkish SMEs for the year 2015. We find that size and firm growth rate have a negative relationship with the perceived frequency of encountering difficulty in paying off bank loans. Firms that make a profit and firms that break even encounter difficulty in servicing debt obligations less frequently than firms that make a loss.

The remainder of the study is organized as follows: Section 2 presents the research methodology. Section 3 describes the sample and gives the summary statistics. Section 4 presents the empirical results and section 5 concludes.

2. Research Methodology

The perception of the frequency of encountering difficulty in paying off loans can be described with the following multiple regression model:

$$\text{Difficulty}_i = \beta_0 + \beta_1 \text{Age}_i + \beta_2 \text{Size}_i + \beta_3 \text{Debt}_i + \beta_4 \text{Growth}_i + \beta_5 \text{Innovative}_i + \beta_6 \text{Manager}_i \qquad (1)$$
$$+ \beta_7 \text{Profitability}_i + \beta_8 \text{Sector}_i + \varepsilon_i$$

Difficulty represents the dependent variable. The opinions of the respondents on the following statement is used to form the dependent variable: "Our firm encounters difficulty in discharging its bank loans." The responses vary between 1 (never), 2 (rarely), 3 (sometimes), 4 (very often) and 5 (always).

Among our independent variables, *Size* stands for firm size which is proxied by the natural logarithm of the number of full time employees. *Age* represents natural logarithm of firm age. We expect to find that larger and older firms encounter difficulty in discharging their bank loans less frequently because larger and older firms have more stable cash flows (Amendola et al., 2015; Bhattacharjee et al., 2009; Esteve-Perez et al., 2010). *Debt* stands for the share of bank loans in total funding of the firm. The variable is measured with the responses to the following question: "What is the share of bank debt in total financing of the firm in terms of percentage?". The level of indebtedness is expected to affect the level of difficulty that firms encounter in paying off their debt (Altman, 1993; Taffler, 1982). Being highly leveraged increases the risk of default.

Growth represents firm growth. Firm growth may influence the perceived difficulty experienced in paying off bank loans because of its effect on cash flows (Canton et al., 2013). High growth firms are expected to have better perceptions about the difficulty faced in paying off bank loans because they do not feel financially constrained as a result of their increasing cash flows. Firm growth is measured with the percentage change in sales revenue in the last year.

Innovative stands for the dummy variable that takes value 1 when the SME implemented a new or significantly improved product, service or process last year and 0 otherwise. Innovativeness can affect the level of perception of the difficulty faced in paying off loans because innovative firms generally have unsteady cash flows (Brown et al., 2012; Moore and Garnsey, 1993).

Manager represents the natural logarithm of the number of years of experience of the general manager in the sector. We expect that sector experience of the general manager has a negative effect on the frequency of facing difficulty in debt repayment. *Profitability* stands for the dummy variables that give whether the firm made a profit, broke even or suffered a loss last year. *Sector* represents the sector dummies. We include the sector dummies in the model to control for sector specific effects.

We do not encounter the problem of multicollinearity in our model because the independent variables have a VIF value that is below the cutoff value of 4. Variable description is given in Table 1.

3. Data

The cross-sectional data set comes from a survey we carried out in 2015. We draw the sample of SMEs from six cities of Turkey with the highest number of SMEs. Each city's percentage share in the sample is equal to the proportion of the number of SMEs that operate in those cities to the total number of SMEs that operate in six cities. Our sample is composed of 573 SMEs that employ from 1 to 249 people. Executives of SMEs that are in charge of the financial affairs filled the questionnaires. 502 of the firms in the sample are small enterprises with 10-50 employees. Remaining 71 firms are medium-sized enterprises with 50-249 employees.

Table 2 shows the summary statistics of the variables used in multiple regression analysis. We see that difficulty variable has a mean of 2.607. This shows that firms on average indicate that they occasionally encounter difficulty in discharging their bank loans. The SMEs in our sample have 24 employees on average. Their mean age is 38.12. Although the small size of the SMEs may exacerbate the difficulties faced in the loan payment period, the effect of smallness can be mitigated with experience.

Table 1: Variable Descriptions

Dependent Variable	
Difficulty	On scale from 1 (never) to 5 (always), the respondent gives opinion on the following statement: "Our firm encounters difficulty in discharging its bank loans".
Independent Variables	
Size	Ln (Number of full time employees)
Age	Ln (Firm age)
Debt	Percentage share of bank loans in total funding of the firm
Growth	Percentage change in sales revenue in the previous year
Innovative	Dummy=1 if the SME implemented a new or significantly improved product, service or process last year, 0 otherwise.
Manager	Ln (number of years of experience of the general manager in the sector)
Financial Performance	Dummy=1 if the firm is in one of the following three groups last year: Firms that made a profit, firms that broke even, firms that made a loss
Industry	Dummy=1 if the firm belongs to one of following sectors: Manufacturing, Service, Wholesale and Retail Trade, Construction, Other

Source: author's compilation

Table 2: Summary Statistics

	Mean	Standard Deviation	Median	25th percentile	75th percentile	Percentage Frequency of 1 (as a dummy variable)	Number of Observations
Dependent Variable							
Difficulty	2.607	1.293	3.000	1.000	4.000		573
Independent Variables							
Size	2.813	0.707	2.485	2.303	2.996		573
Age	3.586	0.384	3.611	3.434	3.807		573
Debt	0.160	0.841	0.000	0.000	0.200		573
Growth	0.057	0.159	0.080	0.000	0.100		573
Innovative						51%	292
Manager	2.342	0.855	2.303	2.079	2.996		573
Profit						40%	229
Break Even						47%	269
Loss						13%	75

Note: Descriptive statistics of Size, Age and Manager variables are calculated from the natural logarithm values.

Source: author's calculations

Bank debt has a 16% share in the total funding of the sample firms on average. The mean of the sales revenue growth of the firms in the sample is 5.7%. 51% of firms in the sample implemented a new or significantly improved product, service or process last year. The general managers have 14.43 years

of sector experience on average. 40% of the firms in the sample made a profit last year. 46% of them could break even and 13% of them made a loss.

The correlation matrix for the numerical independent variables is given in Table 3.

Table 3: Correlation Matrix

	Size	Age	Debt	Growth	Manager
Size					
Age	-0.03				
Debt	-0.03	0.01			
Growth	0.09	-0.03	0.05		
Manager	0.06	0.19	-0.10	0.02	

Source: author's calculations

The low bivariate correlations indicate that we do not encounter the problem of multicollinearity in our regression model. The VIF values of the independent variables which are below the cutoff value of 4 also show that we should not be concerned about multicollinearity.

4. Empirical Findings

Table 4 presents the estimation results of the multiple regression model. We see that Age, Debt, Innovation and Manager variables do not have a statistically significant relationship with the perceived frequency of facing difficulty in paying off bank loans. Size has a statistically significant negative relationship with the dependent variable at the 0.01 level. The coefficient indicates that larger firms are less inclined to encounter difficulty in discharging their bank loans. The estimated coefficient for the Growth variable is statistically significant at 0.05 level. The negative coefficient indicates that high growth firms have better perceptions about the frequency of encountering difficulty in paying off bank loans.

Table 4: Regression Estimation Results

Dependent Variable: Difficulty	
Independent Variables	
Size	-0.151*
	(-1.788)
Age	-0.159
	(-1.039)
Debt	0.035
	(0.273)
Growth	-1.154**
	(-2.553)
Innovative (Dummy)	-0.091
	(-0.757)
Manager	-0.004
	(-0.660)
Profit (Dummy)	-0.484**
	(-2.422)
Breakeven (Dummy)	-0.415**
	(-2.291)
R^2	0.04
F-Statistic	3.36
Prob (F-Statistic)	0.001

Note: The null hypothesis that each coefficient is equal to zero is tested. P-values in brackets.
*** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.
Source: author's calculations

Profit and Breakeven dummy variables also have statistically significant negative coefficients at 0.05 level. The coefficients show that firms that made a profit and firms that broke even last year are more positive about the frequency of facing difficulty in loan payments than firms that made a loss. Because Profit dummy variable has a lower coefficient than the Breakeven dummy variable, we can say that the negative effect of being a profitable firm on the frequency of encountering difficulty in paying off bank loans is higher than that of being a firm that breaks even.

The negative effect of Size, Growth and Profit variables on the perceived frequency of encountering difficulty in bank loan payments signals the importance of availability and stability of cash flows on the ability of firms to pay off their debt.

To check robustness, we rerun the regression model on the sample of firms that made a loan application last year. Because firms that have made a recent loan application can have a different evaluation about the difficulty faced in loan payments, looking at whether the relationship effects are similar for these firms can be viewed as a robustness check. The results of the model run for this group is presented in Table 5. We see that the findings are similar for our main model and the model run on the sample of firms that made a loan application last year. The statistically significant coefficients of Size and Growth variables at the 0.05 level shows that larger firms and firms that have a high growth rate face with difficulty in paying off bank loans less frequently. We again find that the coefficients of Profit and Breakeven dummy variables are statistically significant at 0.05 level. The negative coefficients show that firms that make a profit and firms that break even encounter difficulty in loan payments less frequently than firms that make a loss.

Table 5: Regression Estimation Results for the Sample of Firms that Made a Recent Loan Application

Dependent Variable: Difficulty	
Independent Variables	
Size	-0.237**
	(-2.128)
Age	0.041
	(0.226)
Debt	-0.036
	(-0.507)
Growth	-1.085**
	(-2.108)
Innovative (Dummy)	0.087
	(0.589)
Manager	-0,035
	(-0.025)
Profit (Dummy)	-0.491**
	(-2.045)
Breakeven (Dummy)	-0.39*
	(-1.748)
R^2	0.05
F-Statistic	3.37
Prob (F-Statistic)	0.000

The null hypothesis that each coefficient is equal to zero is tested. P-values in brackets. *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.
Source: author's calculations

5. Conclusions

This paper examines the firm level determinants of the perceived difficulty in paying off loans for SMEs. Data is obtained from a survey conducted with the financial affairs executives of 573 Turkish SMEs. The estimation results show that age, percentage share of bank loans in total funding of the firm, innovativeness and number of years of experience of the general manager in the sector do not have an effect on the perceived frequency of facing difficulty in paying off bank loans.

Larger firms and high growth firms encounter difficulty in loan payments less frequently. Firms that made a profit and firms that broke even face difficulty in discharging debt obligations less frequently than firms that made a loss. Firms that made a profit are in a better position than firms that broke even in terms of the perceptions about the frequency of encountering difficulty in paying off bank loans. All these results suggest the importance of availability and stability of cash flows on the ability of the firms to discharge their debt obligations.

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References

ALTMAN, E. I. (1993). *Corporate Financial Distress and Bankruptcy: A Complete Guide to Predicting and Avoiding Distress and Profiting from Bankruptcy*. John-Wiley: New York

ALTMAN, E.I., SABATO, G. (2007). Modelling Credit Risk for SMEs: Evidence from the U.S. Market. *Abacus*, vol. 43, no. 3, pp. 332–357.

AMENDOLA, A., RESTAINO, M., SENSINI, L. (2015). An Analysis of the Determinants of Financial Distress in Italy: A Competing Risks Approach. *International Review of Economics and Finance*, vol. 37, pp. 33–41.

BADULESCU, D. (2010). SMEs Financing: The Extent of Need and the Responses of Different Credit Structures. *Theoretical and Applied Economics*, vol, 17, no. 7, pp. 25–36.

BHATTACHARJEE, A., HIGSON, C., HOLLY, S., KATTUMAN, P. (2009). Macroeconomic Instability and Business Exit: Determinants of Failures and Acquisitions of UK Firms. *Economica*, vol. 76, no. 301, pp. 108–131.

BECK, T., DEMIRGUC-KUNT, A., LAEVEN, L., MAKSIMOVIC, V. (2006). The Determinants of Financing Obstacles. *Journal of International Money and Finance*, vol. 25, no. 6, pp. 932–952

BECK, T., DEMIRGUC-KUNT, A., MAKSIMOVIC, V. (2008). Financing Patterns around the World: Are Small Firms Different? *Journal of Financial Economics*, vol. 89, no. 3, pp. 467–487.

BROWN, J.R., MARTINSSON, G., PETERSEN, B.C. (2012). Do Financing Constraints Matter for R&D?, *European Economic Review*, vol. 56, no. 8, pp. 1512–1529.

CANTON, E., GRILO, I., MONTEAGUDO, J., VAN DER ZWAN, P. (2013). Perceived Credit Constraints in the European Union. *Small Business Economics*, vol. 41, no. 3, pp. 701–715.

ESTEVE-PEREZ, S., SANCHIS-LLOPIS, A., SANCHIS-LLOPIS, J.A. (2010). A Competing Risks Analysis of Firms' Exit. *Empirical Economics*, vol. 38, no. 2, pp. 281–304.

FIDRMUC, J., HAINZ, C. (2010). Default Rates in the Loan Market for SMEs: Evidence from Slovakia. *Economic Systems*, vol. 34, no. 2, pp. 133–147.

HANEDAR, E.Y., BROCCARDO, E., BAZZANA, F. (2014). Collateral Requirements of SMEs: The Evidence from Less-Developed Countries. *Journal of Banking and Finance*, vol. 38, pp. 106–121.

HUGHES, A. (2009). Hunting the Snark: Some Reflections on the U.K. Experience of Support for the Small Business Sector. *Innovation: Management, Policy and Practice*, vol. 11, no. 1, pp. 114–126.

MASON, C., KWOK, J. (2010). Investment Readiness Programmes and Access to Finance: A Critical Review of Design Issues. *Local Economy*, vol. 25, no. 4, pp. 269–292.

MCCANN, F., MCINDOE-CALDER, T. (2012). *Determinants of SME Loan Default: The Importance of Borrower-Level Heterogeneity*. Research Technical Paper. No: 06/RT/12. Dublin: Central Bank of Ireland.

MENKHOFF, L., NEUBERGER, D., RUNGRUXSIRIVORN, O. (2012). Collateral and Substitutes in Emerging Markets' Lending. *Journal of Banking and Finance*, vol. 36, no. 3, pp. 817–834.

MENKHOFF, L., NEUBERGER, D., SUWANAPORN, C. (2006). Collateral-Based Lending in Emerging Markets: Evidence from Thailand. *Journal of Banking and Finance*, vol. 30, no. 1, pp. 1–21.

MOORE, I., GARNSEY, E. (1993). Funding for Innovation in Small Firms: The Role of Government. *Research Policy*, vol. 22, no. 5-6, pp. 507–519.

OECD (2006). The SME Financing Gap: Theory and Evidence. *Financial Market Trends*, vol. 2006, no. 2, pp. 87–97.

PISSARIDES, F. (1999). Is Lack of Funds the Main Obstacle to Growth? EBRD's Experience with Small- and Medium-Sized Businesses in Central and Eastern Europe. *Journal of Business Venturing*, vol. 14, no. 5-6, pp. 519–539.

SHEN, Y., SHEN, M., XU, Z., BAI, Y. (2009). Bank Size and Small-and Medium-Sized Enterprise (SME) Lending: Evidence from China. *World Development*, vol. 37, no. 4, pp. 800–811.

TAFFLER, R.J. (1982). Forecasting Company Failure in the UK Using Discriminant Analysis and Financial Ratio Data. *Journal of the Royal Statistical Society*, vol. 145, no. 3, pp. 342–358.

UNCTAD (2001). *Improving the Competitiveness of SMEs in Developing Countries. The Role of Finance to Enhance Enterprise Development*. Geneva: UNCTAD.