Small and Medium-sized Enterprises' Credit Rationing on the Tunisian Bank Credit Market

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Abstract: We use a disequilibrium model to estimate credit rationing to Small and Medium-sized Enterprises on the Tunisian bank credit market. Based on a panel dataset of 1,275 SMEs over the period 2001-2006, results show that the demand for bank credit is not determined by "endogenous" factors, i.e. the activity level and internal available resources of SMEs, but rather by "exogenous" factors, i.e. the cost of financing and guarantees required by banks. The latter, especially real guarantees, explain to a large extent the lack of bank lending and results in an average share of 80% — partially or totally — credit rationed SMEs.

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1. Introduction

SMEs are the backbone of the Tunisian fabric of enterprises (INS 2013); they are expected to take over the role of State in order to cope with the challenges of integration into the global economy (Adair and Fhima 2009). Nevertheless, SMEs have difficulty accessing bank credit and are more affected by information asymmetries (Baas and Schrooten 2006). They are assumed to be less reliable, less predictable, and usually more risky than large firms (Gertler and Gilchrist 1994). SMEs do not usually access financial markets and cannot issue debt securities — unless they belong to a group —; they mostly depend on financial intermediaries in as much as bank loans are their main source of external financing (Berger and Udell 2006). Credit rationing means that demand for credit exceeds supply as regards market equilibrium: it involves both credit volume and rationing of the borrower. Credit volume rationing takes place if lenders supply a smaller credit amount than some borrowers demand, although the latter would be willing to pay a higher interest rate for a larger loan amount. The rationing of borrower occurs if some credit applicants are rejected, whereas other applicants with identical risk-return project characteristics are accepted. This market failure occurs when banks, due to imperfect information on the credit market, are unable to identify ex-ante their customers' profile, and cannot fix correctly the interest rate with regard to risk (Stiglitz and Weiss 1981).

In this study we focus on Tunisian credit market to analyze the magnitude of the constraint upon Small and Medium-sized Enterprises (SMEs) to access bank lending and their exposure to credit rationing; such studies are very scarce in Tunisia.

The estimation of credit rationing is a complex procedure as credit demand and supply are not directly observable. We chose to use disequilibrium models, mainly the one developed by Maddala and Nelson (1974). The technique consists in estimating credit demand and supply indirectly by assuming that the actual quantity of credit extended is equal to the minimum of both the estimated quantities of credit demand and supply. Credit rationing is deemed to exist if estimated supply is below estimated demand. Such a model had never been applied to Tunisia before.

In this connection, we estimate our disequilibrium model upon a panel dataset of 1,275 SMEs over the period 2001-2006, comprising 5,438 observations. Results show that demand for bank credit from SMEs is not driven by "endogenous" factors such as the level of activity and internal available resources of the firm, but rather by other "exogenous" factors in the credit demand function, namely the applied financing cost and required guarantees. The strong risk aversion of banks makes the decision of supplying credit mainly dependent on real guarantee, and leads to an average share of 80% – partially or totally – credit rationed firms.

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The article is designed into five main sections. Section two provides the background in which we briefly define credit rationing and sketch the specific characteristics of SMEs that explain their exposure to rationing, and we outline the importance of disequilibrium econometrics to test the existence of such credit rationing. Section three presents the stylized facts emerging from previous studies and some rare available statistics that highlight the exposure of Tunisian SMEs to this phenomenon. Section four details the specification of individual equations in our disequilibrium model as regards credit demand and supply. Section five describes the sample, reports and discusses the empirical outcomes of our estimation, and calculates the percentage of credit rationed firms. Section six recaps our findings and suggests future research paths.

2. Estimation technique of a disequilibrium model

Since the seminal paper of Fair and Jaffee (1972), a large literature has been devoted to the econometric methods of estimation for a market in disequilibrium. The main approach consists in using some maximum likelihood methods. Maddala and Nelson (1974) designed the derivation of the general likelihood function for the four main disequilibrium models — so-called "switching models" — and proposed the appropriate procedure of estimation. Their basic model consists in the following equations:

$$L_t^D = X_{1t}^{'}\beta_1 + u_{1t} \tag{0.1}$$

$$L_t^S = X_{2t}^{'}\beta_2 + u_{2t} \tag{0.2}$$

$$L_t^D = X_{1t}^{'}\beta_1 + u_{1t} \tag{0.3}$$

Where L_t^D is the unobservable quantity of bank credit demanded during period t, L_t^S is the unobservable quantity of bank credit supplied during period t, L_t is the actual quantity of bank credit observed during period t, X'_{1t} and X'_{2t} are variables that influence respectively bank credit demand and supply, and u_{1t} and u_{2t} are the residuals.

Allowing for the possibility that the price of credit is not perfectly flexible and rationing occurs; equation (1.3) is the crucial disequilibrium hypothesis. More generally, equation (1.3) indicates that the occurrence of any disequilibrium, i.e. any discrepancy between the quantities supplied and demanded results from the lack of complete price adjustment. Therefore, on the basis of voluntary exchange, the short side of the market must prevail.

In the absence of any information concerning the price adjustment process and assuming that errors are normally distributed random variables, and with regard to equation (1.3), the model

itself enables the determination of the probabilities according to which each observation belongs to the demand or supply equation (Maddala and Nelson 1974).[3]

The estimation follows three steps (Maddala 1983; Quandt 1988). First, we estimate the coefficients of each explanatory variable in the supply and demand equations assuming the existence of equilibrium on the bank credit market; equilibrium is embodied by the equality: actual quantity of bank credit granted = quantity requested by enterprises = quantity supplied by banks ($L_{it} = L^d_{it} = L^s_{it}$). Then, these coefficients enable us to calculate the fitted values of the credit demand and supply for each enterprise in the sample. Thus, we identify the unobservable variables — at the outset — that are the credit demand and supply. Finally, we calculate the share of credit rationed firms for each year by means of a simple comparison of the fitted values for credit demand and supply. An enterprise is considered to be — partially or totally — rationed when the amount of credit that it asks for is greater than the amount of credit that banks are ready to supply, i.e. whenever $L^d_{it} > L^s_{it}$, according to the equation (1.3) of the above model.

Disequilibrium econometrics seem best suited to overcome problems that often result from the use of macroeconomic data (aggregation bias problem: no credit rationing appears, whereas some firms do struggle with credit rationing (Perez 1998; Shen 2002)), survey techniques (inconsistencies and biases in the used survey data (Sealey 1979)), and the proxies (dependence of results on the accuracy of the proxy to actually reflect the degree of credit rationing (Sealey 1979)).

The interesting results of the pioneer's papers testing credit rationing in a disequilibrium framework (Laffont and Garcia 1977; Sealey 1979; Ito and Ueda 1981) have fuelled a growing series of empirical studies applied to businesses loans, e.g. in the USA (Perez 1998), in Japan (Ogawa and Suzuki 2000), in Taiwan (Shen 2002), in the UK (Atanasova and Wilson 2004), in Poland (Hurlin and Kierzenkowski 2007), and in Belgium (Steijvers 2008).

3. Model specification

Building on several previous works (see references for the various variables), we specify an explicit set of demand and supply equations for Tunisian bank loans.

Demand for bank credit is assumed to be:

- An increasing function of the variable "activity level of the firm", approximated by the level of sales (*SALES*) (Perez 1998; Atanasova and Wilson 2004).

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[3] The probability that the quantity L_t observed at time t belongs to the demand equation is: $\pi_t = \Pr(L^D_t < L^S_t) = \Phi((L^S_t - L^D_t)/(\sigma_1^2 + \sigma_2^2))$. Where $\Phi(.)$ is the cumulative normal distribution function.

- A decreasing function of the variable "internal resources", measured by *internal cash flow* or *net cash flow* (*INTERNALCASHFLOW*) corresponding to the following sum: Net result + Allowances for depreciation and provisions (Laffont and Garcia 1977; Sealey 1979).

- A decreasing function of the variable "cost of financing", approximated by the *financial cost* (*FINANCIALCOST*) defined by the ratio: Financial expenses/Total of debt (Bouabidi and Rajhi 2008).

- A decreasing function of the variable "trade credit", approximated by the indicator *payable accounts* (*ACCOUNTPAYABLE*) (Rodríguez-Rodríguez 2006; Steijvers 2008).

- An increasing function of the economic state of affairs (business outlook) especially when prospects are bright. The influence of business outlook on the desired demand for bank credit is approximated by dummy variables for the years 2001–2006, defined as *DUMMYYEAR* (Atanasova and Wilson 2004; Steijvers 2008).

From the other side of the market, supply of bank credit is assumed to be:

- A decreasing function of the variable "firm risk level", approximated by *interest cover of financial expenses* (*INTERESTCOVER*) defined as follows: Profit before interest and taxes/Financial expenses.

- An increasing function of the variable "size of the firm", approximated by *total assets* (*ASSETS*).

- An increasing function of the existence of assets offered as collateral by the firm. The "collateral" variable is measured by the *real guarantee* (*COLLATERAL*) defined as follows: Net tangible assets + Net financial assets.

- An increasing function of the frequency with which the firm uses trade credit. The "trade credit" variable is measured by *payable accounts* (*ACCOUNTPAYABLE*) as on the demand side. We also use, following Steijvers (2008), an additional measure that compares the use of trade credit by a firm with the use of trade credit by other firms active in the same industry. We create a dummy variable *accounts payable industry dummy* (*ACCPAYINDUSDUMMY*) that is assigned value 1 if the firm uses more trade credit (*payable accounts*) than the average of the industry, and 0 if less.

- A function of the activity sector of the firm, it increases if the SME belongs to the manufacturing sector. The intervention of Tunisian authorities to promote manufacturing SMEs may encourage banks to increase their financing supply (Adair and Fhima 2009). The influence of manufacturing industry on the decision to grant credit is checked by a dummy variable (*ACTIVITYSECTOR*) taking the value 1 if the manufacturing industry is concerned, and 0 otherwise.

- A decreasing function of the share of non-performing loans which is a recurring burden for the Tunisian banks' assets, around 20% over the period of our study (Table 1). SMEs are the main source of demand for these loans; e.g. 90% of the STB's non-performing loans were contracted by SMEs (Trabelsi and Ries 2006).

Table 1: Tunisia, non-performing loans (% of gross credit)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2010	2012
NPRFLOAN	21.6	19.2	20.8	23.9	23.7	20.9	19.1	17.6	15.5	12.1	14.3
Rate of variation	--	-11.11	+8.33	+14.9	-0.84	-11.81	-8.61	-7.85	-11.93	-21.94	+18.18

Source: Central Bank of Tunisia (2013)

The dependent variable L_t is here the total amount of bank credit obtained by a given firm i in year t. This overall bank debt is measured by the following sum: borrowing (long term debt, lasting > to 1 year) + loans and other financial liabilities (short term debts, lasting ≤ to 1 year). Following the most recent articles (Ogawa and Suzuki 2000; Shen 2002; Atanasova and Wilson 2004; Steijvers 2008), the demand and supply equations (and consequently the actual loan for the ith transaction) are expressed in terms of financial ratios rather than levels. This specification alleviates the problem of heteroscedasticity that the sample data may encapsulate.

The final form of our estimated model is expressed in the following equations:

$$
\frac{L_{it}^d}{TA_{i,t-1}} = \beta_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{SALES_{it}}{TA_{i,t-1}} + \beta_2 \frac{INTERNALCASHFLOW_{it}}{TA_{i,t-1}} + \beta_3 FINANCIALCOST_{it} +
$$
$$
\beta_4 \frac{ACCOUNTSPAYABLE_{it}}{TA_{i,t-1}} + \sum_{j=2002}^{j=2006} \varphi_j DUMMYYEAR_j + v_{1,it}
$$
(0.4)

$$
\frac{L_{it}^s}{TA_{i,t-1}} = \gamma_0 \frac{1}{TA_{i,t-1}} + \gamma_1 INTERESTCOVER_{it} + \gamma_2 + \gamma_3 \frac{COLLATERAL_{it}}{TA_{i,t-1}} + \gamma_4 \frac{ACCOUNTSPAYABLE_{it}}{TA_{i,t-1}}
$$
$$
+\gamma_5 ACCPAYINDUSDUMMY + \gamma_6 ACTIVITYSECTOR + \gamma_7 NPRFLOAN_t + v_{2,it}
$$
(0.5)

$$
L_{it} = \min(L_{it}^d, L_{it}^s)
$$
(0.6)

Whereby i refers to an enterprise, t refers to a year, and TA refer to Total Assets.

In the demand equation, because total assets enter the equations in terms of a one period lag, we lose the year 2001 and therefore the yearly dummy variables span from 2002 to 2006 (See Atanasova and Wilson 2004, p. 602).

In the supply equation, the size of the firm is assumed to be invariant throughout the year (year t), so it is expressed by total assets at the beginning year t, which is nothing else than total assets at the end of the previous year ($t-1$), and the effect of the variable "size of the firm" on bank credit supply is given by γ_2 (See: Ogawa and Suzuki 2000, p. 5; Atanasova and Wilson 2004, p. 603).

4. Model estimation

4.1. Data and descriptive statistics

Our disequilibrium model is estimated using a panel data set of SMEs provided by the Central Bank of Tunisia (*Centrale des bilans*). Initially, the sample accounted for 1,790 enterprises; all of them are non-listed, privately owned, and independent (i.e. they do not belong to a group of firms). The removal of enterprises with missing or unreliable data, as well as non-SMEs according to the definition of the Financial Market Council (CMF), i.e. those with net fixed assets (*INVSTMNT*) above or equal to TND 4 million,[4] reduced the sample to 1,275 enterprises over a 6 years period (from 2001 to 2006). Data on each enterprise in our sample cover the overall period (2001–2006), as well as a shorter period of time, hence our panel is incomplete (or unbalanced).

Table 2 gives some descriptive statistics for all the firms of our sample. Our median firm holds 170,071,000 Tunisian Dinars (TND 1.70071D+08) in net fixed assets (*INVSTMNT*), and TND 8.94016D+08 in total assets. Only 10.97% of these assets are financed by bank credit (9.80569D+07). Furthermore, albeit it is an expensive financing source if cash discounts for early payment are given,[5] trade credit (TND 2.15125D+08) is more than twice as important as bank credit in the total assets (24.06% vs. 10.97%).

Table 2: Descriptive statistics of 1,275 Tunisian SMEs over the period 2001–2006

Variable	Mean	Standard deviation	Min	Max	Median
INVSTMNT	*5.40506D+08*[a]	*(8.08795D+08)*[a]	*0.00000*	*3.99558D+09*	*1.70071D+08*
ASSETS	2.53267D+09	(1.31247D+10)	10,900,000	5.94554D+11	8.94016D+08
SALES	3.19116D+09	(2.19899D+10)	0.00000	1.34127D+12	1.07965D+09
INTERNAL-CASHFLOW	2.15268D+08	(2.78687D+09)	-1.55043D+10	1.88414D+11	5.47049D+07
ACCOUNT-PAYABLE	8.10860D+08	(6.12290D+09)	-1.91252D+07	2.78437D+11	2.15125D+08
COLLATERAL	5.21758D+08	(7.91337D+08)	0.00000	3.99558D+09	1.56671D+08
L (Amount of bank credit)	5.58546D+08	(2.38520D+09)	0.00000	1.00575D+11	9.80569D+07

[a] : 10^1 (10 exponent 1).

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[4] In Tunisia, among the many definitions of SMES, two are mainly adopted in academic researches: the first according to which SMEs are firms hiring a workforce between 10 and 100 employees, and the second according to the Financial Market Council (Conseil du Marché Financier) that considers as an SME any firm holding a total of fixed assets below TND 4 million.

[5] Sellers that extend trade credit typically offer cash discounts to encourage early payment. In most cases interest rates that are implicit in the cash discounts are far above the interest rates on loans for working capital charged by financial institutions. Assuming a 10 days discount period and a 2% discount rate for a TND 100 purchase, the full price can be viewed as the future value of a loan on the discounted amount for the remaining 20 days period. The implicit yearly interest rate can be expressed from $98(1+i)^{365/20}=100$, whereof $i = 0.446$. See for example Wilner (2000) for the calculus of implicit rates from trade credit terms.

4.2. Estimation results

Our disequilibrium model estimation was carried out by means of Time Series Processor "TSP" software, and has provided satisfactory results. The Wald test of joint significance of the estimated coefficients indicates that the disequilibrium model is highly significant. The empirical *chi2* (*χ2*) of the test (5,577,256.4) is far above the theoretical value (i.e. critical value of the test) of *χ2* to 20 degrees of freedom at 5% threshold. Similarly, the critical probability of the test (0.000 for both equations) is significantly below 1%. The estimated coefficients are reported in table 3. However, they do not actually support our prior expectations.

Table 3: Estimated parameters of the disequilibrium model

Variables	Estimation	Standard Error	T-statistic	P-value
Desired demand for bank credit				
Constant /TA_{t-1}	-.232223E+07	.124255E+07	-1.86892	[.062]
SALES/TA_{t-1}	-.035693	.021932	-1.62739	[.104]
INTERNALCASHFLOW/TA_{t-1}	-.134449	.152491	-.881682	[.378]
FINANCIALCOST	-144.885	57.5485	-2.51761	[.012]
ACCOUNTPAYABLE/TA_{t-1}	-.115952	.058972	-1.96621	[.049]
DUMMYYEAR				
2002	341.419	40.9848	8.33038	[.000]
2003	341.671	33.3688	10.2392	[.000]
2004	296.668	28.4370	10.4325	[.000]
2005	320.237	34.1070	9.38920	[.000]
2006	410.779	53.1241	7.73245	[.000]
Supply of bank credit				
Constant /TA_{t-1}	-2632.38	1228.24	-2.14321	[.032]
INTERESTCOVER	.871429E-08	.124125E-08	7.02057	[.000]
ASSETS/TA_{t-1}	.088452	.049783	1.77676	[.076]
COLLATERAL/TA_{t-1}	.920576	.655896E-03	1403.54	[.000]
ACCOUNTPAYABLE/TA_{t-1}	.135421	.681479E-03	198.717	[.000]
ACCPAYINDUSDUMMY	.133383	.119856	1.11286	[.266]
ACTIVITYSECTOR	-.058963	.835638E-02	-7.05604	[.000]
NPRFLOAN	-.645944E-02	.224263E-02	-2.88029	[.004]
S.D. of demand equation	110.093	9.33293	11.7962	[.000]
S.D. of supply equation	.278052	.451903E-02	61.5291	[.000]

TA: Total Assets; S.D.: Standard Deviation

As regards the credit demand equation, outcomes are the following:

- The coefficient relative to the "firm activity level" variable is not significant. This first surprising result implies that Tunisian SMEs do not decide their demand for bank credit according to their production and/or sales capacity.

- Another surprising result is the non-significance of internal available funds in explaining the demand for credit. This suggests that the financing behaviour of Tunisian SMEs does not support pecking order theory (Myers and Majluf 1984) that is often invoked in the case of SMEs.

These two first results suggest that SMEs' demand for bank credit is not driven by factors that are "endogenous" to the firm; thus, the credit demand function should be affected by other "exogenous" factors.

- The "financing cost" variable is significantly negative in the demand for credit. SMEs' sensitivity to financing costs (IEQ 2004) is well documented: SMEs reduce their demand for credit of almost TND 145 for any 1% increase in financing charges related to the amount of requested credit.

- The extent to which trade credit substitutes for bank credit is significant: a TND 1 increase in trade credit will reduce bank borrowing by TND 0.12. Thus, trade credit stands as a substitute for bank credit, especially with respect to recurring needs for working capital, as the combined interest and transaction costs may make bank credit more expensive than trade credit.

- The coefficients of dummy variables for the years 2002–2006 are significantly positive and closely comparable. Results suggest that, as compared to 2002, the desired demand for bank credit is slightly decreasing for the year 2004 and slightly increasing for the years 2005 and 2006; whereas it is stable over the entire period. This means that during the period under review, the Tunisian economy did not experience a prominent periodic event that affected SMEs' demand for credit and their dependence on banks.[6]

As regards the credit supply equation, outcomes are the following:

- The "risk level" of an SME virtually exerts no effect on the decision to grant bank credit (0.0000000087). Tunisian banks seem to be rather insensitive to the means revealing the ability of applicant firms to payback.

- The coefficient γ_2 related to the "size of the firm" variable is significant but weakly positive on the decision to grant bank credit. A TND 1 increase in an SME's assets will lead to a TND 0.088 increase in credit supply. Although it confirms the importance of size factor in the financing process of firms, this low sensitivity to the size of firms suggests that banks are rather sensitive to factors ensuring the repayment of credit.

- The "collateral offered by the firm" exerts an important effect on the decision to grant bank credit. A TND 1 increase in the value of property to pawn will entail an increase of TND 0.92 in credit supply. Collateral is the best device allowing banks to ensure repayment and to protect themselves from hazards; i.e. to recover at least a large part of the loan in case of default. The

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[6] If, for example, compared to the coefficient β_5 (relating to the year 2002), coefficients β_7, β_8 and β_9 (relating to the years 2004, 2005 and 2006) are noticeably higher (lower), this indicates the occurrence of a periodic event that resulted in an increase (decrease) in the SMEs demand for credit; such an event must be identified (Ogawa and Suzuki 2000, pp. 10–11; Atanasova and Wilson 2004, p. 604–605 and Steijvers 2008, p. 28).

role of collateral in the decision to grant bank credit confirms the two previous results, as well as the results of surveys on the risk aversion of banks and the rigidity of credit conditions in Tunisia (Casero and Varoudakis 2004).

- As regards the demand side, our previous results show that trade credit is a substitute for bank credit. On the supply side, an SME having a large recourse to trade credit also improves its access to bank credit. A TND 1 increase in the trade credit amount within the liabilities of an SME raises credit supply by TND 0.14. Banks are very sensitive to the means ensuring payback; they perceive any firm with a strong reliance on trade credit as a solvent firm that will pay back its loan, especially if it is cheaper than trade credit.

However, we find that the "accounts payable industry dummy" variable is not significant in the decision to grant bank credit. The fact that an SME uses more trade credit than the average firm in the same industry does not indicate that SMEs' suppliers do trust more this very firm than others. It is also possible that all these firms compared to firms from other industries, make little use of trade credit; in this case, greater use of trade credit remains weak.

- The "activity sector" variable is significantly negative. For a requested TND 1, banks reduce the credit supply by TND 0.06 to manufacturing SMEs in comparison with firms of the two other industries. From the perspective of risk-averse banks, Tunisian policy of promoting manufacturing SMEs cannot offset the threat posed by globalisation on Tunisian industries (Adair and Fhima 2009, p. 27).

- "Non-performing loans" exert a negative effect on the decision to grant bank credit. An additional TDN 1 of non-repaid loan within a bank' assets results in a decrease of TDN 0.007 of credit supply.

5. Share of credit rationed firms

We define "credit rationed firm in year t" (simply abbreviated as credit rationed firm) as the firm whose probability that the desired demand exceeded the ceiling level in year t is over 0.5 (Gersovitz 1980). Firms can switch between regimes of credit rationed (supply regime) and non-credit rationed (demand regime), depending on the relative size of bank loan demanded to the maximum amount available: a non-credit rationed firm one year might be credit rationed another year (Ogawa and Suzuki 2000; Atanasova and Wilson 2004). This implies that the severity of credit rationing can vary significantly over time.

Table 4 presents results for our sample period (2002–2006). We observe that the percentage of Tunisian SMEs that may apply for credit[7] and that are — partially or totally — rationed is large

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[7] We ignore the actual share of firms that apply for credit. Our sample comprises firms without any debts in their liabilities (see table 2, last line, fourth column); these firms may be rationed or may not have applied for credit.

and increasing. Throughout the entire period, the average share of credit rationed firms is about 80%. We also observe that this share follows the same variation as non-performing loans: it is increasing from 2002 to 2003 and decreasing since 2003 (see Table 1). Banks react to growing non-performing loans within their portfolio by a restriction in credit supply.

Table 4: Percentage of credit rationed firms

Year	Total number of firms	Rationed firms	Percentage of rationed firms (%)	Variation rate (%)
2002	1,145	753	65.76	--
2003	1,275	954	74.82	+13.78
2004	1,275	1,081	84.78	+13.31
2005	1,114	993	89.14	+5.14
2006	622	562	90.35	+1.36
2002–2006	1,086.2 [a]	868.6[a]	79.97[a]	-/-

[a]: Mean over the overall period.

6. Conclusions and further researches

Our study estimated the exposure of Tunisian SMEs to rationing on the bank credit market. It is based on the so-called "switching models", mainly the model 1 developed by Maddala and Nelson (1974), which had never been applied to the Tunisian case. We used a large panel data set of 1,275 Tunisian SMEs over the period 2001-2006, wherein most firms operate within the service industry.

Empirical outcomes suggest that SMEs do not decide their demand for credit on the basis of their activity level or their internal available resources, which are factors "endogenous" to the firm. SMEs' demand for credit is determined by "exogenous" factors, namely the financing cost applied and guarantees required by banks. Difficulties in accessing credit are due to excessive requirements from Tunisian banks that decide to grant credit only according to means ensuring payback. If a large use of trade credit by a firm affects the banks' decision, real guarantee remains the *nexus* of the bank/enterprise relationship in Tunisia. The strong risk aversion of banks leads to an average share of 80% — partially or totally — credit rationed firms in our sample. It seems that Tunisian banks do not perform their role as regards intermediation in a bank-based financing economy. It calls upon the banking system, which needs to evolve toward greater competition, as well as the program recommended for its reform (World Bank 1995). Tunisian banking system responds inadequately to the financial needs of small-sized firms customers, whose resources are particularly limited and that do not offer sufficient guarantees, but their weight in the economic fabric makes them a potential strategic customer. The strong requirement from banks and the dependence of SMEs on short term bank credit anchor the bank/SME relationship on mistrust and not on communication. In turn, it may drive entrepreneurs towards the informal sector, and therefore cause a potential loss for the Tunisian economy.

Our model produced robust but asymmetric results: in the supply function, the five variables are all significant as well as one of the two dummy variables; however, in the demand function, only two of the four variables are significant as well as the dummy variables for the years under review. This is a case of disequilibrium on the supply side.

Although our findings are restricted to a five years period of time, they are a starting point for further researches that will be tackled following two paths.

A first path will emphasize the motives for the use of trade credit by SMEs. Outcomes suggest, on the one hand, that Tunisian SMEs reduce their demand for bank credit when they get credit from their suppliers; thus, trade credit stands as a substitute on the demand side. On the other hand, Tunisian banks increase their supply of credit for firms making a significant use of trade credit; thus, trade credit stands as a complement. Hence, Tunisian SMEs' demand for trade credit is worthwhile investigating.

The second path is somehow double. We will compare differences in the investment and financing behaviour of the two categories, i.e. credit rationed versus non-credit rationed firms. The focus concerning investment behaviour is on the role of substitutes in investment decision, mainly cash-flow; whereas it is on the capital structure as regards financing behaviour. Eventually, it could shed additional light upon the ongoing debate between trade-off theory versus pecking order theory.

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