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The duration of bank relationships and the performance of Tunisian firms¹

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Abstract. In this article, we investigate the link between the duration of bank relationships and its consequences on the performance of Tunisian firms. Performance is measured by the return on equity (ROE) and the return on Assets (ROA). We collected data of 100 Tunisian companies for the period of 2000-2007. Applying panel data estimation, our results opine that the cost of credit decreases the performance of Tunisian firms while the duration of bank relationships improves their performance and increase their profitability.

Key words. Duration, Bank-relationship, Performance, Tunisia.

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I. Introduction

Modern literature on financial intermediation provides support for the importance of bank relationship in financing small business. First, there is no unique definition of the term relationship banking. According to Boot (2000) relationship banking is defined as the provision of financial services by a financial intermediary that: invests in obtaining customer-specific information, often proprietary in nature; and evaluates the profitability of these investments through multiple interactions with the same customer over time and/or across products.

Nowadays, the relationship between banks and enterprises is becoming ever more significant for two reasons. Firstly, banks are the principal channel of financing firms. Secondly, firms became one of the major accelerators of the economic development by creating employment and contributing to the economic growth. As a result, banks and firms became among the most important institutions of the economy and thus, their relationships should be strong in order to ensure the safety of the economic system as a whole because the failure of the former or the later could generate an economic disaster (Hamdi *et al* 2012).

In the literature, several theoretical and empirical studies focused on the nature of bank relationships (determinants of the relationships, costs and availability of credits, etc) whereas there are few studies that treat the duration of the bank enterprise relationship. A lot of importance is attached to this issue to understand why the lending contract lengths several years for a company and only some months or years for some others. Broadly, based to its borrower, the firm determines the duration it wants.

The duration of the lending contract constitutes one of the principal components of the bank-enterprise relationships and it is a significant measure of the solidity of the banking relationship. Like the dimension of the number of relationships, the duration can influence the negotiation of credit conditions and consequently the performance of the firms. The duration of the banking relation is differed from a system to another and its dimension varies from one country to another one. In Germany, the average duration of the bank-firm relationship is 20 years (Elsas and Krahen, 1998). The estimates for Sweden are for over 20 years (Sjogren, 1994) and 14 years in Italy (Angelini, Di Salvo and Ferri, 1998). In Japan, the duration varies between 21 and 30 years (Horiuchi, Parker and Fakuda 1998) and in the United States it is around 7 years ((Petersen and Rajan, 1995, Blackwell and Winters, 1997; Cole 1998) and for

nine years in Finland (Peltoniemi, 2007). Why the duration of the banking relationships varies from a country to another? What are the benefits of long lending contract duration and what are their drawbacks?

Broadly, the duration reflects the degree of relationship intensity over time. Some studies show that the long duration allows enterprises to benefit from competitive interest rates and high degree of availability the credits during financial instability. Berger and Udell (1995), Blackwell and Winters (1997) and Bodenhorn (2003) find a significantly positive impact on loan rates for US SMEs. In the Finnish study, Peltoniemi (2007) also finds similar results. Harhoff and Körting (1998) and Eber (2001) show that a long duration reduces the problem of asymmetry of information. The repetitive character in the time of these relations makes it possible for the two parts to collect the maximum of necessary information what reduces the problem of asymmetry information origin of the credit rationing. In the same way, the long term relations support the availability of credit at a lower cost (Peterson and Rajan (1994), Angelini et al. (1998)).

The long duration of bank relationships has some drawbacks according to Degryse and Van Cayseele (2000), Lehmann and Neuberger (2001) and Hernandez-Canavas and Martinez-Solano. Authors show that the long duration will lead to soft budget constraints problem which refers to a situation by which an economic entity expects to obtain a bailout during a period financial trouble Korani (1980). According to the soft budget constraints, a borrower can request additional funds from the lender but the later can refuse this request.

Another concern raising from long duration is the hold-up problem (Greenbaum and Al (1989), Sharpe (1990), Rajan (1992), Von Thadden (1998). During the time, the lending relationships generate a lock-in problem given that banks will have the monopoly power over the customer. In same line of analysis, when the duration of the lending contract lengthens, banks endogenously gain an information monopoly and are able to extract additional rents from their clients. Those problems may generate some costs for the borrowing firms which usually affect the credit amount and loan covenants.

Following this development, we distinguish an ambiguity according to the advantages and disadvantages from each type of relationship (short and long). So the performance of the firms can be influenced by the benefits and the costs of the duration of a bank relationship. The aim of this paper is to test empirically the effect of the duration of bank relationships

(long term) on the performance of the Tunisian SMEs. Our sample is based on 100 firms observed during the period 200-2007. The empirical study is based on panel data analysis with fixed effect regression.

The remainder of the paper is as follows: the second section gives a literature review on the bank relationship as well as a cost advantage analysis of the duration of the lending contract between a borrower and a lender. This section allows us to formulate our hypothesis. The section three is the empirical part of this paper which gives information of the data collection, the econometric methodology and discusses the results and section 4 concludes.

II. Bank relationships and firms performance: the literature review

According to the available studies, we may summarize the literature on the bank-firm relationships in three axes:

- The first axe analyses the number of bank relationships and its impacts on the performance of the firms. The major issues were studied by Bhattacharya and Chiesa (1995), von Rheinbaben and Ruckes (1998), Shepard (1987), Farrell and Gallini (1988), Petersen and Rajan (1997), Djelassi *et al* (2011a,b). Results of the first axe are not unanimous. While some authors have found a positive relationship between multiple bank relationships and performance of firms, some others recommend the single bank relationships.
- The second axe investigates the bank-firm relationships and the cost of credits (Bolton and Scharfstein (1996), Detragiache and *al.*(1997) Blackwell, and Winters (1997), Hamdi et al (2012)). Overall results show that young firms and start-up suffer more from credit rationing rather than old companies. Fama (1985) argues that banks are inside lenders and as insiders they have access to some private information about the borrowers that is not available to outside lenders who purchase publicly traded debt. (Elyasiani and Goldberg 2004). In case that the bank has incomplete information (imperfect information), and restricted control over the borrowers actions (incentive effect), it will use collaterals or guaranties as an approach to limit the risk of default and increase the return (Berger and Udell 1998). Consequently, the cost of credit increase.

Generally large firms are more transparent than small firms because small businesses are relatively opaque with respect to providing the necessary information in the loan process (Stieglitz and Weiss, 1981)

- The third axe examines the impact of the bank-firm relationship on the availability of loans during the periods of boom and bust (Agelini, Di Salvo and Ferri (1998) and Cole, R (1998) D'Auria, Foglia and Reedtz 1999, Hamdi *et al* (2012)). The main results suggest that availability of credits is closely linked to the financial historical statement of the firms as well as the size of the company. In periods of political and financial instability, lending activities are very restricted and credits are available for companies with strong financial statement only.

Despite the abundant literature on the bank enterprise relationships, fewer are the articles which empirically focus on the importance of the duration of the relationships between the two institutions. To the best of our knowledge, there is no article analyzing the duration of bank firm relationship for an emerging economy. Hence, the aim of this section is to develop this axis and to analyse the costs and advantages of a long/short term duration of a bank-firm relationship.

1. Advantages of long term bank relationships

A long term bank enterprise relationship is considered as a repetition of lending contracts for several years and it aims at financing investments and projects of borrowers when they need funds. The bank and the enterprise can decide on the length of their contract. A firm can decide to shorten the duration or to change from one lender to another one or switch from multiple bank relationships when credit is not available by its bank or when the cost of funds is unaffordable. In the other hand, a bank can decide to stop financing a firm when the later is considered as riskier or when its financial statement is ambiguous. A bank can also cut-off the contract with the borrower when the later did not provide the information required by the lender. Information about borrowers is fundamentally important to the lending process. Low asymmetric information leads to low cost of monitoring, low interest rates and low charges. In the other hand, high asymmetric information leads to high charges (interest rate, collateral and guarantees) and to a credit rationing which will limit the availability of credit.

According to Eber (2001), the long term bank relationship offers several advantages to the companies which in turn contribute to the improvement of their performances. A long duration reduces the cost of lending and hence the probability of credit rationing will also be reduced (Fried and Howitt 1980) and Okun (1981). The repetitive lending contracts over the time allow the two parts to get gradual information about each other. According to Boot (2000), the long term banking relationship facilitates the exchange of information between the two institutions and hence increases the transparency. Onega and Smith (2001) opine that the repeated provision of bank services through time may reveal valuable private information about the customer to the bank which will make the credit process faster and easier. In the same way of analysis, Harhoff and Körting (1998) show that the long term relationship reduce the problems of asymmetric information which in turn will reduce requirements of the guarantees necessary to obtain the credit. In this case, the firms profit from an access facilitated to the credit with less low interest rates owing as result as the monitoring and control costs decrease when the company weaves long term relations. The model of Boot and Thakor (1994) predicts that, as a relationship matures, interest rates decline and collateral requirements fall. Berger and Udell (1995) find that the interest rate charged and collateral pledged on lines of credit is decreasing in the length of a firm's relationship with its bank. The firm may want to borrow from the same bank again because repeated borrowing gives the bank an opportunity to efficiently tax and subsidize it over time in order to reduce the use of (costly) collateral (Boot and Thakor (1994)). Peterson and Rajan (1994) concluded that the duration of the bank-firm relationship is central for accessibility and availability of credit what makes it possible to support the investment of the firms. Once the investment is stimulated, the performance of the firms improves

This literature also suggests that longer relationships generally improve credit availability (Berger & Udell, 1995; Petersen & Rajan, 1994). The bank is better positioned to enforce compliance with the terms of the new loan because of the information on the firm it has already learned. Haubrich (1989)). Angelini et al. (1998) show that the survival of the long term relationship must be rewarded by a payment for the less raised interest rates and by a privilege of accessibility to the credit. This will be reflected positively on the firm performance following a reduction of the financial expenses. The relations of long term present a flexible character in opposition to the rigidity of the strictly structural engagements subscribed on the financial market.

According to these perceptions, the long duration of bank relationships minimizes the motivation of firms to switch banks or initiate multiple relationships as the costs of credit is affordable and funds are availability during harsh periods. Hence, we can suggest our first hypothesis which is

H1: the duration of the banking relation improves the performance of the firms.

2. Costs of a long term bank-firm relationship

While some authors recommend the long term bank relationships many other support the short duration of lending contracts. Literature provides two principal costs of relationship lending which are the soft budget constraint problem and the informational capture problem (hold-up).

The concept of the soft budget constraint was initially introduced by Kornai (1979) to illustrate the performance of socialist economies. Precisely, Kornai cites government paternalism and high social and political costs of worker layoffs. Broadly, the soft budget constraint refers to a situation by which an economic entity expects to obtain a bailout during a period financial trouble. During the past decade, a sizable literature has accumulated explaining the causes and consequences of the soft budget constraint and recently, this concept has been applied to phenomena in market economies as well (Du and Li 2004). The growing literature on soft budget constraint (SBC) has mainly focused on the SBC on enterprises (Maskin, 1996, 1999; Maskin and Xu, 2001; Kornai, Maskin, and Roland, 2003). The current modern idea of the SBC theories almost suggests that banks serve as rescuers for enterprises that are on the border of bankruptcy (Dewatripont and Maskin, 1995; Shleifer and Vishny, 1994; Berglof and Roland, 1998). In this case banks have usually the superior power and they are considered as the only decision-makers of the future of their clients enterprises. Some authors argue that the soft budget constraint constitutes a serious problem for enterprises which have a long duration of bank relationship because their survival is related to their banks. If a bank refuses subsidizing a fragile enterprise, the later will fails.

The second problem related to the long run duration is the monopoly power for the banks with regards to the information held of their clients. This can giving rise to a hold-up problem (Ongena and Smith, 2001). In fact, with repetitive lending contracts with their clients, banks collect information permanently and revise their evaluations of firm credit worthiness.

Information is gathered through repeat lending or the provision of deposit and other information-intensive financial services (Boot 2000)

Some empirical literature shows the drawbacks of long banking duration. For example Blackwell and Santomero (1982) argue that long-term relationships may not lead to privileged behavior by banks. In an instable period, banks did not distinguish between an old client and a new one. The most important thing for banks is the guaranties provides by their customers in trouble periods as well as their solid wealth. If an enterprise with long bank duration appears in fragile situation, the bank automatically refuses financing its consumer to avoid and minimize the risk of credit. Petersen and Rajan (1994) investigate credit costs and loan availability to more than 3,000 small businesses in the US and their findings did not suggest any positive relationship between the duration of bank-borrower relationships and the cost of credit. Similarly Blackwell and Winters (1997) find no statistical relationship between relationship duration and credit costs. For the German context, the study of Harhoff and Körting (1998) fails to reveal any significant correlation between relationship duration and credit costs.

In their studies, Greenbaum *et al* 1989; Rajan, 1992; Sharpe, 1990; Wilson, 1993 demonstrate that interest rates will raise as the relationship get longer since lenders finance the borrowers initially but will be reimbursed with higher rates later. Degryse and van Cayseele (2000), studying a sample of European banks, find that the terms of the contract deteriorate with the duration of the relationship. In another study, the authors (Degryse and van Cayseele 2000) find that the loan rate increases with the duration of the relationship. The same conclusion was found by Angelini *et al.* (1998) for the Italian context. Authors show that loan rates tend to increase with the length of relationship.

According to what is cited above, we can suggest a second hypothesis to be tested in the second section of the paper which is:

H2: The duration of the banking relation deteriorates the performance of the firms.

III. Empirical analysis

1. Data and model specification

Our study is based on data collected from 100 Tunisian companies of different size and operating in various sectors for the period 2000-2007. Regarding quantitative variables we use the firm's financial statements (balance sheets and income statements). In the other hand, qualitative data were obtained following a distribution of a questionnaire².

The performance of the firms is measured by the return on equity (ROE) and the return on assets (ROA). The estimation method is based on panel data technique and the econometric equation is written as follows:

$$\mathbf{ROA} = \alpha_0 + \beta_1 \mathbf{SIZE}_{i,t} + \beta_2 \mathbf{AGE}_{i,t} + \beta_3 \mathbf{SECT} + \beta_4 \mathbf{COST} + \beta_5 \mathbf{RAT}_{i,t} + \beta_6 \mathbf{MLTPL}_{i,t} + \beta_7 \mathbf{NBANK} + \beta_8 \mathbf{DUR} + \varepsilon_i \quad (1)$$

$$\mathbf{ROE} = \alpha_0 + \beta_1 \mathbf{SIZE}_{i,t} + \beta_2 \mathbf{AGE}_{i,t} + \beta_3 \mathbf{SECT} + \beta_4 \mathbf{COST} + \beta_5 \mathbf{RAT}_{i,t} + \beta_6 \mathbf{MLTPL}_{i,t} + \beta_7 \mathbf{NBANK} + \beta_8 \mathbf{DUR} + \varepsilon_i \quad (2)$$

Where

ROA and *ROE*: they measure the performance of the firms;

DUR: the duration of bank relationships measured by the number of years the both parties are partners,

COST: refers to the cost of credit;

Age: is the age of the firm (date of creation to the date of the collected data),

SIZE: is the size of the firm measured by the natural logarithm of total assets,

MLTPL: is a dummy variable reflecting the multiplicity of relationships, it takes 1 if the company is financed by more than one bank and 0 otherwise,

NBank: is the number of banks financing the company,

RAT: is a dummy variable of credit rationing it takes the value of 1 if the amount of future credit granted is constant or has increased and 0 if the amount of credit decreases.

SECT: is a dummy variable reflecting the sector of activity; it takes the value of 1 if the firm operates in the industry and 2 otherwise.

2. The Results

² Questionnaire was sent to 187 firms, only 100 of them have responded (53.47%). Sectors include manufacturing, service and trade only.

According to the table 1 below, the average return on assets is 2.81% and the average return on equity is 5.13%. Companies built their bank relationships that last 8.97 years on average. The number of bank relationships varies between one and two (1.74). This low number of bank partners is associated with an average of 41.10% of multiple banking. The average age of this sample is 9 years and the average cost of credit for these companies is 8.3% with a minimum of 5.75% and a maximum of 11.8%. The table 2 below illustrates the degree of correlation between the different variables of the study.

Table 1. Descriptives Statistics

Variables	Nbr of obs.	Mean	std. Dev	Minimum	Maximum
Roa	800	0.0281	0.0054	0.0051	0.05
Roe	800	0.0513	0.0081	0.0245	0.075
Dur	800	8.970	4.688	0	26
Mltpl	800	0.411	0.492	0	4
Nbank	800	1.740	1.015	1	1
Size	800	0.965	0.6058	-0.1815	2.185
age	800	9.045	4.671	0	26
Sect	800	0.5875	0.4925	0	1
Rat	800	0.231	0.4218	0	1
Cost	800	0.083	0.0111	0.0575	0.118

This matrix shows that the correlation between different variables is very low³; implying the absence of multicollinearity between different variables of our estimation.

Table 2. The correlation Matrix

	Roa	Roe	Dur	Mltpl	Nbank	Size	Age	Sect	Rat	Cost
Roa	1									
Roe	0.678	1								
Dur	0.028	0.0042	1							
Mltpl	-0.026	-0.0244	0.1013	1						
Nbank	-0.027	-0.0181	0.0612	0.1675	1					
Size	0.487	0.3340	0.0059	0.2531	0.2462	1				
Age	0.031	0.0063	0.3874	0.0877	0.0494	0.0047	1			
Sect	-0.037	-0.0457	0.0488	-0.073	-0.102	-0.177	0.0233	1		
Rat	-0.045	-0.0616	-0.1028	-0.229	-0.213	-0.076	-0.097	0.0019	1	
Cost	-0.025	-0.0221	-0.3919	-0.009	0.0194	0.0432	-0.390	0.0008	0.0242	1

³ Except for Size/ROA and Age/DUR

The results of various tests are provided in the table 3 below. The Chow test is significant; in addition, the Breush Pagan (LM) statistic test and the Hausman test are significant at 1%. According to Hausman test we apply the fixed effects specification for the model.

Table 3. Results of the fixed effect estimation

Explanatory variables	Model 1 (Return on Assets = ROA), (FE)		Model 2 (Return on Equity = ROE), (FE)	
	Coefficients	(z- statistic)	Coefficients	(z- statistic)
Dur	0.0001*** (0.000)	8.12	0.0012*** (0.000)	2.61
Mltpl	-0.0007 (0.244)	-1.17	-0.0003*** (0.000)	-3.26
Nbank	-0.0005* (0.089)	-1.73	-0.0005 (0.425)	-0.80
Size	0.0116 *** (0.000)	33.58	0.0115*** (0.000)	16.50
Age	0.0002*** (0.000)	9.21	0.0008 (0.66)	0.44
Sect	-0.00005 (0.972)	-0.03	-0.0010 (0.725)	-0.35
Rat	-0.0004 (0.268)	-1.11	-0.0006* (0.089)	-.179
Cost	-0.0400 ** (0.025)	-2.25	-0.052 (0.149)	-1.44
R ² w	0.6271		0.2904	
R ² b	0.0505		0.0154	
Fisher Test	12.35***		9.89	
Prob > F	(0.000)		(0.000)	
Hausman	1401.29***		137.05***	
Prob>chi2	(0.000)		(0.000)	
Breusch-Pagan (LM)	91.07***		28.01***	
Prob > chi2	(0.0000)		(0.000)	
Number of observations	800		800	

The results show that the duration, the age and the size have a positive and a significant correlation with the firm's performance indicators (ROA and ROE). The variables NBank and Cost act negatively and significantly while the variables MLTPL, RAT and SECT are negative and not significant.

The Firm's performance⁴ is positively and significantly correlated with the age of the firm at the 1% level. This means that the older the companies are, the more their market share increases and the more their performance get better. The average age of companies in our sample varies between 9 and 10 years. This period allows firms to have more experience in negotiating the credit conditions and strengthen their position in the market. The oldest firms control better the market in which they take place and increase their market share and improve their performance.

The size has a significant and a positive effect on the performance. Broadly, large enterprises are often more efficient than small and medium size enterprises (SMEs). This is due to their position in the market and their ability to give the necessary guarantees in obtaining credit (Mitchell and Rajan 1994). However, this conclusion seems to be in contradiction with our finding since most companies of our sample are SMEs. This leads us to conclude that despite the small size of firms, results indicate a positive and a significant relationship between the firm's size and the performance. Regarding the variables reflecting the sector (SECT) and the credit rationing (RAT), their effects are not significant.

According to the results, only the variable "Cost" affects negatively and significantly the performance of the Tunisian firms. This means that the cost of credit decreases the performance. This negative relationship is justified by the importance of financial charges during the contract. Generally speaking, small companies suffer from high financing costs because of the lack of experience and reputation. Banks do not trust on start-up, they apply a high interest rate which may enhance the cost of credit and consequently decrease the performance of the firms (Degryse and Van Cayseele. 2000). The duration of the bank-enterprise relationship becomes a *sine qua none* condition allowing firms to access to finance at low costs and consequently contributes to increase their welfare.

In conclusion, we can opine that the cost of credit decreases the performance of Tunisian firms while the size, age and duration of banking relationship improve the profitability. These results allow us to accept the hypothesis H₁: the duration of the bank relationship improves the firm's performance.

⁴ In the rest of the paper we will analyze only the ROA as a measure of performance and profitability because it provides more meaningful results.

IV. Conclusion

The lack of extensive theoretical and empirical literature analyzing the duration of the bank lending contract and its effects on the performance of firms motivate us to investigate the nature of this relationship for the Tunisian context. Our sample cover 100 companies observed over the period 2000-2007. We used an econometric model based on panel data with fixed effect regression. Our results showed positive and significant correlation between the duration, the age and the size with the performance of the firms (ROA). The Variables NBANK and COST act in a negative and significant way whereas the effects of variables MLTPL, RAT and SECT are not significant. As for the effects of the duration DUR on the performance of the companies, our results show a positive and a significant correlation. The number of banks exerts a negative and a significant effect on the firm performance (ROA) whereas it has a positive and a non significant consequence if we retain ROE as the measure of financial profitability. The feeble bank relationships⁵ of the Tunisian companies and the orientation towards the exclusive and long term relationship support their performances and improve their profitability. To conclude, we opine that the main benefits of the long term relationship for Tunisian firms are the guaranty of the good conditions of credit in terms of costs and availability and the improvement of their performance.

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⁵ In terms of the average number of bank partnership.

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