

Universal Banking and Credit Risk: Evidence from Tunisia

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ABSTRACT: The aim of this paper is to study the effect of universal banking on the Tunisian banking credit risk. By using a sample of Tunisian banks over the period 1980-2010 and based on the panel data analysis method, results show that the universal banking increases significantly the credit risk. However, the level of competition is positively correlated but not significantly with the dependant variable. For the macro variables, we find that only the GDP exerts a positive and significant effect on the credit risk, but the effect of the inflation variable is not significant.

Keywords: Universal banks; Credit risk; Liquidity; Competition; Panel data; Tunisia

JEL Classifications: E13, G24; G28, N24

1. Introduction

The Tunisian banking sector has undergone many changes and proliferations. This period of rapid growth in the Tunisian banking sector has coincided with major structural changes such as the structural adjustment program, the liberalization of the exchange rate and the reforms of the central bank during the 1992's.

According to Boughrara (2002), the stability-oriented monetary policy is the framework adopted by the Central Bank of Tunisia to achieve the price stability. In addition, Bouri and Ben Hmida (2006) note that financial regulation has evolved considerably, from lending of last resort approach to deposit insurance and activity restrictions. The latest approach in banking regulation is the risk-based regulation.

While the selection of a strategy is of great importance for a central bank, it represents a structure for the filtering and the processing of information. Therefore, banking system is determined by a refined risk model and audited by the supervisors. The reform of 10 July 2001, contributes to not distinguish between deposit, investment and development banks. Currently, there is more talk about the universal bank than those specialized institutions. In Tunisia, this strategy was favored by the law of 10 July 2001 which aims to more restructure the banking sector by the institution of universal banking, the merger and the privatization of banks.

The purpose of this paper is to investigate how the universal banking can affect the banking credit risk in the Tunisian context during the period 1980-2010. Theoretical and empirical researches carry out on the link between universal banking and credit risk are treated in a double and different way. According to Teichova et al., (1994), Benston (1994, p. 121), (Boyd et al. (1998)), Laeven (2002), Boot and Ratnovski (2012), Johnson et al. (2000), White (1986), Vennet (2002), and Rime and Stiroh (2003) universal banking can reduce the credit risk.

Similarly, Boyd (1999), Kanatas and Qi (1998), Boyd et al (1998), Gande et al (1999), Beck et al., (2006), Boyd et al., (2006), De Nicolò and Loukoianova (2007), Matutes and Vives (1996),

Repullo (2004) and Dam and Zendejas-Castillo (2006) support that Universal banking increases the credit risk.

But, research on the Tunisian context affected on this topic remains weak or missing. We are seeing completely theoretical research, which coating to the character of our pioneer research in the field of Tunisia. Also, studies in this context have focused mainly on other aspects of bank performance. For example, Boughrara (2002) and Bouri and ben hmida (2006) have focused their research on the Tunisian banking system. Boughrara (2002) studies the difficulties of implementing a base regime under the financial stability restriction in the Tunisian context. Although, Bouri and Ben Hmida (2006), have study the impact of the capital regulation on the banking behaviors and particularly on the levels of risk taking and capital in the Tunisian context. Our study differs from the other studies, first, we focus solely on the effect of universal banking on the credit risk, and second, we take a representative sample of 9 banks which are considered as the most active in the Tunisian banking system over a more recent period, thus providing more appropriate and recent empirical evidence.

The articulation of this paper is as follows; in the part one, we introduce our paper, the literature review and the hypothesis are given in the second part. The third part treated an overview of the Tunisian banking system. We model and interpret the link between universal bank and credit risk banking in the fourth part. Finally, we conclude the paper in the five part.

2. Universal Banking and Credit Risk: Literature Review and Hypothesis

Universal banking is a combination of commercial banking, investment banking, development banking, insurance and many other financial activities. The concept of Universal Banking or a bank that engages in a broad range of financial service activities began to enter into the banking system in the 1930's and 1940's.

Cheang (2004) state that universal banks, which offer a variety of financial products and services in one house, have experienced growing popularity in some industrialized countries. In this context, banking institutions have assumed an important place in the financial sector, which make many efforts to diversify their products and services.

Many countries have abolished regulations limiting the range of activities in which their banks can engage in recent years. In the United States, the Glass-Steagall Act restricting commercial bank involvement in investment banking was abolished in 1999. The abolition of the separation of commercial and investment banking in the United States and the efforts to industrialize developing countries provided an impetus for empirical inquiries into universal banking.

Teichova, Gourvish and Pogany (1994) have studied the evolution of universal banking in Central and Eastern European countries. Every country has a version of universal banking, but the German banks are the most typical definition of a universal bank. *Germany today and before the Second World War offers the best example of universal banking* (Benston, 1994, p. 121). The need for large scale investment, heavy industry, and economies of scale in late industrializes combined with a lack of credit market resulted in universal banking in Germany.

It should be noted that benefits and costs of universal banking have been mainly analyzed on theatrical ground whereas the empirical literature is much less developed (Boyd et al. (1998)). The advantages and disadvantages of universal banking can influence the situation and the banking behavior. In this paper and after clarifying the concept of universal banking, we will be interested on the relation between these "phenomena" and the credit risk. The literature founded on this topic is ambiguous. There are many researches witch valorize the importance of universal banking on the institution performance (Boot and Ratnovski, 2012; Johnson et al., 2000; Vennet, 2002; and Rime and Stiroh, 2003), whereas there are others which provide that this context increases the risk taking, the credit risk, the fragility and the banking crises (Beck, Demirgüç-Kunt and Levine (2006), Boyd et al., (2006), Loukoianova (2007), Repullo (2004) and Dam and Zendejas-Castillo (2006)).

For Laeven (2002), the supervisory frameworks of a universal banking model can have a positive impact on the current financial situation. In this way, the capital structure, the risk management in universal banking model will increase the confidence into the average investor community (Boot and Ratnovski, 2012). They will also well give the average individual for a better feeling of security because of the ability of universal bank to diversify risk. Consequently, the look into the future of universal banks will continue to play an important role. They possess a number of

advantages over specialized institutions. In other way, Johnson et al., (2000) argue that is one alternative hypothesis, is that banks can use their influence in a firm's governance to promote the banks particular interests.

White (1986) finds that universal banks were not more unstable and risky than other banks during the 1930s. Moreover, Vennet (2002) has provided evidence that in Europe universal banks benefit from higher levels of efficiency relative to specialized banks. By diversifying the activities, the bank can use its existing expertise in one type of financial service in providing other types. So, it entails less cost in performing all the functions by one entity instead of separate bodies. The diversification of the banking activities can reduce the credit risk compared to the specialized banks which concentrate the credit allocation for a most important sector privileged by the financing. With universal banking, the risk of default of one among several customers does not unstable the banking system.

One of the most significant advantages of universal banking is the economies of scale; it results in greater economic efficiency in the form of lower cost, higher output and better products. Rime and Stiroh (2003) observed the prevalence of economies of scale in Swiss universal banks. They suggested the suitability of measuring profit efficiency rather than cost efficiency. The universal banks make it possible to better finance the economy through a strategy of diversification. Once the firm finds the necessary financing for its project, the probability of success increases and the probability of default are reduced. Thus, lenders of today can be depositors of tomorrow. This increases the liquidity and banking solvability. The borrowers try to be well perceived by their bank and it tries to provide the maximum effort which can reduce the credit risk. Following this development founded on the benefit of universal banking we can put this hypothesis: *H₁: Universal banking reduces the credit risk.*

Despite potential for benefits and better performance, universal banking has also many costs and higher levels of risk. The risk taking, the conflict of interest, the information asymmetry, the credit risk and the banking failure remain the most significant disadvantages. In the following development we will try to present the link between all those costs and the concept of universal banking.

Working with a variety of customers, universal banks can not collect all the sufficient information for their borrowers. So the problem of information asymmetry and the conflict of interest increase which can affect the credit decision. In this framework and in absence of a historic bank-firm relationship, banks can accept to finance a «bad» borrower. This decision leads to an increase of the credit risk. To Boyd (1999), Kanatas and Qi (1998) and Boyd et al., (1998) have found that moral hazard; conflicts of interest are the most important issues to be dealt with carefully in practice of universal banking. Gande et al (1999) found that the risk exposures of universal banks generally exceed the risk levels of specialized banks. It may be due to the problems of moral hazard and conflicts of interest (Benzoni and Schenone, 2010). Also, Wilmarth (2009), find that Universal banks have used innovative to provide huge amounts of high risk credit to marginal borrowers in the household and business sectors. In addition, universal banks created massive debt burdens within the financial sector.

In a context of universal banking, the level of competition between banks is being very high. Each bank seeks to attract the maximum of customers by adopting many strategies of competition. We can note the most significant: the price (interest rate), the quantity (amount of credit) and the quality of credit (condition of negotiation). Beck et al., (2006) examine banking data for 69 countries over a 20 year period, and they found that a higher level of competition can lead to a bad decision of credit which increases the probability of default and the banking fragility. Thus, they found that more concentrated national banking systems are subject to a lower probability of systemic banking crisis and hence are more stable. In the same line of idea, Adalet (2002) have studied the vulnerability of universal banks to failures. Based on the data available for 1931, the conclusion of this research is that «illiquidity» increased the probability of failure and universal banking decreased financial stability. In the same line of idea, Chia-Ru et al., (2012) found that universal banking which combined commercial banking and investment banking resulted in economic instability and conflicts of interest.

In a universal context, there is a link between bank competition¹ and the risk taking behavior. Boyd et al., (2006) as well as De Nicoló and Loukoianova (2007) provide empirical evidence of a positive relationship between banking market competition and bank risk-taking. Matutes and Vives (1996), Repullo (2004) and Dam and Zendejas-Castillo (2006) are interested in the risks associated to competition for deposits, banking deregulation and risk taking behaviour of banks. Damjanovic et al., (2012), suggest that the benefits of universal banking are positive but decreasing in the value and volatility of shocks to the quality of financial capital and increases the level of competition between banks which favors the risk taking behaviour.

Banks faced to a high level of competition, a problem of information asymmetry, a risk taking behaviour and more vulnerability and a systemic risk² seemed to support a high level of credit risk. In this intention, we can put the following hypothesis: **H₂: Universal banking increases the credit risk.**

3. The Tunisian Banking System

The Tunisian banking sector has undergone significant structural reforms over the past three decades. Those reforms are carried out in order to have a more dynamic and modern banking system. It should be noted, that the reforms of the Tunisian banking system are induced by the adoption of the structural adjustment program suggested by the International Monetary Fund.

During 1987, the Tunisian banking environment knew a vast program of reform which aimed to facilitate the banking activity. The lifting of credit framing, like the most spectacular form of liberalization was marked by the interest rate liberalization. The credit rate liberalization was completed in 1994. In November 29, 1996, the debtor interest rates were completely liberalized for the whole of the bank credits, including those granted to the priority sectors.

In 1992, the central bank of Tunisia (CBT) launched several reforms aimed to improve the supervision of the banking sector and also to remove a variety of restrictions on participation in the sector and the nature of products and services that could be provided. The control of banking resulted in the institution of prudential's rules of banking reglementation. These rules aim to cover the risks. In the same way, the role of the Central Bank, as an organization of reglementation, is more clearly defined and more restricted.

The privatization of the public banks in 1997 lead to the increase of the level of competition between banks, and financial services were improved drastically especially concerning the modernization of the Tunisian payment system.

The banking reform of 10 July 2001 abolished the distinction between deposit banks and development banks at the profit of the principle of the universal bank. The law of organization of the banking system N° 2001-65 of 10 July 2001 relative to the application of the universal banking principle authorizes the banks to practice all the banking activity. A universal bank is a financial service conglomerate combining retail, wholesale and investment banking services under one roof and reaping synergies between them. The notion is that they would benefit from economies of scale in information technology and access to capital to serve companies and retail customers around the world.

In 2005, the organization of the Tunisian banking sector has known three major events: first the creation of a new bank called "Banks of Financing of Small and medium-sized firms", second, Tunisia knew an experience of acquisition of the "Banque de Sud" (old denomination) which became Attijari Bank. 53.54% of its capital was acquired by Attijariwafa Bank (Morocco) and Grupo Santander (Spain).

In January 2008 and within the framework of the program of restructuration of the banking system there was the privatization of the "Tuniso-Koweitienne Bank" by the transfer of 60% of its capital to the profit of financial company "OCEOR", a subsidiary of the French group "Caisse d'Epargne". Actually, the Tunisian banking system includes 29 banks: 18 universal banks, 8 offshore banks; 2 investment banks and 1 Islamic bank. Among the 29 banks, 11 of them are listed in Tunis

¹ Focarelli et al., (2011) have found that the level of competition with universal banks is higher in comparison with the specialized banks but they find instead very weak evidence consistent with the "conflict of interests" hypothesis.

² For more details, see Saunders and Walter (2012).

Stock Exchange. The table 1 below indicates the annual evolution of the total credit, total customer and the net income for the three state-owned Tunisian banks³.

Table 1. Annual evolution of the total credit, total customer deposit and the net income

Total Customer Credit in MDT					
	2005	2006	2007	2008	2009
STB	3 326 915	3 672 622	3 822 731	4 454 385	4 796 044
BNA	3 123 213	3 335 197	3 881 073	4 543 386	4 357 967
BH	2 563 565	2 857 306	3 067 593	3 449 418	3 611 552
Total customer deposit in MDT					
	2005	2006	2007	2008	2009
STB	2 775 283	3 057 283	3 608 461	4 008 460	4 296 450
BNA	3 066 738	3 298 386	3 630 123	4 191 625	4 395 917
BH	2 023 048	2 329 104	2 443 469	2 657 294	3 255 034
Net banking income in MDT					
	2005	2006	2007	2008	2009
STB	143 637	182 727	206 548	220 070	244 376
BNA	147 937	176 775	191 231	217 650	241 549
BH	123 270	145 260	168 931	187 187	186 507

Source: Tunisian professional association of the banks and the financial establishments

After giving an overview of the Tunisian banking system, we will present in the following development the econometric methodology and the result of regression.

4. Universal Banking and Credit Risk: An Empirical Test

In this section we present the data of our sample and the methodology used in this research. Also, we present the empirical results.

4.1 Data and Methodology

To model the effect of the universal banking on the credit risk, we used a sample of nine banks which are considered the most active in the Tunisian banking system. Based on the panel data method and over the period 1980-2010, we will try to study how the universal banking context can affect the credit risk level. We have choice the panel data method because our sample is made of banks observed on many years. Thus the panel data provides several advantages. It allows us to control for unobserved heterogeneity. Panel data can help us addressing questions of dynamics as discussed in class. It offers obvious statistical advantages. They may help us reduce the problem of collinearity among variables.

We collect the financial and accounting data from the financial statements of each bank which are available in the Tunisian professional association of the banks and the financial establishments. The macro variables are collected from the national institute of statistics (NIS). In this paper, the credit risk can be a function of universal banking, banking activities characteristics and macro factors.

$$CRISK = f \left\{ \begin{array}{l} \text{Universal banking, banking characteristics and macro factors} \end{array} \right\}$$

The model to be tested can be written as following:

$$CRISK_{i,t} = \alpha_0 + \beta_1 UNIVB_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 CAP_{i,t} + \beta_5 OWNS_{i,t} + \beta_6 COMP_{i,t} + \beta_7 GDP + \beta_8 INF + \varepsilon_i$$

Where, *CRISK* is the measure of the banking credit risk. It measured by total credit divided by the total assets. The *UNIV* variable (universal banking) is a dummy variable which take 0 before 2001 and 1 after this year. (*LIQ*) is the variable measuring the bank liquidity. Like measures liquidity, we will use the following ratio: $LIQ = \text{total credit} / \text{total deposit}$. (*SIZE*), the bank size measured by the Neperien logarithm of total assets. (*CAP*), the ratio of capital is defined as the ratio of equity capital to

³ STB : Société Tunisienne des banques, BNA : Banque Nationale Agricole, BH : Banque de l'Habitat.

total assets. (OWNS), the ownership structure a dummy variable that equals 1 if it is the case of State-controlled banks' (Public Ownership) and 0 otherwise (Private and Foreign ownership). (COMP), the bank level competition. Generally, the competition is the inverse function of bank concentration. In this paper, we use a proxy of competition which is presented as follows: $1 / IHH$

For the macro variables, we have introduced two measures which are the most important determinants of the credit risk and the bank performance. It is about, the real growth of GDP per capita and the inflation rate (INF).

4.2 Empirical Results

In this development, we will present the descriptive statistics of our sample, the level of correlation between the variables and the result of regression. Table 2 indicates on the descriptive statistics of the sample.

Table 2. Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Crisk	279	.6134617	.1598738	.3765538	.9543063
Univ	279	.3225806	.4683038	0	1
Liq	279	1.091153	.4005269	.6065989	2.597088
Size	279	14.64043	.5219513	13.62969	15.74801
Cap	279	.0740903	.0319424	.0109848	.1748179
Owens	279	.2166065	.4126778	0	1
Comp	279	1.869769	.1331146	1.660979	2.094911
Gdp	279	.0311573	.0161891	.0165835	.063
Inf	279	.0467097	.0195223	.02	.089

Table 2 shows that the mean of the credit risk (*CRISK*) for Tunisian banks is about 0.6134 with a higher value equal to 0.9543 and 0.3765 like the low value. We can consider that the credit risk is not very volatile with a standard deviation equal to 0.1598.

The mean of the dummy variables is 0.3225 and 0.2166 for (*UNIV*) and (*OWNS*), we conclude that those variables are more volatile than the credit risk with a standard deviation equal to 0.4683 for universal banking and 0.4126 for the ownership structure. The variable of banking liquidity (*LIQ*) has an average value about 1.091 and 2.5970 and 0.6065 like a maximum and minimum value respectively.

For the mean of macro variables, we have 0.0311 for the (*GDP*) variable and 0.0467 for the inflation (*INF*). We can conclude that the volatility of those two variables seems to be identical.

After studying the characteristics of our sample, we will discuss the signs and the correlation between the variable of our study. The correlation matrix, presented in table 3 shows that the level of correlation is very weak except for (*UNIV/CRISK*) and (*LIQ/CRISK*) variables. This finding confirms the absence of multicollinearity problem. Thus, this matrix shows that all the variables of our study are positively correlated with the dependent variable (*CRISK*) except for the (*SIZE*) and (*INF*).

Table 3. Correlation Matrix

	Crisk	Univ	Liq	Size	Cap	Owens	Comp	Gdp	Inf
Crisk	1.0000								
Univ	0.5961	1.0000							
Liq	0.5824	0.3293	1.0000						
Size	-0.0312	-0.0471	0.1128	1.0000					
Cap	0.4476	0.4624	0.2277	-0.1507	1.0000				
Owens	0.0914	-0.0052	0.3118	0.1842	-0.0490	1.0000			
Comp	0.4642	0.6005	0.1514	-0.0241	0.5467	0.0026	1.0000		
Gdp	0.1464	-0.0354	-0.1132	-0.0082	0.0345	-0.0082	0.1209	1.0000	
Inf	-0.2755	-0.4324	-0.0835	0.0147	-0.4565	-0.0020	-0.4964	0.1534	1.0000

The results of regression are presented in table 4. It should be noted that our estimation is random effect. The Hausman test is not significant with a probability of chi2 equal to 1.65 and the test of Breush Pagan is significant with a probability of chi2 equal to 0.0000. For the estimators within and

between, we find that the *R-sq within* is equal to 0.3157 and the *R-sq between* is equal to 0.7136. The table 4 below summarizes the random effect results of regression.

Table 4. Random effect regression: dependent variable is Credit risk (CRISK)

Crisk	Coef.	Std. Err.	z	P> z
Univ	.1110791	.0332703	3.34	0.001***
Liq	.2076278	.0199127	10.43	0.000***
Size	-.0162423	.0098572	-1.65	0.099*
Cap	.0967034	.2182216	0.44	0.658
Owms	.0238867	.0135929	1.76	0.079*
Comp	.1734979	.1238346	1.40	0.161
Gdp	2.060888	.7740476	2.66	0.008***
Inf	-.4878733	.74416	-0.66	0.512
cons	.2353468	.2737818	0.86	0.390
R-sq: within = 0.3157				
 between = 0.7136				
Wald chi2(8) = 193.92				
Prob > chi2 = 0.0000				
Number of obs = 279				

*, *** sig at 10% and 1%

The examination of the table 4 shows that all the variables of the study are positively correlated with the credit risk (CRISK) except for the bank size (SIZE) and the inflation rate (INF). Thus, the effect of all the variables is significant except the inflation rate, the level of competition and the capital ratio.

In this study, the universal banking seems to increase significantly the credit risk for the Tunisian banks. This finding can be explained as follows. In a universal banking environment, banks are faced to the heterogeneity of customer and they are unable to have the sufficient information about all borrowers. Thus, the information asymmetry between bankers and customers is very high. Within a framework of imperfect information, the credit decision is being very difficult and the bank can distribute the credit for the "bad" borrower and refuse to finance the good "borrower". The first situation leads to an *adjustment cost* and a high level of credit risk, and the second situation is followed by an *opportunity cost*. With this finding we can accept the hypothesis **H2: Universal banking increases the credit risk** and rejects the hypothesis **H1: Universal banking reduces the credit risk**.

The banking liquidity (*LIQ*) exerts a positive and significant effect on the credit risk at level of 1%. The liquidity is the most important factors for bank survival especially for the classic intermediation function. Thus, the credit bank is the significant source for firm financing. The problems arise when the bank can not provide the necessary fund for the project extension. So, the firm investment is constrained and the firm activity is restricted. In this situation, the firm is unable to honor the debt payment and the credit risk is increased.

As a significant bank character, the size of bank (*SIZE*) is correlated negatively and significantly with the credit risk. The bank size is measured by the Neperien logarithm of total assets. In our study, the average bank size in our sample is 14.64. All the banks are small and medium size and may be this character obliged banks not to distribute credit without sufficient guarantees and to adopt a strict credit policy. This behaviour and this strategy can reduce the level of credit risk.

The capital ratio (*CAP*), the level of competition (*COMP*) and the inflation rate (*INF*) have no effect on the credit risk. Despite that we are waiting especially for a positive association with the competition variable and the credit risk, the effect of this variable is insignificant.

The GDP per capita as a macro variable comes to increase the credit risk for the Tunisian banks. With a low⁴ or negative GDP, borrowers can not honor the payment of the credit perceived. So the probability of the credit risk increases. Thus, this relation can be explained by the weak macroeconomic policies of the government and the prudent financial policies and regulations.

⁴ The minimum value of GDP is 1.6% and the maximum value is 6.3%. We should be careful for this value because after the Tunisian revolution of the 14 January 2011, the real value of the GDP has a negative level.

In spite of the low number of state-owned banks in our sample (only three banks), the ownership structure (OWNS) increases the credit risk for Tunisian banks. Reminds that those three banks are the most important⁵ in our sample. Thus this positive effect can be explained by a weak control mechanism and by an inefficient supervision.

5. Conclusion

This study investigates the impact of universal Banking on the banking credit risk. An unbalanced panel data set of 9 Tunisian universal banking, covering the period 1980-2010, provided the basis for our econometric analysis.

The results show that the universal banking seems to increase significantly the credit risk for the Tunisian banks providing support to the argument that universal banking increases the credit risk, also support this finding Demirgüç-Kunt and Levine (2006), Boyd et al., (2006) and Loukoianova (2007). The other significant determinants are banking liquidity (*LIQ*) that exerts a positive and significant effect on the credit risk at level of 1%. The impact size of bank (*SIZE*) is correlated negatively and significantly with the credit risk. Specifically, strategy can reduce the level of credit risk. Further, the capital ratio (*CAP*), the level of competition (*COMP*) and the inflation rate (*INF*) have no effect on the credit risk. We find also that the ownership structure (*OWNS*) increases the credit risk for Tunisian banks, according for a weak control mechanism and an inefficient supervision.

As the limit of this paper, we can mention the small size of our sample which covers only nine banks. In fact, this choice is justified by the structure, the architecture of the Tunisian bank system and the dynamic character of those banks. For further researches, we can introduce other Tunisian banks in our sample or we can use a cross country data to have more significant results.

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⁵ The most important in term of credit, deposit and total assets.

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