

*Full length research paper*

# Household indebtedness in Tunisia

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**This paper aims to analyze the development of household indebtedness in Tunisia and its microeconomic determinants. The probit method was used to identify the determinants of household indebtedness with reference to gender. The results show that the Tunisian household indebtedness is in continuous increase and each type of credit is associated with specific determinants. The findings show that only some variables are significant in explaining the differences between the number of credit.**

**Keywords:** household, indebtedness, credit, microeconomic indicators, probit model.

**JEL Classification:** D; D1; D12

## INTRODUCTION

Today's world is characterized by an increasing consumption which has become an outward sign of wealth. The excess in consumption in developed countries is considered as a factor of industrial development and an undeniable instrument of any economic policy.

There is a consensus between economists that the recent developments of technologies contributed to credit facilities and to the increase in the number of operators, namely the lending institutions. The encouragement of consumption could only lead to the individuals' recourse to indebtedness. The theoretical economic framework for consumption, saving and indebtedness decisions are developed within the Life-Cycle theory.

Many researchers focused on studying the determinants of household indebtedness (Friedman, 1957; Hall (1978); Blundell and Gizycki, 1992; Diagne et al., 2000; Hofmann, 2001; Crook, 2001; Magri, 2002; Tudela and Young, 2005; Kirchler et al., 2006; Nieto, 2007; Vandone, 2009). The industrialized countries were the focus of the majority of these researchers' studies. As for developing countries, few studies were conducted. The literature has shown that supply and demand-side of consumer credit is determined by many individual factors (socio-demographic, economic and institutional factors). In recent years, research on behavioural economics has focused instead on the psychological variables influencing the individual's behaviour and explaining the rational choices (Vandone, 2009). Consequently, having raised problems for the individuals and having involved social consequences, debt is a phenomenon that has become a subject of public interest and is

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now in the process of being a social problem.

Today, household indebtedness is an issue that is overtly discussed. Its problematic character at the individual and social levels has increased in some people the desire to understand and in others the need to intervene.

This paper has two objectives. First, it aims at analysing the development of household indebtedness in Tunisia. Second, it seeks to investigate their determinants using a probit model.

Therefore, the current paper is organised as follows: the first section is devoted to the summary of the development of household indebtedness in Tunisia. The second section focuses on the microeconomic determinants of household indebtedness. The last section presents the results of applying the probit model. Finally, a conclusion is made in light with the main findings

### **Household indebtedness in Tunisia**

The end of the Nineties was marked by a remarkable emergence of household indebtedness and the extent of its widespread had never been observed before. In 2010, the total outstanding household indebtedness amounted to 10702 million TD, representing approximately 25% of the total credit to the economy and 16.9% of the household's Gross Domestic Income.

Debt per household increased to approximately 68% between the period 2002 to 2010, while the outstanding loans to individuals / GDP has almost doubled from 9.5% to 16.9%.

This upward trend makes it possible to highlight the phenomenon of indebtedness.

### **Evolution of the Households' outstanding indebtedness**

Household indebtedness pattern showed the preponderance of the outstanding Middle and long-term credits. As Table 1 indicates, these credits decreased from 64.44% in 2002 to 82.23% in 2010 while short-term credits have decreased from 35.56% to 16.57%.

What is also worth pointing out is that the outstanding household indebtedness reached an amount of 10702 million TD in 2010, which

represented 22.16% of the remuneration of wage earners against only 2835 million TD in 2002, that is to say, 25.2% (Table 2, Figure 1).

### **The Major indicators of household indebtedness in Tunisia**

Table 3 below is a record of indicators showing the extent of Tunisian household indebtedness.

Compared with the other countries, the debt of the Tunisian households evolves at a normal pace at the macroeconomic level (26%). Today, the ratio loan/income of the households exceeds 100% in Canada and 90% in the United States.

### **Types of Credit granted to the private individuals in Tunisia**

The major types of credit that the household can be granted are the consumer credit, the housing credit and sales with easy terms. The number of the beneficiaries of credits granted to private individuals (the person who takes out the loan) continues to grow. The statistics published by the Central Bank of Tunisia (CBT) indicate a 50% increase in the number of beneficiaries in 2005 compared to 2002.

Therefore, there exist three types of credits that can be allocated to the private individuals: consumer credits, housing credits and sales with easy terms.

### **Consumer credits**

The consumer credits are the ones granted by professionals, i.e., commercial banks, to people who resort to credits for non professional reasons.

CBT Article 14 bis of decree N° 87-47 defines the consumer credit as being "a contest intended to finance the acquisition by the private individuals of durable consumer goods as well as their current expenses". Two types of consumer credits are distinguished:

### **Credit non-related to a given use:**

It is also called a personal loan. It corresponds to the amount placed at the disposal of a particular

**Table 1:** The Increase of the debt of the households

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total outstanding (MD)	2835	3073	3605	4493	5208	6333	7295	8813	10702
Short-term outstanding credit	1008	982	1340	1926	2236	2543	1987	1828	1902
Middle and long outstanding credit	1827	2091	2265	2569	3065	3790	5308	6985	8800
Middle and long outstanding credit (%)	64,44	68,04	62,83	57,18	58,85	59,85	72,76	79,26	82,23
Short-term outstanding credit (%)	35,56	31,96	37,17	42,87	42,93	40,15	27,24	20,74	17,77
Debt per Household TND	13558,11	14376,8	16429,64	20061,3	23163,13	27186,48	30510,3	35241,46	42160,6
Outstanding credit per gross disposable income	13.5	13.4	14.3	16.7	17.9	19.8	20.7	24.7	27,9
Outstanding credit per GDP	9.5	9.5	10.6	11.9	12.8	14.0	14.6	16.4	16.9

Source: INS (Institut Nationale de Statistiques : National Institute of Statistics, 2010)

customer who has to refund it in a predetermined term, generally in monthly terms, by a standing order. These credits can take several forms or names such as overdraft facilities, overdraft, personal loan, etc.

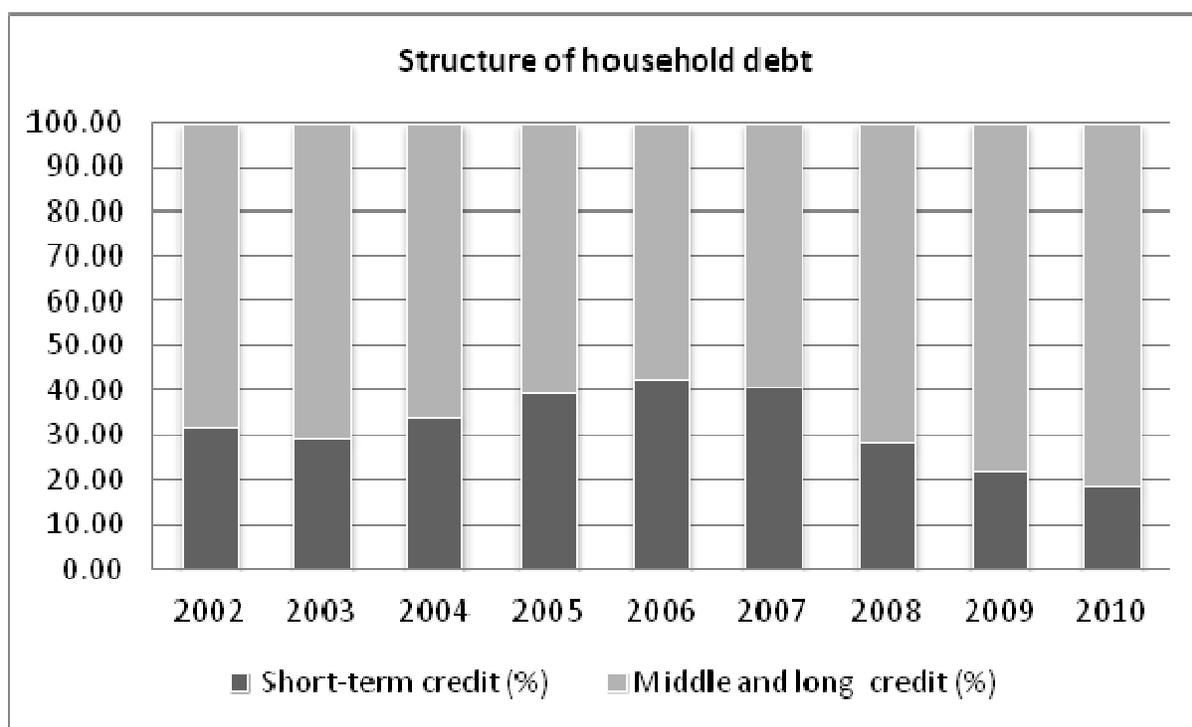
#### **Credit used for the acquisition of a real estate or a service:**

They can be useful for financing a travel or a fitting-out of houses and for the acquisition of house equipment or a car. The consumer credit is thus supposed to play, a priori, a role of social regulator by maintaining and/or reducing social inequalities. According to the statistics of the Central Bank of Tunisia, the consumer credits

underwent an increase from December 2002 (1.008.786.797 MD ) until September 2006 (2.400.371.982 MD).

#### **Property Loans**

Housing is the only patrimonial asset that a household can buy with an overdraft. In Tunisia, the housing credit witnessed an evolution between December 2002 and September 2006. The TCB statistics (2010) showed the increase in all types of credits granted to private individuals. It is noticed that the rate of increase has almost trebled during three years. It was 8.38% in December 2003 and reached 24.64% in December 2005.



**Figure 1:** Structure of household debt

**Table 2:** The Increase of household's debt (Million dinars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Outstanding property loan	1827	2091	2569	2805	3557	4995	6481	8379	9198
Outstanding consumer credit	1008	982	1340	1924	2403	2776	2300	2240	2323
Total household debt	2835	3073	3605	4493	5208	6333	7295	8721	10702
Household debt/payment wage	25.2	25.5	27.6	31.8	32.49	35.18	37.31	41.01	22.16

Source: TCB, social case, INS (2010)

The following (Figure 2) graph represents the increase of the credits granted to the private individuals by the banking system from 2002 to 2010.

The amount of credits granted to the private individuals has increased to nearly 60%. Concerning this type of credit, it is noticed that the property loan is undoubtedly the most requested one although its increase is relatively lower with only 14%. The consumer credit comes next in terms of increase. Besides, detailed information is quasi non-existent. The amount of the students' loans remains minimal.

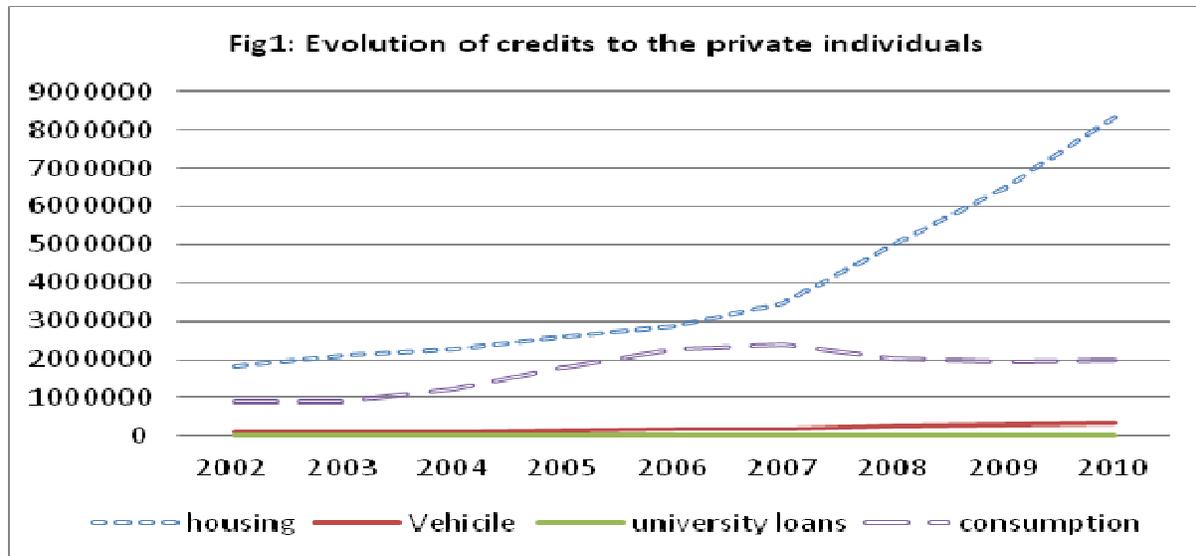
### Sales with easy terms

These are the facilities given to their customers by tradesmen at the time of purchasing consumer goods of domestic use, such as household goods, furniture, construction materials and so on. According to the law n° 58-90, the Central Bank of Tunisia considers these facilities as a credit to the private individuals. In certain countries, these credits are allocated only to financial companies having conventions between the tradesmen and purchasers.

**Table 3:** Indicators of households' debt in Tunisia

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Household debt / national disposable income	9,4	9,46	10,16	11,96	12,8	14,02	14,69	17,56	16,8
Debt of the household / Household Consumption	21,7	21,6	23,2	26,9	18,79	20,75	21,76	24,13	26,95
Nr of profitable of credit / working population	15,3	16,6	18,2	21,2	19,56	20,78	24,15	24,8	
debt of households / Total Population (DT)	289,8	312,3	361,8	447,5	523,99	623,28	711,01	840,98	1014,79
Household debt / working population (DT)	994	1041,3	1258,5	1556,8	1563,18	1859,64	2121,32	2341,07	2797,23
Debt of the Households/ NR of beneficiaries of households debt	6517,2	6284,3	6896,4	7331,2	7991,98	8950,16	8785,21	9377,26	9418,82

Source: TCB (Central Bank of Tunisia, 2010)



**Figure 2:** Evolution of credits to the private individuals (Source TCB, 2010)

### The microeconomic determinants of household indebtedness

The combination of several factors have led to the growth of consumers' debt which has therefore become a primary monetary agent for consumers.

To provide an exhaustive approach of the variables of the household indebtedness is not simple. However, it seems possible to conduct a synthesis, coming up with different categories of microeconomic determinants.

### Income

The variable of income can be studied with reference to Ando and Modigliani's (1963); Guy (2004) model of life cycle as it proves to be useful to study the development of household indebtedness. When the income is lower than average, households will borrow to finance their everyday consumption and will refund when their income increases. Given that the majority of households profit from a rise in their income during their life, their debt will tend to be higher than their income at the beginning of their life cycle, and decrease gradually with age. Consequently, as shown by Crook (2005), household indebtedness is related to income as it has an impact on the amount of debt.

### Age

The second variable of household indebtedness is the age of the head of the family. Several authors show that age has an effect on the amount of debt. This is also justified by Ando and Modigliani's (1963); Guy's (2004) hypotheses of the life cycle of savings. According to this hypothesis, households' borrowing and consumption reflect a stage of the households' life cycle. Also, consumption is a linear function of both liquidities available and the discounted value of the future income. For these authors, the income increases during the years of work but decreases during retirement. The households tend to borrow when they are young, save during their middle ages, and lower their expenditures during retirement. Consequently, the age of the head of household has a significant impact on the total amount of debt and on the different types of debts since, during their life, the consumers have the possibility of being granted several types of credits.

### Family size, property of housing, wealth, profession and the number of dependent children:

According to Brown et al, (2005), the debtors involved in debt are the ones who belong to a lower social class, and who have less chances of being home owners. Crook, (2001); Ana and

young (2005), affirm that the property of housing and the size of the family have on the whole a positive impact on the amount of the households' debt. Bridge and Disney, (2002); Ana and young (2005) found that there is a positive correlation between levels of indebtedness and the profession and the number of dependent children.

### Attitudinal factors

Lea et al., (1993); Livingstone and Lunt, (1992) as well as Berthoud and Kempson (1992), have also found out that the amounts of debt are strongly associated with attitudinal factors, and have informed that positive attitudes to high levels of debt combined with the great availability of the credit were able to create a culture of debt.

Therefore, the literature suggests many factors that can lead to the indebtedness of households in general. In the next empirical section, we will attempt to study the impact of some individual factors on household indebtedness in Tunisia.

## EMPIRICAL STUDY

The probit model aims to identify in probability the factors that distinguish two groups of households: households that obtained one credit and households that obtained two and more credits. To apply the probit method, our study is based on data collected from the Central Bank of Tunisia (TCB) (2010). This is composed of 1062 Tunisian households that obtained various credits. Seven variables (profession, gender, number of credit, type of credit, family size, number of years of repayment, repayment period) are used to identify the characteristics of household indebtedness based on the number of credits (one or two and more).

### The model

In order to identify the key determinants of household indebtedness according to the number of credit, we used the probit model.

The binary variable is noted Y.

$$Y_i = \begin{cases} 1 & \text{if the number of credit is equal to 1} \\ 0 & \text{otherwise} \end{cases}$$

The explanatory model can be expressed as follows:

$$Y_i = \beta X_i + U_i \quad \forall i = 1, \dots, 1062$$

$X_i$ : is the vector of explanatory variables

$\beta$ : The vector of parameters.

$U_i$ : error term is normally distributed with mean zero and variance  $\sigma^2$

The probability:  
 $P_i = \text{Prob}(Y_i = 1/x_i) = F(\beta X_i) \quad \forall i = 1, \dots, 130$

Where F is a distribution function of the standard normal densities evaluated at the probit

So, the probability of granting a single credit:

$Y_i = 1$  is :

$$\text{Prob}(Y_i = 1) = \text{Prob}(U_i > -\beta X_i) = \text{Prob}(U_i < \beta X_i) = F(\beta X_i)$$

Where  $\sigma^2$  standardized to 1.

Thus, the equation can be written as follows:

$$Y = \text{Cst} + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \alpha_4 x_4 + \alpha_5 x_5 + \alpha_6 x_6 \quad (1)$$

With :

$x_1$ : profession,  $x_2$ : gender,  $x_3$ : type of credit,  $x_4$ : family size,  $x_5$ : number of years of repayment,  $x_6$ : repayment period

## RESULTS

In the probit model, the numerical values of the coefficients have no direct significance. To do this, economists are interested in the signs of the coefficients of variables, the reactions of the dependent variable and in the level of explanatory variables, ie the elasticities. The endogenous variable (Y) in our case is probability, the calculation of marginal effects can be calculated as follows:  $p(1-p)\beta_i$ , P is the rate of one credit (see appendix).

Overall, the model is statistically valid. Indeed, the chi-square model (58.179) is significant and McFadden R-squared (0.43) is quite satisfactory. The results of the Probit model are presented in the appendix. Student values in absolute terms ( $z = \text{statistic} = \text{coefficient} / \text{std. Error}$ ) indicate that three variables are significant (profession, gender and type of credit).

These results seem to be coherent with others' results. Indeed, as Vandone (2009) indicates many variables (such as gender, income, etc) influence individuals' spending habits, saving and borrowing choices. Moreover, there is a link between credit demand and housing demand as indicated by Fortin and Leclerc, (2007) and the gender variable can be explained by this link. In Tunisia, men buy houses more than women for some reasons. Firstly, some work suggests that women are more risk-averse in financial decisions than men (Meier et al., 1999; Weber et al., 2002; Kirchlner et al., 2006). Secondly, women usually have lower incomes than men (van Staveren, 2002; Kirchlner et al., 2006). Thirdly, men are often more impatient and may thus be more in favor of credit use compared to saving (Lawrance, 1991). Also, according to Yilmazer and Devany (2005) gender has significant effects on the likelihood of holding debt. Generally, women, being heads of households are less likely to hold mortgage and installment debt than single men as heads of households.

On the other hand, the literature review has shown that income or economic activity is one of the determinants of household indebtedness and as income is closely related to profession, "Demographic and labour market being determinants of household indebtedness are related to profession" (Nieto, 2007).

The type of credit constitutes an explanatory variable because it is related directly to the repayment period. For example, a consumer credit is a credit which is frequently used by households because it is a short term credit which is allocated without guarantee whereas the property loan is a long term credit with a guarantee.

## Conclusion

In this paper, we have attempted to analyse the development of households' indebtedness in Tunisia and its main determinants. The statistical description shows that various credit types granted to households in Tunisia do not cease to increase. This can be explained by several reasons, especially the bad international economic situation (recent financial crisis, increase in oil price, etc). The accelerating of inflation rate, due to this bad international

economic situation, leads household consumers to reduce their purchasing power. The results of the probit model show that households' indebtedness depends on many individual factors. Three variables can explain this difference (profession, gender and type of credit).

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## Appendix

## Codification of variables

Variable	Name of the variable	codification
$X_1$	Profession	1: the professions and senior executive 2: middle manager. 3: employees (other employees. bosses individual commercials. independent individual commercials) 4: workers 5: unemployed 6: personne retired. 7: other inactive
$X_2$	Gender	1: male 2: female
Y	Number of credit	1 : one credit 0 : two or more credit
$X_3$	Type of credit	1: property loan 2: Consumer Credit 3: sales facilities payments 4: credits from companies or individuals employers 5: loans from friends or families
$X_4$	Family size	0: one or tow 1: three or more
$X_5$	Number of years of repayment	1 : one years 2 : tow years 3 : three years 4 : four years 5 : five years 6 : six years 7 : seven years 8 : eight years
$X_6$	Repayment period	1 : one year 2 : tow years 3 : three years 4 : four years 5 : five years 6 : six years

Probit model: Dependent variable : Y = 1 if the number of credit is equal to 1 ; = 0 if non Total sample = 1062

Variable	Coefficient	Std Error	Z-Statistic	Prob	Marginal effect
Constant	0.35188	0.338053	1.040917	0.2979	0.07815874
Profession	0.181547	0.038898	4.667275	0.0000*	0.04032478
Gender	1.071077	0.170520	6.281244	0.0000*	0.23790505
Type of credit	-0.155739	0.053301	-2.921883	0.0035*	-0.03459237
Family size	-0.494762	0.195464	-2.531224	0.0114	-0.10989535
Number of years of repayment	0.169181	0.133587	1.266445	0.2054	0.03757808
Repayment period	-0.213402	0.169890	-1.256121	0.2091	-0.04740034
Mean dependent var	0.666981		S.D. dependent var	0.471516	
S.E. of regression	0.459540		Akaike info criterion	1.230913	
Sum squared resid	222.3690		Schwarz criterion	1.263708	
Log likelihood	-645.3839		Hannan-Quinn criter.	1.243342	
Restr. log likelihood	-674.4737		Avg. log likelihood	-0.608853	
LR statistic (13 df)	58.17958		McFadden R-squared	0.43130	
Probability(LR stat)	1.05E-10				
Obs with Dep=0	353				
Obs with Dep=1	707		Total obs	1060	

\* Significant at 1% ; \*\* Significant at 5% ; \*\*\* Significant at 10% ; P : Mean dependent var =  $707/1060 = 0.666981$