European Journal of Economic and Financial Research
ISSN: 2501-9430
ISSN-L: 2501-9430
Available on-line at: http://www.oapub.org/soc

10.5281/zenodo.221096 Volume 1 | Issue 1 | 2016

LOANS UNDER SCHEME OVERDUE ANNUITIES THROUGH NON-BANK FINANCIAL INSTITUTIONS AND BANK INSTITUTIONS. WHAT'S THE BEST CHOICE?

Ignacio, Ortiz-Betancourt[1Ψ], Arturo, García-Santillán[2], Jesica J., Ramos-Hernández[3], Martha, Zapot-Loissell[4], Luis A., Huitrón Méndez[4], Claudio, Morales López[4]

[1]Professor in Economics' Department
[2]Researcher Professor and Doctoral program in Management Science coordinator
[3]Second year doctoral student in Management Science at UCC Business School
[4]Master in Finance student at UCC Business School
UCC Business School, Universidad Cristóbal Colón, Veracruz, México

Abstract

This paper aims to prove which could be the best financing option for individuals with low incomes seeking sources of funding, depending on their profile and according to the available options in the national financial system, specifically through commercial banks and non-bank financial institutions. For that, we develop scenarios to show the benefits provided in each case, using a payments scheme with overdue annuities. The result shows a better choice to get loan through non-bank financial institutions.

Keywords: overdue annuities, interest rate, compound interest, loans

Introduction

Nowadays, the issue of financial education is discussed in several academic fields and also represents a priority on the global agenda. In recent years, it has increased the interest to know what is happening with people who have access to the financial system. Some authors like García-Santillán (2007); Bernheim and Garrett (2001) Lusardi and Mitchell (2006) have generated information about the financial behavior of people.

The use of financial services among population is related to the demand for loans, savings and investment instruments. Therefore, the importance of providing financial services to the entire population, especially the lower income is recognized

Ψ Correspondence: email ignacio.ortizbetancourt@gmail.com

today. An example of this is the link indicated by the Organization for Economic Co-operation and Development (OECD, 2015) between access to capital and human capital formation.

Thus, self-employed individuals are constantly seeking founds in the popular savings cooperatives, to perform or provide services for productive project. According to Johnson and Rogaly (1997) the knowledge that people have about the real cost of borrowing is very low. The results show that only 42% calculates the sum of interest more capital and the causes for which acquired a loan of this type are, first, low interest, and the speed of funding approval; this, because accessing financing through commercial banks the process usually take longer when the authorization of a loan application from the list of requirements applying, contrary to savings Banks where the requirements are minimal.

In this sense, Beck, Demirguc and Martinez (2007) note that some barriers such as maintaining a minimum balance, fees for account management and rigorous documentation exclude from the formal financial system a large percentage of the population in various countries.

Considering the Mexican context, the study of savings has been approached by Villagomez (2011), who emphasizes its relationship with investment rates and economic growth. Also, Orozco (2008) emphasizes that access to financing is unequally. This fact, adversely affects the low-income population living in areas of low population density. From this growing interest of the Mexican population to access services offered by financial institutions for financing, analysis of this paper aims to serve as a reference in funding decisions that seeks to optimize interest payments. For all this, the question that we make is: In order to get a loan through Non-bank financial institutions and Bank Institutions, what's the best choice?

Methods

To understand the concept of amortization we refer García-Santillán (2014) points who states that the amortization is associated with debt; besides, it refers to the gradual payment made to settle a debt coming generally from a loan or credit. In the business environment, it is common that companies and individuals keep seeking for credit for the acquisition of goods (assets).

To calculate the amount of the installments must use the formula of Present Value of an overdue payment (*Rp*) from the following formula:

$$NPV = Rp\left[\frac{1-\left(1+{}^{i}\!/_{m}\right)^{-{}^{n}\!/_{m}}}{{}^{i}\!/_{m}}\right] \quad (1)$$

To find the value of *Rp*, the value of the debt passes dividing the resulting factor:

$$\frac{1-\left(1+{}^{i}\!/_{m}\right)^{-{}^{n}\!/_{m}}}{{}^{i}\!/_{m}}$$

Now the formula is become to get *Rp*:

$$Rp = \frac{NPV}{\frac{1-\left(1+{}^{i}\!/_{m}\right)^{-{}^{n}\!/_{m}}}{{}^{i}\!/_{m}}} \quad (2)$$

The variables used are:

- NPV: Net present value of debt
- Rp: The regular income to be paid during the term of financing
- i: Nominal interest rate
- m: Capitalization can be weekly, monthly, yearly, etc.
- i / m: is the nominal rate
- n: term of funding

Here are two scenarios in which the amount of regular income to be paid in each period according to the capitalization of the same is determined.

The first hypothetical scenario presented corresponds to the funding request with bi-monthly payments to a financial institution of commercial banks. This scenario suggests applying for a loan for $ 50,000.00 at a nominal rate of 25% within one year. We must determine the amount of the periodic audits to make interest payments to be made during the term of financing monthly payments.

Given the above data, the development is as follows:

$$Rp = \frac{NPV}{\left[\frac{1-\left(1+(\frac{i}{m}*60)\right)^{-{}^{n}\!/_{m}}}{{}^{i}\!/_{m}}\right]} = \frac{\$50,000.00}{\left[\frac{1-\left(1+(\frac{.25}{360}*60)\right)^{-{}^{360}\!/_{60}}}{\frac{.25}{360}*60}\right]} = \frac{\$50,000.00}{\left[\frac{1-(1+(0.04166667))^{-6}}{0.04166667}\right]} =$$

$$Rp = \frac{\$50,000.00}{\left[\frac{1-(1+(0.04166667))^{-6}}{0.04166667}\right]} = \frac{\$50,000.00}{\left[\frac{1-(.7827576)}{0.04166667}\right]} = \frac{\$50,000.00}{\left[\frac{0.21724221}{0.04166667}\right]} = \frac{\$50,000.00}{[5.21381305]}$$

$$Rp = \$9,589.91$$

In order to verify the above calculation, we proceed to perform the following Amortization Schedule (chart 1):

Chart 1: Amortization annuities overdue (Financial Institutions-Commercial bank)

Payment No.	Annuity	Interest payment	Capital	Balance
				$50,000.00
1	9,589.91	2,083.33	7,506.58	42,493.42
2	9,589.91	1,770.56	7,819.35	34,674.07
3	9,589.91	1,444.75	8,145.16	26,528.92
4	9,589.91	1,105.37	8,484.54	18,044.38
5	9,589.91	751.85	8,838.06	9,206.32
6	9,589.91	383.60	9,206.31	00.00
Total	$57,539.46	$7,539.46	$50,000.00	

Source: own

The second hypothetical scenario presented corresponds to the loan application with weekly payments to a savings bank serving. This scenario suggests applying the same amount of scenario one for $ 50,000.00 at a nominal rate of 25% within one year (weekly capitalization period). We must determine the amount of the periodic audits to make interest payments to be made during the term of financing monthly payments.
Given the above data, the development is as follows:

$$Rp = \frac{NPV}{\left[\frac{1-\left(1+(\frac{i}{m}*7)\right)^{-n/m}}{i/m*7}\right]} = \frac{\$50,000.00}{\left[\frac{1-\left(1+(\frac{.25}{360}*7)\right)^{-360/7}}{\frac{.25}{360}*7}\right]} = \frac{\$50,000.00}{\left[\frac{1-\left(1+(0.00486111)\right)^{-51.4285714}}{0.00486111}\right]} =$$

$$Rp = \frac{\$50,000.00}{\left[\frac{1-\left(1.00486111\right)\right)^{-51.4285714}}{0.00486111}\right]} = \frac{\$50,000.00}{\left[\frac{1-\left(.77927263\right)}{0.00486111}\right]} = \frac{\$50,000.00}{\left[\frac{0.22072737}{0.00486111}\right]} = \frac{\$50,000.00}{\left[45.4067738\right]}$$

$$Rp = \$1,101.16$$

In order to verify the above calculation, we proceed to perform the following Amortization Schedule:

Chart 2: Amortization annuities overdue (Non-bank institution)

Payment No.	Annuity	Interest payment	Capital	Balance
0				$50,000.00
1	1,101.16	243.06	858.1	49,141.90
2	1,101.16	238.88	862.28	48,279.62
3	1,101.16	234.69	866.47	47,413.15
4	1,101.16	230.48	870.68	46,542.47
5	1,101.16	226.25	874.91	45,667.56
6	1,101.16	222	879.16	44,788.40
7	1,101.16	217.72	883.44	43,904.96
45	1,101.16	38.96	1,062.20	6,952.65
46	1,101.16	33.8	1,067.36	5,885.28
47	1,101.16	28.61	1,072.55	4,812.73
48	1,101.16	23.4	1,077.76	3,734.97
49	1,101.16	18.16	1,083.00	2,651.96
50	1,101.16	12.89	1,088.27	1,563.69
51	1,101.16	7.6	1,093.56	470.14
52	470.29	0.1	470.28	0
Total	$ 56,629.45	$ 6,629.45	$ 50,000.09	

Source: own

Conclusion

- As a result, performing calculations using the method of annuity due, the following results were obtained:
- The total amount to be paid at the end of the period of financing through commercial banks is $57,539.46; of which $ 50,000.00 corresponds to the principal payment and the remaining $ 7,539.46 is the total interest accrued during 12 months.
- The amount to be paid at the end of the period of financing through Non-bank financial institutions is $ 56,629.45; of which $ 50,000.00 corresponds to the principal payment, and the remaining $ 6,629.45 is the total interest accrued during the 12 months. Therefore, after comparing the results of both financings, we can say that the best option is hiring debt through popular savings box because there is least amount of interest paid. Therefore, should to consider the number of capitalizations when a funding request is carried out. We remember that, the higher number of capitalizations period payments, apparently are lower the payment of interest, which translates into a direct benefit in the personal finance of the population.

References

1. Beck, T., Demirguc, A. & Martinez, M. (2007). Banking Services for Everyone? Barriers to Bank Access and Use around the World. The World Bank Economic Review, Vol. 22, NO. 3, pp. 397–430.

2. Bernheim, B. & Garrett, D. (2001). The effects of financial education in the workplace: evidence from a survey of households. Journal of Public Economics 87(2003) 1487-1519.

3. García-Santillán A**.** (2007) *Sistema financiero mexicano y el mercado de derivados. [Mexican financial system and derivatives markets]* Euromediterranean Network. Universidad de Málaga. España ISBN**:** 13-978-84-690-7143-4 Registro en la Biblioteca Nacional de España: 07/60277. Retrieved from: http://www.mexder.com.mx/wb3/wb/MEX/ligas_interes

4. García-Santillán, A. (2014) *"Matemáticas Financieras para la toma de decisiones"* [Financial Math for making decisions]. Euro-Mediterranean Network. Universidad de Málaga. España ISBN-13:978-84-16036-61-5 Registro en la Biblioteca Nacional de España Nº 2014/60144. Retrieved from: http://www.eumed.net/libros-gratis/2014/1406/index.htm

5. Jhonson, S. & Rogaly, B. (1997) Microfinanciamiento y reducción de la pobreza, Universidad de Colima.

6. Luisardi, A. & Mitchell, O. (2006). Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education Programs. Michigan Retirement Research Center Research Paper No. WP 2006-144. Available at SSRN: http://ssrn.com/abstract=957796 or http://dx.doi.org/10.2139/ssrn.957796

7. OECD (2015). OECD Economic Surveys Mexico. January 2015 Overview. Retrieved from: http://www.oecd.org/eco/surveys/Mexico-Overview-2015.pdf

8. Orozco, R. (2008). Canales alternativos de acceso a servicios financieros. Retrieved from: http://www.banxico.org.mx/publicaciones-y-discursos/publicaciones/seminarios/modernizacion-e-inclusion-financiera-en-america-la/%7B9EA6A714-9D3F-227B-CF8C-C4FA5E0968E5%7D.pdf

9. Villagómez, A. (2011). El ahorro en México. Tintero Económico. Diario el Universal. Retrieved from: http://archivo.eluniversal.com.mx/columnas/88864.html

Appendix

Amortization (overdue annuities)				
Payment no.	**Annuity**	**Interest**	**Capital**	**Balance**
0				50,000.00
1	1,101.16	243.06	858.1	49,141.90
2	1,101.16	238.88	862.28	48,279.62
3	1,101.16	234.69	866.47	47,413.15
4	1,101.16	230.48	870.68	46,542.47
5	1,101.16	226.25	874.91	45,667.56
6	1,101.16	222	879.16	44,788.40
7	1,101.16	217.72	883.44	43,904.96
8	1,101.16	213.43	887.73	43,017.22
9	1,101.16	209.11	892.05	42,125.18
10	1,101.16	204.78	896.38	41,228.79
11	1,101.16	200.42	900.74	40,328.05
12	1,101.16	196.04	905.12	39,422.93
13	1,101.16	191.64	909.52	38,513.41
14	1,101.16	187.22	913.94	37,599.47
15	1,101.16	182.78	918.38	36,681.08
16	1,101.16	178.31	922.85	35,758.23
17	1,101.16	173.82	927.34	34,830.90
18	1,101.16	169.32	931.84	33,899.05
19	1,101.16	164.79	936.37	32,962.68
20	1,101.16	160.24	940.92	32,021.76
21	1,101.16	155.66	945.5	31,076.26
22	1,101.16	151.07	950.09	30,126.16
23	1,101.16	146.45	954.71	29,171.45
24	1,101.16	141.81	959.35	28,212.09
25	1,101.16	137.14	964.02	27,248.08
26	1,101.16	132.46	968.7	26,279.37
27	1,101.16	127.75	973.41	25,305.96
28	1,101.16	123.02	978.14	24,327.81
29	1,101.16	118.26	982.9	23,344.91
30	1,101.16	113.48	987.68	22,357.24
31	1,101.16	108.68	992.48	21,364.76
32	1,101.16	103.86	997.3	20,367.45
33	1,101.16	99.01	1,002.15	19,365.30

34	1,101.16	94.14	1,007.02	18,358.28
35	1,101.16	89.24	1,011.92	17,346.36
36	1,101.16	84.32	1,016.84	16,329.52
37	1,101.16	79.38	1,021.78	15,307.74
38	1,101.16	74.41	1,026.75	14,281.00
39	1,101.16	69.42	1,031.74	13,249.26
40	1,101.16	64.41	1,036.75	12,212.50
41	1,101.16	59.37	1,041.79	11,170.71
42	1,101.16	54.3	1,046.86	10,123.85
43	1,101.16	49.21	1,051.95	9,071.90
44	1,101.16	44.1	1,057.06	8,014.84
45	1,101.16	38.96	1,062.20	6,952.65
46	1,101.16	33.8	1,067.36	5,885.28
47	1,101.16	28.61	1,072.55	4,812.73
48	1,101.16	23.4	1,077.76	3,734.97
49	1,101.16	18.16	1,083.00	2,651.96
50	1,101.16	12.89	1,088.27	1,563.69
51	1,101.16	7.6	1,093.56	470.14
52	470.29	0.1	470.28	0
	$ 56,629.45	$ 6,629.45	$ 50,000.09	