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Financial Management of Credit Sales for Future Services: Cost Estimates for Businesses

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Abstract: The aim of this study is to show a brief analysis on credit sales for future services to protect the financial stability of businesses that offer them. An introductory review on the existing demand of future services is done, some theoretical basis on the concepts of savings funds, investment funds and future services are analyzed in order to understand their differences. Finally, a formula to estimate costs for future services is proposed in order to obtain the approximate costs of the services they are selling today to the moment when they are required in a future date and to make this profitable by using a financial scheme based on ordinary annuities.
Keywords: Cost estimates, interest, future services.

INTRODUCTION

Sometimes people resort to partial payment services in deferred periods, which provide them the freedom to choose whether they will continue or not with the same provider, best-known in the telecommunication Industry as prepaid or *pay as you go* plans [1]. This system offers advantages to the customers because they get more versatility and place the companies in an environment of more competitive conditions to retain the larger amount of clients and customers, as well as improving their QoE (Quality of Experience) through more flexible services, better networks, lower latency on communications and virtual services [2] as this industry does, others offer similar payment options.

Nevertheless, there is another scheme in which the investment is partialized, but it's not used to acquire services in the present, like in the above mentioned example, but to acquire future services and there are many examples of this possible future services such as educational services, traveling, timeshare travel and even funeral services. This scheme is used by some Educational Institutions such as the ITESM (Instituto Tecnológico de Estudios Superiores de Monterrey), the insurer MAPFRE and travel agencies like 'Muchoviaje.com'. In fact, their advertising slogan is as follows:

"Rest reassured that you are securing your children´s future in their education". –ITESM [3].
"Your cheapest holidays just by booking a little bit before thanks to this option for advance sale". -Muchoviaje.com [4].
"With MAPFRE's funeral services plan, we help you in those difficult times" -MAPFRE [5].

Basically, it's all about contracting in the present, paying in dribs and drabs and using the services when the client requires them. From the customer's point of view, it's an attractive option because you can forecast future expenses and save some money on the way. In that regard, PROFECO [6] refers on the document "Educational Services: A savings plan with a specific purpose", that educational insurances work as an ordinary savings fund that provides educational services in periodical payments.

Likewise, in educational services, it is sometimes possible to seize the tuition fee prices of the year in which the contract is signed, particularly if the plan is negotiated directly with the educational institution, or to be reassured that the money is being constantly reinvested if they were contracted in the financial system.

In many cases, parents choose to acquire services in which they pay small fees to assure their children´s education, as mentioned in 2009 by the Ontario Securities Commission (OSC) on a document named *Saving for your child's education*, where it is stated that educational savings plans can be an effective way of saving which offers tax advantages and that it is important to find a plan suiting the customer's needs.

Similarly, when purchasing travel services, it is possible to obtain promotions of advance purchase or low-season prices. In another industry, it is possible to

acquire funeral services in advance for an agreed price and once the payment is settled, it does not matter if the costs of the services (burial, cremation) or the urns, coffins, visitation room rent, among others, increases, because the contract stipulates the services the customer is entitled to and they must be respected.

However, estimating the cost for a business that will provide these services in the future is a difficult task since they must manage the risk involved. Avila [7] states that risk management seeks to reach the objectives of gaining a profit within the business, warranting solvency, stability and efficiency in their operations, as well as to maintain their capital. As a result of this situation, businesses may consider several factors such as the rising costs of the needed resources to provide the contracted services, since there are cases where the exact moment in which the services are needed is not stated on the contract, such as funeral services, which are difficult to foresee or educational services, because the resources needed vary as time goes by and it is important for these business to know the possible costs of these services when the customers requires them so the business can foresee them.

All of the above leads us to the question: How can a business estimate the cost of a future service that it offers?

LITERATURE REVIEW

In order to clarify the object of study that is debated on this document, it is important to distinguish some of the schemes that will be used and also avoid any confusion in their understanding, specially their way of operating. Hence the importance of comprehending the difference between a saving fund, an investment fund and an acquisition of future services. Therefore, in the following paragraphs the theoretical and empirical bases of the discussed variables are analyzed.

Saving Fund

According to Esquivel [8] in an article about Mexican's savings and credit system, it is important to distinguish the people's savings and credit System (*SACP in Spanish*) as part of microfinances because SACP is not part of the Formal Financial System; this causes the formation of several institutions involved in that market niche, which are being incorrectly called microfinance institutions, because as mentioned by Esquivel, their priority is to offer financial services to people with scarce resources, that is to say, they respond to a need of context, whereas the SACP keeps the savings and credit dynamics as the main goal. From the former it is possible to say that savings are understood as designating an amount of money to be put aside periodically and in doing so, the amount increases.

Depending on the time the person saves, he/she will be able to use the total amount of money. In Mexico, savings are regulated by The Law of Savings and Popular Credit, where the first article regulates savings by attracting funds or monetary resources and its placement as loans. Likewise, this law verifies the credits' balances in terms of their development, protects the customers' interests and sets the terms in which the government has a steering role.

This dynamic called savings is beneficial for people on their economy: by saving a person creates a habit which in the end can lead to an amount of money available for immediate use and which can be used to settle his/her liabilities. Depending on the product, saving funds can allow the user to dispose of his/her resources in shorter periods than investment funds and besides, the former poses a much lower risk in comparison as described below.

Investment Fund

According to Gorinstein, [9] an investment fund contains a series of financial products, from titles of property and stocks, to bonds or certificates that an institution builds to be taken advantage of by several investors.

Castañeda [10] finds that these resources are put together with other investors´ resources to use different financial products and thus, the returns are not fixed but are expected to be higher than those in a savings fund since they have a greater risk that can't be anticipated and the variation is constantly calculated, in contrast with a savings fund, where the risk level can be known in advance with a certain degree of certainty. In addition, the cost of administration and professional management of these funds is distributed among the users of these products, which reduces the costs of this concept. Finally, depending on the type of fund, it is possible to sell the fund to the share managers and quickly obtain liquidity. The resources derived from this type of funds can be used for the enterprise or be released for the purpose that the user requires.

Acquisition of Services to the Future

The services offered in this category can be found in several industries, they are contracts between institutions and individuals where there is a description of the future services the contractor is entitled once he/she covers the entire payment. In this type of contract, the user is not saving or investing, but is taking advantage of conditions that could help him/her to face future expenses more easily in the specific institution where he/she is hiring.

In funeral services field, which is an industry that makes use of these plans, they are known as Pre-need services by its nature, and it becomes responsibility of the institution to cover the obligations

of the contracts and decide how or where to invest the resources they receive and the way they're managed; the important thing is that the agreement must be fulfilled according to the things that were previously promised to the customer [11]. The similarity with savings funds is in regard with the periodic contributions, but differs in the fact that there is a specific purpose, which is difficult to modify.

The purchase of a contract for a future service must be objective, both by the service providers and those who are acquiring them; financially the provider must carry out the analysis so that the service provided has a profit, because Sussman & Alter [12] say that people regularly are inaccurate when estimating and their predictions become optimistic. However, companies dedicated to these services must forecast the financial risk by projecting, since, as HSBC [13] mentions, the tendency to increase costs in education, for example is always continuous; they also point out that in Indonesia the cost of education will increase around 15% every year, in the United States university rates have been rising continuously since 2010 and in England, fees have risen and the British inflation rate has increased. Therefore, the increase of costs must be considered in order to successfully conclude the commitment made by these future service providers.

However, from the point of view of a business that has made the necessary calculations for their sales in the present time and seeking to obtain a profit margin, it is very useful to know the National Price Index for Producers (INPP) which according to INEGI [14] is a tool intended to measure changes in the prices of a fixed representative mixture of the country's production, that is, the variation of the cost of production for businesses.

Something remarkable is that this index is divided into Primary sectors (such as agriculture and marine exploitation), Secondary (as the generation and distribution of electricity) and Tertiary (such as education and transport services). This is very useful because instead of using an index that groups all industries, the statistics provide us with segmentation tools that will give us a more realistic scenario regarding the industry that will be evaluated if we take into account that there are sectors such as mass media outlets that have reduced their production price index by an average of 3.2% per year from June 2012 to June 2017, indicating a clear deflation while in the plastics and rubber industries there is a an increase of 5.15% per year during the same period according to the indicators presented by INEGI [14].

In this scenario it is possible to state that these two industries are not comparable and that the segmentation by industry is more precise due to the great existing differences between them and surely proceeding in this way is much more useful than using the National Index of Consumer Prices (INPC) because it uses a group of values oriented to the purchasers of the products that might not be related to the industry which will be analyzed. Despite this, there is an interesting causal relationship between National Producer Price Index (INPP) and INPC, according to what Banxico [15] concludes, stating that the INPP can be useful projecting values over 8 months, with the condition that both indexes appear in the forecast equation.

DEVELOPMENT OF THE FORMULA

Using credit in your favor

When a company sells a service for the future, in many cases it does not receive the payment on a single exhibition, but rather it is financed by the company by deferring it in months or years according to the agreement signed on the contract, the one that according to the interest rate and the capitalizations can be a great help to make that in a future the company complies with the agreement. Considering the former, the company will receive payments aimed to be invested properly until the date of exercise of the contract arrives and thus, it will be very useful to make use of the formula about Ordinary Annuities or Periodic Revenues 'Rp' presented by García-Santillán [16], in which the Net Present Value (PNV), the number of periods, the interest rate and the capitalizations are considered to know the payment that must be done.

$$Pr = \frac{PNV}{\frac{1-(1+i/m)^{-n}}{i/m}}$$

To use INPP as a tool for estimating the cost of the service to the future, we propose using the historical annual average from a series of years that can be used as basis to calculate the expected cost increase. As an example, the formula for the calculation of inflation rate by Blanco-Sánchez and Aznar [17] will be used, where TDI is the annual inflation rate and the INPPe represents the National producer price index according to the sub index period.

$$TDI_{2013.06} = \frac{INPPe_{2013.06} - INPPe_{2012.06}}{INPPe_{2012.06}} x100$$

It is worth mentioning that this calculation is suggested as a way to address a reality in the future, works better in countries with low variable inflation rates and needs to be subject to further analysis in order to ensure its effectiveness.

Once we get the average of the variations from the formula, it is necessary to know the actual estimated cost of the service that we want to prospect. It shouldn't be confused with the price that will be offered to the public in general, since it is the estimated cost that is necessary to fulfill the contractual commitment. According this information, the formula shown by García-Santillán [16] is used and therefore, it is possible to obtain the future value (FV) or Amount (A) regarding the agreed period with a simple interest of the Current Value (CV) and there can be deadlines of 6, 12, 18 years depending on the agreement and industry you study.

$$FV = CV + (1 + in)$$

DEVELOPMENT OF A HYPOTHETICAL CASE

Suppose that a prestigious college such as Universidad Cristóbal Colón launches an education investment plan program in which a parent / guardian could pay in 6 years for his / her 6-year-old and use it 12 years later when he / she is 18 years old. This plan would be paid at the current price they offer ($450,000.00), which is the approximate total cost of the architecture program in 2017 with all the semesters included. As payments would be made in 6 years, through monthly payments, a rate of 5.5% per year would be applied, to encourage people to make their payments in shorter periods. When the child is 12 years old will already have covered his/her studies, the company still has 6 years of inflation to face, years elapsed between the final date of the last payment and the year number 18 of the representative / child. In this case, the estimated cost for the University to comply with what it is offered at the time of signing the contract is $ 305,000.00, so it expects to keep as much profit as possible.

Which would be the annuity corresponding to this term? Which would be the possible 12-year future costs of educational services for the company?

The services in this example would be paid within 6 years, so annuities or periodic Revenue would be paid during that time with a previously mentioned rate of 5.5% per year with a monthly capitalization that would help us recover the return margin, so the following formula is used:

$$Pr = \frac{PNV}{\frac{1-(1+i/m)^{-n}}{i/m}} \quad Pr = \frac{\$450,000.00}{\frac{1-(1+0.055/12)^{-72}}{0.055/12}} \quad Pr = \frac{\$450,000.00}{\frac{1-(1+0.0045833)^{-72}}{0.004583333}}$$

$$Pr = \frac{\$450,000.00}{\frac{1-0.719465968}{0.004583333}} \quad Pr = \frac{\$450,000.00}{61.20742509} \quad Pr = \$7,352.05$$

The result is the following amortization system.

Table-1: Amortization Table

Payment	Annuity	Interest	Capital	Balance
0				**450,000.00**
1	7,352.05	2,062.50	5,289.55	444,710.45
2	7,352.05	2,038.26	5,313.79	439,396.66
3	7,352.05	2,013.90	5,338.15	434,058.51
4	7,352.05	1,989.43	5,362.61	428,695.90
5	7,352.05	1,964.86	5,387.19	423,308.70
6	7,352.05	1,940.16	5,411.88	417,896.82
7	7,352.05	1,915.36	5,436.69	412,460.13
8	7,352.05	1,890.44	5,461.61	406,998.52
9	7,352.05	1,865.41	5,486.64	401,511.88
10	7,352.05	1,840.26	5,511.79	396,000.10
11	7,352.05	1,815.00	5,537.05	390,463.05
12	7,352.05	1,789.62	5,562.43	384,900.62
13	7,352.05	1,764.13	5,587.92	379,312.70
14	7,352.05	1,738.52	5,613.53	373,699.17
15	7,352.05	1,712.79	5,639.26	368,059.91
16	7,352.05	1,686.94	5,665.11	362,394.80
17	7,352.05	1,660.98	5,691.07	356,703.73
18	7,352.05	1,634.89	5,717.16	350,986.57
19	7,352.05	1,608.69	5,743.36	345,243.21
20	7,352.05	1,582.36	5,769.68	339,473.52
21	7,352.05	1,555.92	5,796.13	333,677.39
22	7,352.05	1,529.35	5,822.69	327,854.70
23	7,352.05	1,502.67	5,849.38	322,005.32
24	7,352.05	1,475.86	5,876.19	316,129.13
25	7,352.05	1,448.93	5,903.12	310,226.00
26	7,352.05	1,421.87	5,930.18	304,295.82
27	7,352.05	1,394.69	5,957.36	298,338.46
28	7,352.05	1,367.38	5,984.66	292,353.80
29	7,352.05	1,339.95	6,012.09	286,341.70
30	7,352.05	1,312.40	6,039.65	280,302.05
31	7,352.05	1,284.72	6,067.33	274,234.72
32	7,352.05	1,256.91	6,095.14	268,139.58
33	7,352.05	1,228.97	6,123.08	262,016.51
34	7,352.05	1,200.91	6,151.14	255,865.37
35	7,352.05	1,172.72	6,179.33	249,686.03
36	7,352.05	1,144.39	6,207.65	243,478.38
37	7,352.05	1,115.94	6,236.11	237,242.27
38	7,352.05	1,087.36	6,264.69	230,977.58
39	7,352.05	1,058.65	6,293.40	224,684.18
40	7,352.05	1,029.80	6,322.25	218,361.93
41	7,352.05	1,000.83	6,351.22	212,010.71
42	7,352.05	971.72	6,380.33	205,630.38
43	7,352.05	942.47	6,409.58	199,220.80
44	7,352.05	913.10	6,438.95	192,781.85
45	7,352.05	883.58	6,468.47	186,313.38
46	7,352.05	853.94	6,498.11	179,815.27
47	7,352.05	824.15	6,527.90	173,287.37
48	7,352.05	794.23	6,557.82	166,729.56
49	7,352.05	764.18	6,587.87	160,141.68
50	7,352.05	733.98	6,618.07	153,523.62
51	7,352.05	703.65	6,648.40	146,875.22
52	7,352.05	673.18	6,678.87	140,196.35
53	7,352.05	642.57	6,709.48	133,486.86

54	7,352.05	611.81	6,740.23	126,746.63
55	7,352.05	580.92	6,771.13	119,975.50
56	7,352.05	549.89	6,802.16	113,173.34
57	7,352.05	518.71	6,833.34	106,340.00
58	7,352.05	487.39	6,864.66	99,475.35
59	7,352.05	455.93	6,896.12	92,579.23
60	7,352.05	424.32	6,927.73	85,651.50
61	7,352.05	392.57	6,959.48	78,692.02
62	7,352.05	360.67	6,991.38	71,700.64
63	7,352.05	328.63	7,023.42	64,677.22
64	7,352.05	296.44	7,055.61	57,621.61
65	7,352.05	264.10	7,087.95	50,533.66
66	7,352.05	231.61	7,120.44	43,413.22
67	7,352.05	198.98	7,153.07	36,260.15
68	7,352.05	166.19	7,185.86	29,074.29
69	7,352.05	133.26	7,218.79	21,855.50
70	7,352.05	100.17	7,251.88	14,603.62
71	7,352.05	66.93	7,285.12	7,318.51
72	7,352.05	33.54	7,318.51	0.00

Thus, if the parent / guardian / mother pays $ 7,352.05 for 72 months, upon making his / her last payment he / she will have paid a total of $ 529,347.54, which can be compared with an estimated future cost using the formula:

$$TDI_{2017.06} = \frac{INPPe_{2017.06} - INPPe_{2016.06}}{INPPe_{2016.06}} x100$$

INPPe = Tertiary activities, 61 Educational services. Average of variation in the index National Producer Price

$$TDI_{2017.06} = \frac{124.080518 - 118.8395037}{118.8395037} x100 = 4.41\%$$

$$TDI_{2016.06} = \frac{118.8395037 - 114.0023094}{114.0023094} x100 = 4.24\%$$

$$TDI_{2015.06} = \frac{114.0023095 - 109.1944273}{109.1944273} x100 = 4.40\%$$

$$TDI_{2014.06} = \frac{109.1944273 - 104.4972958}{104.4972958} x100 = 4.50\%$$

$$TDI_{2013.06} = \frac{104.4972959 - 100}{100} x100 = 4.50\%$$

$$TDI_{2013.06} = \frac{104.4972959 - 100}{100} x100 = 4.50\%$$

With this, the result of an average inter-annual rate of inflation is 4.41%, which we will use as reference for further calculations.

If we estimate that our costs at the time of the contract will be $ 305,000.00 and we want to know the effect of this type of inflation, it might be useful to use the future value formula as follows:

$$FV = CV + (1 + in)$$
$$FV = \$305,000.00 * (1 + (.041)(144/12))$$
$$FV = \$305,000.00 * (1 + (.041)(12))$$
$$FV = \$305,000.00 * (1 + (0.492))$$
$$FV = \$305,000.00 * (1.492)$$

$$FV = \$455,060.00$$

The former would be our possible cost within 12 years, taking into account that this effect is caused by the variation of the purchasing power of money over time.

To know the effect that this increase would have on the costs during 12 years, a calculation is made considering the actual budgeted cost. However, considering that the price offered to the public covering the expenses is $ 450,000.00 and it was found that the possible future cost is $ 5,060.00 higher, which would not only represent a total loss of the profit margin, but a loss in general economic terms. Nonetheless, helped by the periodic rent payments for 6 years made by the client, we got a total of $ 529,347.54 which means that if our cost 6 years after the last payment is $ 455,060.00 we still have $ 74,287.54, which is a smaller margin than the $145,000 that would be obtained by giving the service in the moment, but is still a considerable amount and it has been insured to cover the cost of the future event.

CONCLUSIONS

As a result of these analyzes and estimates, we conclude that through financing, a business could recover part of the profit margin that would otherwise be diminished by the loss of purchasing power over the time, especially over long periods, and if businesses want to maximize income and increase the use of these types of plans it might be convenient to acquire financial assets or products with low risk or at least close to the estimated increase in production costs, a very common practice in the funeral industry, as stated by Gilson [11]. Another possible option for companies that offer these services is to negotiate with suppliers to keep costs with only slight variations or to use the expected profit to acquire assets that reduce the possible future costs, such as infrastructure, furniture and stable staff that help them not to outsource services as much as possible.

Likewise, a formula was presented to project future costs, which works as an estimation and it could help companies decide if the prices they offer are feasible to obtain profits. On the other hand, this document aims to inform the consumer on how these services work in the future, because there are conditions to affirm that these services represent a win-win relationship between the businesses and the consumer, who does obtain services at lower prices because they are contracting these schemes beforehand and they can also settle the debt over the time.

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