

## Determination of financial capital with aperiodicity Fractal

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In this article the development of financial variables as Fixed Capital, Cost and Margin with Lagrange, Finite condicionada and Koch models applied to the company Bachoco, to determine if it is profitable is presented. Based on the Lagrange matrix of the Mexican stock exchange in the month of April, it was gradually working in each of the models. When performing the calculation steps allowed us to observe the share price and thus have a prediction of the amount of the gain according to the expected values according to the modeling. projections were made , which provide you visualize the behavior and calculation of profit. To conclude a comparison was made between the 3 prediction models, identifying the scope, cost and fixed capital that each one presents. It was determined which could be profitable for the company.

**Fractal, production, holding, shares, stock.**

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## Introduction

The company was founded in 1952 in the State of Sonora, Mexico, and is officially incorporated as Industrias Bachoco, S.A.B. de C.V., on April 17, 1980, for an indefinite period. The Company is commercially known as Bachoco. In 1963, the Company began operations in the cities of Navojoa, Los Mochis and Culiacan, and in 1971 in Culiacan. In 1974, the productive operation was established in Celaya, later in 1993 the company moved its corporate city of Celaya, and opened a new operation in the city of Tecamachalco, south of Mexico. In 1994, I continue the growth of the Company, this time with a production complex in the city of Lagos de Moreno in Jalisco, totaling up to that point with four integrated manufacturing operations, the Company purchased the assets and equipment of MACSA, S.A. de C.V., which led the Company to the opening of 3 distribution centers in the state of Baja California Sur. Bachoco Group has no financial activity in Mexico in the field of food production sector is distributed with meat and derivatives with economic activity, the sector of Bachoco is frequently consumed products.

Its main products are processed chicken, egg and pork. The economic activity pure holding shares through its subsidiaries production processing and marketing of chicken, egg production and marketing, production and sale of pork. Total Shares representing the share capital of the Company: 600'000,000 Total shares outstanding at the end of the reporting period: 600'000,000. The Company has authorized Trust Certificates Program for an amount of \$ 5,000,000,000. under authorization of the National Banking Commission. We determine the Fixed Capital, Margin and Cost.

The fixed capital is defined as all assets of the companies in which said materialize in installations or, put another way is part of the capital that is invested in goods or services that will be linked permanently, such as machinery, office furniture Etc. The original model of fixed capital is structured as follows:

$$CF = \left[ \frac{AC}{PPP} \right]^{\pi-1} \quad (1)$$

CF is defined as variable and fixed capital will not be useful to verify the profitability of the company to analyze, in this case Bachoco, S.A. de C.V. It is essential to mention each of the variables in order to understand the analysis. Then exemplified with information collected on April 16, 2016, it is important to mention this because none of our variables is fixed, the timing of change in the value of these variables is impossible to define. The variables obtained have the following values: AC: 600,000,000, PPP: 76.45 and Inflación: 2.75, substituting in the model:

$$CF = \left[ \frac{600,000,000}{76.45} \right]^{2.6-1} [7848266.84]^{1.6} = 1.07 \quad (2)$$

The final value is the fixed capital of Bachoco, S.A. de C.V. with the date information provided. Having made the proper breakdown of the original model Lagrangian apply a transformation, this method uses the differential calculus, and is used for converting large numbers in small numbers, this can be and optimization purposes or cost reduction. The model is defined with the following mathematical model:

$$CF = \frac{\log AC (\ln PPP)}{\pi-1} \quad (3)$$

Similarly, the relationship with the information obtained on the date given above is exemplified. Substituting in the model:

$$CF = \frac{(\log(600,000,000))(\ln 76.45)}{2.6-1} = 23.73 \quad (4)$$

This transformation is made from Lagrangian model, focused on the oscillations of closing prices, it is a tool that uses differential calculus to carry out the transformation of the previous financial profile.

$$CF = \frac{\lim AC \left(\frac{d}{d_1} PPP\right)}{\pi-1} \quad (5)$$

Exemplified same manner as the above. Substituting in the model:

$$CF = \frac{((0.68)(600,000,000))((0.5)(76.45))}{2.6-1} = 9687.5 \quad (6)$$

Relying on the lagrange profile of our model of fixed capital, we apply this methodology in order to complete the analysis of the profitability of the company, the model developed by this method is as follows:

$$CF = \frac{\frac{1}{2} AC \left(\frac{3}{4} PPP\right)}{\pi-1} \quad (7)$$

Exemplified with the information obtained from the relevant date. Substituting in the model:

$$CF = \frac{((0.5)(600,000,000))((0.75)(76.45))}{2.6-1} = 1.06 \quad (8)$$

The margin or net interest margin in this case is a difference between the yields obtained from the company through the various financial products and the costs generated by external resources. The original model that defines the variable margin is comprised of:

$$Mg = LP[AC] \frac{TC-Ti}{\frac{3}{4}} \quad (9)$$

Where again we see within its structure to the outstanding shares, but it is important to mention the other variables in order to make comprehensible the model. *i)LP*: The long term is one of the variables to manage in this analysis indicates no more than a periodicity which has a value of 1 year or 12 months. *ii)TC*: Refers to the exchange rate in our case corresponding to dollars, and the information is equally available on the official website of BANXICO. *iii)IT*: The interest rate is the payment stipulated above an amount paid, this information like the TC is available in BANXICO, it is important for the model, select the target rate which is directly related to the country of our company to be treated. Exemplified with the information collected: *TC: 17.55, IT: 3.75 and LP meses*

Substituting in the model:

$$Mg = 12[600,000,000] \frac{17.55-3.75}{0.75} = 12[1.46E110] = 1.75 \quad (10)$$

Applying the transformation to the original model profile is as follows:

$$Mg = \frac{\log LP[\ln AC]}{\frac{TC-Ti}{\frac{3}{4}}} \quad (11)$$

Substituting in the model:

$$Mg = \frac{\log 12[\ln 600,000,000]}{\left(\frac{17.55-3.75}{0.75}\right)} = 1.17 \quad (12)$$

Applying the transformation to model Finite profile is as follows:

$$Mg = \frac{\lim LP\left[\frac{d}{d_1} AC\right]}{\frac{TC-Ti}{\frac{3}{4}}} \quad (13)$$

Exemplifying the data obtained.

Substituting in the model:

$$Mg = \frac{((0.68)(12))[(0.5)(600,000,000)]}{\left(\frac{17.55-3.75}{0.75}\right)} = 133043478.3 \quad (14)$$

Applying the transformation to model Finite profile is as follows:

$$Mg = \frac{\frac{1}{2}LP\left[\frac{3}{4}AC\right]}{\frac{\partial}{\partial Ii}} \tag{15}$$

Exemplifying the data obtained. Substituting in the model:

$$Mg = \frac{((0.5)(12))[(0.75)(600,000,000)]}{\left(\frac{17.55-3.75}{0.25}\right)} = 48913043.47 \tag{16}$$

We can understand the meaning of this variable as the monetary value of resources that should provide a good or a service, but not always, the elements to determine the costs are variants depending on the company to analyze. Here the original cost profile is defined to carry out the analysis, which has the following form:

$$CT = CP[AC] \left(\frac{TC}{Ti}\right)^{\frac{1}{2}} \tag{17}$$

Exemplified with the same information excluding the long-term is not in this profile yet more if we have the CP which is defined as the short-term and indicates a period of time you have an overall value of 6 months. The values of the variables are as follows: CP: 6 ,AC: 600,000,000 ,TC: 17.55 and Ti: 3.75 substituting in the model:

$$CT = 6[600,000,000] \left(\frac{17.55}{3.75}\right)^{0.5} = 6[9.13E18] = 5478 \tag{18}$$

Applying the transformation to the original model profile is as follows:

$$CT = \left[\frac{\log CP[\ln AC]}{\frac{TC}{Ti}}\right]^{\frac{1}{2}} \tag{19}$$

Exemplified same manner as the above. Substituting in the model:

$$CT = \left[\frac{\log 6[\ln 600,000,000]}{\left(\frac{17.55}{3.75}\right)}\right] = [3.32]^{0.5} = 1.82 \tag{20}$$

Applying the transformation to model Finite profile is as follows:

$$CT = \left[\frac{\lim CP\left[\frac{d}{d_1}AC\right]}{\frac{TC}{Ti}}\right]^{\frac{1}{2}} \tag{21}$$

Exemplified same manner as the above. Substituting in the model:

$$CT = \left[\frac{((0.68)(6))[(0.5)(600,000,000)]}{\left(\frac{17.55}{3.75}\right)}\right]^{0.5} = 16172.15 \tag{22}$$

Applying the transformation to model Finite profile is as follows:

$$CT = \left[\frac{\frac{1}{2}CP\left[\frac{3}{4}AC\right]}{\frac{TC}{Ti}}\right]^{\frac{\partial}{\partial I}} \tag{23}$$

Exemplified same manner as the above. Substituting in the model:

$$CT = \left[\frac{((0.5)(6))[(0.75)(600,000,000)]}{\left(\frac{17.55}{3.75}\right)}\right]^{0.75} = 2213430.73 \tag{24}$$

After removing all the results will have to make a sum total of Proposals Finite Formulas, Lema Itto and Koch

$$\sum 0 = 23.73 + 1.17 + 1.82 = 26.72 \tag{25}$$

$$\sum 1 = 9687.5E6 + 133043478.3 + 13172.15 = 9820559650 \tag{26}$$

$$\sum 2 = 1.06E10 + 48913043.47 + 2213430.73 = 1.06 \tag{27}$$

With the proposed formulas with their results will have to make a sum of each of the summations

$$\Sigma = 26.72 + 9820559650 + 1.06E10 = 2.04 \quad (28)$$

Then divided by 3 to get if you have performance or has lost in the bag with the result obtained earlier mind:

$$\Sigma = \frac{2.04e10}{3} = 6,800,000,000 \quad (29)$$

If it happens that if the result is large should use the log to be reduced and clearly appreciates what it takes see below

$$\Sigma = \log(6,800,000,000) = 9.88 \quad (30)$$

### Conclusions

With this result it will be appreciated having lost in the bag as it only covers 9.88% in Mexico to cover the market selling fresh chicken and derivatives thereof, and is very reasonable, since in all the Mexican Republic is one food that is essential in the diet of Mexicans therefore is not only Bachoco which sells this product but also in supermarkets, shops selling cold meats and markets, leading to have that percentage, but that does not implies that this evil because as sells also has hatcheries causing you to have control of what is generating and not as in other places only buy the product and then sell it without knowing whether it is good or have a good quality control but still and it has a low percentage loss generating it rather than have a promising performance.

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**OPTIMIZATION**

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