Currency exposure coverage of ICA S.A.B. of C.V. using Fractal methodology

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The present anylisis was made in order to obtain the basis of the financial performance and the risk level of Empresas ICA S.A.B. of C.V. due to the importance of the enterprise in the Mexican economy, based on financial models and data given by the Mexican Stock Exchange, the Bank of Mexico and Bloomberg.Empresas ICA is a company that offers engineering, construction services and infrastructure development based in Mexico founded in 1947 and subsequently extended in Latin America, USA, Europe and Asia.ICA is involved in projects such as the construction of highways, airports, office buildings, shopping centers, manufacturing facilities and housing projects. Also operates water distribution and treatment systems, highways, mines aggregates, ports and parking facilities. Between 2012 and 2015 the value of capitalization of ICA was reduced by 69% since it is in financial trouble, adding a net 46 billion pesos of debt; as a result of this impact has focused on selling their assets to improve its liquidity, looking to generate 40 billion pesos.

Coverage, Exposure, Currency, Engineering, Construction.

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Introduction

The international medium of exchange in a currency other than domestic, it is trough the foreing exchange market that is the purchase and sale of different national currencies, it is function is to transfer the purchasing power of de currency of a country to another. To determine the currency have the following financial model:

$$D = \left[\frac{\log Dd}{\ln Di}\right]^{1/2} + \pi \qquad (1)$$

Where D stands for “Currency” is the result sougth, log Dd is the logarithm of direct currency, Dd lim is the limit of direct currency, ln is the natural Di indirect currency, ½ is long-term call brauniano, ¾ is put gold short-term average, with ∂/∂I antilog 0.25 value of orden “n”, d/dI is differential order “n”, and π in inflation.

Realizing the clearance of our base formula taking the Lagrange model has the following formula.

$$D = \left[\frac{\log Dd\ (\ln Di)}{\pi}\right]^{1/2} \qquad (2)$$

Performing always clear formula based on the model Lagrange model lim is obtained.

$$D = \left[\frac{\lim Dd\ (\text{ə}1\, Di)}{\pi}\right]^{1/2} \qquad (3)$$

Performing always clear formula based on the model Lagrange model Koch Principe is obtained.

$$D = \left[\frac{½\, Dd[\ ½\frac{d}{dI} + ¾\left(\frac{d}{dII}\right)]Di}{\pi}\right]^{0.25\ \partial/\partial I} \qquad (4)$$

Start with the first part substitute values into the model:

$$D = \left[\frac{\log 0.0576\ (\ln 17.3993)}{2.6}\right]^{1/2} = 0.7159 \qquad (5)$$

$$D = \left[\frac{((0.618)\ 0.0576)\ ((0.75)\ 17.3395)}{2.6}\right]^{\frac{1}{2}} = 0.42195 \qquad (6)$$

$$D = \left[\frac{½\ 0.0576[\ ½(0.5) + ¾\ (1)]Di}{2.6}\right]^{0.25\ (0.5)} = 0.8136 \qquad (7)$$

$\Sigma D = 1.95$
$D_{Average} = 0.65$

Exposure

Exposure to currency risk arises in all kinds of both domestic and foreign companies. Both assets, liabilities and cash flows of an economic entity are subject to currency risk and measured for a period.

Exposure to currency risk of the cash flows is generally long term, ie a year or 12 months. For the calculation of Exposure is presented the original financial model:

$$E = \left[\frac{12(Tc-\pi)^{\frac{1}{2}}}{\pi-(3/4)}\right]^{Ac} \qquad (8)$$

Where E stands for "Exposure" is the desired result, 12 is the risk in number of months in a year that has long-term, Tc is the exchange rate, π is inflation, ½ is call long-term brauniano, ¾ is put average gold short term, AC are the outstanding shares, 12 log is the logarithm of the long-term, ln π is the natural pi, lim Tc is the limit of the exchange rate, d/dI π is the differential order "n" in pi, brauniano ½ Tc is the exchange rate, π is half golden ¾ of pi, ∂/∂n is the antilog of order "n" value of 0.75 and 0.25.

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Realizing the clearance of our base model taking the Lagrange model has the following formula.

$$E = \left[\frac{12\ log\ TC - \ln \pi}{\pi/3/4}\right]^{½Ac} \quad (9)$$

Performing always clear model based on the model Lagrange model lim is obtained.

$$E = \left[\frac{12\ (lim\ TC - \mathrm{d/dI}\,\pi)½}{\pi/3/4}\right]^{Ac} \quad (10)$$

Performing always clear model based on the model Lagrange, Koch Model is obtained.

$$E = \left[\frac{12\ (½\ TC) - ¾\,\pi}{\pi/0.75}\right]^{0.25\partial/\partial I} \quad (11)$$

We substitute the values in the next model:

$$E = \left[\frac{12\ log\ (17.3993) - \ln\ (2.6)}{(2.6)/(.75)}\right]^{.5(6.0735)} = \left[\frac{(14.88637) - (0.95551)}{(3.4666)}\right]^{.5(6.0735)} \quad (12)$$

$$E = [4.01859]^{3.0367} 68.2952 \quad (13)$$

$$E = \left[\frac{12(lim\ (17.3993) - (.0576)/(17.3993)(2.6))0.5}{(2.6)/(0.75)}\right]^{(6.0735)} = \left[\frac{(34.27715) - (.00127326))0.5}{(1.95)}\right]^{(6.0735)} \quad (14)$$

$$E = [17.210565]^{(6.0735)} 32.033 \quad (15)$$

$$E = \left[\frac{12\ ((0.5)\ 17.3993) - (0.75)(2.6)}{(2.6)/0.75}\right]^{0.25\partial/\partial I} = \left[\frac{(104.3958) - (1.95)}{(3.4666)}\right]^{0.25\partial/\partial I} \quad (16)$$

$$E = [29.5522]^{0.25\partial/\partial I} \quad (17)$$

Coverage

It is ke cover of a risk in the short term equivalent 0 to 6 months. They are operations aimed at eliminating or reducing the risk of a financial asset or liability in a company or an individual. To determine the coverage, have the following financial model:

$$C = \left[\frac{6(\pi)^{3/4}}{Tc^{1/2}}\right]^{Ac} \quad (18)$$

Where C stands for “Coverage” is the desired result, 6 or log 6 in the maximum number of months for the short-term, 6 lim is the limit of 6 months of short-term coverage, in Π is the natural pi, ½ is call long term brauniano, ¾ is put average short gold term, AC are the outstanding shares of the company, d/dI is differential order “n”, with ∂/∂II antilog 0.25 value of orden “n”, with ∂/∂I antilog 0.75 value of orden “n” and π is inflation.

Realizing the clearance of our base model taking the Lagrange model has the following model.

$$C = \left[\frac{log6(ln\pi)^{3/4}}{Tc/^{1/2}}\right]^{Ac} \quad (19)$$

Performing always clear formula based on the model Lagrange, lim modelis obtained.

$$C = \left[\frac{lim6(d/dI\pi)^{3/4}}{Tc/^{1/2}}\right]^{Ac} \quad (20)$$

Performing always clear formula based on the model Lagranjiano model Koch Principe is obtained.

$$C = \left[\frac{½6(¾\pi)^{0.75\ \partial/\partial I}}{Tc/^{0.25\ \partial/\partial II}}\right]^{Ac} \quad (21)$$

We substitute the values in the next model:

$$C = \left[\frac{\log 6(\ln 2.6)^{3/4}}{\frac{17.3395}{1/2}}\right]^{607357582} =$$
$$\left[\frac{(0.618)\,6(0.5(2.6))^{3/4}}{\frac{17.3395}{1/2}}\right]^{607357582} =$$
$$\left[\frac{(1/2)6(0.5)^{3/4}}{\frac{17.3395}{1/2}}\right]^{607357582} \quad (22)$$

Risk

It is the risk that have to change a currency. This is the fixed change (constant) and flexible (it has a 3% risk) or fluctuating (smoothing or logarithm) the latter can be infinite (it recedes negative sing is cost/loss) or finite (advances is a sing positive that is the profit or surplus). For the calculation of RISK is presented the original financial model:

$$R = \int_{\alpha 0}^{RB} B + \int_{\alpha 1}^{RM} B + \int_{\propto 2}^{RA} B + \varepsilon^2 \quad (23)$$

Realizing the clearance of our base formula taking the Lagranjiano model has the following model.

$$R = \left[\frac{\log \int_0^{RB(\alpha 0)} B + \ln \int_0^{RM(\alpha 1)} B}{\int_0^{RA(\alpha 2)} B}\right]^{\varepsilon^2} \quad (24)$$

Performing always clear formula based on the model Lagranjiano, lim model is obtained.

$$R = \left[\frac{\lim \int_0^{RB(\alpha 0)} B + \frac{d}{d_1}\int_0^{RM(\alpha 1)} B}{\int_0^{RA(\alpha 2)} B}\right]^{\varepsilon^2} \quad (25)$$

Performing always clear formula based on the model Lagranjiano, Koch model is obtained.

$$R = \left[\frac{\frac{1}{2}\int_0^{RB(\alpha 0)} B + \frac{3}{4}\int_0^{RM(\alpha 1)} B}{\int_0^{RA(\alpha 2)} B}\right]^{\varepsilon^2} \quad (26)$$

We substitute the values in the next model:

$$R = \left[\frac{\log \int_0^{0.33(0.066)} 2.429 + \ln \int_0^{0.66(0.066)} 2.429}{\int_0^{0.99(0.066)} 2.429}\right]^{0.5^2} =$$
$$\left[\frac{0.618 \int_0^{0.33(0.066)} 2.429 + 0.5 \int_0^{0.66(0.066)} 2.429}{\int_0^{0.99(0.066)} 2.429}\right]^{0.5^2} \quad (27)$$

$$R = \left[\frac{\frac{1}{2}\int_0^{0.33(0.066)} 2.429 + \frac{3}{4}\int_0^{0.66(0.066)} 2.429}{\int_0^{0.99(0.066)} 2.429}\right]^{0.5^2} \quad (28)$$

Conclusions

When gathering the main financial variables obtained in real-time for ICA, S.A.B. DE C.V. will begin to replace each value models that were developed both in the original model like models methodology fractal such as the management of currency where the greatest risk factor is the impact of inflation.

This foreign exchange risk is the result of uncertainty generated by fluctuations in future in exchange rate values as well as also the value of the national currency. This is clear that currently investors have opted to perform Exchange rate hedges in order to cover lost important due to the weakness of the peso against the dollar each time more is it comes worse more, this is a reflection on the depreciation of 9.6% of the Mexican peso against the dollar so far in the year.

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