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Journal-Mexico

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In Number 3th presented in Section of Economy an article *Empirical analysis of the economic sector of Mexico in R3 with fractal randomness* by Ramos-Maria, with adscription in the Instituto Politécnico Nacional, in Section of Computing an article *Theory of the Pygmalion effect in the Information Technology* by Flores-Pedro, Solares-Pedro and Zamora- Carlos with adscription in Instituto Tecnológico de Estudios Superiores Monterrey, Universidad *Iberoamericana.* respectively, in Section of Optimization an article *Fractal modeling for rational consumer* by Espinoza-Gomez, Luis Éric, Cano, Viridiana, Garcia, Susana and Espinoza, Alexsandrini, with adscription in the Universidad San Francisco Xavier de Chuquisaca and Universidad Tecnologica de Mexico respectively, in Section of Risks an article *Risk- Benefit of the electronic comerce in Internet* by Diaz- Elsie, with adscription in the Universidad Nacional Autónoma de México, in Section of Finance an article *Mexico: Financial Growth direct foreign investment and its terms of trade* by Leon-Melquiades with adscription in the Universidad del Valle de México, in Section of Administration an article *Strategic management of the Institutional Sectors, the informal sector and the no protected job in Mexico* by Fernandez-Oscar with adscription in the Instituto Politécnico Nacional, in Section of Net Business an article *Business on Internet of the PYMES in Mexico as free form* by Diaz-Maria, with adscription in the Universidad Insurgentes.

Content

ECONOMY

Empirical analysis of the economic sector of Mexico in R3 with fractal randomness.

RAMOS-Maria †*

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In this article fractal is applied to the method for is to analyze the series of time of the Economic Sectors of Mexico in relation to the IPyC. For the effect, the methodologic guidelines are applied of *(Mandelbrot, 1997, p.245)*, (*Bouchaud, 2000, p.168*), *(Mantenga and Stanley, 2000, p.235)*. It is made a statistical analysis and fractal. Previously, it is necessary to demonstrate that the behavior of this indicator has properties of similarity and affinity. With software (*Fractal, 2010)* the exponent of Hurst is considered, whose value is a statistical one of test which it indicates if the series of time is persistent, antipersistent or random.

Stock market, technical analysis, stock-exchange analysis, analysis fractal, theory of the chaos.

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Introduction

The changes of prices of a serie of time are normally media for the increases in the prices, the logarithms performances or the absolute value of the last ones. If P_t points the price of some active (*price of an action as an example*) in any they of negotiation, the increase in the price is defined as:

$$\Delta_P(\tau) = P_t - P_{t+\tau}$$

(1)

And the relative change in the price or percentage performance $\Delta_{t,}$ as

$$\Delta_t(\tau) = (P_t - P_{t-\tau})/P_{t-\tau}$$

(2)

Also, over a base of continuous composition, the performance of the price in a gave period could be calculated as the logarithm of the final price less the logarithm of the initial price:

$$\delta_t(\tau) = \ln(1 + \Delta_t) = \ln(P_t/P_{t-\tau}) = p_t - p_{t-\tau}$$

(3)

About the absolute value of the performances, this describe the amplitude of the fluctuation, because by definition is always positive and there are not global tendencies which could be visually obvious; A key variable in the majority of the financial tools and which play a determinant role in many areas of finances that in our research is the Economy with presence of volatility in the time series of the prices. [1].

Daily profitability of the IPyC in the period from 03-01-10 to 03-01-11.
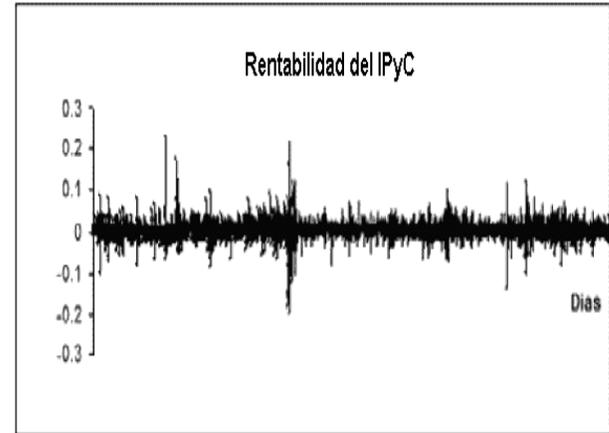
Graphic 1

Source: Bolsa Mexicana de Valores, cotizaciones diarias del IPyC.

From the empirical point of view, it is important to model carefully any temporary variation during the volatility process. *(Bouchaud, 2001, p. 11).* However is normal to talk about volatility, there is not a universally accepted definition of the same. Different estimators could be used to measure the fluctuations of the prices, in particular the absolute values of the performances, the performances squared and the logarithms of the performances squared[2].

[1] The terminus of volatility represents a general measurement of the magnitude of the market fluctuations. The volatility is crucially important in the model of price

fixing of the actives and the dynamic of the coverage strategies, as well in the determination of the price options.

[2] The normal curve is focus around the average, which is present by μ. The variation or dispersion around the average is express in units of the standard deviation, represent by σ. In finances, the average is a mean performance and the standard deviation is the volatility. Additionally to the average and the standard deviation, the distribution function of normal probability has to characteristics: skew and the kurtosis which also are known as third and fourth moment and future performers on their fifth moment, respectively.

$A = \beta_1 + \beta_2 (B) + \beta_3 (C) + \beta_4 (K) + \beta_5 (F) + \beta_{6-7} \neq (T)$

Where:

In recent studies found that some of these estimators provide practically the same empiric evidence about the long term dependence. A form to calculate the historic volatilities of the daily price registers, for different time horizons: n,..., 3, 2 = m, using the next equation:

$$V_n(\tau) = (n-1)^{-1} \sqrt{\sum_{i-1}^{n}(P^2(\tau+i) - \langle P^2(\tau)\rangle)} \qquad (4)$$

Where the average value of $P^2(\tau)$ points the average time of negotiation and (τ) is the time to make the transactions (including weekends and holydays of the market).

Statistic and fractal analysis of the IPyC [3]

The statistical analysis of the profitability and its volatility consisted in determinate if its behavior conforms to a normal distribution and also identify if accomplish with the distribution of the heavy tails (*persistence*) with all the possible profiles of skews. [4].

Daily volatility of the IPyC in the period of 03-01-10 to 03-01-11.
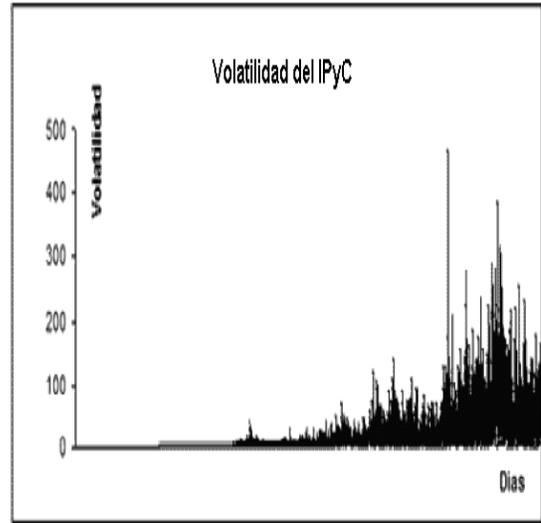
Graphic 2

Source: Bolsa Mexicana de Valores, cotizaciones diarias del IPyC.

The records comprise since January 03 of 2010 to January 03 of 2011, we divide the IPyC in time horizons with a variation from ten to ten, from and interval of ten facts: 10, 20, 30... 600, 610 and 620. It calculated for each horizon the kurtosis. The average of this statistical is calculate in scale log-log..[5]

β_1 -β_6-7= Economic Sectors
C= Constant Capital
K= Share Capital
F= G fource of investment
T= Discretionary Time (In our research is 1 year)
[3] The decision to study the IPyC obey to, above being the principal stock indicator of the BMV, it is of interest analyze long series and of high frequency per days, because the market comprehension enrich when capture facts that could not be obtain with models that required of facts of less frequency and series of time which dispose a few observations.. (Ludlow, 1997, p.25).

[4] Skew topology:
    Selection skew: No comparable groups because the form that the sample or facts were chose.
    Information skew: No comparable groups because the form in which the facts were obtained.
    Confusion skew: There is a mix of effects because a third variable..

[5] Is the measurement scale which use a logarithm of the physic amount instead of the amount of itself when the facts cover a big number of values- the logarithm reduce this to a number more manageable, doing the logarithm scales for this amount of the entry especially appropriate, like that, our senses aware perceived equal frequencies.

Normality Test

It is opportune emphasize that in statistics is possible to demonstrate that if we consider a sample of size N belonging to a population that normally distribute (*with measurement μ and standard deviation σ)* named sample will have a normal distribution of measurement $\bar{x}$ and standard deviation.

$$\frac{\sigma}{\sqrt{n}}.$$

The theorem of the central limit establishes when the simple of size *N* is big enough, the distribution of the simple is approximately normal. [6].

Additionally, to the measurement and to the standard deviation, the function of distribution of normal probability has two characteristics: skew and the kurtosis, which are also known as third and fourth moment, respectively.

The skew is and indicator which measure the curve symmetry. In the case of a normal perfect curve, the skew will be equal to cero.

If this is negative, the curve will be biased to the left; if this is positive the curve will be biased to the right.

$$Sesgo = \frac{\sum(x_i - \mu)^3}{(n-1)\sigma^{3/2}}$$

(5)

---

[6] The normal curve is centered around the average which is represented by μ. The variation or dispersion around the average is expressed in units of the standar deviation, represented by σ. In finances, the average is the normal performance and the standard deviation is the volatility.

Where:

x_i = Level of IPyC on each period expressed in days
μ = Averge in the period
σ = standard deviation

The kurtosis is the indicator which measures the lifting of the curve respect to the horizontal.

This situation is presented when there are many observations far from the average. To this phenomenon of high kurtosis is also known as fat tails. The kurtosis of a perfect distribution

$$Kurtosis = \frac{\sum(x_i - \mu)^4}{(n-1)\sigma^4}$$

is equal to 3.

(6)

Therefore, we present the obtained results in order to know the skew and the kurtosis of the IPyC in the Chart 1.

Skew and Kurtosis del IPyC Vs Economicla sectors in Mexico

	ean		td.Dev	ariance	kewness		urtosis	
	tatistic	t.Error	tatistic	tatistic	tatistic	t. Error	tatistic	t. Error
AXIMO	8.1010	7249	1.91169	41.888	635	148	.019	295
INIMO	7.1235	7374	2.11692	46.820	654	148	.019	295
OLUMEN	80.473	.2293	02.35838	0477.238	.425	148	.182	295
XTRACTI	7.1769	.4162	3.27079	41.530	.276	148	.221	295
RANSFOR	2.7333	9866	6.21169	62.819	.174	148	120	295
ONSTRUC	.7879	4872	.00575	4.092	482	148	.490	295
OMERCIO	1.4703	9608	5.78796	49.260	.161	148	148	295
OMYTRAN	4.8630	8445	3.87587	92.540	.209	148	.646	295
ERVICIO	2.5243	.0125	6.63656	76.775	621	148	.396	295
ARIOS	.7988	4351	.15011	1.124	111	148	.542	295
CIERRE	7.4127	7320	2.02871	44.690	664	148	.007	295

Chart 1

Source: Own elaboration with Software SPSS 17.0.

Considering the Average of the Extractive Sector for be the major participation with 47.17% in IPyC as principal detonator of the Commerce Sector's activities which is the most affected by: little participation of 11.47%,

Extraction Sector and the IPyC.
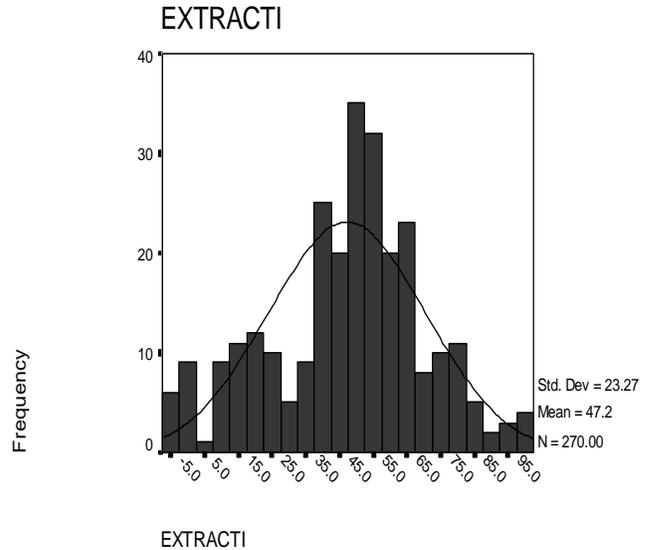
Graphic 3

Source: Own Elaboration

It is calculated the statistical test:

$$LM = \frac{N.sesgo^2}{6} + \frac{N.(kurtosis-3)^2}{24}$$

(7)

Where *LM* is a test statistic and is distribute according to a bi-squared with two freedom degrees. The hypothesis is considered null the value 0.5 (value which correspond to the normal or guassiana curve) with a 95% of the confidence level.

Commerce Sector and the IPyC.

COMERCIO

COMERCIO
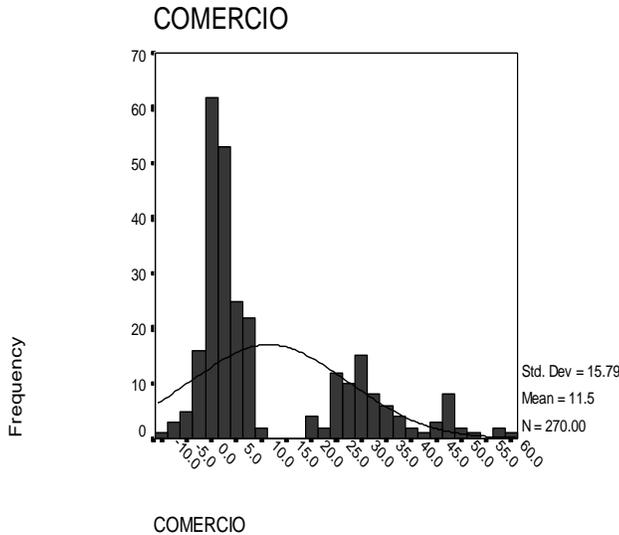
Graphic 4

Source: Own Elaboration

Therefore, the alternative hypothesis sustains that he value is minor to 0.5 (value which correspond to a Fractal evidence, for not being Brownian or the 1/2), in this case if passed the named test, it is not normal, for each one of the sectors of economic activity, like the charts 2, 2.1 and 2.2 show respectively and presented in the following:

Test 1 of the IPyC abnormality and the economic sectors in Mexico.

Runs Test

|	CIERRE	MAXIMO	MINIMO	VOLUMEN	EXTRACTI	TRANSFOR	CONSTRUC	COMERCIO	COMY TRAN	SERVICIO	VARIOS
Test Value[a]	15.8550	16.7000	15.4000	171.0000	50.3950	5.7000	8.1100	3.3500	26.3600	20.9500	9.5200
Cases < Test Value	135	135	135	135	135	135	135	135	135	134	135
Cases >= Test Value	135	135	135	135	135	135	135	135	135	136	135
Total Cases	270	270	270	270	270	270	270	270	270	270	270
Number of Runs	14	18	18	112	22	14	14	16	14	12	21
Z	-14.877	-14.389	-14.389	-2.927	-13.902	-14.877	-14.877	-14.633	-14.877	-15.121	-14.023
Asymp. Sig. (2-tailed)	.000	.000	.000	.003	.000	.000	.000	.000	.000	.000	.000

a. Median

Chart 2

The probabilistic analysis consisted in determinate which distribution of the probability better adjusted to the historic behavior of the IPyC, using the SPCC software [7]. Once identify the statistic distributions, it proceeded to analyze its parameters. The purpose of this analysis was to find distribution of fat tails (*potency laws behavior*).

Fractal analysis

The fractal analysis consisted in detect if the tail of probability distribution of the profitability and the volatility accomplish with the law of potency and, also, if the time series of the IPyC has properties of self-similarity and self-affinity through the stimation of the Hurst exponent (H)[8].

In first place, are study the distributions of the potency law for its characteristic of being self-similarly in different scales or exponents; in second place, the Hurst's exponent is estimated using the Fractal software; finally, are studied the self-relation functions.

[7] The SPSS software was used for a better adjust of the probability distribution of the behavior of IPyC. This software is developing to analyze situation sensible to the risk, order the probability distributions, starting with those that better adjust the facts.

[8] Harold Edwin Hurst, Design the Assuan dam (Egypt) and studied temporal series related with the caudal of the Nilo River and the problems of water storage. Used a facts base of 800 years of archives and notices that were a tendency of a year of high caudal followed by other of higher caudal, and for one of low caudal were followed for one lower; with this motive, made a new statistical method (*R/S*).

The oldest and famous potency law in the economy is the wealth distribution of Pareto (*Bouchaud J, 2002, p.67*). The individual wealth distribution F(X) is frequently described, on it asymptotic tail, for a potency law:

$$F(X) \cong \frac{x_0^{\mu}}{x^{l+\mu}}, X \gg X_0$$

(8)

Where:

F(X) is the wealth distribution of an economy

μ is characteristic of the parameter of the growing of big wealths (*X*'s).

X wealth of the economicla agents.

Conform the value of μ is smaller that *1*, the growing is slower, and the gap between the richest and the poor is bigger. According to Pareto, in a population of *N* size, the quotient of the biggest wealth and the typical wealth (*average*) grown as $N^{1/\mu}$. In the case of $\mu < 1$, the average wealth diverges: this corresponds to an economy in which a finite fraction of the total wealth is in the hands of few people. In the other hand when $\mu>1$, the richest people only have a fraction of the total wealth (*in the limit when N → 1*). Empirically, the exponent is in the rank $1 \leq \mu \leq 2$. This exponent of Pareto also describes the entry distribution, the companies' size, the pension funds, etc.. (*Bouchaud, 2001, p.123*).

Where *R* indicates the Rank (for example the difference between the maximum cumulative download of the river and the mine, during the period of study) and *S* the typical deviation of the observed values of the *X* downloads.

The evaluation of the Hurst's exponent is the first step in the recognition and characterization of the complex dynamic in series of time. This analysis allows difference a random series of other not eventful and helps in the qualitative description of financial markets behavior [9].

In the other hand, a series of time that have some level of predictability will show positive self-correlation. Otherwise a series with negative self-correlation does not have predictability level. An exponent of Hurst in the rank *0.5<H<1* correspond to temporal series which sow persistence (*a period of growing is follow by an analogue one*). This means that there is more possibility that an increase will be followed by a similar one. It has positive self-correlation. While the values placed in *0<H<0.5* correspond to a behavior anti-persistent (*a period of growing is follow by a growing one or vice versa*), there are more probabilities that the next period will be under the average. It has negative self-correlation.

Finally, if H is equal to 0.5 correspond to a random movement; an increase could be followed by a low or by other similar (*the movements do not unfold any memory*). It has self-correlation equal to cero.

---

[9] An exponent with rank 0.5<Gh<1 corresponds to temporal series which sow persistence (a growing period is followed by an analogue one). We present easier form of limit shortening of finite to infinitesimal movement:

$$\lim\int_{t-1,t>\ell}^{\infty} = \left[\frac{Gh}{1-J}\right] + Jj + Jj' + Jj''\left[\lim dJj, dJk, dJl\right] + \theta \, \mathrm{E}_{1-i}^{n} = \lim\frac{Gh^{1-1/E}}{1-J}$$

The exponent of Hurst *"H"* is bigger than *0.5* and minor that *1*, which means that the IP^YC has a persistent behavior, the daily information has a fractal behavior, because the exponent H is bigger than *0.5* and minor than *1*. In other words, the most probable is that continuous with the higher tendency in the long term, existing under noise in the analyzed facts.

And to detect the existence of memory in volatility time series of the price $X(\tau)$, were use.

$$C(\Delta\tau) = \left(X(\tau + \Delta\tau)X(\tau)\right)/\left(X^2(\tau)\right)$$

(9)

The form in which the correlation was quantified was through the determination of the Hurst exponent, *H*. The hoped relation between the value of a time series t and its values on time $t + \tau$ is a measure of the present correlation in a series

A stationary [10] time series has a correlation which only depends of the time period τ between the two observations and the growing until cero, the faster enough to τ increase, reflecting the fact that the influence of the former values reduce with considerable intervals. The velocity of this decreasing is a measure of the "memory" of the stochastic process.

Since the time series are conformed by discreet facts, $\{X_\kappa\}_{0 \le \kappa \le N}$, such that $X_\kappa = X(k\tau_0)$, where τ_0 is the minimum interval of time, the self-correlation function is define as:

$$C(n) = \frac{\text{Cov}(n)}{\text{Cov}(0)}.$$

(10)

Where

$$\text{Cov}(n) = \lim_{N \to \infty} \frac{1}{N} \sum_{\kappa-0}^{N/2} X_\kappa X_{\kappa+n}$$

(11)

$$\text{Cov}(0) = \lim_{N \to \infty} \frac{1}{n} \sum_{\kappa-0}^{N/2} X_\kappa^2$$

(12)

N represents the total number of facts. The behavior of the self-correlation functions when $0 \to \tau (0 \to n) y \infty \longrightarrow \tau (\infty \to n)$, determinate the local properties of the time series.

For a white noise where the value in an instant is no correlated with a previous value, the function of correlation is $C(\tau) = 0$ for $\tau > 0$.

Many of the no stationary time series are characterized by correlation of short term with a scale of time characteristic, τ_0, and a function of exponencialmente decreasing self-correlation for example:

$$C(\tau) \propto \exp(-\tau/\tau_0)$$

(13)

If the correlation function $C(n)$ climbs with the interval n like:

$$C(n) \propto n^{-\beta}$$

(14)

For n too big where $0 < \beta < 1$, so $\{X_i\}$ is called correlation to long term, process with memory to long term. The reason to use this terminus is that $C(n)$ Reduce slowly, in such way that $\sum_{n-1}^{N} C(n)$ diverge when $\infty \to N.$[11]

---

[10] Demonstrating with the principle of Economic Seasonality:

$$\frac{Gh}{1-J}\left[\frac{\partial dJj, \partial dJk, \partial dJl}{1^{1-1/E}}\right]^{1/2} = \frac{Gh}{1-J}\left[\frac{dJj}{dt}\frac{dJk}{dt}\frac{dJl}{dt}\right]1 - \frac{1}{E} + \frac{1}{2} + Et$$

[11] Being $\sum a_k$ A series which character is desirable to establish and being $\sum_{k=1}^{\infty} u_k$ a convergent series with plus ∪, verifying that $a_k \le u_k$, so $\sum a_k$ converge and its sum S is minor or equal to the sum ∪. The serie $\sum_{k=1}^{\infty} u_k$ The series is a majoring series of the given series.

To detect the existence of memory in the time series of price volatility, $X(\tau)$, Was used the function of correlation.

$$C(\Delta\tau) = \langle X(\tau + \Delta\tau)X(\tau)\rangle / \langle X^2(\tau)\rangle \tag{15}$$

Scaling of the Hurst exponent in Fractal Methods of R^3.
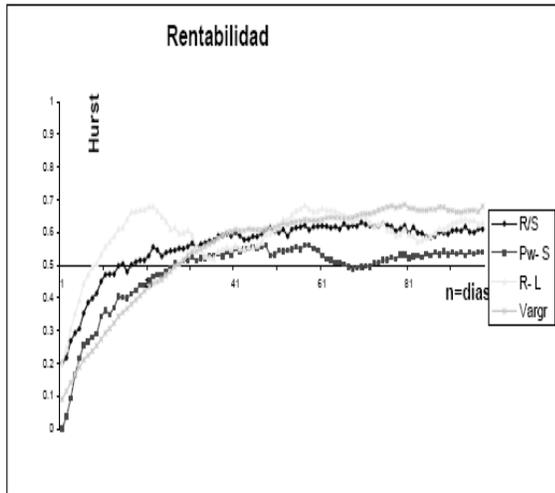
Graphic 5

The statistic method of rescale rank (R/S) used by Mandelbrot and Wallis, is based in the previous analysis of Hurst. It allows the calculation of the self-similarity parameter H to measure the intensity of dependence of long term in a series of time. For time series of length n

$$X = \{X_\tau : \tau = 1,2,\ldots n\} \tag{16}$$

R/S is define as the quotient of the maximum normalized route of the integrate signal R(n) between standard deviation S(n):

Analogously it is possible to say that, if the terminus of a positive terminus are bigger or equal to those corresponding to another divergent series, is divergent. Being $\sum a_k$ Being a series which character is desirable to establish and being $\sum_{k=1}^{\infty} u_k$ a divergent series, verifying that $a_k \geq u_k$, so $\sum a_k$ diverge. The series $\sum_{k=1}^{\infty} u_k$ is a minoring series of the given series..

$$\frac{R(n)}{S(n)} = \frac{\max\{0,r_\tau : \tau = 1,2,\ldots,n\} - \min\{0,r_\tau : \tau = 1,2,\ldots,n\}}{\sqrt{S^2(n)}} \tag{17}$$

Where:

$$\frac{\max\{\ldots\} - \min\{\ldots\}}{2} \tag{18}$$

It is the values route

$$r_\kappa = \sum_{\tau-1}^{\kappa} X_\tau - \frac{\kappa}{n}\sum_{\tau-1}^{n} X_\tau \tag{19}$$

It is the maximun value less the minimun

$$S(n) = \left[\frac{1}{n}\sum_{\tau-1}^{n}\left(X_\tau - \frac{1}{n}\sum_{\tau-1}^{n} X_\tau\right)^2\right]^{1/2} \tag{20}$$

Standard deviation

Scaling of the Hurst exponent in the Fractal Methods of R^3.

Graphic 6

ECONOMY

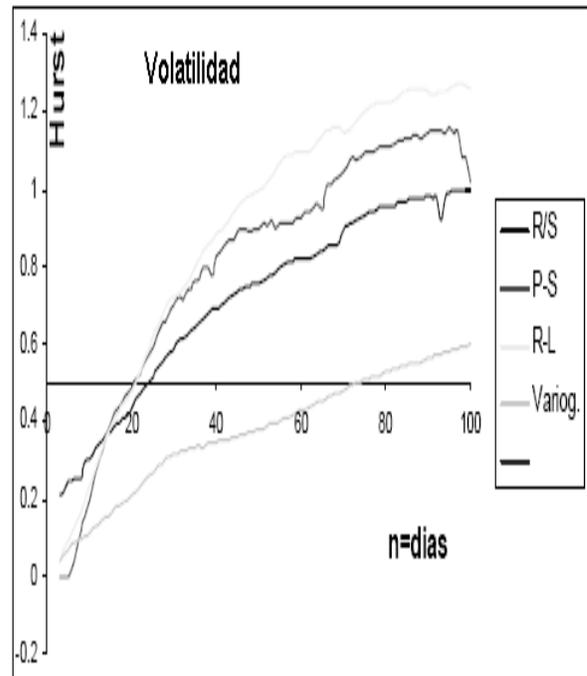A trustable measurement of S(n) requires of a facts of samples with a constant interval because the wonder difference between the constant values of X is a function of the distance which separate them. The exactness in the determination of H depends of the number of facts used in the calculation. If named number is reasonable big, it hopes that the R=S give information about the self-similarity of all the time intervals of the Economic Sectors in Mexico in R3 with fractal randomness, depending in the Skew of the Operation in the IPyC.

Conclusions

After have applied the analysis in base of the R3 and the Fractal Randomness with Evidence for the Economic Sectors of Mexico we get 3 meaningful results:

The fractal analysis of the IPyC allows the determination in an suitable form of the market movements that's why we determinate ranks with higher levels of confidence, the prognostic will be more exact and on this form the real higher tendency or lower, in other words nominal terms in order to carry them to logarithm level through the Chartism with 7 Economic Sector of Mexico (Extraction, transformation, building, commerce, communications and transport, service and various).

In correlation with the IPyC f the Mexican Stock was present framed in 130 companies (all of them stock), its total lost was of 0.2% of 100 in 4 companies *(AGRIEXP[12] ,CNCI[13], QUMMA[14] and TEKCHEM[15])* and was then only one with wrong treatment of information with technic analysis and represents a category of self-similarity.

Because in this stock is exigency that the Chartism looks identical to different scales, this is the proof of a good management and selection of numeric or statistic facts that preserve with the scale change (from nominal to real), and it carry us to focus to the quasi self-similarity that required a Chartism approximately identical to different scales.

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[12] Agro Industrial Exportadora, S.A. de C.V. (AGRIEXP), now a days is a company that act as pure controller, which through of its subsidiaries companies , process fruits preparations for industries of yogurts, ice creams and confectionery.

[13] University CNCI is a company that Works to offer services of education to the Mexican market.

[14] Qumma started its quotation in the Mexican value market in June 29th of 1994, in those days under the denomination of Fernandez Editors, S.A. of S.V. and with key of quotation Gfesa. Since that date until December 31th of 1998, its structure was vertical, in other words Gfesa controller and Fesa as direct subsidiary.

[15] It is a company with more than 50 years of experience in the multimodal transport field. Offer integral services of logistic, land and sea ports supported by a solid operative, technologic structure and capable human resources.

It is a suitable tool of prediction of the moments in which will happened the important events related with the evolution of the market which allow us study to detail the stochastic noise of sample of the IPyC with the Economic Sectors and all the explosion located of the volatility could be easily identify. This characteristic, known as volatility clustering, invokes intermittent fluctuations similarly in turbulent flows.

This effect could be analyzed more quantitatively: the temporal correlation function of the daily volatility could be adjusted by an inverse potency of the displacement, with small exponent in the rank 0.1-0.3.

This slow decreasing of the correlation function of the volatility drives to a multifractal behavior of the Price changes: the kurtosis of the differences of price logarithms only decrease as small potency of the time, instead of the inverse of the time as would be the case id the volatility were constant or if it had correlation in the short term.

That sallow decreasing of the kurtosis has important consequences in the rank of prices theory and according to the negotiated volume because they are strongly correlated.

On each transaction there is a probability that the price change, and after a certain horizon of time, exist a total change of the price. We obtain the price change (because the cumulative distribution obeys to a cubic invers law, the distribution function of probability by differentiation) and obey to a quartic invers law (of fourth moment).

Should be taking on account the periodicity of the counting, the "cycle rank" in which we are. Makin it we will avoid disgusting and expensive errors in the moment to made prognostic of the prices with the inclusion of the time as variable (our research consider 1 fiscal year) , this means that there is not a characteristic scale for the diffusion of prices because it is being define around a media that by itself is changing (like the economic universe in which we live), so the laws of diffusion change and in particular they adopt a form of free scale or Fractal randomness in evidence of the Economic Sectors of Mexico.

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Theory of the Pygmalion effect in the Information Technology

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The first premise of this article is that the information technology produces a real business value. Its quantification can be studied in indirect form using both direct measurement of the investments in Hardware; Software; Human Resources; Telecommunications and Technical Support; and measuring the impact that they have had in key areas of the organizations. Second, there's a direct relation between the participation of executive personnel with his investments in Information Technology and the obtained results. In other words, if exists a high managerial involvement then the results will be much better, and vice versa; and the amount of the investment is irrelevant in such cases.

Business values, hypothetical construct, IT investments, latent variable.

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Introduction

Suppose, a priori, that there is a real value of business generate by the investments in Information Technology (IT), although named value could not be dimensioning, for the moment. The possible results would be: that the investment creates a positive value of business, translate into tangible or intangible benefits from the company; or that does not create any business value and the results are only the spending of the use of the IT.

According to the former approach, from the point of view of business, it is worth to invest in the acquisition of IT if the business value is positive and exceeds the economic expectations; in other words, if it obtains more benefits than spending. The decision to not invest would be wrong.

If named value is minor to the spending that is generated, then, it does not worth to invest in the entry which only will provoke economic lost to the organization that pretends to acquired it. The decision to invest, in this case, would be also wrong. However, if it is necessary or forced get information technology, the correct would be choosing the most expensive option.

The business value of the IT

The concept "Business value of the Information Technology" is subjective and abstract; this is because, it is not possible to measure the direct form for many reasons, to know.

First because it only perceive the intangible form, because it does not count right now with any standardized representation and accepted by all about this value, in monetary terms. The executives glimpsed a value of business, but without a reference measure, it could not be dimensioning.

Second, is a hypothetical construct which could mean many things for the entrepreneurs.

Some understand as business value everything that contribute with determinate utility to the results of the company, or which has any countable sit in the active; For example when an investor searches a performance about capital, this express as a percentage of the original investment [9].

For others the business value is identified with the donations or contributions of each one of the productive elements to the best company performance. For example how much does the ideas that the employees provide worth? Or a discovery, a patent or a system of original information?

Third, this business value should be the sums of many tangible and intangible results provide by the productive factors and for one of the areas that the company has when they do intensive use of the IT. The Information Technology is another element in the system.

From here many arguments emerge which indicates that the intangibility of the business value is the result of the interaction of the IT with a group of components that analyzed, in a isolate form, lost their individual context and value of contribution. Consequently, there is not any correlation between the investment that the companies made in IT and the obtained benefits during the planning horizon? If there is any, how is it correlated?

The multidimensional nature of the IT

It arguments that the business value of the IT has a multidimensional nature conformed by five hypothetical construct: the external environment of the organization which is influenced by the IT; the strategies of business and its informatics support; the company organization and its support in the information technology; the control schemes and feedback of information in organizations; and the business results as outcome of the administrative management supported by the Information Technology, as sum [10], [14].

Each one of these constructs is caused by the construct Business Value, which is defined as an independent variable totalizing the casual effect.

Casual Relation between constructs of higher order
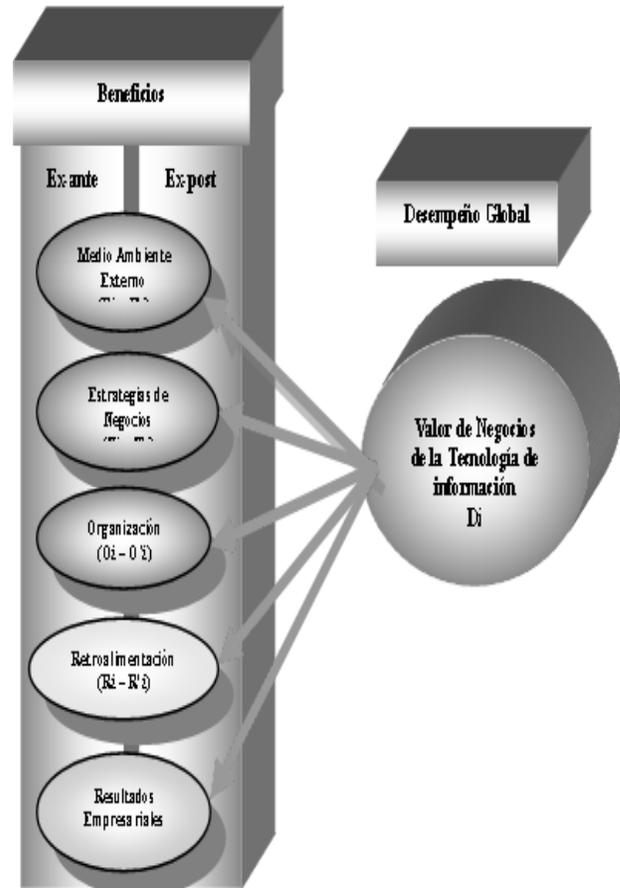
Graphic 1

Hypothetical construct

Each hypothetical concept is defined as a latent variable depended of the second order and as result of the difference of benefits expectative. This is why it's assumed that the directive of a company propose Ex-ante some expectative to intervene in it and that until now, it is possible to determinate the Ex-post benefits of named investments.

The construct of benefits were measured in an indirect form using many observed dependent variables and that the served as reference to determinate the nature of each construct.

According to the Figure 1, the five hypothetical constructs are abstract concepts which should have some real value; but to evaluate them is necessary measure them in some form. Then, it proceeded to relate each construct with five hypothetical constructs in a first level, starting with hardware and software, which are the most identifiable and know.

The other constructs were defined with three new names: humanware, netware y supportware, which conform the investments in IT by the studied companies [7].

Hypothetical constructs of first order
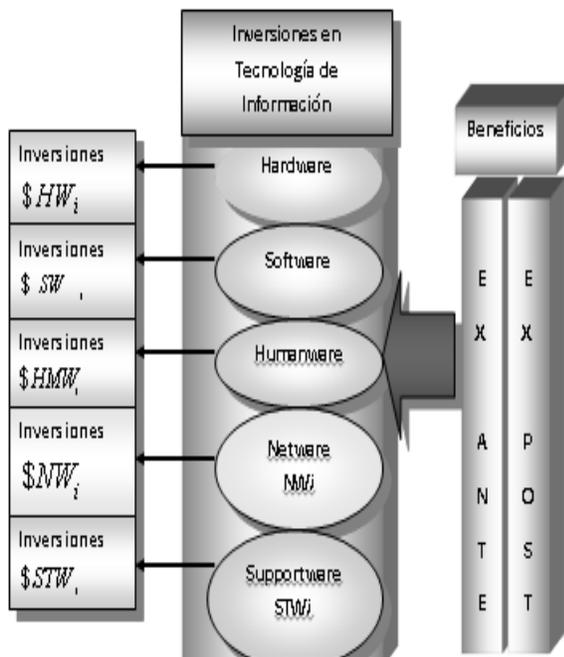
Graphic 2

This last group of latent variables [16], it is also hypothetical, but it has the support of its indirect measurement was made defining many observed variables that were measure, at the same time using a questionnaire projected to such effects.

Methodology

The modeling of the solution to the raised problem using a Structural Equations Model (SEM) to evaluate the existent correlations between the two different dependent and independent constructors and using the obtained values, through questionnaires, for the dependent variables observed.

To make the former process, of general form the next scheme was applied:

$$\text{Facts = Model +Residual}$$

Where:

Facts.- represent the measurement of the observed variables.

Model. - Represents the hypothetic structure that connect the observed variables with the latent variables.

Residual. - Represent the existent discrepancy between the hypothetical model and the observed facts.

First, it builds the matrix of variance-covariance Σ, also called covariance matrix of the model-involved.

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[16] The three formed concepts: humanware, netware and spportware do not have direct reference in the literature and have being define to support the theory that is exposed in this article, with the exception of the word netware which is use commercially for the Novell Company.

The elements of Σ are in function of the model parameters: each Σ element has a counterpart that corresponds to a numeric element of the variance-covariance matrix, S, of the observed sample for the consider variables.

After, it made the measurement or the evaluation of the existent difference between S matrixes (with elements s_{ij}) and Σ (with elements $\hat{\sigma}_{ij}$).

When the Σ and S matrixes are compared, it generates an equation system (the same numeric of no redundant elements) that corresponds to the same number of the parameters to be estimated in the model.
The above has sense if this process is seeing like adjust a model of structural equations through the solution of a given system of equations.

For each equation it has its left side is a numeric value which is obtained from the S matrix, while the right side corresponds to an expression of the parameters of the defined model in the Σ matrix.

If the values that will be compared would be scalars, then it only have to apply a simple rest between both matrixes, using the absolute values of the resulting references, to evaluate the distance between them. However, this could not be directly applied between the both S and Σ matrixes because there is not a number, but a matrix of the differences, this is the matrix of residual covariance $S - \hat{\Sigma}$

The elements of this residual matrix are then $s_{ij} - \hat{\sigma}_{ij}$ the standardized matrix of residual has the elements $r_{ij} - \left(\dfrac{\hat{\sigma}_{ij}}{s_{ii} s_{jj}} \right)$ where r_{ij} is the observed correlation between the I and j variables, $\hat{\sigma}_{ij}$ Is the predicted covariance, and s_{ii} , s_{jj} are the observed standardized deviations. The standardized residuals obtained from the correlation are easier to interpret than the not standardized residuals, based in the covariance, because those do not depent of the used scale in the made measures of the observed variables.

From the former paragraph it derived the concept of distance between the S and Σ matrixes which is a number that results of the comparison between the S elements with the elements of the matrix of the covariance of the imply-model.

This distance is, then, in function of the parameter of the model and of the variances and covariance of the observed elements.

When we talk about the distance between matrixes and relation between the parameters of the model and S matrix, it also talking of an adjustment function analyze the distance between two matrixes, the value of F is always between cero and a positive value. If the value of F is equal to cero both S and Σ are identical.

Because the solution from the mathematic point of view is complex, the evaluation, adjustment and analysis of the proposed model with the observed facts were made leaning in a package of commercial computing, called ™EQS, Version 5.7b.

The statistical results and the conclusion that are exposed derived from the generate runs with this computational package.

Statistic theory in order to justify the process of adjustment of the model it possible to find in different published works about modeling of structural equations like [1], [6], [8] and in different journals like Multivariate Behavioral Research, Psychometrika, Sociological Methods & Research, Journal of Educational Statistics, British Journal of Mathematical and Statistical Psychology and Sociological Methodology.

Relation of latent factors of Intervention in IT against the latent factor of Ex-ante and Ex-post benefits
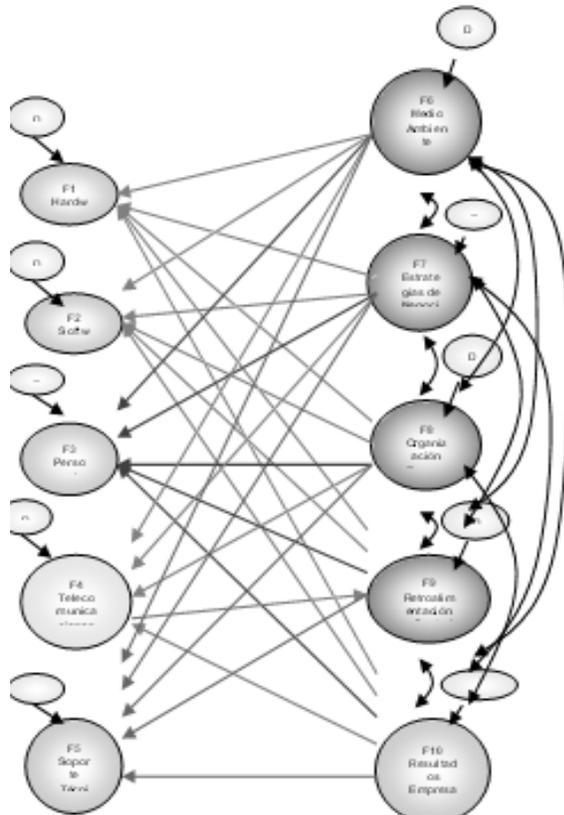
Graphic 3

Results

Frist, if we consider the original model, a latent factor that was discarded was the one of the Business Strategies. The results of the runs indicated a high maladjustment of the model with respect of the gotten sample facts. This was interpreted in the sense that the Business Strategies was a irrelevant factor inside the model because that's how the surveyed executives consider it. Being eliminated this factor, it achieve a higher level of adjustment.

Checking the research made by Sanjay K. Singh [14] of the Alabama University, Birmingham, he also got a similar result.

The obtained result in this research also reveals a similar behavior in Mexican executives. When the business strategies are defined, these keep principally in the directive level and they do not spread to the rest of the levels in the organization. The IT it is not being used to support such important concept for the orientation of business.

However, the results are developers in the sense that there is a direct relation with its investments of Information Technology and the obtained results. In other words, to bigger involvement better results, being the volume of the investment a little bit irrelevant. This is resumed in:

1. If the directive takes the role of leaders in the inversion's conduction in IT, together with its executives in technology, the results are highly satisfactorily.

2. If the directive does not assume the role of leader and left the responsibility to its executives in technology, the results tend to lose value.

The former conclusions are named "the Pygmalion effect of the IT".

The second relevant aspect is the one generated by the construct Business Environment. This latent factor could be evaluated indirectly by eight variables without the indices of goodness of de model adjustments being affected.

Again, to consider the same study of Singh [14], the results that he found coincide with this aspect.

However the obtained results in the indices of goodness of the adjust reveals a partial adjust between the final model and the sample facts, could be conclude that there are statistical evidences pointing that with a N sample size, which contain at least five cases per construct, it could derived statistically better support results.

The final model tries to reflect not only a partial adjust of the facts, but also an explanation of how the business value could be conceptualized through a business dimension chart whom, at the same time, are influenced on its process by the use of the IT.

Discussion

The evaluation of the Information Technology, considering the benefits that the company contribute with, is complicated because it does not count with a standardized patron of measures to made such evaluation, or at least to make comparison of performance with other companies [9], [10]; For the entrepreneurs is necessary to determinate if this justify or not the investments in IT. Like Remenyi [12] points, in many organizations the investments in Information Technology are high and represent more than the 50% of the process associate with the IT, in direct or indirect form.

As well as there are cases of success in the incorporation of the IT to the business process, there are also cases of failures [7], [15] which carry heavy losses of billions of dollars. Then, the entrepreneurs demand that their investments on IT have the minimum uncertainty possible and the maximum probability of success. In the Mexican business exchange it is hard to find these bases.

For example, when the group of foreign passenger trucking "Flecha Amarilla" decided to acquire in 1999 an ERP system of the JD-Edwards company, none of the other Mexican companies did it before. There were not cases to be taken on account as reference of implementation only in foreign countries and of companies different to the trucking. Later, another company of trucking, Pullman de Morelos, did the same but acquiring its ERP system, from the SAP Company. Nowadays, more companies, like ADO, are installing these business systems but they have now same references. The above means that in the Mexican ambit has been investing in Information Technology more as a form of modernized their management process than a real strategy of business.

As corollary of the research it has and architecture of IT, to be efficient should answer questions like: Do we have the correct technology? Is it structured appropriately? What levels of access to the information, to share and should they stand? Which application should be develop and which should be buy? Who will maintain and actualize the tools, facts and the applications? Who will determinate if the architecture of IT is suitable and accomplish with the business necessities?

The answers to these questions will vary depending of the basic competencies of each company, of their strategies, of their administrative orientation, of their propensity and aversion to risk, of their economic capacity to invest in the Information Technology and other factors. Henry Mintzberg [11] points that the executives originally raised a group of basic strategies for the business, and passed a period of time, they develop emergent strategies, different from the firsts, creating with that a perception of the achieve strategies.

The directives that go on board in the adventure of support their business strategies with IT should be conscious that their acquisitions will require a big capacity of adaptation and change.

Conclusions

However the former paragraph could look trivial and inclusive obvious, the reality presents cases in which are forget or are taken for granted this fundamental aspects. The business decisions are taken, generally, under a big number of restrictions and limitations like:

The executives often suffer of the right information for their most important decision-making.

- The directives, as the majority of people, have to give bigger attention to the information that confirms their points of view, while discredit the facts and informs which could contravene their beliefs.

- The high directive often is insolate of the reality or the real situation of their organization.

The explosive growing of the Information Technology and of the information flows they have not being accompanied with a correspondent grown in the abilities of the directives to process such quantities of information [4].

The ahead emerges from the statistic evidences that point to a lack of orientation of the investment in IT to the business strategies of the organization as first conclusion.

The second conclusion is about the business environment of the organizations. The directives know about the changes in technology and market, even do, the statistic evidence points to a overcharge of information in such sense. It only needs canalize correctly all this group of information in order that the Mexican organization will be more competitive with the support of the Information Technology and as well they could generate a real value of business for their invest in that field.

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Fractal modeling for rational consumer

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The development of Lagrange, Financial leverage, Carnot and Koch methods applied to company Grupo Bimbo is presented to determine the risks of Financial Employability.Based on the trading matrix of the Mexican stock exchange in March, he was working in each of the methods. When performing the calculation steps allowed us to observe the variations between models Exchange, shares outstanding and employment, we performed a comparative between three models, which has a higher % Employment taking 33%.

Employment, Exchange, Shares Outstanding, Carnot and Employability.

† Researcher contributing first author.

Introduction

Grupo Bimbo was established in 1945. Since 1980, Grupo Bimbo shares are traded on the Mexican Stock Exchange (BMV) under the ticker symbol BIMBO it has 162 plants; its outlets are located strategically in 22 countries in America, Europe and Asia. Its main product lines include fresh and frozen bread, buns, cookies among others."Growing and create" were the key words from the beginning marked the successful path by which until today has continued to thrive Grupo Bimbo. Their commitment is to be a highly productive and fully human company, as well as innovative, competitive and oriented to the total satisfaction of its customers and consumers.

Methodology

The method to obtain the result of Carnot is star equation's most striking property is that it can generate a power-law distribution with an exponent between 1 and ∞. This happens under delicate conditions that were dismissed as anomalous. It shall be argued that this perception is especially clearly unwarranted in the context of price variationmade by applying the following formula:

$$GISF = \frac{(PUT+CALL)^{\frac{1}{2}}}{\left(\frac{VCALL-VPOST}{2}\right)^{\frac{3}{4}}} = \frac{(117+116.2)^{\frac{1}{2}}}{\left(\frac{117-116.2}{2}\right)^{\frac{3}{4}}} = $$
$$\frac{15.2708}{.5029} = 30.36 \tag{1}$$

Data Call and Put were obtained from the Mexican Stock Exchange of Bimbo Company, where you can see a positive value, as expected, the Carnot cycle, helps us and must place the maximum and minimum of the trading matrix

Type Exchange

This method will try to maximize profits despite resource constraints, such as time and money. This médodo uses a technique inwhichthe consumers can achieve maximum satisfaction and business can maximize the benefit or costs miminizar with the limits specified, an example will be about this great method:

$$TC = \left\lceil \frac{\partial + Tcf + \partial \, Tcft}{\partial \, Tcx} \right\rceil^{Ti} \tag{2}$$

Where:

$$\partial = \frac{.25}{.75}$$
Tcf = 17.55, Tcft = 20.31 and Tcx = 14.79

$$TC = \frac{\frac{0.25 \times 17.55}{0.75} + \frac{0.25 \times 20.31}{0.25}}{\frac{14.79}{0.75}}^{3.75} = $$
$$\frac{\frac{4.3875}{.75} + \frac{5.0775}{.25}}{19.72}^{3.75} \quad \frac{5.85+20.31}{19.72} = 1.3265^{3.75} = $$
2.8850 \tag{3}

Lagrage, very large terms are reduced by lower terms, it is replaced in the formula the value of the differential that is 0.25 flexible exchange rate 17.55, adding the product of the differential floating exchange rate with values of 0.25 and 20.31 respectively. The value obtained from this sum of fractions, will be divided between the values of fixed exchange Exchange, this formula can be deduced that the values obtained from the Mexican Stock Exchange, with respect to the company Bimbo have a positive margin. Indicating that the method is helpful to give us information about how to reduce the variables efficiently terms of time and money

$$TC = \frac{\frac{Lim \, Tcf}{\partial} + \frac{\partial}{\partial}Tcf}{\frac{Tcx}{\partial}} \tag{4}$$

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Where:
Lim = 0.618, Tcf = 17.55
$\frac{\partial}{\partial} = \frac{.5}{1}$, Tcx = 14.79
$\partial = 1.5$

    The values obtained from the Mexican Stock Exchange of the Company are replaced Bimbo

$$TC = \frac{\frac{.618.17.55}{.5} + \frac{.5 \times 20.31}{1}}{\frac{14.79}{1.5}} = \frac{\frac{10.8459}{.5} + \frac{10.155}{1}}{9.89} = \frac{31.8369}{9.89} = 3.2191 \tag{5}$$

    Which resulted in a positive value, it can be concluded that Financial leverage helps reduce values, they change and are very close to Lagrange the argument assumed that all the moments are finite otherwise meticulous scientists make this assumption all the time, without even a thought, but in this context it happens to lead to a paradox., still considered time and money in a tangential manner as expressed values show the behavior of the company with respect to a set time according to the Mexican Stock Exchange, the next task is to specify the rules of statistical dependence between weights.The most important and least constrained case, called canonical, the Wβ are independent random variables and one postulates EWβ = 1/b, hence EMβ = 1. This identity expresses conservation on the average.

$$T.C = \frac{\left[\frac{1}{2}17.55 + \frac{3}{4}20.31\right]}{14.79} = \frac{8.775 + 15.2335}{14.79} = \frac{24.0075}{14.79} = 1.6232 \tag{6}$$

Where:

Lim es igual a ½, Tcf = 17.55, Tcft = 2031 and Tcx = 14.79, of the three values is generated $Sum = Lagrange + Lemma\ de\ Itto + Koch$

$$S = 2.8850 + 3.2191 + 1.6232 = \frac{7.7273}{3} \times 100 = 27\% \tag{7}$$

No. 2 Employment

In this case the information was obtained from INEGI and ermitiéndonos Stock market information to determine values and apply calculations show the following results which added together and divided by three, to obtain the application of this method is as follows:

$$E = \left[\frac{\omega + \pi}{D - \pi}\right]^{TC} + [Y]^{[Ti - \pi]} \tag{8}$$

    To perform the operation corresponding to Jobs must have the detail of the following items: W = 66.15, π = 2.60, D = 1,692.41, TC = 17.55, Y = 100 and Ti = 3.75

$$E = \left[\frac{\log \omega + \ell\eta\ \pi}{\frac{D}{\pi}}\right]^{TC} + [Y]^{b[Ti - \pi]} =$$
$$\left[\frac{(0.25)(66.15) + (0.75)(2.60)}{\frac{1692.41}{2.60}}\right]^{17.55} + 100^{[3.75 - 2.60]} \tag{9}$$

$$E = \left[\frac{16.5375 + 1.95}{650.9269}\right]^{17.55} + 100^{[3.75 - 2.60]} = 199.5262 \tag{10}$$

$$E = \left[\frac{\lim \omega + \frac{d}{d1}\pi}{\frac{D}{\pi}}\right]^{TC} + [Y]^{[Ti - \pi]} \tag{11}$$

    To determine Financial leverage the above formula is developed by replacing the matrix values, substituting, the whole financial or economic system adds up to a highly multidimensional process. The canonical cascade can be rationalized by assuming that investigating a financial time series by itself amounts to extracting a linear cross section from that full system.

Espinoza-Gomez, Luis Éric, Cano, Viridiana, Garcia, Susana and Espinoza, Alexsandrini. Fractal modeling for rational consumer. ECORFAN Journal-Mexico 2011, 2-3:190-195

$$E = \left[\frac{(0.25)(66.15)+\left(\frac{0.05}{0.05}\right)(2.60)}{\frac{1692.41}{2.60}}\right]^{17.55} +$$

$$100^{[3.75-2.60]} = \left[\frac{16.5375+2.60}{650.9269}\right]^{17.55} +$$

$$100^{[3.75-2.60]} = 199.5262 \qquad (12)$$

$$E = \left[\frac{\frac{1}{2}\omega+\frac{3}{4}\pi}{\frac{D}{\pi}}\right]^{TC} + [Y]^{[Ti-\pi]} =$$

$$\left[\frac{(0.25)(66.15)+(0.75)(2.60)}{\frac{1692.41}{2.60}}\right]^{17.55} + 100^{[3.75-2.60]}$$

$$(13)$$

To determine Koch, the above formula the only possibility is to follow the canonical cascades and make the weights into independent random variables, the resulting 'MPCP process' was worked out, first heuristically develops substituting the values of the matrix, reducing:

$$E = \left[\frac{18.48}{650.9269}\right]^{17.55} + 100^{[3.75-2.60]}$$
$$= 199.5262$$

Of the three values is generated $S =$
$199.5262 + 199.5262 + 199.5262 =$
$$\frac{199.5262}{3} \times 100 = 33\,\% \qquad (14)$$

$$AC = \left[\frac{(\log Psm + Ln\,Psn)^{1/2}}{\frac{Pam-Pmg}{3/4}}\right]^{\propto} \qquad (15)$$

To determine each μk (dt) by a 'high-frequency' term corresponding to all the stages beyond the kth. Thanks to the cascade structure, the high frequency terms are independent and identical in distribution to χ.the above formula develops substituting the values of the matrix, sustituting:

$$AC = \left[\frac{(0.25*49.55)+(0.75*49.28)^{0.25}}{\frac{49.55-49.28}{0.75}}\right]^{1} \left[\frac{2.6504}{0.36}\right]^{1} =$$
$$7.3622 \qquad (16)$$

Financial leverage Method

$$AC = \left[\frac{(\lim Psm + \frac{d}{d1}Psw)^{1/2}}{\frac{Pam-Pmg}{3/4}}\right]^{\propto} \qquad (17)$$

To determine Financial leverage, the above formula develops substituting the values of the matrixSustituyendo:

$$AC = \left[\frac{(0.618*49.55)+(0.5*49.28)^{0.25}}{\frac{49.55-49.28}{0.75}}\right]^{1} =$$
$$\left[\frac{2.7265}{0.36}\right]^{1} = 7.3536 \qquad (18)$$

Koch Method

$$AC = \left[\frac{(\frac{1}{2}Psm+\frac{3}{4}Psw)^{\frac{\partial}{\partial 1}}}{\frac{Pam-Pmg}{\frac{d}{d_n}}}\right]^{\propto} =$$

$$\left[\frac{(0.25*49.55)+(0.75*49.28)^{0.75}}{\frac{49.55-49.28}{0.75}}\right]^{1} = \left[\frac{18.6186}{0.36}\right]^{1} =$$
$$51.7183 \qquad (19)$$

To determine Koch, the above formula develops substituting the values of the matrix, of the three values is generated

$$S = 7.3622 + 7.3536 + 51.7183 = \frac{66.4341}{3} \times$$
$$100 = 22\,\% \qquad (20)$$

Conclusions

Of the three values obtained were positive with the methods used, it can be concluded that the formulas used help reduce costs with respect to time and money invested in a company, being Bimbo a profitable company considering TCambio as a determining factor in deciding whether it is viable or not to invest in ela.

The three methods greatly reduce the variables used to determine the correct value that allows to know the behavior of a variable on the market, specifically in a company of great nickname

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Risk- Benefit of the electronic comerce in Internet Mexico, financial growth, foreign direct investment and terms of trade

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The Business commerce to Consumer (B2C) between the Final Companies and Consumers. Ta through Internet is Direct Sale, more is regulated Business to Business (B2B) the made businesses of Commerce between Companies.

Electronic Commerce, Virtual Library, Global Market.

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Introduction

The meaning of the term "electronic commerce" has change during time. On its beginnings meant commercial transaction electronically, normally using technology like Electronic Data Interchange[17] (EDI, presented at the end of 1970) in order to send electronicaly documentas like purchase orders or bills.

After it passed to include activities more precisely denominate "Commerce in the network", of wells and services through the World Wide Web through secure servers HTTPS (Hypertext Transfer Protocol Secure) a form of secure encryption for the realization of confidential purchases, that protect to consumers and the organization facts, used with cards of electronic bought and with service of electronic payment.[18]

In 1995 the countries members of the G7/G8 created the initiative of a Global Market [19] for PYMEs, with the purpose to accelerate the use of the electronic commerce between companies all around the world. During this initiative of the G8 develops the Spanish portal of information and the virtual library in Spanish about electronic commerce Global Electronic Commerce. The electronic commerce nowadays had converted in the biggest media of buy and sell.[20]

Some factors of success for the electronic commerce.
Factor the most representative to take on account is the facility of consult at any time and from any place from any computer with network, lower price, faster service and shopping execution, interphase of friendly access through the web page with the use of colors, graphic, animation, photograph, typography.

Provide a community sense. The areas of chats, forums, registration as client, create fidelity to maintain that little contact with the consumer. Provide confidence and security through the registration of the Asociacion Mexicana de Internet (AMIPCI), Versing[21] the most recognized.

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[17] Marimón Santiago, (2009), *La sanidad en la sociedad de la información* , Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=TxbRL6Xj_bwC&pg=PA219&dq=Intercambio+Electr%C3%B3nico+de+Datos#v=onepage&q=Intercambio%20Electr%C3%B3nico%20de%20Datos&f=false

[18] Lawrence, Eric (31 January 2006). *HTTPS Security Improvements en Internet Explorer 7*, Recuperado el 13 de Mayo de 2009, de http://msdn.microsoft.com/en-us/library/bb250503(VS.85).aspx

[19] Kotler, Armstrong (2003), *Fundamentos de marketing,* Recuperado el 13 de Mayo de 2009, de http://books.google.com.mx/books?id=oZPb2aDJkHMC&pg=PT285&dq=mercado+global#v=onepage&q=mercado%20global&f=false

[20] Davalos Mejia Carlos, (1998), *"Títulos de crédito", Sobre las diferentes etapas del comercio*, Segunda edición Oxford University Press, p. 9-14.

[21] Verisign (2009), *Verisign – seguridad(Certificados SSL), comunicaciones inteligentes, y Protección de identidad*, Recuperado el 13 de noviembre de 2009, de http://www.verisign.es/

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Maintain actualized the portal with the technology; be alert in the economic and social environment.

Some products or services seem more suitable to the online sell; many virtual companies [22] of success, work with digital products like higher, modification and recuperation of information, music, cinema, formation, communication, education, software, photograph and financial transactions. Some examples of this type of companies are: Google, eBay and Paypal.

Electronic Commerce

The Electronic Commerce (e-Commerce) is a business on Internet or other electronic media that allow pick up the purchases or offer the products and services from or to clients or suppliers. The electronic commerce consists principally in the distribution, buy, sell, marketing and supply of complementary information for products or services through the informatics networks like Internet or other.

The industry of technology of the information could see as an informatics application guided to made commercial transactions. The electronic commerce also includes the transaction of information between companies.

Electronic commerce in Latin America

Not having the levels of connectivity which other countries have like United States or Europe, Latin America has been especially slow in the development of the electronic commerce.[23]

As well, the ignorance of the entrepreneurs of this social channel and the distrust that the same generate in many consumers had done also that the topic does not advance as it is wanted.

Even do this situation is a reality now to perspectives do not look to be the same. If we watch only the electronic commerce between companies and consumers (B2C) in other words we let out the electronic commerce between companies (B2B) of annual growth numbers in many countries like Mexico, Venezuela and Chile are over the 100% according with a study sponsored by Visa.

The same study dares to prognostic that for the entire region the electronic commerce will grow at least 40% annual between 2006 and 2011.

These projections are supported in factors like the impulse of young buyers, the advent of the broadband, the major availability of the payment media, the growing offer and the biggest guaranties of security for the shopping.

[22] Briz, Lazo (2007), *Internet y comercio electrónico*, Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=dsMrOEJqFcQC&pg=PA86&dq=internet+y+comercio+electronico#v=onepage&q=internet%20y%20comercio%20electronico&f=false

[23] Unicom , (2009), *Desafíos de la sociedad de la Información*, Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=m8kxnsnsQ78C&pg=PA110&dq=e+commerce+en+latinoamerica#v=onepage&q=&f=false

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Aspects as the improvement of the velocity in the connection it is nothing despicable. The study of Visa found that the 80% of people who buy on Internet have broadband and the volume of their transactions is four times higher than the ones who have switched access. This sum to the fact that Latin America is between the regions that grow the most in broadband is a substantial advance.

Unluckily the available numbers of electronic commerce do not show the behavior of the transaction between companies, which amounts of operation overcame by far those that the online consumers made in the region. In this segment there are also complex problems of culture because the ignorance that the entrepreneurs have about the operation of the transactional platforms.

Electronic Commerce in Mexico

The Fifth study of electronic commerce in Mexico 2009, made by the Mexican Association of Internet (AMIPCI) under the sponsor of Visa [24] and the information of Select.[25] Applied to 30 Companies. See chart 1.

Companies that participate in the sample

Turismo		Consumo	
Aeromexico		Abugaber	Liverpool
Click Hoteles		Bebebet	MercadoLibre
Despegar		Cibernética integral	Mixup
Interjet		Cosmetix	Palacio de Hierro
Lan Chile		Decompras	Plaza Vip
Mexicana		DineroMail	Sanborns
Posadas		Cibernética integral	Seguros S
Volaris		Cosmetix	Sony
		DineroMail	Telmex
		Forever Living	Tododecómputo
		Intelcompras	Tuner

Chart 1

Soruce: Mexican internet asociation

The sales amount of electronic commerce in the year of 2008, $1,768 million of dollars. The annual growth from 2007 to 2008 is of 85%. The percentages of electronic transactions grew in relation with the total of the sales in the companies, the sales of airplane tickes still being one of the factors of higher growth of 2008. See chart 2.

[24] Visa (2009),*Visa América Latina y el Caribe: Seguridad y Protección*, Recuperado el 13 de noviembre de 2009, de
http://www.verisign.es/http://lac.visa.com/home.jsp

[25] Select (2009), *Select – en tus decisiones TIC*, Recuperado el 13 de noviembre de 2009, de http://www.select.com.mx/sec_negociostic.php

Growth of anual sales

Año	Total de ventas (MUSD)
2004	$209
2005	$315
2006	$537
2007	$955
2008	$1,768

Chart 2
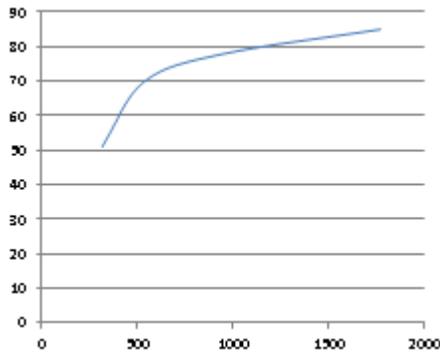
Source: Own elaboration with facts of Mexican internet asociation

Increase of the percentage of the international sales of 2007 to 2008 in a 14% and in the interior of the republic 50%.
In comparison of 2007 to 2008 of the total sales of the electronic commerce, the touristic field increases in a 101% and the consumption only a 45%.

In 2008 the sales of the airplane tickets represented the 79% and the rest 21% to products of consumption. See chart 3.

Distribution of sale of the most soled products through the Internet in 2008

Service or product	Percentage
Airplane tickets	79
Computing	7
Events tickets	3
Hotel nights	2
Electronic	2
Cellphones	2
Travel packages	1
Console and videogames	1
Picture and digital cameras	0.8
Clothes/watches/glases	0.7
Other	0.6
Accesorios de vehiculos	0.5
Deportes y fitness	0.4
Animales y mascotas	0.4
Accesorios celulares	0.3

Chart 3
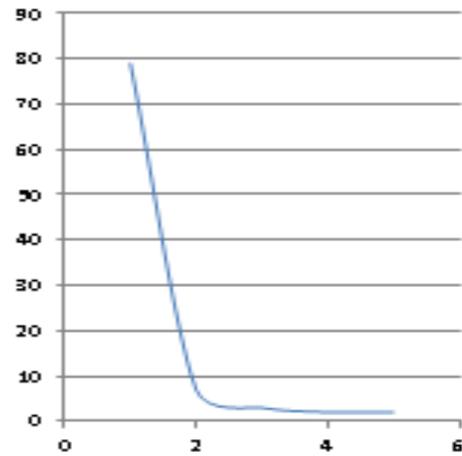
Source: Own elaboration with facts of: Asociación Mexicana de Internet.

The participation of the different types of payment in the 2008, highlight the credit card with a 74% Telmex Bill, gift certificate, Payment Client Banamex, UATP (universal air travel plan), agencies credits, credits and products no banker/ deferred payment 9% COD/Effective 8% Dispositive/Online transference 8%, PayPal 1% affinity card 3%.

Shopping habits of the internet.

Additionally the Mexican Association of Internet (AMIPCI), made an online survey in order to know the shopping habits of the Mexican. Made online in www.consupermiso.com.mx, it obtained 1,329 cases, same that represent to the universe of the Mexican internet use. Date of realization of the survey the month of August 2009.

The distribution of the socioeconomic level of the sample is representative of the universe of Mexican internets users, 28% level D+, 21% level D/E, 12% level C+, 14% level C, 19% ABC+, 7% level AB. According to the shopping type in first instance are the computing portals, followed by the airlines and appliances portals. The most important reliability elements in the moment to buy in a web site for the surveyed people are: Buy only in recommended and recognized sites, do not buy on cybercafés or shared computers, the portal address digit https in the direction and the figure of the padlock in the right inferior part of the browser.

The most used elements of security in the moment to buy through Internet, security policy and guaranties, privacy policy, seal of confidence, information of contact some phone number, fax or e-mail, https in the direction and the padlock figure in the right inferior part of the browser (SSL: Secure Socket Layer), personal user account with password, help section and frequently questions. Number of internet users who had bought on internet of the survey 846.

The seal of confidence of AMIPCI in a web site provide more security for shopping. A 90% of the surveyed compare process in physic stores and/or on internet before to do any shopping. The 77% of the buyers affirm that they will return to the internet shopping because the offer it has. The 67% will buy again for the diversity of products through the internet in order to find stuff that are not in sale in there cities.

Tendencies

Recently, the broadband penetration and the growth in the use of mobile dispositive have been boosting the electronic commerce. The consumers with broadband have been being more active in the electronic commerce than those who do not have access to high velocity.

With the combination of the growth in the access of broadband and he use of mobile dispositive every time more smart (like the 3G cellphones), it hopes that the sales of the electronic commerce increase.

In the practice, the companies are starting to use Internet as a new channel of sales, substituting the personal visits, mail and telephone for electronic purchases, because manage a purchase by internet is cheaper than made it by traditional form.

Article
OPTIMIZATION

International Guidelines

The organization for the Cooperation and Economic Develop (OCDE) [26] is one of the multilateral forums which more studies have approached around the phenomenon of the electronic commerce. In the same form, has shared permanent preoccupation with the finality that the rights of the cyber-consumers be sheltered correctly.

Like that, the OCDE adopted in 1999 the Guidelines for the Consumer Protection in the context of the Electronic Commerce. It hopes that soon, named Guidelines or general principles, wiil be submit to a revision under the light of dynamic develop of Internet and the new challenges faced by the consumer in the digital economy with the finality to ensure its effectiveness.

The Guidelines mentioned above provide a basic frame for the protection of the consumers in the electronic commerce.

It is important to mention that the OCDE is not the only multilateral forum that has showed preoccupation for the protection of the cyber users.

There are many tools developed by other international intergovernmental organisms, as well initiatives implemented by the private sector and the civil society.

The public policy of protection for the consumer and the electronic commerce

- The traditional approaches for the consumer protection should evolve at the same that the Internet does. [27] Between the principal aspects that should be taken on account are:
- Development of the online publicity, trading across the borders, and protection in payments.
- Challenges for the consumers and those who are responsible to design the public policies around the electronic commerce and inclusive around the newest aspects like the mobile commerce.
- The rights and obligations of the consumers in the consumer to consumer transaction (C2C) and the role of the intermediaries in that context.
- Associate topics with the shopping, sale and the interchange of the consumers in a growth variety of digital products.
- Transparency and practices of market associate with the growing participation and creativity of the consumers and the digital environment.
- The protection to children [28], who are exposed to biggest risks.

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[27] Profeco (2009), comercio electrónico */ tendencias del comercio electrónico / Profeco*, Recuperado el 13 de noviembre de 2009, de http://www.profeco.gob.mx/ecomercio/ecomercio_tendencias.asp

[28] W. Lamb Charles, (2009), Marketing – Google Libros, Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=K9Hg3Rpf054C&pg=PA248&dq=proteccion+de+los+ni%C3%B1os+en+internet#v=onepage&q=&f=false

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[26] OCDE (2009), *Lo nuevo en la OCDE*, Recuperado el 13 de noviembre de 2009, de http://www.oecd.org/document/12/0,3343,es_36288966_36287974_36316364_1_1_1_1,00.html

- Responsibility in the electronic commerce; Information, consolidation of a dispute and implementation of the consumer protection laws in the transaction of electronic commerce that raised challenges in the current policies.

Monterrey promotes the electronic commerce.

MercadoLibre.com[29], the leader site of buying-selling of Internet in Mexico and Latin America, inform that Monterrey, one of the cities with biggest development in the Mexican Republic, highlight for the noticeable growth that it has had in the electronic commerce thanks to its internet users.

Along more than 8 years of the Free Mexican Market, Monterrey highlight for be one of the cities where exist a considerable percentage of the better site users, and thanks to them the electronic commerce into the country grows significantly, with new ideas of business [30] and more entrepreneurs who take advantage of the site platform.

For Mercado Libre the expectative of electronic commerce growth in the North of the country are really high, because in the State of Nuevo Leon there is the 15% of the 1,000 bigger users, even do they only represent the 4% of the national population" said Francisco Ceballos, General Director of Mercado Libre Mexico.

The users of Mercado Libre in the Sultana del Norte accord with this tendency because the categories of Electronic Computing, Audio and Video are the principals as much in sales as in publications. "The growth of the electronic commerce in Monterrey is reflect in that the 11% of the sales and the 16% of the profits generated by the 1,000 better sellers of Mexico in the Mercado Libre that are made in this city" pointed Francisco Ceballos.

Part of the success of the internet users of Monterrey in Mercado Libre is because they take advantage of the advices that exist in the site like are the guides of PyMES and to buy or/and sell different things, these are made by the users of the site sharing their experiences with the finality to promote a secure community. The Mercado Libre University, a forum created by the site in order that the users could bring advices to help to achieve the success and increase the profits of more sellers, [31], it take place year by year with different host.

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[29] Cárdenas Luis, (2009), Historias de grandes éxitos – como se hicieron millonarios: historia de mercado libre, Recuperado el 13 de noviembre de 2009, de http://www.historiasdegrandesexitos.com/2009/04/historia-de-mercado-libre.html

[30] Briz, Laso (2006), *Internet y comercio electrónico: características*, Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=dsMrOEJqFcQC&pg=PA37&dq=mercado+global#v=onepage&q=mercado%20global&f=false

[31] Munuera alemán José Luis, (2006), Estrategias *de marketing: un enfoque basado en el proceso de dirección* Recuperado el 13 de noviembre de 2009, de http://books.google.com.mx/books?id=-bhMKddbyRQC&pg=PA443&dq=aumentar+ventas#v=onepage&q=aumentar%20ventas&f=false

A case of use of the electronic market in Nuevo Leon

The user MUNDOLAP1 made its first transaction in Mercado Libre in December 6th of 2004, the objective was to sell its laptop in order to buy a new one, for that made a big inspection of the site searching to put its offer between the things with better prices.

At 8 o'clock of the night decided to publish its product, and three hours later, the computer got a new owner, the buy was made using Mercado Libre.

MUNDOLAP1 seeing the success of its first sell decided to buy more computers in order to continue making it its principal source of income. MUNDOLAP1 have been maintaining a constant growth, getting to need a real office for its administration.

The categories where he published his articles inside Mercado Libre Mexico are, Electronic, Computing, Audio and Video, around the 25% of the sales that he made are inside the State of Nuevo Leon and the 75% in the rest of Mexico.

Conclusions

The term of electronic commerce in the end of the seventies was related with the technology was the form in which used the EDI the Electronic Data Interchange in the electronic send of documents like shopping purchases and bills, later this form changed of operation and implement activities more accurate to commerce of wells and services secure HTTPS (Hypertext Transfer Protocol Secure), a form of secure cypher for the confidential realization of purchases, which protect the consumers and the facts of the organization, where the use of the card of electronic buy in the most use. The

different forms of realization of this commerce are divided in the form in which they are made between companies and the final consumers it is denominate (B2C), between companies and companies (B2B) and from point to point (P2P) in which do not intervene a page or site to share some article or business.

It is the use of a program in common where people interchange archives from a computer to another, the information is not storage in a computer, there are interchange all kind of information from audio, pictures, movies, it is really big, the income of this type of program is the publicity which is announced in the portal, the (B2C/G) consumer, company for the government.

Some factors for the success of the site, is the facility and velocity in the moment to get into the same, to offer reasonable prices, interphases of friendly access like the use of colors, graphics, and animations.

Find chat areas, forums, register as client; create fidelity in the moment to maintain that little contact with the consumer. The fact of having the seal of confidence of the Mexican Association of Internet (AMIPCI), recognized in the community of internet users, provide security in the realization of shopping in the portal, like the example of the portals of books which are implementing shopping carts.

Some products or services look more suitable for this type of online commerce. Electronic commerce is a business on Internet or another electronic media that allowed pick up purchases or offer the products or/and services from or to clients or suppliers.

Electronic Commerce in Latin America, despite to not have the connectivity of United States or Europe, it takeoff in the electronic commerce have been especially slow, connected with the ignorance of the entrepreneurs in this new form of commercialization and the distrust that generate to the consumers to made operation through the Internet.

Despite the pessimism and the distrustful the situation in the nowadays is not that pessimist with the incursion of many companies in the services management, electronic banking, sell of events tickets, this form of commerce result more normal each day.

Only the electronic commerce between companies and consumers (B2C) in other words that we left out the electronic commerce between companies (B2B) the number of the annual growth in many countries like Mexico, Venezuela and Chile, is over the 100%, according with a study sponsored by Visa.

The same study dares to prognostic that for the entire region the electronic commerce will grow at least 40% annual between 2006 and 2011. The use of the connection of broadband, the age of young buyers who saw the use of internet like something daily and normal on their lives, is the perfect combination for the growth of this form of commerce. The study of Visa found that the 80% of people who buy from Internet have broadband and the volume of their transaction is four times higher to those who have switched access.

Electronic commerce in Mexico, according to the publication of "AMIPCI 2009, 10 years 199-2009",

Same that have important statistic about the state of the electronic commerce in Mexico, between the most meaningful in 2008, were counted 27.6 millions of internet users, the import of sales of electronic commerce in 2007 was of $955 millions of American dollars, with an annual growth 2006-2007 of 78%. Of the sales total by internet, in 2007, the 72% were made in the tourism sector with an amount of $955 millions of American dollars, while in the 28% rest of the total the buys were focus to the consume segment.

Regarding to the payment forms, in 2007, the 70% of the volume of sales was made through credit cards, followed in minor proportion by the payments in effective and the deposits and online transferences.

About the national shopping in comparison with the internationals, in 2007, 51% of Mexicans bought from internet to suppliers in the metropolitan area, 44% made it to suppliers placed in the interior of the Republic and only 5% bought abroad. The most sold products through internet are: airplane tickets and others.

Of this second category (others), stand out: computing articles, events and movie tickets, cellphones accessories, electronic, audio and video, host, travel packages.

The Mexican Association of Internet (AMIPCI), made an online survey in order to know the shopping habits, of the Mexican internet user. Made online in www.consupermiso.com.mx, it obtained 1,239 cases, same which represent to the universe of the Mexican internet user. Date of realization of the survey August of 2009.

OPTIMIZATION

The distribution of the socioeconomic level of the sample is representative of the Mexican internet users' universe, 28% level D+, 21% level D/E, 12% level C+, 14% level c, 19% level ABC+, 7% level AB. According to the type of shopping in first instance are the computing portals, follow by the airlines and portal of appliances. The reliability element most important in the moment to buy in a web site for the surveyed people buy only in recognize and recommend sites, it still being the recommendation from person to person.

The second term is that the page address of the portal says https in the address and the padlock figure in the right inferior part of the browser.

The most used security element in the moment to buy through internet, security policy and guaranties. A 90% of the surveyed compare prices of stores and internet before to made any acquisition.

The 77% of the buyers affirm that will buy again on internet because the offers that are offer. The 67% will buy again because the diversity of product on internet, to find thing that there are not on sale on their places.

The tendency in the electronic shopping, I the use of broadband and the growth in the use of mobile dispositive.

With the combination of the growth in the broadband access and the use of mobile dispositive every time smarter (like 3G cellphones), it hopes that the sales in the electronic commerce increase. In the practice, the companies are starting to use Internet with as a new channel of sales, substituting the personal visits, mail and telephone by electronic media, because manage a purchase by internet is cheaper than do it by the traditional form.

The Organization for the Cooperation and Economic Develop (OCDE) is one multilateral forum that more studies have approached around the phenomenon of the electronic commerce.

In the same form, has shared permanent preoccupation with the finality that the rights of the cyber-consumers be correctly guarded.

Like that the OCDE adopted in 1999 the Guidelines for the Protection of the Consumer in the context of the Electronic Commerce. It hopes that soon named Guidelines or general principles, be submit to a revision under the light of the dynamic develop of Internet and the new challenges faced by the consumers in the digital economy with the finality to ensure its affectivity.

The public policy of consumer protection and the electronic commerce, the challenges of the trading across borders and the protection of the payments, challenges for the consumers and for those responsible to design the public policies around the electronic commerce and around the newest aspects like the mobile commerce.

The children protection that are exposed to bigger risks, in the use of the Internet.

MercadoLibre.com, the site buying-selling in Mexico and Latin America highlight in the way in which the electronic commerce does not imply management of big volumes of goods, this portal offers a service in where the users offer goods and are under conditions of buying-selling of a community. It has the consumer to consumer direct sell.

The infinity of products and services that there are on Internet, the variety many times not found in the local markets, the manage facility to be accessible the 24 hour of the day the 365 day of year, made the electronic commerce an excellent shopping option, in the moment of the shopping, in Mexico the seal of confidence of AMIPCI have strength the site given the confidence to the consumer in the transactions.

With the new generations of Mexican internet users that see the connections and portability of internet access as something normal this attached to the services of the government with which we count nowadays as commerce in growth to 2011.

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Mexico: Financial Growth direct foreign investment and its terms of trade

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This research seeks to explain the reasons why the increases in foreign direct investment flows are not sufficient for the Mexican economy have sustained rates of growth. Although many factors may be, it is assumed that the problem lies in trade due to its low contribution to the economic boost in Mexico. Through a VAR (5) model using quarterly data from first quarter of 1980 to first quarter of 2010 with Gross Domestic Product, Foreign Direct Investment and Terms of Trade data, in the impulse-response analysis is that a shock random random foreign direct investment will not disrupt economic growth, but when a random shock in the terms of trade, the economy began a process of instability in the long term.

Economic growth, foreign direct investment, term of trade, co-integration.

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Introduction

The economic growth in any country is important because orient to the extern capital to the formulation of new projects of investment, to the application of the productive plant in dynamic sectors and to the consolidation of the most reliable companies.

This phenomenon resulting in a biggest production, an increase in the income and, for the same, an increase in the employment, translating it in a better welfare for the population. The behavior of the national production of our country was market by the different circumstances in the application of the economy policy. The best years of growth of the Mexican economy had been in the denominate model of stabilized develop, but at the end it generated structural problems. In the eighties it had and structural adjustment in the economy in order to made it more efficient, searching to set up the sustainable growth in the flow of external capital. For such purpose in the beginning of the nineties it is execute a reform to the foreign direct investment under a perspective of economic freedom. However, the results have not been the expected, the flow of foreign investment has increased but the economic growth of the last years has not been sustainable. For the above, it is important to make the next approach: Which economic variables affect to the Gross Domestic Product of Mexico given its exterior dependence?

The present research tries to explain the causes for which the increases of the foreign investment flows are not enough for Mexican economy to present a sustainable growth.

For such reason, it assumes that the problem lies in the directory of the interchange terms.

In this form, this study analyzes the long-term relation of the economic growth (presented by the evolution of the PIB) with the foreign investment, trying to identify the impact that the last two variables have over the Gross Domestic Product in Mexico. It starts from the supposed that the economic growth in Mexico, although is positively influenced by the capitation of foreign direct investment, it maintains with moderate variations because the deterioration of the interchange terms. The corroboration of this hypothetical affirmation will be achieve through the specification and estimation of a self-regressive model that involve representative production variables, the foreign direct investment and those that are used in researches and in the teaching of economic science.

Antecedents

From the perspective of the Mexican economy evolution, the economic growth had its best registers before the eighties. To this, Leon (1998; 56) affirm that the stability model and the economic growth that Mexico applied since the fifties until the beginnings of the seventies allowed the country grew in an annual inflation average of 3.85 percent. As well, points that during the period of Luis Echeverria the production decelerates, because the average annual growth of the production falls to 4.5 percent and the inflation increase almost 10 percent.

One of the principal causes was the lack of internal save: the increase of the deficit in the current account triply and the public deficit passed from 1.8 to 7.2 as percentage of the Gross Domestic Product (PIB). The financing of both deficits was made with more engagement of public debt, passing from 12.6 to 24.7 percent respect to PIB.

In that same period, points, the inflationary pressures in Mexico propitiated that the prices differential with United States expanded even more: the relation of interchange and, in consequence, a production fall (Leon 1998; 65).

In the eighties it had a structural adjustment of the economy in order to make it more efficient, searching to set up the sustainable growth with flow of external capital. For such purpose, in the bingeing of the nineties execute a reform to the foreign direct investment under a perspective of the economic liberalism. However, the results were not the expected, the flows of foreign investment have increased but the economic growth of the last years has not been sustainable.

Theorical Framework

In which from could it be analyzed the economic growth? What kind of relation does the economic growth, the direct foreign investment and the interchange terms have? Then it describes in a short form the way to analyze the economic growth and the studies that had been elaborated to the respect.

From a historic perspective, the economic growth could be analyzed by the different phases that a society could get through. These phases of the economic growth could transit in the follow steps: the traditional society, the predisposition of takeoff, the takeoff, the impulse to the maturity and the step of the mass consumption (Rostow, 1959).

However, is important analyzed the economic growth from a theorical perspective in order to search the factors that in the long term influence in the production of a country.

To this respect, the pioneer work of Solow (1956) affirm that the per capita product of long term is determinate by the save range and the income level, doing emphasis accumulation of capital and the technology state.

In the other hand, the behavior of the economy in the long term could be analyzed through the own information structure. To this respect, Toro (2009) estimate in the per capita income of long term in some emergent markets of Asia and Latin America. To eliminate the observed volatility in the PIB per capita used mobile averages of 15 years in order to find the growth rate of the series through the application of the filter of Hodrick- Prescott. The research found that the convergence process of the Latin American countries required twice the time that the Asiatic economies need (Toro, 2009).

There is an important relation between the economic growth with the flows of capital that get through the countries' frontiers, because they could be inverted in actions, bonds or in the productive sector.

For that, the movements of capital classify in foreign stock market investment o and foreign direct investment (IED).

This last is the biggest importance for the economies in development, because in 2004 represents around the 2.5 percent of the gross national income, as much as the stock market investment was approximately of the 1.5 percent (Kumar, 2007).

The importance of the IED in emergent economies and the economies in development lies in the source of resources that represents, is more stable and, therefore, least volatile.

To this respect, and in general terms, the economies that present a bigger volatility on it flow of capital obtain a minor economic growth. In 2006, for example, China presented an annual average growth of the Gross Domestic Product (PIB) of 9 percent with a volatility of capital flows near to 0.9 percent; while South Africa got an annual average growth of the PIB near the 2.5 percent associate to a volatility of the 3.1 percent (Kumar, 2007).

Additionally, the flows of IED generate a potential to the economies for the impact that have in the technologic development, in the formation of human capital and in the growth of PIB. As well, the countries with growth models to outside could conceive the IED as a promoter tool of the exportations and a source creator of researches. Also, given the conjuncture of the extern sector of some countries, the IED could finance the deficit in current account and supply or complement to the domestic investment.

In this sense, Kumar (2007) points that for each dollar of IED generated an increase of 50 cents in the domestic investment and of 75 cents in the domestic save.

From the above, the IED of biggest importance in the international movements of capital. Although its impact in the economic growth is discussed because the economists have problems to establish a strong link between the two variables. However, the analysis suggests a meaningful link between the IED and the PIB. Even do that the IED does not impulse an immediate economic growth, its effects are positives in a year after the increase (Kumar, 2007).

In the other hand, a variable of important analysis for anchored economies to the economic growth of the exterior in the correspondent to the relation of inter and extern prices, denominate terms of interchange. The influences of the variations in the interchange terms are seen as important driver forces of the newest economic cycles and which affected to many industries and developing countries posterior to the oil crisis of the seventies.

In the eighties, the fluctuations in the princes of the primary services non-oil caused an impact in the interchange terms (IT) of the developing economies (Mendoza, 1995).

In that sense, the relation between the economic growth and the TI is analyzed by Wong (2010) whom use information of series of time in order to analyze the impact of the IT and its volatility about the economic growth in Japan and Korea.

Using the cointegration method of Johansen (1988),[32] shows that the real PIB per capita and the TI determinate jointly. According to the described study, an increase in the volatility of the TI will cause a diminution in the real PIB per capita and an increase in the price of the oil will drive a diminution in the TI. Estimating the variance decomposition shows that the important factors of real PIB per capita are different between Japan and Korea.

For example, in Japan the financial development has a negative impact in the PIB per capita; while in Korea register a weak positive impact. Additionally, a little economy is more susceptible to the shocks in the TI. In general, although, a favorable and less volatile indicator of the TI is important for the economic growth (Wong, 2010).

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[32] Citado por el autor

Additionally, the impact of the TI volatility about the levels of products is generated by Grimes (2006) for the economy of New Zeeland. In the beginnings of the growth with minimum volatilities of PIB.

On its search for explain that phenomenon; Grimes (2006) affirm that approximately the half of the annual variations of PIB could be explained by levels and the volatility of the TU; although highlight that the explanation is better in a chart of steps of the economic activity (Grimes, 2006).

Methodology

The present research is of type correlational, longitudinal, non-experimental and therefore qualitative where is assumed that the economic growth in Mexico, even if is influenced positively by the capitation of the foreign direct investment, it maintains with moderate variations because the deterioration of the interchange terms. For such effect, is estimated a model of self-regressive vectors of order 5, identify as VAR (5), where are use the variables of the Gross Domestic Product (PIB) for the economic growth; Foreign Direct Investment (IED), represent of the flows of extern capital; and the last, the Interchange Terms (TI) Importations (IPIM) and the Prices Index to the Exportations (IPEX). The information of the variables is storage in the official web sites of internet of the State dependencies like The National Institute of Statistic Geography and Informatics (INEGI) and the Bank of Mexico (Banxico). The type of information is sample with trimestral frequency understood between the first trimester of 1980 and the first trimester of 2010.

Once captured the information, it submit to the analysis study impulse-answer and, posteriorly, to the analysis of cointegration for submit the economic theory in the field of the statistical rigor. This procedure allows identify, in first place, the convergence to the balance in the VAR and, in second place, the existence of a stable relation (of long term) between the dependent variable (PIB) and the explicative variables (IED and TI). To support the convergence of the model re used different statistics of test in order to know the number of necessary laggards in the VAR.

In the relation of long term is applied the statistics of test of Johansen to know the co-integrant vector. Afterwards is presented the tool of analysis for the evaluation of the general statistic models, the cointegration analysis.

Analysis of the cointegration and self-regressive vectors.

Stable relationship (of long term) between the variables of the statistic model could be carried to the cointegration analysis. However, it necessary to approach previously the concept of the unit roots to determinate if the series of the model have the same order of the integration. When used time series in the modeling of an economic situation is presented a common problem: the phenomenon of the spurious regression. This problem surge because the series of time involved present strong tendencies and, therefore, a R^2 high, even if there is not a meaningful relation between variables. Therefore, is important to find if the relation between the economic variables is real or spurious (Gujarati, 1997). If it is modeled with series that present tendencies is possible that the results of the regression be apparently satisfactory: R^2 closer to one, statistic t and F meaningful but with a low Durbin-Watson (d).

To this respect, granger and Newbold suggest as good practice rule to suspect that the regression is spurious that $R^2 > d$. This problem i is not newly discovered. In 1926 Yule identified the existence of correlations "without sense";[33] analyzed the risk of return a non-stationary variable over another non-stationary without relation, that is known as regression "without sense", calcified the series of time according to its properties of serial correlation in random to level, in first differences and in second differences.

Nowadays this three types of series are called integrates with order cero, one and two, respectively (Hendry & Jusellius, 2000). The integration of the series eliminates the problem of the unit root. In the econometric analysis of the time series have some proves to corroborate the existence of the unit root like the one of Dickey-Fuller Increased (ADF), the Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS). Named tests are approached by Leon (2008) and are resumed in the char 1. In the other hand, the cointegration is possible to understand it as an econometric tendency to evaluate the correlation between non-stationary variables of time series.

Statistic of test for the detection of the unit root

rueba	Estadístico	Hipótesis nula
DF	$\tau = \dfrac{\hat{\delta} - 0}{Se(\hat{\delta})}$	Existencia de raíz unitaria
P	$\tilde{t}_\alpha = t_\alpha \left(\dfrac{\gamma_0}{f_0}\right)^{1/2} - \dfrac{T(f_0 - \gamma_0)[Se(\hat{\alpha})]}{2f_0^{1/2}s}$	Existencia de raíz unitaria
PSS	$LM = \sum_t \dfrac{S(t)^2}{(T^2 f_0)}$	Existencia de estacionariedad

Chart 1

If two or more series are non-stationary, but in a lineal combination are stationary, then it said that the series are cointegrated. The null hypothesis of statistic meaning affirm that between the involved variables could or not be vector of cointegration. If mentioned vector has an order of integration one, could mean a balance relation between the original series, is said that such series are cointegrated in order one.

The balance is characteristic by force that tends to push the economy of return to its relation of long term. Traditionally, the economic theory proposed the forces which tend to maintain the relation between the involved series. If this situation is presented is decided that there is a relation of balance ç8or long term).

In statistic terms is possible to affirm that exist a measure in which the values of the series tend to return in the overtime. Therefore, the force of cointegration implies the inexistence of common tendencies between the observed facts of the analyzed variables.

This could suggest, from the perspective of the economic modeling that there is not congruency between the empirical facts and the theorical explanation which relate the involved variables.

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[33] Quoted in Hendry y Juselius (2000)

FINANCE

In this last situation is possible to affirm that the theorical model lack of empiric content in the facts; or, that the variables which have been selected in the econometric model do not represent adequately to the variables that the economic theory proposes.

Nowadays, the procedure of Johansen is used to prove the cointegration existence through the tests lamda-max and the trace. The comprehension of Johansen procedure by the part of a model VAR (1) where is stable that follows a stationary process when $\lim_{n \to \infty} B^n = 0$ and was posible is in the determinant $[B - \lambda I] = 0$ the absolute value of the characteristic roots is $|\lambda_i| < 1$. Si alguna de las raíces características es $|\hat{\lambda}_i| = 1$, The model is not necessary. In the search of a stationary process is modeled the VAR in first differences which is expressed as:

$$\Delta Y_t = (B - I)Y_{t-1} + U_t \qquad (1)$$

Or

$$\Delta Y_t = \Phi Y_{t-1} + U_t \qquad (2)$$

Being Φ a matrix of (m×m) parameters. The principal objective of the test of cointegration of Johansen is to find the Rank of matrixΦ, Which determinates the number of cointegration vectors.

The principal supposed to evaluate the test is that $U_t \sim N(0,1)$. Therefore, even do the used variables are of integration order I(1), error term of the equation (2) is highly correlated for present some tendency in the facts, violating, in consequence, the supposed that the errors present a normal distribution. A form to overcome this problem is to increase the self-regressive process to stay as:

$$Y_t = B_1 Y_{t-1} + B_2 Y_{t-2} + ... + B_p Y_{t-p} + U_t \qquad (3)$$

Having U_t a better behavior, namely, get close a normal distribution. Subtracting Y_{t-1} In both sites of the equation (5) obtain:

$$\Delta Y_t = (B_1 - I)Y_{t-1} + B_2 Y_{t-2} + ... + B_p Y_{t-p} + U_t \qquad (4)$$

Sum and subtracting in both sites of the equation $(B_1 - I)$ Y_{t-2} has:

$$\Delta Y_t = (B_1 - I)\Delta Y_{t-1} + (B_1 + B_2 - I)Y_{t-2} + ... + B_p Y_{t-p} + U_t \qquad (5)$$

Repeating the procedure, but now with $(B_1 + B_2 - I)$ Y_{t-3} has:

$$\Delta Y_t = (B_1 - I)\Delta Y_{t-1} + (B_1 + B_2 - I)\Delta Y_{t-2} + (B_1 + B_2 + B_3 - I)\Delta Y_{t-3} + ... + B_p Y_{t-p} + U_t$$

In general terms is obtained the follow specification:

$$\Delta Y_t = \sum_{i=1}^{\rho-1} \Phi_i \Delta Y_{t-i} + \Phi Y_{t-\rho} + U_t \qquad (6)$$

Being $\Phi_i = (B_1 + B_2 + ... + B_i - I)$ y $\Phi = (B_1 + B_2 + ... + B_\rho - I)$. The equation (6) is known as a vector model of error correction (VECM). The parameters of the matrixes Φ_i Are adjustments of short term and Φ are adjustments of long term to a change in Y_t. Therefore the matrix Φ could be expressed as:

$$\Phi = \alpha\beta' \qquad (7)$$

Being α the velocity of balance adjustment and β the matrix of long term coefficients.

The second term of the equation (6) represents the cointegration vector which ensure that Y_t converges from long term to balance

If we supposed that the content variables in Y_t are I(1), the ΔY_{t-i} should be I(0) And the term of error, U_t, Is white noise, that's why is said that the equation is balances and therefore exist $r \le (m-1)$ Relations of cointegration.

If the variables in the levels are stationary the spurious regression problem is took off and the model in levels is adequate to explain the economic relation of cointegration in levels, it passed to make the VAR in differences.

The numbers of vector of cointegration are obtained through find the characteristic roots of Φ.

If the rate of the matrix is cero is because the characteristic roots are cero and, therefore, the content variables in Y_t, do not cointegration. Johansen and Juselius (1990) provide two different statistics of test which could be used to prove the hypothesis about the existence of r vectors of cointegration: the test of drawn and the test of the own maximum root. The test of drawn presents the statistic:

$$\lambda_{traza} = -T \sum_{i=r+1}^{m} \ln(1 - \hat{\lambda}_i)$$
(8)

Being the hypothesis null the existence of at least r vectors of cointegration, in other words, the rate of the matrix is minor or equal to r and the alternative hypothesis is the existence of $r+1$ vectors of cointegration, the existence of more than a vector of cointegration.

The test of the maximum own root use the follow test statistical:

$$\lambda_{max} = -T \ln(1 - \hat{\lambda}_{r+1})$$
(9)

Where the null hypothesis assumes that the rate is r, r vectors of cointegration and the alternative hypothesis is that the rate is $(r+1)$, $r+1$ relations of cointegration.

In both tests is calculated the number of characteristic where $\hat{\lambda}_i$ are the i-esima characteristic estimated root of the matrix Φ and T is the total number of observations. The equation (6) could be extended and include determinate components (constant, tendencies and fictitious variables) that could be part of the VAR and/or of the cointegrator vector of long term.

The mechanism with Sargan who linked the static balance of the economic theory with dynamic models denominated distributed lag models; posteriorly, Davison, Hendry, Srba and Yeo (1978) introduced a type of model which they called mechanism of "error correction" (ECMs) [34] (Hendry & Juselius, 2000). The distributed lag models have the follow specification.

$$y_t = b_0 + b_1 y_{t-1} + b_2 x_t + b_3 x_{t-1} + \varepsilon_t$$
(10)

The former model called be formulated in the called form of balance correction substring y_{t-1} in both sides and summing and subtracting $\beta_2 x_{t-1}$ of the right side (Hendry and Juselius, 2000) in order to stay in the following form:

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta x_t - \alpha_2 (y_{t-1} - \beta_1 x_{t-1} - \beta_0) + \varepsilon_t$$
(11)

Being $\alpha_1 = b_2$, $\alpha_2 = (1 - b_1)$, $\beta_1 = (b_2 + b_3)/(1 - b_1)$ y $\alpha_0 + \alpha_2 \beta_0 = b_0$.

Models such the above explain the growth in y_t for the growth in x_t and the passed imbalance between levels.

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[34] '*Error-correction' mechanisms* (*ECMs*).

The magnitude of the imbalance is represented by $\left(y_{t-1} - \beta_1 x_{t-1} - \beta_0\right)$ and the velocity of adjust to its balance by α_2 (Hendry & Juselius, 2000).

To understand the former equation, initially Granger introduces the concept of cointegration where there is a genuine relation.

Then, Engle and Granger (1987) points that the mechanism of errors correction and the cointegration are two names of the same thing (Hendry & Juselius, 2000); Therefore, the relation between the analysis of the cointegration and the mechanism of errors correction could be analyzed from the perspective of Engle and Granger (1987). In this focus, is supposed that there is a relation of long term between y_t and x_t, being both *I(1)*, the model to estimate with simple information is represented as:

$$y_t = \beta x_t + u_t \qquad (12)$$

A relation of long term between the variables implies that the lineal combination of the same should be $I(0)$, in other words, u_t should be stationary. To clarify u_t of the former equation is obtained the following equation.

$$y_t - \beta x_t = u_t \qquad (13)$$

The matrix form of the former equation is represented as:

$$\begin{pmatrix} 1 & -\beta \end{pmatrix} \cdot \begin{pmatrix} y_t \\ x_t \end{pmatrix} = u_t \qquad (14)$$

If the vector $\begin{pmatrix} 1 & -\beta \end{pmatrix}$ achieve that u_t be stationary then it is denominate cointegration vector.

In other words, if y_t and x_t cointegrate, $CI(1,1)$, then the cointegration vector $\left(1, -\beta\right)$

Allows that the deviations of y_t, in respect of its trajectory of the long term be $I(0)$. Such situation require that the information of the variables to be of time series. A model or a mechanism of error correction (ECM) could be raised (Engel & Granger, 1987) in the following form:

$$\Delta y_t = \alpha_1\left(y_{t-1} - \beta \cdot x_{t-1}\right) + \varepsilon_{1t}$$
$$\Delta x_t = \alpha_2\left(y_{t-1} - \beta \cdot x_{t-1}\right) + \varepsilon_{2t} \qquad (15)$$

Where

ε_{1t} and ε_{2t} are withe noise or random crashes which could be correlation.

α_1, α_2 and β are positive parameters.

In a balance situation (of long term), in other words when $y_{t-1} = \beta \cdot x_{t-1}$, the parameters ($\alpha_1$ and α_2) take the value of cero and therefore the first differences to the random crashes (Δy_t and Δx_t) will be the same that the random crashes (ε_{1t} and ε_{2t}).

However if y_t and x_t Are deviated of the balance to long term in the current period, the term error correction (α_1 and α_2) Is different of cero each variable partially adjust to reestablish the relation of balance. Therefore, α_1 and α_2 measure the velocity of adjustment of the short term dynamic and its relation of long term.

In this way, for example, while α_1 is bigger, bigger will be the answer of y_t to the deviation of the former period to its balance of long term. Otherwise, while α_1 is minor, y_t is

a little bit sensible to the balance error of the former period.

If both parameters are equal to cero then the balance relation of long term will not be in the model stopping to be a model of error correction or cointegration.

It is possible to obtain different specification of the ECM in the moment to suppose that have intercept: or well through a VAR are added different lags of the first differences of the series, in such form that the generalized form of the ECM is:

$$\Delta y_t = \mu_1 + \phi_1(L)\Delta y_{t-1} + \Omega_1(L)\Delta x_{t-1} - \gamma_1\left[y_{t-1} - \alpha x_{t-1}\right] + \varepsilon_{1t}$$

$$\Delta x_t = \mu_1 + \phi_2(L)\Delta y_{t-1} + \Omega_2(L)\Delta x_{t-1} - \gamma_2\left[y_{t-1} - \alpha x_{t-1}\right] + \varepsilon_{2t}$$

$$(16)$$

The election of the optimum quantity of the lags in the above equations could be establish in analogue form to an VAR, selecting the order k that minimize the Akaike criterion or the Schwarz criterion, the error of the final prediction and the information criterion of Hannan-Quimm. For elation effect of the present research the relation of long term stay established by the following equation:

$$LPIB_t = \beta_1 LIED_t + \beta_2 LTI_t + U_t \qquad (17)$$

One of the techniques to obtain the relation of balance is through the dynamic specification which starts from the equation (17).

According to the model of error s correction exposed in the equation (11), the former relation could be established as:

$$\Delta LPIB_t = \alpha_1\Delta LIED_t + \alpha_2\Delta LTI_t + \gamma U_{t-1} + \varepsilon_t$$

$$(18)$$

The product, the foreign direct investment and interchange terms in a stable model of long term

The specification of the long term model between the PIB, the IED and the TI represented in the equation (17) was formulated, in a logarithm form, from the established in the in the theorical framework of the research. The hypothesis that it search to prove through the estimation of such model is the following: the economic growth in Mexico, even do is positively influence by the capitation of foreign direct investment, it is maintain with moderate variations because the interchange terms deterioration. The representative variables in the model are the PIB for the economic growth, the IED as representative of extern capitals flows and the relation of the TI represented by the quotient between the Index of Prices to the Imports (IPIM) and the Index of Prices to the Exports (IPEX). The information was obtained of the internet official web sites of the National Institute of Geographic Statistic and Informatics (Instituto Nacional de Estadística Geografía e Informática INEGI) and the Bank of Mexico (Banxico). The type of information is sample with trimestral frequency understood between the forst trimester of 1980 and the first trimester of 2010.

To start the empiric analysis is necessary to identify the behavior of the series that are part of the model.

For that, the figure 1 present the evolution of the variables where is observed that the PIB, the IED and the TI present a higher tendency similar during the period of study; although the behavior of the TI are very irregular. Additionally, is possible to observe an existent relationship between the PIB and the IED and TI variables: as much for the PIB, the IEDP and the TI seems to be a positive relation.

In order to know if the series could be related in a statistic model, is necessary use statistics proves that show the order of the integration of the previously described series. For such reason, and then presents the results of the tests of unitary root (chart 1) of the series in logarithm form which are presented in the chart 1.

Evolution of the IED, the PIB and the TI in Mexico.
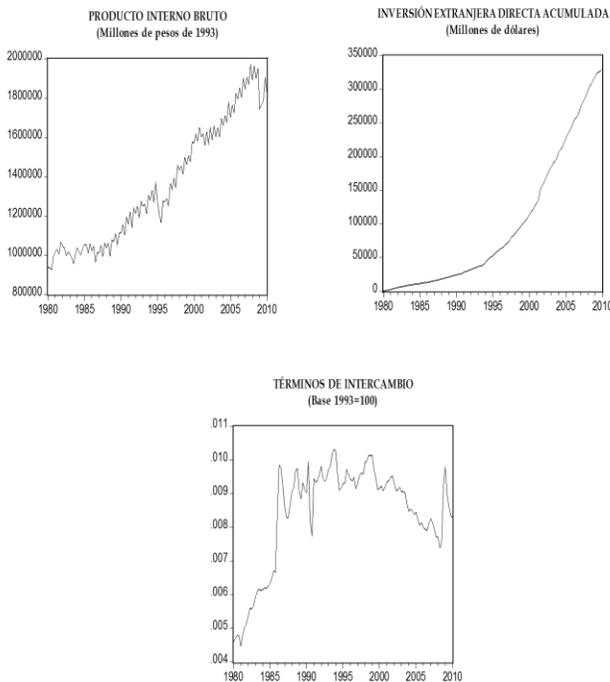
Graphic 1

Pruebas de raíz unitaria

Varia ble	ADF		PP		KPSS	
	$estadístico$	$Prob$	$estadístico Aj.$	$Prob$	$LM_{estadístico}$	Valores críticos asintóticos
$LPIB_t$	0.1742 46	0.96 98	-0.7517 94	0.82 85	1.2885 28	
$\square LPIB_t$	-6.0266 52	0.00 00*	-25.755 01	0.00 00*	0.0715 58	0.739 al 1%
$\square^2 LPIB_t$	-8.3389 53	0.00 00	-135.94 93	0.00 01	0.1532 52*	
$LIED_t$	-2.6580 82	0.08 45	-4.5401 84	0.00 03*	1.3114 70	0.463 al 5%

$\square LIED_t$	-13.750 53	0.00 00*	-16.878 28	0.00 00	0.5544 77	
$\square^2 LIED_t$	-14.457 87	0.00 00	-12.487 50	0.00 00	0.5012 72	
LTI_t	-3.79857 6	0.00 39*	-3.0588 27	0.03 25*	0.5963 74	
$\square LTI_t$	-7.1548 51	0.00 00	-9.2492 52	0.00 00	0.5189 80	0.347 al 10%
$\square^2 LTI_t$	-8.9218 02	0.00 00	-63.895 41	0.00 01	0.1814 52*	

Nota. Las pruebas ADF y PP tienen como hipótesis nula la existencia de raíz unitaria y la KPSS la estacionariedad de la serie.

Chart 1

The results of the unitary root test of the above chart are evaluated to 5% of significance and points that, according to the ADF test, the series LPIB and LIED are stationary in first difference and the LTI series is stationary in first difference; the PP test shows that only the logarithm of PIB is stationary in first difference while the PIB and TI logarithms are stationary until the second difference. Therefore, and given the heterogeneity of the test's results, is possible to accept the results of the ADF test because its results are congruent with the behavior to long term of the representative series of the model. Now, in order to know the random crashes effect that IED and the TI exert over the PIB, first it should determinate the number of lags that are need in the VAR estimation.

For such purpose, presents in the chart 2the reason studies of the plausibility (LR), final error of prediction (FPE) and the criteria of Akaike information (AIC), Schwrz (SC) and Hanana-Quinn (HQ). In named chart is showed with asterisk the number of lags that should be include in the VAR, having as result that in all the statistics is pointed that should be include until five lags.

Statisitics of test to identity the number of lags in the VAR

Lag	LogL	LR	FPE	AIC	SC	HQ
1	663.7343	NA	1.86e-09	-11.58822	-11.37099	-11.50007
2	712.0711	91.54057	9.28e-10	-12.28445	-11.84999	-12.10815
3	725.2718	24.29850	8.62e-10	-12.35879	-11.70712	-12.09435
4	754.7344	52.66776	6.01e-10	-12.72096	-11.85206	-12.36837
5	796.6874	72.76801*	3.36e-10*	-13.30420*	-12.21807*	-12.86346*
6	804.4534	13.05788	3.45e-10	-13.28236	-11.97901	-12.75347
7	810.7198	10.20370	3.64e-10	-13.23398	-11.71340	-12.61694
8	814.6165	6.138167	4.01e-10	-13.14366	-11.40585	-12.43847

Chart 2

The estimation of the VAR(5) model should accomplish with a condition of convergence to the balance. In other words, the model should be stable or follow a stationary process in the long term, meaning that the roots that solve the determinant of the matrix should be minor to one in absolute terms. This is observed in the unitary circle of the figure 2, in which is observed that all the roots that give solution to the model are found inside, that's why they are minor to one in absolute values.

Characteristic roots that guaranty the stability in the VAR(5)

Raíces inversas que solucionan al polinomio característico
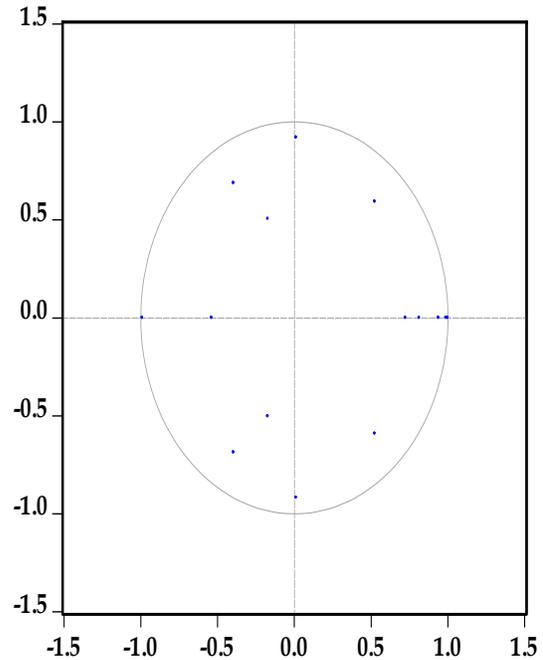
Graphic 2

Additionally, to estimate the VAR(5) model and identify the effect that cause the random crashes of the IED and TI logarithms over the PIB logarithm it has the following observation of the figure 3. The perturbations in the interchange terms cause a destabilization in the long term in the product levels; while those random crashes in the foreign direct investment flows do not destabilize in a big way to the intern product.

Impact of random crashes of the LIED and LTI over LPIB.
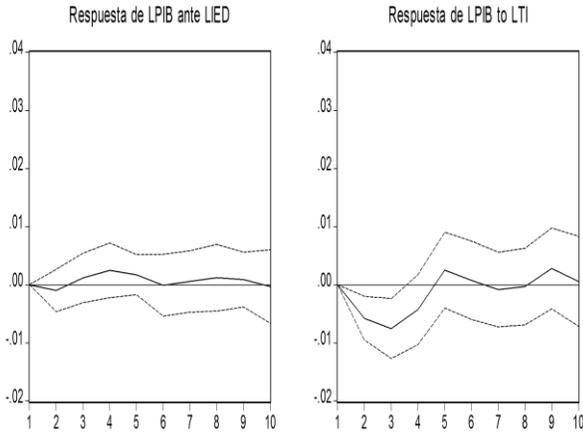
Graphic 3

Furthermore, the application of cointegration analysis in the study of economic growth and its relation with the productive extern capital flows and the relative prices of the commercial interchange throw interesting results. For one part, to apply the test of the specific trace in the equation (8) in a level of significance of the 5% is obtained three cointegrated vectors; such results are observed in the next chart:

Test of trace in the model VAR(5).

Hipótesis No. de ecuaciones	Valor propio	Estadístico De la traza	Valor crítico 0.05	Probabilidad**
Ninguno *	0.156329	40.44954	29.79707	0.0021
Al menos 1 *	0.109759	20.90041	15.49471	0.0069
Al menos 2*	0.063381	7.530102	3.841466	0.0061

Chart 3

However, because the objective of study is to know the relation between the PIB as endogenous variable and the IED and the TI as exogenous variables, the test of cointegration of Johansen throw the follow cointegrated equation.

$$LPIB_t = 0.214663 LIED_t - 0.172359 LTI_t$$

The cointegrant vector points that for each 1% of increase in the IED the PIB will increase, in average, 0,21% while if the TI increase 1% the PIB decrease 0.17% in average.

Finally, the statistic justification to use LIED and LTI as exogenous variable in the model is possible to see in the application of the causality test of Granger with 5 lags, which throw the follow results of the chart 4.

Causality test of Granger.

Hipótesis Nula:	Obs.	F-estadística	Probabilidad
LIED no Causa Granger a LPIB	116	3.70660	0.00395
LTI no Causa Granger a LPIB	116	5.62954	0.00012

Chart 4

In both cases the null hypothesis is rejected because the probability levels of the F statistic are minor to 1% if is consider a level of significance of the 5%. Therefore, the LIED and LTI variables are approved to be specified as exogenous variables in the cointegrant equation of LPIB.

Conclusions

Since the commercial opening in the eighties, the economic policy in Mexico has searched to cement the economic growth about the extern capital flows, necessaries to complement the domestic investment in productive projects.

This, in effect have carries positive results to the economic growth. However, because the deterioration of the interchange terms, the competitive of the Mexican economy have been decreasing in front of the international competence, pointing that in the exterior produce with lower prices that in our country.

This means that the countries which have commercial interchange with Mexico have more efficient economies.

The presented model and estimated in the present research realize the commented before: The flows of extern direct investment positively influence in the level of national product; otherwise the deterioration and instability in the interchange terms negatively impact to the economic growth and also, destabilizes it.

Although the search of the economic efficiency implies more competitive prices for the Mexican economy, is recommendable generated public policies guided to support the wells and services production with the big aggregate value.

For the above, the competitively should be based in better and new products which could be offer in the international markets.

In that sense, the productive sector in Mexico should be linked to programs of technologic innovation which make reference to the proposal of Solow (1956) in order to generate better and new products in the international market. Posterior researches to this respect should board proposes to the national prices of the economy be more competitive in national and international level. The consequence of the above, and according to the presented model of this work, is reflected in stability about the economic growth in our country.

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Strategic management of the Aninstitutional Sectors, the informal sector and the no protected job in Mexico.

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In theoretical and practical terms when it is the informal sector normally an enormous confusion around this concept exists and seems that instead of advancing towards a point in agreement and a exactly definition a greater confusion is created and to an impressive dispersion. This problem has arrived at such magnitude that some investigators when talking about to this concept compare it with a "gale without course" (Rendón and Rooms 2000) that instead of clarifying itself are confused more and more. Luckyly the inclusion of the institutional sectors within the framework of the national accounting and the labor statistics has allowed us to save this problem favorably

Employ, wage-earning, working.

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Different concepts about the informal sector

In an article published by Teresa Rendon and Carlos Salas in 2000, quote some definitions of the International Organization of Work (OIT) that respect to the informal sector raised: "are workers and/or companies in non-organized activities, which use simple technologic procedures"… "the force of the informal sector is composed by those employed in no modern little companies, the independent workers with the exclusion of the university professionals and those who work in the domestic service" (PREALC 1976, p. 39).

In the case of Mexico authors like Clara Jusidman defined to the informal sector as a group of aggregates (Jusidman 1993) which include:

- Domestic workers
- The employers, employees and pieceworkers in establishments with five or less workers, except in the subsidiaries of state companies or companies of big sice and domestic work.
- Workers on their own
- Worker without salary

Bryan Roberts define the informal sector (Roberts 1993) in two categories:

- In establishment level include the registered private units of non-agrarian sectors with 15 or less people employ if is about manufactured activities and 5 or less people in the other activities.
- In individual level, include the workers without salary, independently if they are familiar or not, and the workers with salary who do not have social benefits (medic service, pay vacations, bonus, registration in the IMSS, utilities repartition).

Francois Roubaud defined the urban informal sector, like the economic units that do not count with the correspondent register in hacienda (Roubaud, 2005).

Kathleen Saudt include on it definitions the followed people (Saudt, 1998), occupied in the informality:

- Workers on their own.
- Worker with salary that are not cover by the social security.
- The occasional work.
- The work in activities of housing self-construction.

Fernando –mires, consider that the informal sector is associate to the backward and impoverish sectors of the economy (Mires, 1998).

Eduardo Rodriguez Oreggia, Martin Lima and Alberto Villalpando (Oreggia, Lima and Villalpando, 2004), define the informal sector in a generic form as that conformed by the workers who do not count with benefits of social security and also do not enjoy of the establish benefits in the general law of work.

The model raised by Harris and Todaro about labor market consider the informality as part of the labor market which is sent outside (Harris and Todaro, 1970), to the not covered by the social benefits, because the remunerations are over the point of balance in the formal sector.

Osorio, Alvez and Graham had argument that the workers protect in the formal or modern sector, counts with higher salaries, vacation, bonus and legal protection on their work (Osorio, Alvez and Graham, 2005).

Difference of those that could not obtain jobs in these companies and have to move to second better alternative, the informal sector, in little companies or as self-employees, getting involved in intensive alternatives in handwork and without social and labor benefits.

The named Rendon and Salas (200), consider that the informality include at least one of the follow activities of economic units:

- Clowns in cruises, fire-eaters and wipers, etc. which get into what we know as survival strategies.
- The domestic workers with salary.
- Workers on their own familiar workers without salary.
- The workers with salary that have lack of suitable conditions of work, being in salary terms, labor contract or payment of benefits.

- The worker who made some work in the field of the subcontracting with companies typically capitalists (Maquiladores)
- The micro companies, with a number of workers inferior to ten.
- All the establishments that do not accomplish with any legal disposition relative to the labor ambit (no vacations payment, bonus, and social ensure, etc…)
- Those units which break some governmental regulation, for example the registration with the fiscal authorities.

Also in 2000, Rendon respect to the informality agree with Haan when affirm that:

"In the more than 15 years that have passed since the concept of informal sector was introduced, have been impossible translate the former notion in the generally accepted definition consistent and usable of the informal employment" (Haan 1989). Finally Rendon and Salas establish that the informality notion from the conceptual point of view is something very week and that the conceptualization problems that have are in the big groups.

- The presence of many criteria, each one of which could be accomplish in independent form from the others.
- The impossibility to wait effectively to the universe of reference in two sector (formal and informal) outside and complementary.
- The impression in the reference universe, because used interchangeably the establishment, the home or the person.

Fortunately in 1993 during the XV International Conference of Works Statistics (CIET XV) organized by the International Organization of Work (OIT) were achieved important advances in the suitable conceptualization of the informal sector. After that these definitions were integrate in the System of National Account of 1993 (SCN93[35]) Edited jointly by the United Nations (UN), International Monetary Fund (IMF), World Bank (WB), Organization for Economic Co-operation and Development (OECD) and European Union (EU). In this conceptualization, start from the concept of institutional units and sectors, and in this frame, the informal sector is only a subsector belonging to the institutional sector of homes as is showed next.

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[35] El SCN93 es la metodología que utilizan los países para elaborar sus cuentas nacionales

Conceptualization of the institutional units and sectors

The institutional sectors are those that in the moment to group constitute the institutional sectors; an institutional unit could be defined as: An economic entity which has the capacity, by own right, to poses actives, contract passive and made economic activities and transaction with other entities (ONU et to 2000).

The different sectors and subsectors of economy are formed by institutional units which are residents in named economy.

The concept of institutional sector starts from the premise of the institutional units property; this particular form of sectorization of the economy allowed define clearly to the companies of the informal sector as economic entity that are property of the institutional units called homes, therefore the informal sector is no more than a subsector that is part of the institutional sector of the resident homes in a determinate economy (ONU et to 2000).

Classification of the institutional units in two big groups

In the real works, the institutional units could be classified in two big groups: a) the juridical or social entities which existence is recognized by the law or society with independence of the entities or people who could be their owners and control them and, b) the people or groups of people that are part of the homes (ONU et to 2000).

Subsectorisation of the institutional sectors according to SCN

The resident institutional units are grouped in five institutional sectors, which are mutually exclusive; each one of these institutional sectors could also subsectorized itself in many forms, like is showed next

The sector of the financial societies

Include all the resident societies and quasi-societies which principal activity is to financial made intermediation, the sector of the financial societies are composed by the follow subsectors:

-   The central bank
-   Other deposit societies
-   Another financial intermediaries except societies of insurances and pension funds
-   Insurances societies and pensions funds
-   Financial auxiliaries

The sector of the non-financial societies

In this sector are include all the resident non-financial societies and quasi-societies. For effects of a most detailed study the sector of the non-financial societies are subsectorized in:

-   Non-financial public societies
-   Private Non-financial societies
-   Foreign control non-financial societies

The sector of the general Government

It is constituted by units of the central, state and local governs and also by the social security funds which are obligatory for those units.

The most used form to subsectorize the general government is:

- Central Government
- State Government
- Local Government
- Funds of social security

The sector of the private institutions without profit which serve to the shelters

It is conform by all the resident units that provide wells and services not of homes market, except those that are principally financed and controlled by the government.
Could be distinguished two principal kinds of IPSFLSH:

- Those that are created by associations of people in order to offer wells and principally services in benefit of its associates, examples: professional or scientific associations, political parties, syndicates, consumers associations, churches or religious associations, social, cultural, recreational or sport clubs.
-
     The benefits institutions, of assistance or help create with philanthropic purposes.

The shelter sector

The shelter sector in conformed by all the resident shelters include the institutional homes composed by people who live for long periods in hospitals, nursing homes, convents, prisoners, etc.

     The shelter sector could be subsectorise in many form, the SSCN93 mention the follow:
First: according to the major income source for the shelter on its set (employers; workers on their own, salaried workers, incomes by count of the property and; transferences).

Second: for the occupation of the reference person or shelter chief (This should be the one who has the biggest income or the one who takes the important decisions relative to the consumption of the shelter). Third: for the industry (activity field), on its case, in which work the reference person. Fourth: the type of zone in which the shelter is located (rural, urbane or metropolitan).

     Otherwise, for many countries is important distinguish between the formal and informal sectors of economy; about the particular is important to point that the informal sector of the economy in a subsector belonging to the shelter sector, shaped by the companies of shelters no constitute in society (except for the quasi-societies).

Definition of the informal sector by the rector organisms, of the statistic generation at international level

Extract of the adopted resolution, in June 28th of 1993 by the XV International conference of Workers Statistics (CIET), convoked by the international organization of work:

     The informal sector could be described in general terms as the group of units dedicated to the production of wells or service benefit with the primordial finality of creates employment and generates incomes for the people who participate in that kind on activity.

     There relation of employment- en cases that exist- are base more in the occasional work, the personal and social relationships, and not in contractual accordance which supposed formal guaranties.

The production units of the informal sector present characteristic features of the shelter companies. The fixed assets and other values do not belong to the company, but to the owners. The units like those could not make transactions or make contracts in other units, neither get obligations in its name. The owners have to gather the necessary funds buy its own and the risk and should personally answer, in a limit form, of all the debts or obligation that have carried in the production process.

In many cases, is impossible to clearly distinguish between the part of the payment and the expenses assignable to the production activities of the company and that which simple correspond to the normal spends of the shelter. As well, some well of the crew, like the buildings or vehicles could be interchangeably used with commercial purpose and for the use of the shelter.

According to the System of National Account of the Unit Nations (Rev. 4), the shelter companies (those which belong to the shelters and that are not constituted in society) are difference of the societies and the quasi-societies in base of the juridical organization of units and type of accountability that have.

The shelter companies are units dedicated to the wells production or the services benefit that are not part of a juridical entity independent of the shelter owner neither of the member of the same and which do not have a complete accounting (including the active and passive balance) that allows a clearly distinction between the company production and the other activities of their owners, like the flow capital incomes.

Occupied in different institutional sector and subsectors

In the sector of shelters that are in the following subsector of occupation:

- Occupied in the informal sector: workers in companies of shelter properties for the market, are not constituted in society and could be companies of informal employers or worked companies by their own.
- Domestic salaried workers: subordinate workers in homes that produce domestic services for the self-consumption of the shelter employer.
- Workers in the production of self-consumption; principally the worker in survival agronomy, which principally produce for the self-consumption.

I) Occupied in the financial societies
Are employers of financial companies constituted in society or quasi-society, public or private, belongs to the formal sector.
II) Occupied in non-financial societies
Are employers of non-financial companies constituted in society or quasi-society, public or private, agrarian or not agrarian; belong to the formal sector.
III) Occupied in the general government
They are the public employees of the three Republic powers (executive, legislative and judicial) in the three government levels (federal, state and municipal), we add here to those occupied in autonomic organisms financed by governmental units (IFE, UNAM, etc.). We also include to the employees in the institutions of social security and the pension funds; in other words, the workers of IMSS, ISSSTE and the state services of social security, these occupied belong to the formal sector of the economy.

IV)   Occupied   in   the   private   institutions
without profits

Are workers of the churches, political parties, syndicates, non-governmental organization, etc. belonging to the formal sector of the economy.

Group of the occupied in institutional units

In this case we have an aggregation of the occupied in the big groups of units (Chart 1), which are on a site those who work inside the shelter sector and for the other site those who work in juridical and social institutions, societies and quasi-societies which existence is recognized by law.

Big groups of institutional units.

| Shelters |
| Juridical and Social entities |
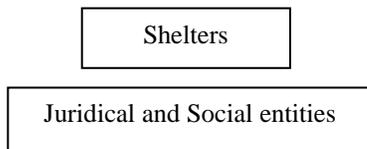
Chart 1

Group of the units by institutional sectors

In this level of disintegration (Chart 2) we have the occupied in the different institutional sectors that establish the System of National Accounts of 1993.
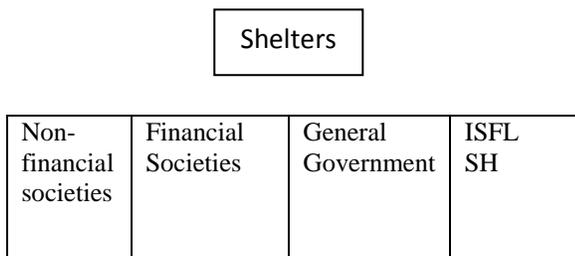
The institutional sectors.

| Shelters |

Non-financial societies	Financial Societies	General Government	ISFL SH

Chart 2

Group of the institutional sector to determine the occupation in the formal and informal sectors and the self-consumption of the economy

The principle of all the occupied came of the shelter sector, but worried in the different institutional sectors. In the next chart is observed that the group of occupied in the big group of the juridical and social entities are part of the formal sector of the economy.

In the other hand the shelter sector could be disaggregate in three subsectors of occupation that are: a) the domestic employees, b) the country people occupied in agrarian activities of survival and other self-consumption production and, c) the occupied in the informal sectors.

Of this last allow us to determinate the informal sector of the economy as a subsector of the institutional sector of the shelters and put apart the self-consumption production sector of the homes formed by the survival agrarian producers (country people) and for the occupied in the domestic services prediction (domestic employees).

Attending to the recommendation of the XV CIET and the SCN 93 the occupied in the shelter sector which are not part of the informal subsector, the country people and the domestic employees are also integrant of the formal sector of the economy, even if they work with frequency in precarious conditions and do not count with social security neither saving systems for their retirement. In the chart 3 schematized detail the occupation of the institutional sectors. On purpose of the shelter sector disaggregated by sector of occupation to define with precision the place that the informal sector have as a subsector of the shelter sector.

Chart 3

Occupation in the institutional sectors

Percentage distribution of occupied by institutional sectors Mexico 2008

Graphic 1

Relation of the occupation by institutional sectors with develop of the labor market, social security and the quality of employment

The form in which is conformed the labor market of a country, is a clear indicator of the develop level of the economy when in that country near the half of the occupied population work in the shelter sector, that country has without question an economic low level of develop.

In the period of 2005 and 2008 (Graphic 1) was an increase of the occupied proportion in the juridical and social entities, from 47.5% to 52.8%, against the contra part of the occupied population subsector in the countryside have been decreasing from 23.5 to 15.9; the informal subsector of the shelters increase its relative participation from 25.7 to 26.7% in this period.

Analysis of the distribution of the percentage occupation by institutional sectors according to the size of the locality in which the occupied people live and work

In the big cities with more than 100 thousand habitants the informal occupied proportion (24.3%) is minor to the reported by less urbanized sectors, 35 and 35.1%, in the localities of 15 thousand to 100 thousand habitants in the semirural of 25000 to 15 thousand habitants respectively.

Percentage distribution of the occupation per institutional sectors according to the locality size. Mexico 2008.
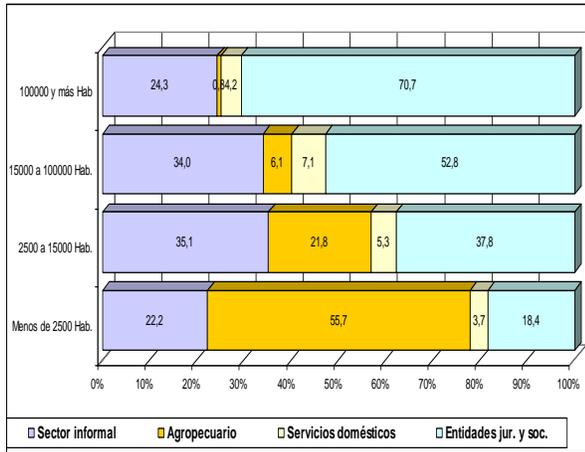

Graphic 2

Source: Own elaboration with facts of the INEGI, occupation of the non-structured sector in Mexico 2005-2008 and the National Survey of Employment (ENE) many years.

Analysis of the occupation per institutional sectors in the different federative entities of the country.

The information referent to the federative entities (Graphic 10) was organize in a falling form according to the rate of informality reported by each one of them regularly the stated with bigger agrarian vocation are also those that report bigger informality rates.

The entities of the north frontier of Mexico or those which have higher industrial and economic develop in general report a minor rate of informality in the juridical and social entities is numerously.

Percentage distribution of occupation per institutional sectors according to the federative entity, Mexico 2008

Graphic 3

Source: Own elaboration with facts if INEGI, occupation of the non-structured sector in Mexico 2005-2008 and the National Survey of Employment (ENE) many years.

Application of the institutional sectors in order to know the protect and non-protect occupation of the economic system

The occupied in the shelter sector by general rule do not count with the benefits of social security and generally do not have the labor benefits contemplated in law, this situation is observed in the sub-develop countries of Africa, Asia and America.

As is possible to see, the occupied in different subsector of the Shelter Sector in summary form do not count with social security, in the case of the occupied in the formal sectors and subsectors, formed by juridical and social entities, the majority count with social security but this coverage should be total.

Application of the Institutional Sectors to determinate protect and non-protect sector of the occupation.

With social security

Without social security

Sector hogares

Su bsector informal	Sub sector formal	Sub sector formal
Em presas de producció n de mercado no constituida s en sociedad	Prod ucción de bienes de autoconsum o	Ser vicios domesticos rem unerados

Chart 4

Entidades juridicas y sociales

So ciedades no financiera s	So ciedades financiera s	G obierno general	I PSFLSH

In Mexico as is possible to observe in the Graphics 14 to 19 the proportion of occupied in the juridical and social entities have been increasing and consequently has been increasing the proportion of people who count with social security, however it is not enough because less than four of each ten in 2008 counted with the benefit of the social security as result of their work.

Percentage distribution of the occupation with social security according to the institutional sectors where they work 2005.

Graphic 4

Source: Own elaboration with facts of INEGE, occupation of the non-structured sector in Mexico 2005-2008 and the National Survey of Employment (ENE) many years.

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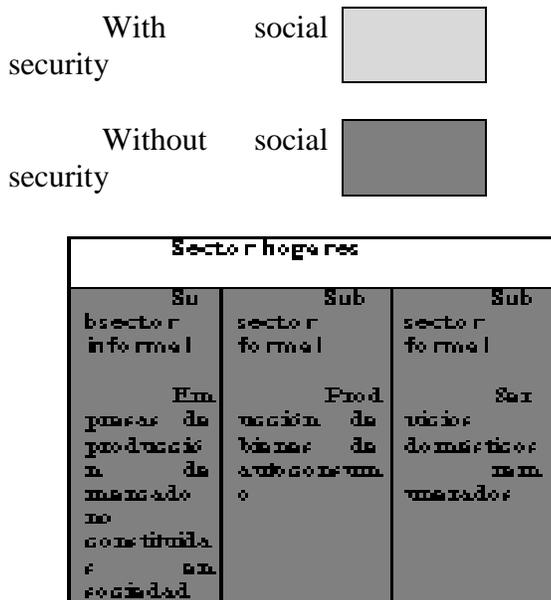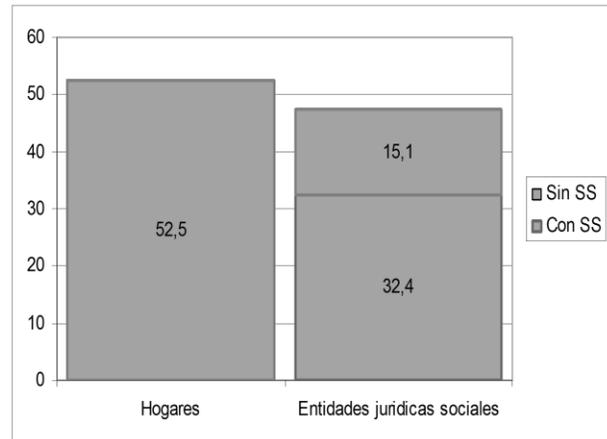
Percentage distribution of the occupation with social security according to the institutional sectors where they work 2008.
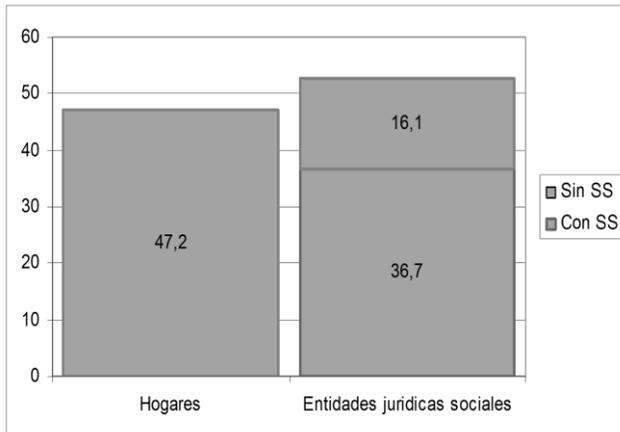

Graphic 5

Source: Own elaboration with facts of INEGI, occupation of the non-structured sector in Mexico 2005-2008 and the National Survey of Employment (ENE) many years.

Conclusions

With the exposed before is possible to observe that the use of the units and institutional sector concept is contributing to end with the terms confusion that still existing in many academic and investigation sectors respect of the informal sector, that allows a suitable appreciation and quantification of the phenomenon. It is also possible to know the number of occupied who do not count with social security.

Obviously this information allows the possibility to design the suitable public policies in order to attack this problematic oriented to improve the life conditions of work of the people who work in Mexico, particularly of those occupied in the informal sector and their families.

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Business on Internet of the PYMES in Mexico as free form

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The small and medium companies represent the greater percentage in Mexico, but at investment level the competition that faces the international corporations is unfavorable, to very affected by the economic contraction.

PYMES, LatinAsia, Internet, Electronic Business.

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Pymes in Mexico, opportunities of publication on Internet

The domain of the little and middle companies (PyMES) as protagonists of the international commerce is the result of the new economic structure derived of the international financial contraction, Simon Levy, general director of the commercial consultant, consider.

The way to compete in a more profitable form with big companies of international scope is through internet, the tendency to reduce the costs oriented to this tendency, the technologic innovation in base of the digital services.

Digital gap in Mexico

Some authors prefer in Spanish, the term digital fracture [36] o estratificación digital,[37] because is more expressive about the real meaning of it.

Some of the first authors who took the problem of The Digital Gab from a systemic and social point of view were Herbert Schiller[38] and William Wresch.[39] In general form, these authors raised the necessity to include all the population sectors in the access of the information through the new information and communication technologies, as well the possible derived advantages that are given to have the access.

Principal aspects: the global gap (which is presented between different countries), the social gap (that happened inside a nation) and the democratic gap (referred to the one that exist between those who participate and those who do not participate in the public issues online). The digital gap base in previous differences to the technologies access[40]. In the measure that in Mexico the public services, of health, education and even commercial generalize through the network, be disconnected or not know how to use them will be a disadvantage. In a commercial level, this disadvantage will be noticeable, because those who can promote their products or services through the network will have access to even global markets that the not connected competitors could not achieve. But in the other hand, the introduction to the technology without an integral vision could equally have disastrous effects. The differential access will amply the social distances historically inherited, margining even more to the margined groups.[41]

Reflections facing the future

Internet is, by definition and vocation, a decentralize system of information. This is, will not result if, pretended that the contents or the administration of the system made in central form. The only form to count with contents locally relevant is, for a site capacitates the local users to create its own contents, sharing its history, tradition, promoting its products and services.[42]

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[36] Baigorri, A. (2000), 'La fractura Digital', I Congreso Mundial de Alfabetización Tecnológica, Cáceres; Mattelart, A. (2001). *Historia de la Sociedad de la Información*. Barcelona: Paidós, p. 163

[37] Carracedo Verde, J.D. (2003). "Jerarquías y desigualdades en el diseño de las Sociedades de la Información: Explorando la estratificación digital", p.1

[38] Schiller, H. I. (1996). *Information inequety*. Nueva York: Routledge
[39] Wresh, W. (1996). *Disconnected. Haves and have-nots in the information age*. New Brunswick, Nueva Jersey: Rutgers University Press

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[40] Servon, L. (2002). *Bridging the Digital Divide. Technology, community and public policy*. Inglaterra: Blackwell Publishing, p. 5

[41] Gándara, Manuel (2001) ¨Cómo evitar que Internet se convierta en el 'nuevo traje del Emperador' en la educación". Ponencia presentada en el II FORO INTERNACIONAL SOBRE LA BRECHA DIGITAL. Centro de Cultura Digital/Inttelmex, México.

[42] Gándara, Manuel (2001), "Aspectos sociales de la interfaz con el usuario" Tesis Doctoral en Diseño y Nuevas Tecnologías UAM/A.México.

One of the newest aspects that have been analyzed,[43] it is not only about the internet Access, but also with the quality of such Access and the availability of broadband connections that allows acceding to multimedia contents in time and costs suitable to the users' context.

Statistics of Internet use in Mexico

To the close of 2008 Mexico had 27.6 millions of internet users, which reflect an increase of 16.4% with respect to 2007, according with the most recently study of the Mexican Association of Internet (AMIPCI).

Dispositive with the possibility to access to internet in Mexico. See chart 1.

Dispositive with the possibility to Access to internet in Mexico, 2008. (Cyphers in millions)

	2007	2008
PC's	14.8	18.2
PC's with Internet	8.7	11.3
Cellphones	63.2	73.6

Chart 1

Source: Own elaboration in facts of: Mexican Association of Internet.

Personal computers acquired in 2008, 52 percent Homes, 48 percent Companies. The 93 percent of the total of the installed accounts of internet access are of Broadband. This has tight a relation with the consumption of equip in homes, where is preferred and have bigger promotion connection of broadband in front the other types. See chart 2.

Account of internet Access in México

Total Accounts	2007	2008
Dial Up	727 thousand	462 thousand
Dedicated link	14 thousand	16 thousand
Broadband	4 millions	6.4 millions
ADSL	2.9 millions	5 thousand
Cable	928 thousand	1.1 thousand
Wireless	180 thousand	284 thousand
ISDN	29 thousand	26 thousand
Total accounts	4.8 millions	6.9 millions

Chart 2

Source: Own elaboration with facts of the Mexican Association of Internet

Profile of the Mexican internet user, the universe per gender is integrated in 44 percent female and 66 percent masculine.

The internet is now an accessible media for all the Socioeconomic Levels (NSE) 44 por cent of the internet users are Socioeconomic Level D+ and DE.[44] The internet is now an accessible media for all the Socioeconomic Levels (NSE 44 percent of the internet users are socioeconomic level D+ and DE [45] in the year 2008. See Graphic.

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[43] Serrano, A. y Martínez, E. (2003). *La brecha digital. Mitos y realidades*. Mexicali: Universidad Autónoma de Baja California, p. 16

[44] D-VIRTUAL (2009), *Amai – Login*, Recuperado el 11 de noviembre de 2009, de
http://www.amai.org/login.php?PROCESO=REGISTRO&urlPag=niveles.php
[45] D-VIRTUAL (2009), *Amai – Login*, Recuperado el 11 de noviembre de 2009, de
http://www.amai.org/login.php?PROCESO=REGISTRO&urlPag=niveles.php

Comparative Composition of the Internet Users Universe per Socioeconomic Level 2007 vs. 2008
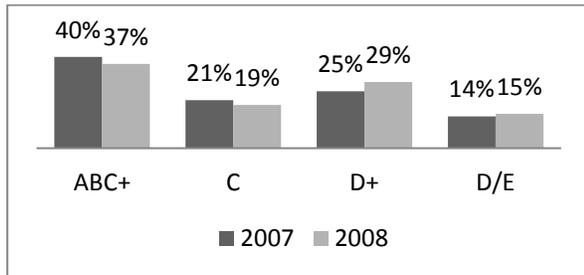
Graphic 1

The biggest growth of penetration of the users was gage in the socioeconomic level D+, in the year 2008. See Graphic.

Comparative 2007 vs. 2008, Penetration of the internet users' universe per Socioeconomic Level.
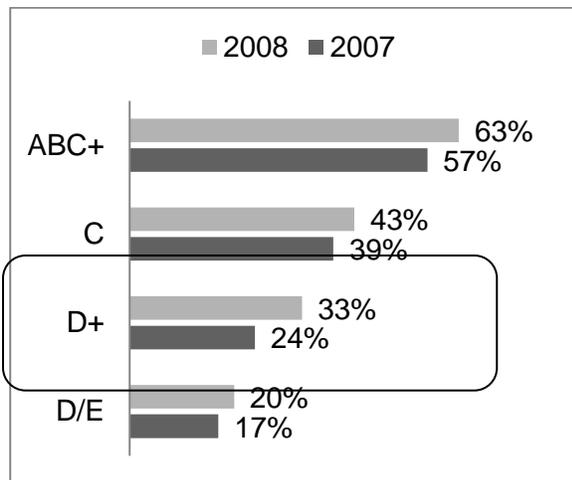
Graphic 2

Source: Own elaboration with facts of the Mexican Association of Internet.

Demographic profile of the Mexican internet user in the cities, the internet users between 12 and 19 years represent 63 percent of the total; follow them the 20 to 24 years, with 55 percent; from 25 to 34 years is of 35 percent; from 35 to 44 is the 24 percent; from 45 to 54 years 19 percent and from 45 to 64 years are only ten percent of total internet users.[46] Average time of connection of major Access, from Monday to Friday from 4:00 to 6:00 PM.

The digital life style still growing, 9 percent use telephony through internet.

Internet increases the media scope in total population (12-64) until 26 points. 6 for each 10 young (12-19) connect to internet. 7 of each 10 internet users use e-mail, 6 of each 10 instant couriers and 4 of each 10 chat. 50 percent of them download music, 32 percent watch humor pages and 30 percent play online. Accelerates the growth of the digital mobility of the cellphone telephony users, the 6% use internet by their cellphones. The home continuous being the principal place of access with 48 percent, the café internet with a 34 percent, work 19 percent, study place 11 percent, other 5 percent.

Internet contacts

I will mention the complete article of the Universal portal through Notimex, of Thursday 13th August 2009. Internet rates in Mexico, of the most expensive, Mexico not only reports the most expensive services of telecommunications between the countries members of the Organization for Economic Co-operation and Development but also to compare with similar economies of the continent.

[46] KMR Group – TGI Latina (2003, septiembre 11), KMR Group – TGI Latina, de http://www.kmr-group.com/main.asp?p=22&r=1500.903

Especially in Internet costs, that's why the federal government should reevaluate the situation of the sector. For the president of the Internet Competitive Intelligence Unit (CIU), Ernesto Piedras, in countries as Argentina, Brazil, Chile and Colombia are delivered services with capacities of two or four Megabits per second (Mbps) for an average of 21 dollars. "While for the same price, in Mexico are offered services of only one Mbps in average for the access of broadband", lament in the interview with Notimex.

Highlights that for that the Secretary of Communication and Transport (SCT) like the Federal Commission of Telecommunications (Cofetel) should intensify their policies of new technologies and the reduction of the costs structure, in order to improve the position of Mexico in the ranking of the Economic Co-operation and Development.

In this study Communication Outlook 2009, released this week, the organization for the Economic Co-operation and Development exposed that in Mexico the most expensive broadband is offer per Mbps of its 30 countries members, having tariffs which go from the 18 dollars per month and get high until the 115 dollars. In contrast, according with the study, in September of 2008 the lowest price per Megabit was placed in Japan with 0.07 dollars, followed by France with 0.22 dollars, Korea with 0.31 dollars, and Sweden with 0.32 dollars and Finland with 0.38 dollars. About the telephony, the calls in the business segment less expensive are available in Germany with a price of 0.10 dollars and the most expensive in Mexico with a cost of 2.43 dollars in PPP terms (Purchasing Power Parity) or 1.77 dollars which use the nominal exchange rate". The less expensive calls in residential level are in Germany with 0.16 dollars PPP, while the most expensive in Mexico with 3.52 dollars PPP.

"The international call cost 22 times more in Mexico in nominal terms, the price in Mexico is 12 times higher than in the named European country.

Ernesto Piedras pointed that "in any other country saw bills for the telephony service of more than 100n dollars and if there is they are for telephony, more internet, cable and mobile telephony; in Mexico is normal to have in middle class bills of 200 thousand pesos in the month for telephony.

Clarify that for product type, Mexico is closer to the levels of the competitive that exist in the markets of mobile and fixed telephony in the four cited Latin American countries, but where the prices still being high is in Internet of broadband in terms of the capacity per Mbps offer. For Telephones of Mexico (Telmex), the study of the Organization for the Economic Co-operation and Development is not directly applicable in some cases in Mexico, to argue that the service baskets do not reflect the domestic consumption patron and do not take on account the packages, especially in broadband. The consulted specialist clarify that if well the posture of Telmex is relevant because its position in the Mexican market, "is the posture of a very important company in the market if, but is not the authority, will be more valuable to listen the evaluation that of all this will make the SCT and the Cofetel". To the respect, the member of the Federal Commission of Telecommunication (Cofetel), Rafael del Villar, said that is possible that the Mexican telephony fells alluded with the results of the newest study in the subject of the Organization for Economic Co-operation and Development, however, consider, because the countries that do it that way have demonstrated advance faster in the outstanding issues.

The recommendation and insistence of the Economic Co-operation and Development and the Economic Development, is that Mexico should open the market of the telecommunication of the health competence, pointed.

Said that the low velocities in the internet services in Mexico are the reflection of the lack of investment in the sector.

"We have ten years of a very low level in investment and the way to get out of this situations is to balance the opportunities in order that thirds have opportunities to intervene and for that is necessary certainty in topics as the interconnection", pointed the functionary of Cofetel. [47]

Government plans

What does or government do to the respect to reduce the digital gap) Let see this new of March 19th of 2009, informative note, of the presidency page. 48 Mexico take a medullary step in the telecommunications sector: President Calderon. The Federal Government accomplish with the compromise to develop the telecommunication sector insuring convergence, competence and coverture. Mexico City. With the objective to make more efficient the telecommunications in Mexico, and because these are a public well that should be used in benefit of all the Mexican, the President Felipe Calderon Hinojosa announced the tender of dark fibers in the available routes of the National Electric System of the Federal Commission of Electricity (CFE), for the voice transmission, facts and images.

"We are literally creating, as is known in the field, a new backbone which allows the coverture, accelerate the competence and facilitate the convergence with the huge redundancy of economic and social benefit for the Mexicans" affirmed.

In the principal courtyard of the Technologic Museum of the CFE, the Mexican Mandatary insure that with this actions his government show the impulse to develop of the telecommunication in the country and give a big step in this subject to provide this new trunk network to the specialists companies and users in Mexico. "We are building with real decisions, with real acts, the possibilities of a telecommunications market more efficient and we are, also, transporting to Mexico to a better future, to the telecommunications future", pointed. Accompanied of the Energy Secretaries, Georgina Kessel Martinez and the Communication and Transport, Juan Francisco Molinar Horcasitas; as well the Director of the CFE, Alfredo Elias Ayub, the Head of the Executive consider that a Nation that is capable of dominate the technology, could domain its destiny; for that, the country will count in the next months with 3 trunks networks of national coverture.

With which will increase the competence, the coverture, the quality and convergence in this sector. Informed that will be the Federal Government who will determine the conditions and forms of the tender of the dark fiber, in coordination with the Secretary of Energy and the CPE according with its integral policies of communication.

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[47] Notimex (2009, 13 de Agosto), *Tarifas de internet en México, de las más caras – El universal – Computación,* Recuperado el 11 de noviembre de 2009, de http://www.eluniversal.com.mx/articulos/55127.html

Also, in a term no longer 90 days, the Commission will establish the technic conditions to install, work, and give the maintenance to the illumination equipment and the repetition of this network, to guaranty the Security of the National Electric system and to preserve the rights of the workers of the institution. The President Calderon pointed that with this new network, that will count with 21 thousand kilometers, Mexico insure competitive conditions to transmit voice, facts and images, during the coming decades.

Highlight that in the measurement in which the prices will allow that more communities and more homes get connected to internet, will be achieve to carry ne knowledge and more services to the population.

"I'm convince, friends, that the telecommunication, the frequencies that are property of the Nation, the public wells and the infrastructure property of the companies of the State, like is the Federal Commission of Internet, are also public wells and all them, the frequencies, this public infrastructure, the telecommunications, on their selves, are public wells; and is the duty and right of the State maximize their efficiency, their coverture, their convergence and the competence on it in order to generate common well and public wells", added. In front of companies represents and of telecommunications the Head of the Executive enumerated the benefits that will be obtained of this trunk network; between them, the interconnection of the health services, improve the education and more approach to the service that bring the Government to the Mexicans.

Also, said, the companies will also benefit because the telecommunication services will be cheaper, because there will be more competence; the entrepreneurs could offer their products faster and will increase the influence of their companies. The October 20th of 2009, The General Director of the Mexican Association of Internet was made "under the base of the ignorance" and have the hope that the deputies no to approve it, because it will be "recoil for Mexico". He said that the negative impact of the tax in telecommunications will affect directly to the micro, little and medium companies; "a study of the Association shows that during 2008 the electronic commerce increased 85% with respect to the former year, winning space to the traditional commerce because the savings and the efficiency this have".[48]

International visión

Internet is one of the phenomena that more growth has had. According to the last study made by the ComScore consulter in December of 2008, on internet we are more than thousand millions of users all around the world. [49] According to the facts of this study, the regions of Asia and Pacific are the ones who have more connected people in the network representing the percent of the world total.

While in Europe is in the second position with a 28 percent. In the end of the list is North America with a 18 percent, Latin America with a 7 percent and Africa with 5 percent.

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[48] Milenio (2009), *Impuesto a Internet, un retroceso para México: AMIPCI | Milenio*, Recuperado 11 de Noviembre de 2009, de
http://www.milenio.com/node/306599

[49] Fernando Vateos (2009), *Mil millones de personas conectadas a Internet*, Recuperado 11 de Noviembre de 2009, de
http://grupoinformaticos.com.mx/vateos/2009/01/mil-millones-de-personas-conectadas-a-internet/

The study also realizes the number of users that connect for each country. China is the first place of the list, with around 180 million of internet users. The second of the list is Unites States which have 163 million of people browsing. It is important mention that in our country is in the place number fourteen of this ranking; having a 12 million 486 thousand connected people, which represent the 1.2 percent of the global total.

In the other hand, CommScore inform that the more visited sites in the world are: Google (77 percent), Microsoft (64.2 percent), Yahoo! (55.8 percent); Being these which have the three first places of the list. In order to make this study, ComSocre consider only those users older than 15 years that were connected the last month from their homes or offices. The traffic from cyber cafes or mobile dispositive was not taken in account.

Free Sites

Geocities, on its beginnings the company <<Beverly Hills>> (BHI) in the middle of 1995 decided to offer to users of its website, known as "Homesteaders", the possibility to develop own web pages in the neighborhoods of the company, assigning a street and an address. Nowadays, that scheme is abandoned in favor of a scheme with the name of the users as subordinate. So then, chats, news and other elements of the virtual community are added quickly, helping the fast growth of the website.

With the time many companies, including Yahoo!, begun to participate in Geocities and invest on it. The site still growing with introduction of advanced payment. In May 1997, the company included publicity on its pages. Even do the negative reaction of the users, the company still growing.

Getting to June of 1997, GeoCities is the fourth most visited website on internet. In October of the same year the company achieved a million Homesteaders. In 2001, after speculations of the analyzers of about that GeoCities was no longer profitable (has declared $8 millions of loses in the final four months of 1998), Yahoo! introduced for-free premium hosting service in GeoCities.[50] In April of 2009 it was announced that GeoCities will disappear forever, for which left to accept new registrations, finally in October 26th of 2009. Social networks like Facebook or MySpace are the new space of exposition for the marketing of business, the formation of a structure of salespeople and the capitation of clients.

Conclusions

Opportunities of publication of the Pymes in Mexico, as the protagonists of international level business, sharing with the big companies a virtual market in where the consumer will see through a screen the exposition of the products or services of the different companies, giving in this way a big advantage to any company allowing the sale of any day the 24 hours through the technologic innovation.

There is a lot of way to overcome in Mexico in relation to the new informatics illiterate, those people who do not manage a computer, the first reason it's always economic, the prices of the computers are high for the people of limited resources adding to it we add the ignorance and the fear to use it.

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[50] Schiffman, Betsy (2001). «A Community That Stays Together, Pays Together». Consultado el 2006

Herbert Schiller and William Wresch mention that this gab should be cut in all the population sectors providing the access to the new technologies exalting the derived advantages of learning to use it. In Mexico the public services, health, education, products and services are made through the network if the people do not participate in learn to manage them will be out of all the advantages, the government should give of follow in order to get the technology to different groups or the effects will be more digital gap. It could not be left everything centralized about education, should be in a form that get to approach to the most remote locations, teaching people to face the challenge that represent the technology, always towards quality. Statistically the growth of internet users reflect a growth of 16.4% respect of 2007, fact of the study of the Mexican Association of Internet (AMIPCI), nowadays the access through cellphones is increasing.

The purchases of computing equipment in home are bigger of those made by companies, this allow us see the tendency in the market of the possible consumers of products and services on Internet. Of the form to access of internet for its different media from the easier as the telephonic cable, (Dial UP) to the most sophisticated, in Mexico the bigger demand in 2008 is the Broadband where the telephonic line transform in telephonic service and internet connection (Telmex), there is the option of television, music, internet like is the Cablevision and others more. Broadband service with 6.4 million of users.

The internet is now an accessible media for the D+ and DE socioeconomic levels, only in 2008 represent the 44%. Who are the internet users that have more access?

Between 12 and 19 years represent the 63% are followed by those from 20 to 24; with 55%; from 25 to 34 years is of 35% the biggest percentage are young that do not have a job yet, they have the support of their family to get wells, are followed by those from 20 to 34 years these potential consumers have the capacity of acquisition for being in the rate of their productive rate, the young acquire tendencies that are reflected in products, the companies continuous with the tendency of exhibit themselves through internet, represent a variable of very attractive competence with the tendency to reduce costs.

Internet costs, analyzing the big challenge that has cheap services represent the reports of the Organization for Economic Co-operation and Development to compare us with similar economies in the continent, we are located as the most expensive tariffs in the internet services, according to the study, to September of 2008 the lowest price per Megabit was placed in Japan with 0.o7 dollars per month, follow by France with 0.22 dollars, Korea with 0.31 dollars, Sweden with 0.32 dollars and Finland with 0.38 dollars. The recommendation and insistence of the Organization for Economic Co-operation and Development, is that Mexico should open the telecommunication market to the health competence.

The government plans. In May 19th of 2009, in the courtyard of the Technologic Museum of the CFE, with the objective to make more efficient the telecommunication in Mexico, and because these are a public well that should be used in benefit of all the Mexicans, the President Felipe Calderon Hinojosa announces the tender of dark fiber in the available routs of the National Electronic System (CFE), for the voice transmission, facts and images.

Commented to the respect, "We are literally creating, as is known in the media, a new backbone that allows us to transform the telecommunications, amply the coverture, accelerate the competence and facilitate the convergence with a huge redundancy of the economic and social benefit for the Mexicans". Also, in a term no longer than 90 days, the commission will establish the technic conditions to install, work and give maintenance to the illuminating equipment and repetition of this network, to guaranty the security of the National Electronic System and preserve the workers' rights of the institution.

The users of internet in Mexico, who already pay the higher tariffs between the countries member of the Organization for Economic Co-operation and Development (OCDE), now have to sum the 3% of gravamen to the telecommunications approved for the majority of the Deputy Camera, which is part of the physical package for 2010; Affecting in the sales in the electronic commerce.

Definitely the use of free sites, social networks, allow to the marketing a big field of action to begin the capitation of clients, without the necessity of huge infrastructures, an overwhelming example the blogs of google above to offer the free e-mail service, allows relation to this e-mail account a blog where there is a tool of easy use for the publication of articles, reception of comments, statistics, survey elaboration, of easy and cheap management, as well as this service there are promoting places little companies an example is Citypunto through the registration allows the publication of images, logos, localization maps of the company.

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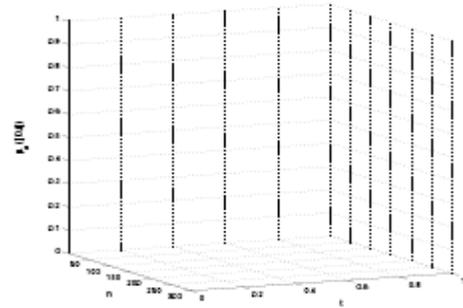
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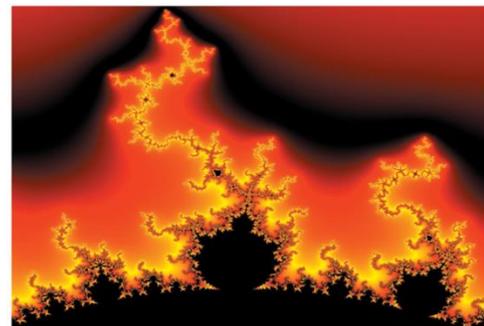
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