FINDING INTERNATIONAL FISHER EFFECT TO DETERMINE THE EXCHANGE RATE THROUGH THE PURCHASING POWER PARITY THEORY: THE CASE OF MEXICO DURING THE PERIOD 1996-2012
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Abstract
Nowadays, the exchange rate is one of the most relevant issues of modern macroeconomics. Its importance is essential because of its impact on nominal and real variables. Our central question is whether the nominal interest differentials might be used to anticipate currency changes specially the Mexican-US exchange rate. So the purpose of this paper is to describe the theory of the international fisher effect and test its empirical validity for the Mexican case.

Key words: Exchange rate, nominal interest rate, inflation rate, expectations
JEL F31, E43, F41

1. Introduction
It is widely known that the exchange rate is defined as the price of a currency in terms of another currency and it is expressed as the number of units in the domestic currency that have to be exchanged for a unit of a foreign currency. What we are not able to assert as fluently is its determination, for this purpose, economists have proposed so far, five different theories that are intended to clarify which are the variables that influence the exchange rate. These five factors are: purchasing power parity, fisher effect, interest rate parity, international Fisher effect and expectations theory. These theories are not independent one from the other; on the contrary, they are closely correlated.

The present paper has as objective to verify the international Fisher effect through the purchasing power parity; nevertheless, throughout this work the close relationship amongst these entire hypotheses will become evident.

The text is structured as follows: in the first section, the abovementioned five theories will be raised and described, then we will go deeper into the international Fisher effect theory to ipso facto expose a methodology followed to contrast this effect. Since the exchange rate is a very unstable and changing variable, we will proceed by contrasting the effect with annual and monthly data; last, main conclusions will be mentioned at the end.

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2 Taken from the website http://www.banxico.org.mx/ayuda/temas-mas-consultados/tipo-cambio.html
2. About theories for exchange rate determination

There are several causes for the differences between offer and demand of a certain currency, which entail an alteration in its price, that is, its exchange rate; among the main causes are: international commerce, investment, arbitrage and speculation. (Gonzalez: 2000)

Behavior of investors is a function of 2 major factors: the price of products or services and, the money interest rates. As Gonzalez establishes, the reason for purchasing or selling more products abroad lies in the differences of their prices thereof, while the evolution of capital invested in one or another country is the result of a different retribution of those capitals.

Series of theories correlate the exchange rate with the inflation rate and interest rate; among which stand: Fisher effect, purchasing power parity theory, expectations theory as well as interest rate parity and the international Fisher effect. Each will be described as follows.

Fisher Effect or Fisher Hypothesis, was postulated by the economist Irving Fisher in 1930 in its famous work *The theory of interest*, this effect postulates a relationship between nominal interest rate and inflation rate in such a way that the expected inflation rate is completely absorbed by the nominal interest rate in the long run, which leads to the onset of a one on one relation between both series; this hypothesis assumes that the real interest rate remains as a constant in the long run, not affected by changes in the inflation expectations.

Occasionally, the preceding theory is known as domestic Fisher effect since there is a generalized version of the Fisher effect, which states that real returns are worldwide equalized due to arbitration. For this to happen, the assumption that investors consider both internal and foreign instruments as perfect substitutes is considered. (Shapiro: 1998)

In such a manner that if markets are efficient and capital is fully mobile, there will be an equalization of real interest rates among the countries. Thus the nominal interest rate will be equalized approximately to the expected inflation rate differential. This is shown in the following equation, where \( r_h \) y \( r_f \) are the domestic and foreign nominal interest rate respectively. \( \pi \) represents inflation.

\[
\frac{r_h - \pi_f}{1 + r_f} = \pi_f - \pi_h
\]

Another theory that tries to explain movements in the exchange rate is theory of purchasing power parity (PPP theory) its origin is found in the work of the British economist David Ricardo, this theory takes as a starting point the *Law of One Price*, this law states that under conditions of free competition and absence of transportation costs and trade barriers, identical goods should have one price in any given country.

PPP is an extension of the law of one price. If the law of one price is observed for all goods, it should also be complied when instead of the price of a single good a price index of a basket of goods and services is used. This theory asserts that the exchange rate

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3 According to the text; “El sistema monetario internacional y el mercado de divisas“ González Susana, 2000.

4 This theory is also known as Purchasing Power Parity.
between currencies of two countries equals the relation between the price levels of these two countries. Only in this way the purchasing power of currencies in both countries is the same.

There are two versions of PPP, absolute and relative, the former is considered quite restrictive since it will be valid when financial markets are efficient and baskets of goods are identical, which does not occur due to market imperfections, transaction costs, product differentiation and international trade restrictions. However, relative PPP states that prices and exchange rates vary maintaining a constant ratio in the purchasing power of the domestic currency of each country regarding other currencies. Thus, the country with a higher inflation differential should raise the exchange rate of its currency regarding the other one, that is, it should recognize the loss of value of its currency (depreciation); being this raise in the exchange rate same as the difference between both inflation types.

The equation that models such behavior is:

\[
\frac{s_{t+1} - s_t}{s_t} = \pi_f - \pi_h
\]

Where: \(s_t\) is the spot exchange rate in the period \(t\); \(s_{t+1}\) is the spot exchange rate in the period \(t+1\), finally \(\pi_f\) is the foreign price index and \(\pi_h\) is the domestic price index.

So, PPP predicts that given the foreign price index; a raise in the domestic price level reduces the purchasing power of the internal currency in the domestic economy and therefore the exchange rate should also reflect this reduction of purchasing power, resulting in a depreciation of the internal currency; although it may be possible that vice versa the appreciation of such a currency may occur.

Another theory that explains the behavior of the exchange rate is the interest rate parity, which relates the forward exchange rate with the interest rates offered in two different countries. There are two versions: one named covered and the other named uncovered.

On one hand, the relationship that exists between the spot exchange rate expected in the future, that is, a specified period between two different currencies, is defined as covered interest rate parity, this theory helps to explain the correlation between the movements of spot and forward exchange rate, while the uncovered interest rate parity relates domestic and foreign interest rates with the expected exchange rate depreciation.

In such a way that the principle that increases the exchange rate of currencies reflects defects in the interest rates regarding risk free instruments denominated in various currency alternatives. The exchange rate and the structure of interest rates\(^5\) reflect these parity relations. Currencies of countries with high interest rates in the market are expected to be depreciated over time and currencies of countries with low interest rates are expected to be appreciated over time, reflecting along with other elements, implicit differences in inflation (Kozikowski: 2000).

The equation supporting this theory is as follows:

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\(^5\) Better known as Temporary Structure of Interest Rates (ETTI for its acronym in Spanish), analyzes the relationship between maturity dates of several bonds and their respective yields during the period under analysis, as long as they bear the same risk degree. It is also known as yield curve. Graphically it is represented as a sequence of points in time; each point shows yields up to its maturity and the time period. The curve that links all these points is the graphic representation of ETTI.
Where: $f_t$ is the forward exchange rate; $s_t$ is the spot exchange rate in the time $t$, while $r_h$ is the domestic interest rate and $r_f$ is the foreign interest rate.

A highly linked theory to the interest rate parity is the theory of expectations since they both relate the spot exchange rate and the forward exchange rate. Expectations as it is well known are fundamental in economy, since the future behavior of some economic variables determines decision-making at present time.

The first approach to such a theory is found in Cagan (1956), when working on a study about hyperinflation, he uses for the first time what he called as “adaptive expectations”, in which he assumed that agents valued the inflation rates in the previous years for making an estimation for the following years, and the last one received the highest value.

The advantage of this model is that it links the unobserved variable with observed variables. Under this hypothesis, the unobserved value is a weighted average of all current and past rates of observed values. Despite the attractiveness, the former formulation is still subject to criticism.

Afterwards, Muth (1961) takes an important step when considering that for a decision-making the economic agents exploit all available information hitherto. In other words, he introduced the assumption of “rational expectations”, in such setting agents anticipation to price movements are conditional mathematical hopes about the information set, which may include some structural knowledge of the particular model.

One of the most important properties of the rational expectations approach is that it prevents agents from making systematic prediction mistakes.

This model entails three important characteristics: (1) rational expectations errors are zero in average, (2) they have no systematic prediction errors, assimilating the prediction errors, and (3) they are the most precise prediction model and therefore it is the model that best fits in predicting economic variables with a high random component.

However, it was until 1976 with Rudiger Dornbusch that a formal analysis of the exchange rate dynamics and its interaction with expectations is introduced. Such a model conjugates the rational expectations hypothesis with an explanation of the exchange movements under the assumption of a perfect mobility of capitals and a differentiated adjustment velocity between assets market and goods market. With his model, Dornbusch explained overshootings that may be observed in the exchange rate, as a rational movement determined by the perception of the exchange market agents (Rubli: 2006).

In an efficient market, all the information is immediately reflected in the exchange rates. Rational market players base their forecasts on the available information. The expected exchange rate in the period $t+1$ based on all available information in the period $t$ should be on average, same as the future exchange rate to the extend where it is assumed that the agents of such a market are rational.

Expectations theory and exchange rate are related through the following equation:

$$\frac{f_t - s_t}{s_t} = \frac{r_h - r_f}{1 + r_f}$$

[3]

$$\frac{f_t - s_t}{s_t} = \frac{s_{t+1} - s_t}{s_t}$$

[4]
Where: \( f_t \) is the forward exchange rate, \( s_t \) and \( s_{t+1} \) is the spot exchange rate at the moment \( t \), and \( t+1 \) respectively.

Such a theory takes the forward exchange rate as spot exchange rate estimator and its hypothesis show the important role that expectations play for the decision-making at the financial level; and the existing relationship between forward and spot interest rates, presented in the interest rate parity hypothesis.

The international Fisher effect (IFE) can be seen as a combination of the generalized Fisher effect and a relative version of PPP. Such effect explicitly states a positive relationship between the exchange rate and the interest rate. In the long run, an increase in the interest rate of a currency will be followed by a depreciation of the same, that is, an increase in the exchange rate. This hypothesis implies that returns for investors in the international level will consist of two components, the nominal interest rate and the variations present in the exchange rate.

According to this effect, the investor return should in the long term, be the same in different countries. Likewise, the country that offers a lower nominal interest rate should raise the value of its currency to provide the investor with a benefit that compensates the lower interest rate. Conversely, the country with a higher nominal interest rate will see the value of its currency decrease; in this way, the investor total return in both countries will be equalized. In summary, in the extent that the interest rate of a country increases, a depreciation of its currency will occur.

Fisher effect explicitly states that real interest rates in different countries can be the same thanks to arbitrage. The relative version of the purchasing power parity implies that the inflation differential will be compensated with the exchange rate variations.

The international Fisher effect is described from the following equation

\[
\frac{s_{t+1} - s_t}{s_t} = \frac{i_h - i_f}{1 + i_f}
\]

Where: \( s_t \) is the spot exchange rate in the period \( t \); \( s_{t+1} \) is the forward exchange rate in the period \( t+1 \), whereas \( i_h \) is the domestic interest rate and \( i_f \) is the foreign interest rate.

Clearly, in this effect the nominal interest rate variation depends on the variation of real inflation since this hypothesis is the Fisher effect previously described but in an open manner, which we have already reaffirmed that upon an inflation increase, the interest rate will increase to the same extent. Therefore as inflation increases in a country, it will increase the interest rates and consequently a depreciation of the currency of such a country will occur.

International Fisher effect is based on the hypothesis of an efficient market. This implies major considerations about how the exchange rate market works and how fast the exchange rate and the nominal interest rate reflect the newer information. According to the international Fisher effect, this new information should represent the differential between nominal interest rates; and this one in turn, the differences between the expected inflation.

The fact that IFE considers an efficient market as hypothesis helps to understand that its participant agents act partially and rationally; therefore the exchange rate is expected to
change regarding the interest rate differential. If an error term is added to equation [5], we obtain:

\[
\frac{s_{t+1} - s_t}{s_t} = \alpha + \beta \left( \frac{l_h - l_f}{1 + l_f} \right) + \mu_t
\]

Based on the premise that internal interest rate increases as a result of a higher expected inflation, differences between both variables will move in the same direction. That is, a direct relationship is maintained.

So \( \alpha \) presents the exchange rate value when the differential of the exchange rate is zero. If \( \beta = 1 \), this means that for every percentage increase of 1% in the interest rates differential, the exchange rate will increase in the same extent. That is, if the nominal interest rate considered as “domestic” in the country is 1% higher than in a foreign country, the currency of the first country will be depreciated 1% in relation to the foreign currency.

3. From International Fisher Effect

Following, the theory that supports the international Fisher effect will be described, resuming the relationship it holds with the Fisher effect and the Purchasing Power Parity Theory. As abovementioned, on the one hand, the Fisher effect in its generalized version states, according to Shapiro (1998), that countries with higher inflation rates should have higher interest rates, and vice versa; countries with lower inflation rates consequently will present lower interest rates. In terms of empirical evidence, we have the work of Fama (1975) who assures the presence of a relationship between nominal interest rate and inflation rate. Shapiro himself supports such effect, taking under consideration the hypothesis that most of the variation in the nominal interest rates among countries is the result of differences in inflationary expectations. Other studies like the one of Miskin (1992) conclude that there is no such an evidence to assert that there might be a Fisher effect in the short term; in a paper by Coppock and Potras (1999) the statement that nominal interest rate and inflation rate are not fully adjusted on a one on one basis is supported.

On the other hand, PPP in its relative version maintains that exchange rates between two countries will be adjusted to reflect changes in price levels in those countries. In other words, PPP states that higher interest rates countries should have depreciated currencies regarding those countries with lower inflation rates. (Shapiro: 1998). However, there is very famous evidence about this theory, one is the Big Mac Index which generally says that this theory is true in the long run, but not so in the short run. Webster (1987) rejects PPP in the short term as well. Meanwhile, Galliot (1971) concludes in his study that change in prices is the main determinant of exchange rate in the long run. Shapiro (1998) finds that those countries with higher inflation rates also present higher depreciation rates of its currencies. Other studies like the one of Krugman and Obstfeld (1997) conclude that PPP is accepted for some periods but not for others.

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6 If agents are rational, such a term shall not be related with the available information in the period \( l \).

7 Index published by “The Economist” magazine since 1986, it is published twice a year. The theoretical approach is derived from PPP.
In summary, PPP seems to have a very poor explanation to exchange rate changes in the short run, but many studies provide evidence in favor of such a theory in the long run. (Demirag and Goddard: 1994).

Once the theories directly related to the International Fisher effect are explained, we will proceed on it; this effect states in a general way that the profitability of foreign investment will be compensated with an exchange rate change. Consequently, an investor who buys shares in another country will earn a similar return to the local stock investments.

This approximation is achieved as a result of joining or combining equations [1] and [2], so equation [5] is obtained, to remind:

\[
\frac{s_{t+1} - s_t}{s_t} = \frac{i_h - i_f}{1 + i_f}
\]  

[7]

Where: \(s_t\) is the spot exchange rate in the period \(t\); \(s_{t+1}\) is the forward exchange rate in the period \(t+1\), whereas \(i_h\) is the domestic interest rate and \(i_f\) is the foreign interest rate.

This equation can be graphically presented as follows:

Graph 1. Relationship between nominal interest rates differential in Mexico and the US and the USD/peso exchange rate.

The above graph shows the expected change in the domestic currency regarding the foreign currency in the vertical axis, while the horizontal axis reflects the nominal interest rate differentials. So, if the local interest rate is higher that the foreign interest rate, an appreciation in the local currency regarding the foreign one is expected; and vice versa, if the domestic interest rate is lower than the foreign interest rate, there would be a depreciation of the local currency regarding the foreign one.

However, this theoretical parity relationship has been very controversial in practice. As an example we have the work of Aliber and Stickney (1975) who applied the validity of this effect upon 13 countries, both developed and underdeveloped countries during the period of 1966 to 1971, their final conclusion was that the international Fisher effect is fulfilled only in the long run, since in the short one the deviations presented by the variables are quite large to meet this effect.
Other studies indicating the validity of the Fisher effect just in the long run were made by Giddy and Dufer (1975) and Robinson and Warburton (1980), in their texts, they argue that the possibility that arbitration allows equalization of returns in two different countries tends to be invalid in reality, in their final conclusions, they assert that higher returns are achievable and therefore they argued that the international Fisher effect is not empirically fulfilled.

Finally, Kane and Rosenthal (1982), studying the Eurocurrency market in the 6 major countries during the period of 1974 through 1979, conclude that there is sufficient evidence to affirm compliance of the international Fisher hypothesis.

3.1 Regression model methodology

As previously outlined, international Fisher effect is a theory that involves on one side the Fisher effect; and on the other, PPP is incorporated to give rise to this effect. In this section, the necessary elements to contrast the Mexico-United States case during the period 1996-2012 will be given.

First, let us remember equation [5], where parameters to infer and an error term were added originating equation [6]:

\[
\frac{s_{t+1} - s_t}{s_t} = \alpha + \beta \left( \frac{l_{\text{mex}} - l_{\text{usa}}}{1 + l_{\text{usa}}} \right) + \mu_t
\]  

Note that the dependent variable is taken from PPP, while the independent variable is a part of Fisher hypothesis, in such a way, the exchange rate as well as the interest rate have a positive relationship, where according to the hypothesis of this effect \(0<\beta<1\); when \(\beta=1\) means that a 1% increase in the nominal interest rates differential will lead to a 1% increase in the exchange rate; that is, local currency will depreciate, and vice versa.

An explanation of the above lies in considering that if the nominal interest rate in Mexico were higher than the nominal interest rate in the US, depreciation in the exchange rate would be expected; hence, the inflation probability of the “imported” kind is high, so the Central Bank will have to reduce interest rates, generating capital flight in search for higher returns; which will lead to a new balance; opposite case is when the nominal interest rate in Mexico were lower than the nominal interest rate in the US, originating an appreciation in the exchange rate, which would lead to export encouragement in such a manner that USD demand will increase and hence, the exchange rate would return to a balance.

To verify this effect, an ordinary least squares model will be used considering its assumptions; regarding calculation of variables, the nominal interest rate differential was calculated through the formula

\[
\left( \frac{l_{\text{mex}} - l_{\text{usa}}}{1 + l_{\text{usa}}} \right)
\]

and the interest rate was calculated through PPP, that is, by the inflation rate differential in Mexico and in the US \((\pi_{\text{usa}} - \pi_{\text{mex}})\).
3.2 Data and period of analysis

Data used for this analysis are, in the case of Mexico: monthly nominal interest rate of 28-day Mexican Federal Treasury Certificates (CETES) and National Consumer Price Index (INPC); for the USA case, the nominal interest rate taken from 1-month Treasury Bill and the Consumer Price Index were used. Source of this information was the database from the Organization for Economic Cooperation and Development (OCDE) in order to have reliable and above all, comparable information; consultation dates were between April and May 2013.

Analysis period spans from 1996 to 2012, it was chosen for its close date to a regimen of floating exchange rate, since that is consistent with the international Fisher effect in an efficient market and with perfect capital movibility; to comply with these two previous facts nongovernmental intervention over the exchange rate is needed.

III. Contrasting international Fisher effect annually

In this section, the international Fisher effect hypothesis will be contrasted from equation [6], variables involved in this equation are annual periodicity data. Therefore the results for this regression are:

Table 1. Contrasting results of IFE with annual periodicity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Statistical Student</th>
<th>Prob.</th>
<th>Adjusted $R^2$</th>
<th>Statistical Durbin Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate</td>
<td>1.1982</td>
<td>0.2299</td>
<td>5.2116</td>
<td>0.0002</td>
<td>0.8627</td>
<td>2.6407</td>
</tr>
</tbody>
</table>

Source: prepared by the author based on data from http://www.oecd.org/centrodemexico/estadisticas/

The above table shows firstly a $\beta$ coefficient larger than one; statistically we stand before a perfectly consistent model, with a really good goodness of fit (nominal interest rate explains the exchange rate in 86.27%), this model does not corrupt any assumption of ordinary least squares model; statistical Durbin Watson discerns independence of error terms, and statistical Student validates a unbiased and consistent beta coefficient.

Null hypothesis of the effect is rejected, 1% increase in nominal interest rates differential in this countries, on average, would lead to a 1.19% increase over the dollar/peso exchange rate. This would mean that in the long run, and considering the annual periodicity of data, those who have come to invest in Mexico during the period of analysis, have obtained on average a 0.1982% positive return.

This assertion emerges from the following facts: (1) in the long run the interest rate in the US has been on average low, compared to the interest rate that Mexico has offered; that would explain capital inflows to this latter country promoting peso depreciation and therefore inflationary pressure. Remember that international Fisher effect is the result of a set of hypotheses that link interest, inflation and expectations; therefore the explanation that upon an inflationary increase, the interest rate will increase to the same extent, which will attract a larger number of capitals (Fisher effect); let us mention now PPP, which
would consider that this increase in the interest rate will compensate the loss of expected profitability for the investor, derived from peso depreciation. Then arbitrage will play its role, even though the interest rate in Mexico seems attractive, at the end the returns from Mexico and the US will be balanced.

Nevertheless, the previous summing is not met and hence the international Fisher effect is not fulfilled, to the extent that despite a higher inflation rate in Mexico and a depreciation of its currency, investors that decided to invest in Mexico instead of the US on the average, will receive returns above the mean, that is, they obtain an excess.

4. Contrasting international Fisher effect monthly

In this section, the international Fisher effect corroboration is discussed from a different periodicity of data; it is worth mentioning that in the first instance, data were deseasonalized through a method known as “exponential smoothing”; nevertheless the behavior of both variables presented no significant changes in their respective temporality; in front of this, an analysis with the original data, i.e. untreated, was chosen.

So once concluded the international Fisher effect contrasting annually, in this section we will proceed to investigate what happens when data periodicity changes. Regression on β coefficient was conducted in the same manner from equation [6] and with Ordinary Least Squares. Results are shown as follows.

Table 2. Contrasting results of IFE with monthly periodicity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Statistical Student</th>
<th>Prob.</th>
<th>Adjusted $R^2$</th>
<th>Statistical Durbin Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate</td>
<td>2.2149</td>
<td>0.0624</td>
<td>3.441</td>
<td>0.0007</td>
<td>0.5904</td>
<td>1.7248</td>
</tr>
</tbody>
</table>


These results present a biased and consistent β coefficient; to the extent that statistical Student is acceptable in all levels of confidence, and Durbin Watson value exposes non existing self correlation. Unlike the previous model, the interest rate explains the exchange rate behavior in a 59.04%, nevertheless we should consider that the monthly analysis is being reduced just in one variable, the interest rate, in front of this $R^2$ value is widely significant.

Beta coefficient value 0.2149 indicates imperfection of the international Fisher effect for Mexico from 1996 to 2012. Movements of interest rate and inflation variables do not follow a behavior like the one depicted on graph 1, the movement is not one on one. In this case, the deficit that short term investments in Mexico have had is reflected; refer as an example in the appendix section, the behavior of interest rate and inflation in both countries; the interest spread is very wide, even higher than the inflation one.

CETES movement is quite peculiar, the trend is downwards to stabilize afterwards, the same happens with the inflation variable. On the other hand, the behavior of the same variables in the US is not so clear, specially from the mid 2000, end of 2004 and beginning of 2009. This visualization provides a better understanding that in the short run...
(3 months) the interest rate in Mexico does not cover the currency depreciation derived from an inflation increase.

5. Final Comments

It is not surprising that the exchange rate is one of the most complex variables in economy; its determination requires not just a theory but also a set of them. The present work has been supported on a hypothesis that directly collects 3 theories that attempt to determine the exchange rate behavior in Mexico. Results are presented as follows.

- Contrasting international Fisher effect with annual data resulted in $\beta$ a little above the unit, statistically speaking this first model is good because it is unbiased and consistent, it has great goodness of fit and presents no self-correlation.
- The model in turn suggests that during the period 1996 to 2012, the behavior of the exchange rate is explained in 86% of the interest rate. $\beta$ Value 1.1982 indicates that such effect is not perfect, profitability of investors is not the same in the US or in Mexico, in the long run, and returns are higher in the second country.
- Since the exchange rate is a very volatile variable, a contrasting of the international Fisher effect with monthly temporality in variables was conducted. This second contrasting presented a consistent model, with no self-correlation, with an acceptable goodness of fit and a totally unbiased statistics.
- This regression revealed that in the short run, the exchange rate is expressed just in 59% of the interest rate. Now, $\beta$ value is less than the unit; therefore again, the imperfection of the international Fisher Effect for the case of Mexico is proven.
- Statistics show that the movements of the exchange rate react before other factors apart from the interest rate. Which indicates that money markets are not totally internationalized, there are many restrictions that prevent a free movement of capital through countries to equalize the nominal interest rates differential. Examples of these factors are: political risk, transaction costs, taxes, and strong changes in monetary policies of a country, among others.
- According to Fisher effect, changes in the nominal interest rate differential are the result of modifications both in real interest differential and in inflationary expectations; these two possibilities exert an opposite effect on the exchange rate.
- International Fisher effect, when holding an intimate relationship with PPP and generalized Fisher effect, is quite probably that if these two last hypotheses are not met, neither will be the first one.

References:


Annexes

Annex 1. Behavior of the interest rate in the short run in the United States

T-Bills (3 months)

Source: prepared by the author based on data from http://www.oecd.org/centrodemexico/estadisticas/

Annex 2. Behaviour of the interest rate in the short run in Mexico

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Source: prepared by the author based on data from http://www.oecd.org/centrodemexico/estadisticas/
Annex 3. Inflation rate in the United States and Mexico during the period 1996-2012