Financial analysis of the year 2016 of the high volatility of the exchange rate mexican peso / american dollar in Mexico

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Abstract

International securities markets have led to a steady and positive growth in commercial and capital financial services, aimed at investing in the Mexican stock exchange. The changes in the value of our currency against the US dollar cause problems in the decision to buy and sell abroad as well as in the capital market, so that these are continually exposed to an inert exchange rate risk, especially of foreign trade companies and of individuals in general. The sector of the foreign exchange market this phenomenon is perceived as a source of income derived from the investment opportunities that these mean by registering in Mexico a considerable volume every year that suggests a high and intense mobility of capital in this work of analysis was revised the Literature on the volatility of the Mexican peso exchange rate

Exchange rate, competitiveness, volatility

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Introduction

With a retrospective of the last year registered with the highest level of volatility in Mexican finance that occurred in 2016, where the structure of the main indirect direct variables that influence the exchange rate system was analyzed, in addition to providing state of the art knowledge relevant to studies that rely on the use of this type of analyzed theories, in our model is based on an econometric model of the real exchange rate with theoretical and practical applications, the discussion material of this study work It is based on the neoclassical theories of the economists of his time. The economic theory, considers that the scenarios of exchange volatility are very important for the correct decision making since it allows to have estimations of the volatility and be able to formulate the forecasts of levels of volatility of the next months, and this information generates viability and certainty in decision-making models of the public and private sector, the information obtained from this is statistics of propensity of historical and statistical analysis to give results of volatility to the downside or upward, in addition to observing that these variables can pass from one condition to another very quickly and drastically, the exchange markets with these data could also infer in a more concise and timely manner, appreciation and depreciation rates, of the Mexican peso relative to the US dollar, according to this work of analysis focuses on reviewing the models that modify the different volati regimes to respond to the solutions of the structure.

Methodology

The models of application that are the one of Hamilton (1988) in addition to the interest rate of Angel (1990) also this theory is supported by the contributions of Tylor (1995) where he makes important contributions to the financial literature that consists in representing the yields in: in our mathematical model that we provide is the real exchange rate.

A critical concept for the general model of the exchange rate is the real exchange rate, whose long-term value depends on non-monetary factors.

The real exchange rate is defined in terms of the nominal exchange rate and the price level in the two countries Mexico and the US.

The real exchange rate of the peso against the dollar, q, is the cost in pesos of the relative basket of US products, to the cost in pesos of the basket of Mexican products.

q = $\underline{\text{The cost in pesos of the US basket}}$
    The cost in pesos of the Mexican basket

Using symbols, we can define the real exchange rate as follows:

$$q = \frac{S \times P_E}{P_M}$$

Where:

q = real exchange rate of the peso against the dollar

S = nominal exchange rate (pesos per dollar)

PM = price in pesos of the basic basket

P_E = price in dollars of the US basic basket

In practice, the price level in each country is measured by a consumer price index. Thus the formula of the real exchange rate can be expressed as:

$$q= \frac{S \text{ x } CPI_E}{INPC_M}$$

Unlike the nominal exchange rate, what matters in the real exchange rate is not its level, but its changes. As far as the level is concerned, we have to assume that in the base year it will equal 1 (or 100), that is,
$q_0= 1.$[1]

The evolution of the real exchange rate measures the deviations of the relative purchasing power parity, under the assumption that the initial exchange rate is equilibrium. In this context, it is considered that the exchange rate is equilibrium if it complies with the absolute APA.

In the base year: $S_0 = \frac{P_m}{P_E}$

The real depreciation of the nominal peso and the relationship of prices in the two countries remains constant:

$$S\uparrow = \frac{(S * P_E)}{P_M} \uparrow = q\uparrow$$

If prices go up abroad and everything else remains constant:

$$P_E \uparrow = \frac{(S * P_E)}{P_M} \uparrow = q\uparrow$$

If prices fall in Mexico and everything else remains constant:

$$P_M \downarrow = \frac{(S * P_E)}{P_M} \uparrow = q \uparrow$$

Results and discussion

In our analysis case we will use the data provided by the Mexican bank, from the data of the nominal exchange rate where the dollar at the end of 2016 rose to 19.35 pesos for one dollar and the prices in Mexico and the United States were not modified. The new real exchange rate is:

$$q= \frac{S_1 \text{ x } P_E}{P_M} = \frac{19.35 \text{ x } 1\,000}{11\,000} = 1.75$$

By raising the real exchange rate by 7.5%, the US basket is now 7.5% more expensive than the Mexican basket. The purchasing power of the peso in relation to US goods fell 7.35%, given that for the price of a Mexican basket, only 92.65% of the foreign basket can now be purchased. Symmetrically, the purchasing power of the dollar in relation to Mexican products increased 7.5%. For the price of a US basket. Which increases exports, reduces imports and improves the current account.

In practice, real depreciation occurs if the nominal depreciation of the currency is greater than the differential of inflation interest rates between the two countries. It is a rough way we can write that:

What goes up if, and only if $\% \wedge S > iM - i\,E$

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[1] If we have the price indexes of the two countries we can change the scale of an index so that in the base year the real exchange rate is 1

These two states only consider the states of volatility regimes with an analysis of an amplifying scenario because this only allows the volatility that is at a very high level or can be very low, with this model we can estimate the parameters of the neoclassical model of the volatility, in this sense the monetary authorities in Mexico in Banco de México, have applied that the exchange stability has tendencies to look for volatility of Mexican peso-US dollar exchange rate, be as volatile as possible or a volatility regime that implies the lowest existence of instability of the exchange rate taken by the Mexican bank to stabilize exchange markets.

The probability of low volatility is given by the following equation

$$p_{ba} = P(\sigma_t = \sigma_{alta} \mid \sigma_{t-1} = \sigma_{baja})$$

The probability of change from the high volatility regime to the low volatility change is:

$$p_{ab} = P(\sigma_t = \sigma_{baja} \mid \sigma_{t-1} = \sigma_{alta})$$

The non-conditional variance is:

$$\sigma^2 = \text{var}(r_t) = E(\sigma_t^2) = p\sigma_{baja}^2 + (1-p)\sigma_{alta}^2$$

The probability that high volatility will occur is:

$$p_{t-1}^* = P(\sigma_{t-1} = \sigma_b \mid \Omega_{t-1}) = \frac{p_{t-1}\psi(r_{t-1} \mid \mu, \sigma_b^2)}{p_{t-1}\psi(r_{t-1} \mid \mu, \sigma_b^2) + q_{t-1}\psi(r_{t-1} \mid \mu, \sigma_a^2)}$$

$$q_{t-1}^* = 1 - p_{t-1}^*$$

After applying the different exchange systems in Mexico, since they contained a fixed exchange rate, they resulted in failures that only produce depreciations.

Beginning in 1994, our market was plagued by a series of endogenous social, political and economic events, such as the zapatista army in the state of Chiapas, the assassination of the leader of the party in the government of Lic. Jose Francisco Ruiz Massieu, as well as a rise in interest rates in the United States of America, this type of events coupled with monetary policies that encouraged the Mexican peso was overvalued in real terms with respect to the US dollar favoring an increase in the supply of imported products upward, Rudiger Dornbusch (1994) mentioned that the level of devaluation of the Mexican peso was well above the values of 20%, that a devaluation was necessary to begin by solving the problems of imbalance in the balance as in the balance of financial services, this quickly led to a significant and progressive decline in international reserves.

The probability of the high volatility towards the rise that occurred in the year 1994 in Mexico, it was observed that the secretary of finance of that time, affirmed that the Mexican peso would not devaluate, but the loss of confidence of the markets observed that of In an anticipated manner, international reserves decreased abruptly and uncontrollably, offering a catastrophic scenario due to an imminent devaluation of the currency that in the first three months was 50% but quickly the market adjusted the exchange rate, reaching scenarios of loss of the value of the local currency of 100%, reaching December 20, 1994 would adjust the peso-dollar parity raising the upper band of 15% according to the monetary authorities that quickly observed that it was insufficient to maintain parity within the parameters, so that two days later the monetary authorities abandoned the exchange rate regime of floating bands for the free floating regime c

In the minimum intervention of the Mexican bank that continues until 2015, in 1994 the country had an exchange rate price of 5 $ Mexican pesos per US dollar with the devaluation happened in only three months at an average price of $ 9 pesos per an American dollar, this immediately caused a massive outflow of capital that was not to his liking. After 1995 until the date of the 2016 study, the volatility presented has been manageable by the monetary authorities. In general, it can be said that according to the proposed model and the volatility of the dollar peso exchange rate, long periods of more than 10 years were analyzed. low volatility

Future research

It is expected next year Frankfort University in Germany, review our mathematical model and validate it for academic purposes to have a significant result and certified by colleagues who are experts in the area of models of this type

Conclusions

This type of work showed that the volatility of peso-US dollar exchange through the neoclassical volatility model has an approach that allows identifying and analyzing the periods of low and high volatility through statistical probability of occurrence of an event associated with the research variable " volatility".

In the last 10 years, the peso has strengthened against the US currency, which could mean that the long-term behavior of the macroeconomy has arguments based on the stability or controlled reduction of volatility, coupled with the fiscal and monetary policies that are very disciplined, contributing to increase the climate of welfare and economic growth of the country.

The analysis carried out by the Bank of Mexico of the exchange market, the regime that I adopt predicts that in the future there would be greater depreciation of the peso than in the last decade, however the exchange rate volatility of the Mexican currency has shown in the last 5 years a Relative stability since an upward trend has been maintained since the free float regime, the volatility ratio is linked to the overvaluation variable, which the Mexican peso against the US dollar maintains a large imbalance so the trend depreciation will continue, as a factor that corrects the fundamental exchange imbalances with respect to the demand and supply of the North American currency.

The methodology used in this study of integration of variables was applied in a concrete and objective manner which allowed obtaining short and long term determining results, thus validating what neoclassical economic theory says.

Firstly, the theory of purchasing power partially achieved the above, due to the fact that the nominal exchange rate maintained a direct influence with domestic prices in both the short and long term, however, foreign prices did not obtain significant statistical information to make mention of this concept so we can not comment on this research variable.

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