A study on Pricing of currency futures in Indian currency market

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Abstract

This paper attempts to study theoretically the pricing of currency futures and the scope of the available models for pricing. The purpose of this study is to investigate the available literature on pricing of currency futures and understand the empirical analysis employed by various researchers. The thorough review of literature and the study of futures data on National Stock Exchange conclude that in developing countries like India, Athens etc the markets are inefficient and thus the future or forward prices become equal to spot prices at the time of expiry i.e. convergence is there. This study has tested the cost of carry model and convergence empirically through VECM but seeing the pattern of trading and the study on market efficiency in India supports the dependency of two on each other i.e. there is a long run stable relationship between foreign currency spot and futures market.

Keywords: ***pricing, convergence, National Stock Exchanges, future prices, spot prices*** *etc.*
JEL Classification: G12, G14, G15.

I. Introduction

Currencies have been recognized as new asset class and they follow distinctive fundamentals unlike other assets like equity or bond. Shapiro (2006) describes the emergence and growth of the market for derivative instruments back to the willingness of risk adverse economic agents to protect themselves against qualms arising out of fluctuations in asset prices. From 1867 to 1933, fixed exchange rate system was prevailing. During the period most of the economies of world used 'Gold Standard'. This was a fixed exchange rate system in which the value of a currency was fixed relative to the value of gold which was used as the primary reserve asset during that time. Under this system the amount of money issued by a country was directly tied to the gold which in turn fixed the price of one currency to the other currencies. When a country suffered from deficit or surplus in balance of payments, gold flowed out or in. US dollar was the only currency which was strong enough at that time in order to withstand the increasing demand for international liquidity. But the great depression from 1929 to 1934, forced US to partially abandon the gold standard (were not allowed to exchange dollars for gold) and were given silver instead of gold. It gave rise to 'Bretton Woods System' that was an agreement of fixed exchange rates that ruled the international financial relationships. By 1971, US completely rejected the conversion of US dollar to gold. It was followed by ending up of Bretton Woods System and allowed the exchange rates of most western countries to follow in the world markets. These fluctuations in the currency exchange rates led to currency exposure risk which

is one of the major sources of overall risk in international trade and internationally diversified portfolios. Thus controlling this risk is very important for controlling and improving investment performance of international trade and investments as many individuals and firms find themselves helpless in the wake of drastic exchange rate movements.
The price behaviour in the currencies market has become an important barometer for economic activity. The pattern in price discovery reveals suitable strategies that have to be taken in the trading/hedging decisions in currency market. There is a growing literature which explores the developments happening in currency market but Rendlemen and Carabini (1979) were the first researchers to study the pricing efficiency of an (interest rate futures) IRF contract. They studied the Treasury bill futures contract traded on the International Monetary Market (IMM) of the CME. It was found that if the transaction cost is less, the nearby futures contracts have been overpriced while longer-term futures contracts have been underpriced. Overall, there appears to be an affinity for the market to become less efficient over time. Jeng (1999) studied the strength of co-integration between future prices and their spot prices through cost of carry model and found that they are weakly associated .The study of Razak and Bacha (2009) on testing the pricing efficiency of 3-monthKLIBOR (Kaula Lumpur) futures contracts suggests that extent of mispricing is dependent on the trend and volatility of the underlying rate. The latest study by Tharavanij (2012) in Thailand on testing the efficiency through cost of carry model revealed that the cost-of-carry model explains SET 50 futures price properly. It was found that spot and futures prices form a co-integrating relationship. This fact can be explained by a negative correlation between the cost-of-carry and the spot price change, which make a futures price to be different from a forward price due to a future's daily settlement. The cost of carry model though tested but still needs consideration for developing economies like India.

According to the report of NSE derivatives markets have been in existence in India in some form or other for a long time. In the area of commodities, the Bombay Cotton Trade Association started futures trading in 1875 and, by the early 1900s India had one of the world's largest futures industries. In 1999, the Securities Contracts (Regulation) Act of 1956, or SC(R)A, was amended so that derivatives could be declared "securities." This allowed the regulatory framework for trading securities to be extended to derivatives. In the Indian context the Securities Contracts (Regulation) Act, 1956 [SC(R) A] defines "derivative" to include-

1. A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.

2. A contract which derives its value from the prices, or index of prices, of underlying securities.

The term derivative has been defined in section 45U (a) of the RBI act as follows:

'An instrument, to be settled at a future date, whose value is derived from change in interest rate, foreign exchange rate, credit rating or credit index, price of securities (also called "underlying"), or a combination of more than one of them and includes interest rate swaps, forward rate agreements, foreign currency swaps, foreign currency-rupee swaps, foreign currency options, foreign currency-rupee options or such other instruments as may be specified by RBI from time to time.'

The economic liberalization of the early nineties facilitated the introduction of derivatives based on interest rates and foreign exchange. A system of market-determined exchange rates was adopted by India in March 1993. In August 1994, the rupee was made fully convertible on current account. These reforms allowed increased integration between domestic and international markets, and created a need to manage currency risk.

On October 1, 2008 BSE (Bombay Stock Exchange) launched its currency derivatives segment in dollar-rupee currency futures as the exchange traded currency futures contracts facilitate easy access, increased transparency, efficient price discovery, better counterparty credit risk management, wider participation and reduced transaction costs. A large variety of derivative contracts have been launched at exchanges across the world including India. Some of the factors driving the growth of financial derivatives are:

1. Increased volatility in asset prices in financial markets.

2. Increased integration of national financial markets with the international financial markets.

3. Marked improvement in communication facilities and sharp decline in their costs.

4. Development of more sophisticated risk management tools, providing a wider choice of risk management strategies.

5. Innovations in the derivatives markets, which optimally combine the risks and returns over a large number of financial assets, leading to higher returns, reduced risk and lower transactions costs as compared to individual financial assets.

Currently Indian currency derivatives market comprise of instruments like forward, futures and options where the terms have their usual definitions. For the first time in India, mini Futures and Options contracts are being offered. These are new products from BSE based on the leading Indian equity Index 'S&P BSE SENSEX '. These are primarily to enable retail investors to participate in the growing derivatives market. S&P BSE SENSEX is the barometer of the Indian capital market and is widely tracked in the global financial markets. As Indian derivatives markets grow more sophisticated, greater investor awareness will become essential

II. Literature Review

Pradhan and Bhat (2009) investigated the causal relationship between spot and futures prices in Nifty futures markets, using Vector Error Correction Model (VECM). Their study compared the forecasting ability of futures prices on spot prices with three major forecasting techniques namely ARIMA, VAR and VECM model. The findings indicated the importance of taking into account the long-run relationship between the futures and the spot prices in forecasting future spot prices. Ozen et al. (2009) examined that the short-term and long-term causality between futures market and spot market for the period from February 2005 to February 2009. They used the analysis, unit root test, co-integration test and causality analysis depending on Vector Error Correction Model (VECM). Their findings indicated that the series derived from the futures prices and cash market prices were as stationary, as each other and co-integrated. It was also found that futures market leads spot market in the long term on the other hand spot market is the cause of futures market in the short term.

Floros (2009) examined the price discovery between futures and spot markets in South Africa over the period from 2002 to 2006. FTSE/JSE Top 40 stock index futures and spot markets were co-integrated and he found that futures and spot play a strong price discovery role, that was, FTSE/JSE Top 40 futures prices led to spot prices and vice versa. Rosenberg and Traub (2006) compared price discovery in the foreign exchange futures and spot markets. They developed a foreign exchange futures order flow measure that is a proxy for the order flow observed by Chicago Mercantile Exchange pit traders. They find that futures market has the major contribution to price discovery than the spot market.

Gupta and Belwinder (2006) examined the price discovery mechanism in the NSE spot and future market. The study used the daily closing values of index future Sand PCNX Nifty, from

June 2002 to February 2005. The techniques like Johansen and VECM were used and it was found that there exists stronger casual relation from Nifty futures to Nifty index.

Kenourgios (2004) investigated relationship between price movements of FTSE/ASE three-month futures index and the underlying spot market in Athens Stock Exchange over the period of August 1999 until June 2002 by using daily data. This study's results show the presence of a bi-directional causality between stock index spot and futures markets, there is an informational linkage between two markets and the existence of such an informational linkage implies that investors using these markets can explore significant arbitrage profits and hedging opportunities

Kavussanos and Nomikos (2003) investigated the causal relationship between futures and spot prices in the freight futures market. They found that price discovery first takes position in the futures market and then it is transmitted to underlying cash market. Their findings indicate that futures prices tend to discover new information more rapidly than spot prices. They also reported that the information incorporated in futures prices, when formulated as a VECM, produces more accurate forecasts of spot prices than the VAR, ARIMA and random-walk models.

Lin and Stevenson (2001) employed the wavelet analysis to reconstruct data based on the information that differentiated the two fundamentally related time series: spot and futures indices. Wavelet analysis allowed signals to decompose into a parsimoniously countable set of basic functions at different time locations and resolution levels. Because of the compact support property of wavelets, wavelet analysis was capable of capturing short-lived, transient components of data in shorter time intervals, as well as capturing trends and patterns in longer time intervals. The analysis focused on examining the relationship between the two price series. Furthermore, it also enabled examination and comparison of reconstructed prices based on different levels of information detail. The result revealed that the lead-la g relationship described in the empirical literature still existed between the spot and the futures index prices. Such a relationship was more persistent when more detailed information was used for price reconstruction. This implied that, if market imperfection was to be blamed for thenon-contemporaneous relationship between the spot and the futures indices, one should concentrate solely on those imperfections that were likely to occur within very short time horizons.

Patnaik and Pauly (2000) developed a short run model of exchange rates to explain the behaviour of the rupee in foreign exchange markets in the nineties when India moved from a fixed to a floating exchange rate. In the model estimated the real exchange rate deviates from that determined by real interest parity due to risk and intervention. These, apart from the interest differential and the expected exchange rate, determine the current period's exchange rate. The expected exchange rate was a curved combination of the rates derived from predictive behavior and the equilibrium exchange rate which was determined by a version of the purchasing power parity condition

Sarno and Valente (2000) examined empirically the dynamic relationship between spot and futures prices in stock index Futures markets employing a class of nonlinear, regime-switching-vector-equilibrium-correction models. Using data for S&P500and theFTSE-100overthepost-1987 crash period, it was shown that a long run relationship between spot and futures prices exists, which implied mean reversion of the basis. After providing strong evidence against the hypothesis of linear dynamics in the relationship under investigation, regime-switching-vector-equilibrium-correction models for spot and futures price movements were developed and shown to capture well the time-series properties of the data, consistent with a large theoretical and empirical literature.

Thomas, III (1986) examined the profitability of currency futures market trading rules that assume that spot exchange rates could be adequately modeled as drift less random walks for German mark, Japanese yen, Swiss franc, French franc and the British pound for 1974-1983. It compared the expected and actual rates of return realized by an investor who followed such a random walk hypothesis (RWH)-based strategy, using each of the five major currencies that typically sell at a significant discount or premium from spot. For four of the five currencies the regression estimates were not powerful enough to decisively reject either hypothesis—random walk or unbiasness—in favor of the other. However, it was fair to say that the weight of the evidence favors the RWH. All five estimates of the slope term from equation were positive and unbiasness could be rejected in favor of the RWH for one of the currencies, the pound. Zellner's seemingly unrelated regression (SUR) procedure yielded more precise estimates of the parameter values if the $U_t$from equation were correlated across different currencies. It was likely that the error terms for various currencies were related. The SUR results showed that the case for the OLS estimates, the estimates of *b* were positive for all five currencies., and in no case could the RWH (b=1) be rejected. The estimated slope term was significantly positive for two of the five currencies, the British pound and the French franc. Unfortunately, even using SUR the estimates of *b* remained imprecise, so that for three of the five currencies neither the RWH nor the unbiasness hypothesis was rejected by the data.

Levich (1979) studied that whether forward exchange rates were unbiased predictors of future spot rates. The article aimed to examine the accuracy of the forward rate as a predictor of the future spot rate. The relationship between today's forward exchange rate for delivery in n days (call it $F_{t,\ n}$) and the spot exchange rate n days in the future ($S_{t+n)}$ along with the error term $e_{t,n}$ (where et,n = : $S_{t\ +\ n}$ - $F_{t,n}$) had been studied. The results illustrated that the parameters a' and b'(regression equation coefficients) could take on a wide range of values. In several cases, individual parameters differed significantly from their expected values under the null hypothesis. The estimated regression line was significant for Italy (at the 1% level) and for Switzerland (at the 10% level) which stated that the forward premium was an unbiased forecast of the future exchange rate. It was equally true, however, that the predictive power of this relationship, as measured by R^2 was very low and in most cases not significant.

III. Models:

Fama (1991) defines an efficient market as one where prices reflect all available information. Price discovery is the function of the spot and the future rates. According to Tesler (1958) price insurance is only possible if spot and future price move exactly together. Kamara (1984) pronounced that future prices are biased predictors of spot prices. Various researchers have given many models for price discovery. They have been discussed below in detail.

The relationship between spot and future price can be better understood by studying the basis behaviour. Basis is the difference between the cash/spot price and the future price

Basis= Spot price – Future Price or

Spot price= Basis+ Future price

A. Pricing on the basis of Cost of Carry Model

One of the most famous and simple model for explaining relationship between spot and future price is the cost of carry model. In the literature review also it has been found that various researchers have used this model for estimating the future prices. It states that under a perfect market situation the returns in the spot and the futures market should be perfectly correlated. It is an arbitrage-free pricing model and its central theme is that futures contract is so priced as to prevent arbitrage profit. In other words, investors will be indifferent to spot and futures market to execute their buying and selling of underlying asset because the prices they obtain are effectively the same. Expectations do influence the price, but they influence the spot price and, through it, the futures price. They do not directly influence the futures price.

According to the cost-of-carry model, the futures price is given by Futures price = Spot Price + (Carry Cost - Carry Return)

Carry cost (CC) is the interest cost of holding the underlying asset (purchased in spot market) until the maturity of futures contract. Carry return (CR) is the income (e.g., dividend) derived from underlying asset during holding period. Thus, the futures price (F) should be equal to spot price (S) plus carry cost minus carry return.

$\mathbf{F_{(it,n)}=(r-r^*)+(S_{(t)})}$
r=domestic interest rate
r*=foreign interest rate
$F_{(it,n)}$=price of a futures with n periods at time t
$S_{(it)}$=spot rate

B. Pricing on the basis of Samuelson Effect
The net hedging hypothesis (which postulates that future prices are biased estimates of forthcoming cash prices because hedgers must compensate speculators for assuming the price risk of holding future contracts) says that the spot price and the future price will converge at the end of the future contract or at the time of expiration (Future price will be equal to spot price). The arbitrageurs make sure that convergence happens at the expiration. Samuelson (1965) proposed that future price varies less in comparison to spot prices and the variation of future prices reduces as maturity approaches. This effect is called Samuelson effect.

IV. Research Methodology

The pricing is the main issue raised in this paper so the pricing firstly through cost of carry model and then convergence has been verified. The cost of carry has been checked empirically in the form

$\mathbf{Log\ F_{(t,n)}=(r-r^*)+Log(S_{(t)})\ (1)}$
The rationale behind this is that spot exchange rates are assumed to be log normally distributed. This assumption excludes the possibility of negative spot or futures prices.
As mentioned earlier, the convergence happens when spot price and future price become almost equal on the day of expiry. In other words when the basis moves towards zero as the expiration of a futures contract nears (Basis= Spot price – Future Price).
Being the time series data, all the three series have been tested for stationary and autocorrelation through ADF statistics and Durbin Watson statistics respectively.

If the series found non stationary then the cointegration test will be performed. The Johansen co-integration procedure is a robust and powerful technique for testing efficient market hypothesis in the foreign exchange markets. The theory of co-integration was initially pioneered by Engle and Granger (1987) and improved by Johansen (1988; 1991). It helps in understanding the long run equilibrium relationship between multiple variables. The purpose of the cointegration test is to determine whether a group of non-stationary series is co integrated or not.

A vector error correction (VEC) model designed for use with non stationary series that are known to be co integrated will be used if co integration existed. The VEC has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

The data has been taken from official website of National Stock Exchange on futures for US dollar. The rolling over technique has been followed i.e. on the day of expiration there is a significant increase in trading of the next contract, so from the date of expiry of first contract the next contract has been taken. This process generated a data series of 1590 observation during a period of 29th Aug 2008 to 27th march 2015 for rupee-dollar. The corresponding spot prices for the same currency pair have been taken on the same dates. The difference between the risk free rates of interest between domestic currency and the foreign currency has been taken for corresponding dates from official website of Reserve Bank of India and research.stlouisfed.org

Analysis for cost of carry:

As mentioned above the series have been tested for stationary and autocorrelation through ADF statistics and Durbin Watson statistics respectively. The tables below give the results for all the three properties of time series:

Table 1 Stationary Test

Null Hypothesis:	D(LNFUTURE) has a unit root			D(INTERESTDIFF) has a unit root		D(LNSPOT) has a unit root	
Exogenous: Constant							
Lag Length: 0 (Automatic based on SIC, MAXLAG=23)							
		t-Statistic	**Prob.***	**t-Statistic**	**Prob.***	**t-Statistic**	**Prob.***
Augmented Dickey-Fuller test statistic		-37.53120	0.0000	-25.54139	0.0000	-39.72352	0.0000
Test critical values:	1% level	-3.434262		-3.434980		-3.434262	
	5% level	-2.863155		-2.863472		-2.863155	
	10% level	-2.567678		-2.567848		-2.567678	
***MacKinnon (1996) one-sided p-values.**							
F-statistic	1408.591			927.4670		1577.958	
Prob (F-statistic)	0.000000			0.000000		0.000000	
Durbin-Watson stat	1.993308			2.011973		1.999965	

The above results clearly states that all the series are stationary at first difference form at 1%, 5% and 10%. The null hypothesis of non stationary is rejected at all the three significance levels. The Durbin Watson (DW) statistics is also within the limits of no autocorrelation. The DW statistics is 1.99, 2.011 and 1.99 for the three series respectively which is in the region of decision of no autocorrelation, positive or negative (decision rule Du<D<4-Du). Here Du, the upper limit of DW statistics at 1% and 5 % level of significance is 1.684 and 1.778 respectively for one regressor (k=1). So 4-Du is 2.316 and 2.222 at 1% and 5% respectively which are more than calculated DW statistics. It means the data is free from the problem of auto correlation. Now co integration test can be performed. To check for cointegration Johansen test has been done using Eigen value and Trace statistics. The results of the test are summarized below in table 2.

Table 2 -Co-Integration test

Included observations: 1381 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LNFUTURE INTERESTDIFF LNSPOT				
Lags interval (in first differences): 1 to 4				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigen value**	**Statistic**	**Critical Value**	**Prob.****
None *	0.093938	146.7700	29.79707	0.0001
At most 1	0.006700	10.53806	15.49471	0.2416
At most 2	0.000908	1.254124	3.841466	0.2628
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
*** denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values**				
Unrestricted Cointegration Rank Test (Maximum Eigen value)				
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigen value**	**Statistic**	**Critical Value**	**Prob.****
None *	0.093938	136.2320	21.13162	0.0001
At most 1	0.006700	9.283939	14.26460	0.2633
At most 2	0.000908	1.254124	3.841466	0.2628
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
*** denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values**				

Table 3 Vector Error Correction Estimates

Included observations: 1441 after adjustments Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	CointEq1		
LNFUTURE(-1)	1.000000		
INTERESTDIFF(-1)	-0.000214		
	(9.3E-05)		
	[-2.30381]		
LNSPOT(-1)	-1.002827		
	(0.00170)		
	[-588.581]		
C	0.009733		
Error Correction:	**D(LNFUTURE)**	**D(INTERESTDIFF)**	**D(LNSPOT)**
CointEq1	-0.262542	8.393590	0.327107
	(0.05921)	(8.28720)	(0.04803)
	[-4.43410]	[1.01284]	[6.81065]
D(LNFUTURE(-1))	0.319890	-7.776765	0.650766
	(0.05697)	(7.97345)	(0.04621)
	[5.61526]	[-0.97533]	[14.0827]
D(LNFUTURE(-2))	0.116672	-5.517971	0.241919
	(0.04963)	(6.94698)	(0.04026)

	[2.35063]	[-0.79430]	[6.00869]
D(INTERESTDIFF(-1))	0.000438	-0.590851	0.000343
	(0.00018)	(0.02554)	(0.00015)
	[2.39914]	[-23.1366]	[2.31555]
D(INTERESTDIFF(-2))	0.000326	-0.280101	0.000151
	(0.00019)	(0.02593)	(0.00015)
	[1.75811]	[-10.8011]	[1.00228]
D(LNSPOT(-1))	-0.260558	3.974740	-0.467897
	(0.05638)	(7.89177)	(0.04574)
	[-4.62109]	[0.50366]	[-10.2301]
D(LNSPOT(-2))	-0.095081	4.157735	-0.135842
	(0.03887)	(5.44088)	(0.03153)
	[-2.44590]	[0.76417]	[-4.30794]
C	0.000222	-0.004679	0.000191
	(0.00015)	(0.02108)	(0.00012)
	[1.47488]	[-0.22194]	[1.56636]
R-squared	0.274371	0.274477	0.407483
Adj. R-squared	0.226860	0.270933	0.404589
Sum sq. resids	0.046741	915.6519	0.030755
S.E. equation	0.005711	0.799359	0.004633
F-statistic	5.775246	77.44673	140.7851
Log likelihood	5402.556	-1717.975	5704.135
Akaike AIC	-7.487240	2.395524	-7.905809
Schwarz SC	-7.457965	2.424799	-7.876534
Mean dependent	0.000222	-0.005071	0.000213
S.D. dependent	0.005777	0.936178	0.006004
Determinant resid covariance (dof adj.)		2.06E-10	
Determinant resid covariance		2.02E-10	
Log likelihood		9948.170	
Akaike information criterion		-13.76984	
Schwarz criterion		-13.67104	

The Johansen's test for cointegration through trace test and Eigen value reveals that there is at least one co integrating equation which means that variable s have a long run relationship. Now to check if error correction is there and to estimate the coefficients VECM has been run. The VECM results clearly indicate that there is a long run relationship .The coefficient of error correction term is negative as well as significant which signifies convergence in the long run. The estimated equation is equation:

D(LNFUTURE) = C(1)*(LN FUTURE(-1) - 0.0002137834104*INTERESTDIFF(-1) - 1.002826618*LNSPOT(-1) + 0.009733419713) + C(2)*D(LNFUTURE(-1)) + C(3)*D(LNFUTURE(-2)) + C(4)*D(INTERESTDIFF(-1)) + C(5)*D(INTERESTDIFF(-2)) + C(6)*D(LNSPOT(-1)) + C(7)*D(LNSPOT(-2)) + C(8)

The equation tested here is having logarithm of futures price as dependent variable. So in order to confirm the significance of coefficients the p-values have been estimated through OLS.

Estimation Method: Least Squares				
Included observations: 1476 Total system (unbalanced) observations 4393				
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C(1)	-0.288492	0.058807	-4.905723	0.0000
C(2)	0.351599	0.056357	6.238839	0.0000
C(3)	0.134268	0.049482	2.713494	0.0067
C(4)	0.000419	0.000183	2.294028	0.0218
C(5)	0.000288	0.000181	1.595537	0.1107
C(6)	-0.275132	0.056290	-4.887807	0.0000
C(7)	-0.111884	0.038643	-2.895289	0.0038
C(8)	0.000266	0.000150	1.766693	0.0773
Determinant residual covariance		2.07E-10		
Observations: 1476				
R-squared	0.561137	**Mean dependent var**		0.000271
Adjusted R-squared	0.512517	**S.D. dependent var**		0.005848
S.E. of regression	0.005770	**Sum squared resid**		0.048874
Durbin-Watson stat	1.987705			

V. Conclusion:

This paper explores the relationship between spot and future prices of currencies through models and the importance of pricing. It has been tried to understand how the two prices (spot and future) depend on each other and help to explain the currency behaviour. This paper considered the empirical work because methods like Vector Error Correction Method (VECM) provides a sophisticated platform to study multiple time series. The empirical analysis of various researchers has got mixed results. Some found that future prices converge to spot price while others found no convergence. These variations might be due to difference in the data sets used by them. But if we go through the literature and theoretical concepts of pricing of currency futures they suggest that the spot prices are equivalent to future price at the time of expiry i.e. convergence is there as the markets found to be inefficient. The results of the present study are in line with a few researches for convergence in developing countries'. But if convergence is there it means that spot prices are predictable which ultimately leads to profits for the knowledgeable traders.

The currency futures market has greater price transparency for the end-user by the introduction of exchange traded currency futures in India. It can now avoid the legal tangle and also bring the platform of foreign exchange in India same as developed countries. The upward trend of the open interest, number of contracts traded and average daily turnover since its inspection explain the whole story in detail. So, it can be thus concluded that the currency futures market will get more success in the coming future and the economy and the risk hedgers will definitely be benefited from this trade.

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