

# AN OVERVIEW OF THE NON-DELIVERABLE FORWARD (NDF) MARKET

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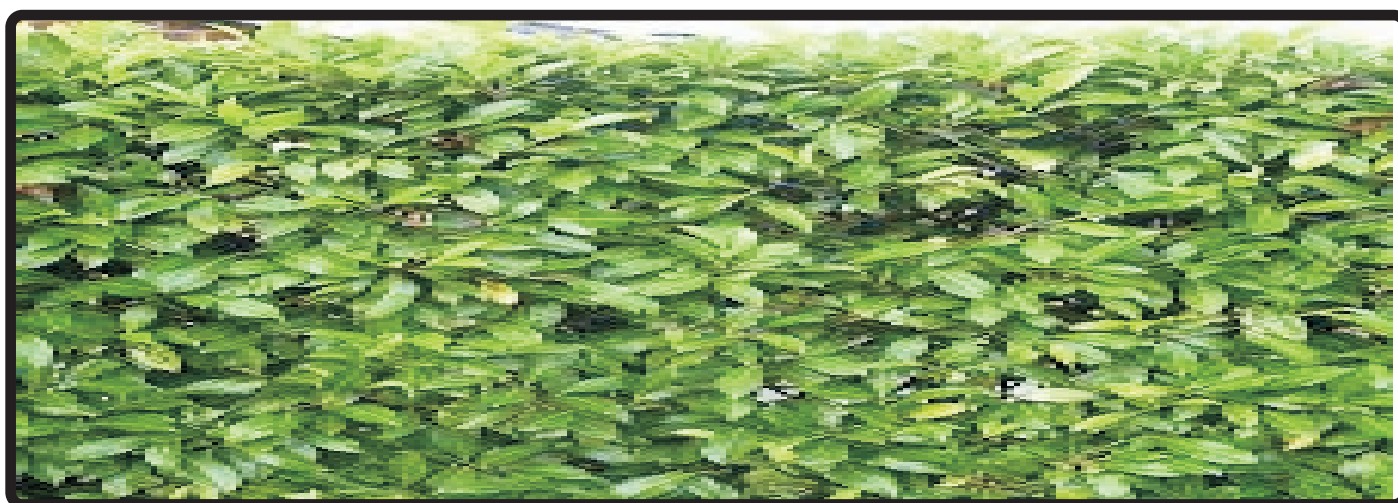
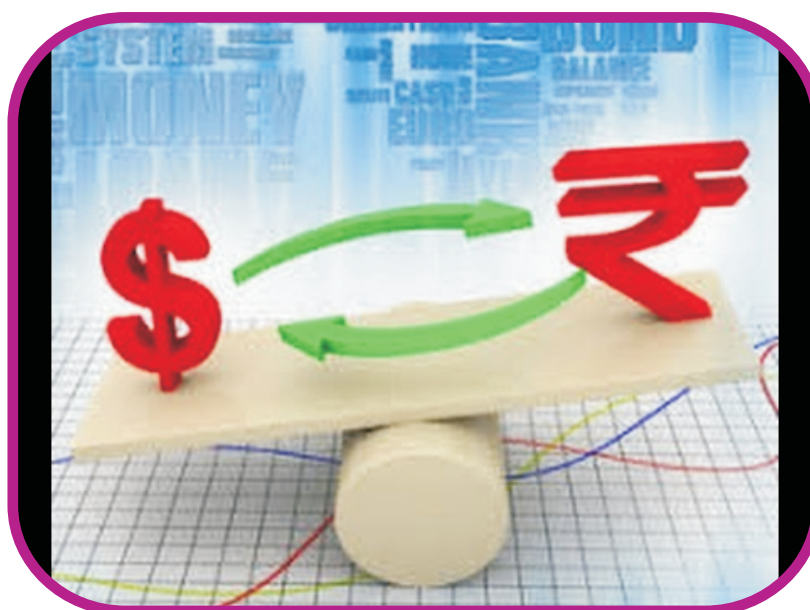
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## Abstract:-

An NDF is a cash-settled forward contract, traded over-the-counter for currencies that are not fully convertible. There is a need to study non-deliverable forwards (NDF) as a hedging tool and various other aspects of NDF market in the Indian context. The objective of this paper is to explore and explain the concept of NDFs, since many people do not understand the reasons for its existence and how it works. Recently, the interest in NDF markets has increased owing to increase in its trading activity and the fear of NDFs weakening the domestic currency. In India, the size of INR NDF market has grown substantially since last few years and RBI has been suspecting that speculation in overseas markets is actually influencing domestic rates and is working on regulating NDF market.

## Keywords:

Non-Deliverable Forwards; NDF; hedging; notional principal; settlement currency; contract rate.



## INTRODUCTION

We all live in a turbulent world and economies have become highly globalized and liberalized. One of the many risks that is associated with the global nature of economies is the risk of currency fluctuations. Exchange rates can fluctuate significantly overtime and can severely affect the cash flows and earnings of the people involved in global operations. Even firms and individuals not directly involved in global operations are affected by the volatility of exchange rates. So there is a definite need to manage this foreign exchange exposure faced by global firms and other affected parties. Exposure to foreign exchange rate risk is often hedged with forward foreign exchange contracts which involve fixing up an exchange rate today for settlement at a specified future date. A forward foreign exchange contract is a bilateral contract to buy or sell a specified currency of specified quantity and on a specified future date at a predetermined and a pre-specified exchange rate or price. The forward prices are based on the prevailing spot rate and the interest rates on the two currencies involved.

However, in many economies the monetary regulators and government restricts access of non-residents to onshore forward markets, in the form of the restrictions imposed on their currency's convertibility, in order to control the currency's inflow and outflow and protect it from excessive speculation. As a result, non-residents sometimes encounter difficulties in hedging their exposure with onshore forward contracts as they might not be allowed to enter into such transactions under the currency restrictions. Examples of markets where government regulations restrict foreign access to local currency markets include Korea, Taiwan, Philippines, India and China. As a result, markets for non-deliverable forwards (NDF), which do not require the delivery of the non-convertible currency, have developed. An NDF is a cash-settled forward contract, traded over-the-counter for currencies that are not fully convertible.

An apt definition of NDF is - "NDFs are foreign exchange derivative products traded over the counter. The parties of the NDF contract settle the transaction, not by delivering the underlying pair of currencies, but by making a net payment in a convertible currency (typically the US dollar) proportional to the difference between the agreed forward exchange rate and the subsequently realized spot fixing. NDFs are also distinct from deliverable forwards in that NDFs trade outside the direct jurisdiction of the authorities of the corresponding currencies and their pricing need not be constrained by domestic interest rates." (Ma, Ho, & McCauley, 2004)

Apart from being used as a hedging tool for currencies with convertibility restrictions, NDFs have also become an attractive tool for speculation and arbitrage on such currencies. So, it became an area of interest for many researchers. Since spot price, domestic forward prices and NDF prices are all prices of the same asset i.e. a particular currency in question, there must be some relationships between these set of prices.

## PURPOSE OF PAPER

The present paper studies non-deliverable forwards as a hedging tool and various other aspects of NDF market in the Indian context. The first objective of this paper is to explore and explain the concept of NDFs, since many people do not understand the reasons for its existence and how it works.

Trading in the offshore NDF rupee market influences the onshore or spot and domestic forward markets. For a long time, Reserve Bank of India (RBI) did not give due importance to the existence and influence of the NDF market because these contracts were earlier seen as abstruse transactions and also because the size of the NDF market was very small in relation to the size of domestic foreign exchange market. But since last few years, the size of NDF market has grown substantially and RBI has been suspecting that speculation in overseas markets is actually influencing domestic rates. Much of the speculative trade that led to the slide in the Indian currency, when rupee plunged to 68.85 to the dollar on 28 August 2013, took place in the offshore NDF market. RBI has conducted some studies on exploring these inter-linkages between offshore Rupee market and onshore rupee markets. The recent interest of regulators in NDF market has also been observed in other countries as well such as Singapore, Korea among others, in the wake of concerns regarding transparency in the operation of NDF contracts in overseas markets. Investigation into the recent LIBOR rigging scandal have raised concerns that spot rates on NDF contracts might have been manipulated for some currencies, including the Malaysian ringgit and the Indonesian rupiah. The concerns are that traders could have attempted to tamper spot rates in order to profit when settling NDFs carried on their books. The leads us to the second objective of this paper which is to explain the reasons that justify monitoring the level of activity in NDF markets by monetary regulators in India and making efforts to deepen the domestic foreign exchange markets.

This paper is organized to discuss the various aspects of NDF including its meaning, markets, origin, relationship with capital convertibility restrictions, pricing, participants and settlement process.

## NDF: MEANING

NDFs are over-the-counter (OTC) derivative instruments for trading in non-convertible currencies such as the rupee, Malaysian ringgit, Philippines peso and the Korean won. It does not require physical delivery of the involved currency at maturity, since delivery is not permissible under convertibility restrictions. Instead, the contract specifies a contracted forward exchange rate or simply a forward rate (also called NDF rate) against a convertible currency, typically the US dollar (USD), a notional amount of the non-

convertible currency like Indian rupee (INR) and a settlement date. On the settlement date, the spot market exchange rate is compared to the forward rate and the contract is settled in the convertible currency based on the notional amount, by paying the difference between the spot rate and NDF rate. NDFs are traded primarily in over-the-counter markets and are cash-settled in the convertible currency.

“An NDF market generally grows when the onshore forward market is either under-developed or its access for market participants is restricted. NDF markets allow market agents, facing regulatory restrictions in the onshore market, to hedge their exposures and speculators to take a position on future movements in domestic currency. In fact, as market players’ interest grows in a particular currency with convertible restrictions, NDF market generally gains momentum in overseas financial centers.” (Hutchison, Kendall, Pasricha, & Singh, 2010)

For example, Company A, an American Company will receive INR 10,000,000 three months from today as a result of an investment in India. Upon receipt, Company A is planning to convert the payment into USD at the then available spot rate; Indian authorities permit this spot market transaction because of the underlying investment. But no deliverable forward foreign exchange contracts are available to Company A for INR, so in order to hedge the exchange rate risk between INR and USD, Company A enters into an NDF with a bank in Singapore. The NDF contract specifies a notional of INR 10,000,000, a maturity of three months and the agreed upon forward rate. The spot rate for INR is set by the RBI. Thus, the idea is the same as a regular foreign exchange forward - an investor or a company wanting to lock in an exchange rate for a certain period in the future.

All NDFs have a fixing date and a settlement date. The fixing date is the date at which the difference between the prevailing spot rate and the agreed upon forward exchange (NDF) rate is calculated. The settlement date is the date by which the payment of the difference is due to the party receiving payment.

#### NDF: ORIGINS

The NDF market began to grow in the early 1990s, mainly because of increased trade liberalization and other market oriented reforms. It was focused mostly on emerging market currencies, primarily as a means for companies to hedge their exposure to currency fluctuations of emerging market countries with actual or potential foreign exchange convertibility restrictions. Initially, most NDF trading was in Latin American currencies. Throughout the 1990s, increasing investments in emerging markets in Asia and Eastern Europe further expanded the size of the NDF market.

“Trading volume in NDFs began to increase in 1994 after voice brokers entered the market as intermediaries facilitating interbank trading, which allowed dealers to more easily offset positions with one another that they had accumulated from their market making activities for clients. The NDF market became sufficiently established that the International Swaps and Derivatives Association (ISDA) added settlement provisions for NDF transactions to its 1997 draft of FX and currency option definitions” (Lipscomb, 2005). During the Asian crisis of 1997, interest in NDF trading further increased as local currency devaluation was expected in several countries. Over the years, the interest in NDF markets has increased, specifically for emerging economies. “The daily global volume for NDFs in the Brazilian real, the Indian rupee and the Chinese renminbi is more than USD 40bn, compared to global spot transactions of USD 30bn in 2010” (BRIC currencies trading in London, 2012).

#### NDF: MARKETS

“Countries whose currencies are actively traded in the NDF markets include Argentina, Brazil, Chile, China, Guatemala, Indonesia, India, Columbia, Korea, Malaysia, Philippines, Peru, Russia, Taiwan, Venezuela and Vietnam” (Goyal, Jain, & Tewari, 2013). These markets are located offshore – that is, in financial centers outside the country of the restricted currency. Large and increasingly active market in NDFs exists, with centers in Hong Kong, Singapore, Seoul, Taipei, Tokyo, London and New York. “The Indian rupee NDF market is most active in Singapore and Hong Kong, though there is also trading in places such as Dubai.” (Hutchison, Kendall, Pasricha, & Singh, 2010)

With the growth in international trade and financial openness, the size of the NDF markets is growing fast, particularly for emerging economies like India, Brazil and China. The average daily UK trading volume in NDFs in the four BRIC currencies, viz., Brazilian real, Russian rouble, Indian rupee and Chinese renminbi has grown by nearly 70 per cent from just over US\$ 11 billion in April 2008 to almost US\$ 20 billion in April 2012 (BRIC currencies trading in London, 2012). The daily turnover in the offshore rupee NDF market was \$10.8 billion in 2010, nearly 52% of the total turnover (\$20.8 billion) in foreign exchange forwards and foreign exchange swaps. (He & McCauley, 2010)

“Korea won NDF market has been the deepest NDF market in Asia as well as globally, whereas New Taiwan dollar has been the second most active in Asia.” (Ma, Ho, & McCauley, 2004). The NDF rupee markets have developed a lot in terms of size, liquidity and depth overtime because of the growing interest of Multi-National Companies (MNCs) and other institutional investors, as these markets serves as an avenue for foreign entities to hedge their foreign-exchange exposure for the currencies. The NDF rupee markets also derive liquidity from speculators who wish to speculate on future movements by of the currency without any actual or potential exposure to currency and from arbitrageurs who have access to both onshore and offshore markets and wish to make risk-less profits by operating in both markets and capitalizing on the price



differences.

As the NDF market is an offshore market, the Indian authorities have no powers to enforce regulations on it. Domestic banks and companies are not allowed to transact in the NDF market. But currently there are no restrictions on the offshore participation in the NDF rupee markets.

While an NDF is primarily an OTC product wherein the market makers such as major banks write contracts for their customers, these banks often use the services of third-party NDF voice brokers to facilitate the purchase of offsetting NDF transactions with other major banks. Voice brokers facilitate banks' ability to offset the currency risk associated with NDF transactions. The major NDF markets generally have sufficient depth and liquidity to enable quick offsets of their positions incurred through market-making activities. "In the case of some countries with relatively well-developed onshore currency and interest rate markets and sufficient regulatory flexibility, notably Korea and Brazil, major international banks are able to offset the currency risk of their NDF positions to some extent with onshore counterparties." (Lipscomb, 2005)

### CAPITAL CONVERTIBILITY RESTRICTIONS AND NDF MARKETS

From the past experience, it has been observed that NDF markets are likely to be most developed for countries with substantial cross-border capital movements but with convertibility restrictions (like India). NDF trading declines in cases once convertibility appears to be firmly established (like Australia). (Debelle, Gyntelberg, & Plumb, 2006)

In India, the restrictions imposed on foreign exchange transactions are prompted the growth of NDF markets. India began with the process of liberalization in 1980s to increase its market orientation. The process got paced up in 1991 after a balance-of-payment crisis, and a rapid economic expansion was supported through market-oriented reforms of liberalization, privatization and globalization. "As a complement to the trade liberalization, effective current account liberalization, as measured by acceptance of IMF Article VIII, was achieved by August 1994. However, Indian policy-makers have proceeded with caution in liberalizing capital flows as there is less theoretical agreement on the economic benefits of capital account liberalization, and in light of the recent externally-triggered financial crises in emerging economies. Various steps have been taken liberalize the capital account and to allow certain kinds of foreign capital flows, but a host of restrictions and discretionary controls remain." (Hutchison, Kendall, Pasricha, & Singh, 2010) India has cautiously opened up its capital account since the early 1990s, making a gradual and compositional shift in capital flows away from debt to non-debt creating flows, including FDI and foreign portfolio investment; strict regulation of external commercial borrowings, especially short-term debt; discouraging volatile element of flows from non-resident Indians and gradual liberalization of outflows. "The status of capital account convertibility in India for various non-residents can be summarized as follows: for foreign corporate and foreign institutions, there is a reasonable amount of convertibility; for non-resident Indians (NRIs) there is approximately an equal amount of convertibility, but one accompanied by some procedural and regulatory impediments. For non-resident individuals other than NRIs there is near zero convertibility." (Mohan, 2008)

Following the recommendations of Committee on Fuller Capital Account Convertibility (March 2006), RBI implemented a number of measures marking a move towards liberalization of the capital account. Some of these measures are enhancement of limit of the remittance, liberalization of procedures for project and service exports, enhancement of banks' overseas borrowings, increase in access of External Commercial Borrowings (ECBs), establishment of corporate offices abroad, enhancement of FIIs' investment in Government Securities; enhancement of ceiling on Mutual Funds overseas investment and liberalization of forward contract regulations, etc. However, the regulators are still very cautious in their approach towards fuller capital account convertibility (FCAC) with a view to maintain healthy and stable financial market conditions. Thus, although India's regulatory regime for capital flows has been substantially liberalized, but we are still away from complete capital account convertibility leaving scope for and need for NDF markets. (Mohan, 2008)

### NDF: PRICING

The prices of forward foreign exchange contracts is primarily based on the interest rate parity (IRP) formula which determines equivalent returns over a set time period based on two currencies' interest rates and the current spot exchange rate. In addition to IRP calculations, other factors affecting prices of forward contracts include trading volume, liquidity and counterparty risk. NDF prices depend on the perceived probability of changes in foreign exchange regime, speculative positioning, conditions in onshore interest rate markets and the relationship between the offshore and onshore currency forward markets. "When international investors have little access to a country's onshore interest rate markets or deposits in local currency, the NDF prices for that currency are based primarily on the expected future level of the spot exchange rate." (Lipscomb, 2005)

NDF prices serve as a useful tool for market monitoring in the sense that these prices reflect market expectations and supply and demand factors that cannot be fully exhibited in onshore currency product prices for a country with capital controls. Prices in the NDF market can also be a valuable informational tool for authorities and investors to assess market expectations of likely pressures on an exchange rate regime going forward. NDF volatility is higher than that of the domestic spot and forward markets. This is primarily because of official intervention by the Reserve Bank of India in the spot and forward markets and also because

of excessive speculative activities in NDF markets.

#### **NDF: MARKET PARTICIPANTS**

There are primarily three types of players in NDF markets according to their objectives of operating in NDFs- hedgers, speculators and arbitrageurs. Major participants in NDF market could include: foreign investors, operating in countries with exchange controls who undertake forward contracts in the offshore markets to hedge currency risk, entities like hedge funds, commercial and investment banks, currency speculators taking positions in the NDF market to speculate on a currency without any genuine exposure to that currency and participants, with access to both onshore and offshore forward markets who operate in the NDF markets to gain from exchange rate differential of a currency pair in the domestic and offshore markets.

The INR NDF market presently derives its liquidity largely from non-residents speculating on the Indian rupee and from arbitrageurs trying to exploit the differentials in the prices in the domestic and NDF markets without any outlay of capital on their part by two offsetting transactions. “The behavior of NDF market players depends critically on their objective for participation. Foreign investors who participate in the NDF market to hedge their exposures generally take long positions e.g. multinational companies. Speculators, on the other hand, operate mostly in the short end of the market e.g. hedge funds, also corporate entities with an international presence who undertake speculative or arbitrage trades, jewel exporters and manufacturers that constitute another group who are active arbitraging between domestic and NDF markets” (Misra & Behera, 2006).

In India, onshore financial institutions are not allowed to transact in the NDF markets. However, since domestic banking entities are allowed specific open position limits for their foreign exchange exposures, there is scope for domestic entities to participate in the NDF markets to take advantage of arbitrage opportunities.

#### **NDF: SETTLEMENT PROCESS**

NDFs are derivatives for trading in non-convertible or restricted currencies without delivery of the underlying currency where physical delivery is not possible because of capital controls on the currency. An NDF contract generally involves two parties who agree to a cash payment from one party to another at a future date based on the price on that day of some underlying asset (spot price of non-deliverable currency) as compared to a contractually agreed future price for the same asset. Every NDF contract involves nominating the amount of the transaction, called the notional principal amount and fixing on the two currencies involved - the settlement currency and the non-deliverable currency (usually an emerging economy currency with capital controls). These currencies are known as the currency pair.

The notional principal amount is denominated in the units of the non-deliverable currency. Every NDF contract also involves nominating a fixing date on which the fixing rate is determined, settlement or maturity date on which you want cash settlement to occur and a contract or NDF rate which is a future price. The contract rate is a nominal foreign exchange rate pre-determined, considering several factors including the currency pair and the time zone chosen for trading, the maturity date set, inter-bank foreign exchange rates, the notional principal amount, market volatility, margins, inter-bank interest rates of the countries of the currency pair. The fixing rate for each particular currency is sourced from independent market rate sources used by the financial markets industry. The manner in which the fixed rate is determined is also agreed upon at the initiation of the contract and varies by currency and jurisdiction. This can be the daily rate published by the central bank of the non-convertible currency (spot rate) or an industry group reference benchmark which is typically an average of rates from several banks and FX dealers (like LIBOR) (Okongwu & Bruegger, 2012). In India, fixing rate is the RBI reference rate i.e. the then-prevailing spot market exchange rate.

NDFs are cash-settled, implying no actual currency exchange at maturity. Instead as outlined above, one party pays the other a cash amount in the settlement currency. The cash-flow is based on the netted difference between the fixing rate (spot price at a fixing date) and the contractual price (Rupee NDF rate). Generally, the differential amount is settled in a convertible currency like US dollar. Thus, the risk on the movement of non-convertible currency is mitigated through the transactions of the differential amount in the offshore market (Behera, 2011).

According to the terms of an NDF contract, if on the settlement date, the fixing rate is greater (in foreign currency per dollar terms) than the contract rate, the holder of the contract who is long the emerging market currency must pay the holder of the other side of the contract the difference between the contracted forward price and the fixing rate. The contract is net-settled in a convertible currency based on the notional amount. Conversely, if the emerging market currency appreciates relative to the previously agreed NDF rate, the holder of the contract short on the emerging market currency pays to the counterparty to the contract. (Lipscomb, 2005)

If a person is concerned about the non-deliverable currency weakening against the settlement currency and is effectively receiving the non-deliverable currency in the future, he/she should enter into an NDF where he/she elects to sell the non-deliverable currency and purchase the settlement currency on the maturity date. Alternatively, if he/she is concerned about the non-deliverable currency strengthening against the settlement currency (i.e. you are effectively paying the non-deliverable currency in the future), you will enter into an NDF where you elect to purchase the non-deliverable currency and sell the settlement currency

on the maturity date (Non-Deliverable Forward Transactions: Product Disclosure Statement; Issued by Westpac Banking Corporation)

## CONCLUSION

The growing activity in NDF rupee market and increasing influence of NDF rupee markets on onshore rupee markets suggests close monitoring of NDF markets. NDFs being OTC products are subject to minimal regulation. NDF rupee market is flourishing as a parallel market for Indian rupee outside India and outside RBI's regulatory jurisdiction. According to a study by the Bank for International Settlements (BIS), the daily turnover in offshore rupee NDF market increased to US \$10.8 billion in 2010, nearly 52 percent of the total turnover (\$20.8 billion) in foreign exchange forwards and forex swaps.

The NDF market for the rupee is mainly concentrated in Singapore, Hong Kong, Dubai, London and New York. In recent years, London has become a key center for trading in the rupee NDFs. According to FXJSC Semi-Annual FX Turnover Surveys, the average daily trading in rupee NDFs in London increased from US \$1.5 billion in 2008 to US \$5.2 billion in 2012, a jump of 250 percent (Singh, 2013).

There are no controls on the offshore participation in NDF rupee markets. However, the onshore financial institutions in India are not allowed to freely transact in the NDF markets. Domestic banking entities have specific open position and gap limits for their foreign exchange exposures and it is through these limits only that domestic entities participate in NDF market. "The main participants in the rupee NDF market consist of commercial and investment banks, hedge funds, currency speculators, international subsidiaries of Indian companies and big diamond merchants" (Singh, 2013).

As discussed, one of the serious risks associated with increased influence of NDF markets on domestic markets is that it has potential of strengthening the downward pressure on rupee, by adding to the negative sentiment of the market. "According to India Forex Advisors (a foreign exchange consulting and treasury management firm), a large demand for forward dollar pushes up forward rate and thereby influences the spot exchange rate in India. As witnessed during July-August 2013, the increased speculative trading in the NDF market exacerbated volatility in both the spot and the forward market in India" (Singh, 2013).

Thus, with this perspective it is inevitable to monitor and regulate the offshore activity in rupee for a stable currency environment.

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- 1.Hedging is an investment technique designed to offset a potential loss on one investment by purchasing a second investment that you expect to perform in the opposite way.
  - 2.Currency Convertibility refers to the freedom to convert the domestic currency into other internationally accepted currencies and vice versa. While current account convertibility refers to freedom in respect of payments and transfers for current international transactions, Capital Account Convertibility (CAC) would mean freedom of currency conversion in relation to capital transactions in terms of inflows and outflow.
  - 3.Open Position in a currency is the sum of the net spot position, the net forward position and the net options position:  
The net spot position is the difference between foreign currency assets and the liabilities in the balance sheet; includes all accrued income/expenses.  
Net Forward Position represents the net of all amounts to be received less all amounts to be paid in the future as a result of foreign exchange transactions, which have been concluded.  
The options position is the "delta-equivalent" spot currency position as reflected in the authorized dealer's options risk management system. (Official Circular of Foreign Exchange Department of RBI, dated 01 March 2013)