

## **Inevitability of Losing Most Traders in the Foreign Exchange Market: New Evidence**

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### **Abstract**

The foreign exchange market (FX market) accounts for 40% of the total volume of the world's e-commerce by its own. Based on statistics, sometimes up to 90 per cent of the traders lose their total capital in this market just within six months to one year and leave this market. The probability of loss in the FX market can be estimated by probability theory. The present paper intends to demonstrate the loss in the FX market within the frameworks of some developed theoretical models using the data on the exchange rates for the currency pairs (EUR/ JPY, USD/ EUR) for the time interval of February-October in 2013.

According to the results of simulation of the loss in the FX market, a number of factors including the leverage level, the volatility of the exchange rate for the currency pair, inflation rate, spread, the number of the transactions and the number of sudden stop transactions are directly related to the percentage of the loser traders so that any decrease in the above-mentioned factors is accompanied by a decrease in the percentage of the losers in the FX market. Furthermore, based on experimental results, the loss probability in this market is as much as 60% for the lower leverage levels. This value amounts to 99% for the higher leverage levels.

**Keywords:** Foreign Exchange Market, Probability Theory, Capital Loss, Leverage Coefficient, Spread.

**JEL Classification:** CO2, C60, C88, F31

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## 1. Introduction

The foreign exchange market in its current form returns to the 1970s after the Bretton Woods regime gave way. Indeed, it is a global decentralized financial market of exchange trading which are transacted in high volumes among sellers and buyers 24 hours a day all time zones except for the weekends. Transactions are done through internet and other media among market activists in different parts of the world, and due to high volume of transactions, maximum liquidation occurs in such markets. Moreover, it is the same market which determines the relative value (rate) of the exchange since the mutual transaction of the currency occurs in it.

FX is the international exchange market which provides the opportunity to buy and sell different exchange financial tools. FX is the world's largest market for daily currency exchange. FX market players are the banks, international investment institutions and corporations, brokers, exporters and importers, and also individual investors. Unlike other financial markets, it does not have any special physical location and trades are executed through interbank networks. Furthermore, it is a 24 hour market, i.e., the rates are changing throughout the day in this market (Amiri et al, 2010).

Although applicants of foreign currencies such as individual, traders and corporations need to convert currencies for capital transfer, good exchange, and tourism, a group of them transact only for investment, stock-jobbery and making a profit. However, all transactions in FX market are in the form of currency pair exchanges. That is, one currency is converted into another for arbitrage opportunities.

When an applicant buys US dollar against Japan's Yen, typically, it means that s/he hopes or guesses the relative value of dollar (compared to Yen) appreciates and value of Yen depreciates. It is obvious that if s/he buys dollar in lieu of Yen, and the relative value of Yen increases, the trader will lose some money since he owns the dollar which decreased in value compared to Yen. Practically, statistics related to traders and speculators in FX market indicates that most traders and especially the new ones face capital loss in this market in the end. One of the important features of FX market is its low margin in comparison with other markets. Daily volatility of exchange rate parity is about one per cent in the market. Thus, traders, particularly individual and small investors may have no interest in trading in FX market. The reason is that if traders can take all the rate change to their own benefit by an appropriate transaction in an

appropriate time, the maximum profit will be one per cent which its absolute value is insignificant for small capitals. Hence, brokers of FX market have provided investors with leverage by means of which they can enter into a transaction up to 100 times more than their capital. This amount can be raised to 500 times by some brokers.

All the profits or losses of such transactions are allocated to the investor. To put it simple, if the transaction led to profit through leverage, all the profit will go to the trader. On the other hand, if the transaction ends up with loss, the loss will be taken from the trader's initial capital; even it can involve the entire initial capital of the trader. That is when the transaction is closed automatically by the broker, and the trader will lose all his capital.

Although the loss of most traders in FX market is theoretically inevitable, it does not necessarily lead to the loss of the entire capital. In other words, existence of leverage, as mentioned above, may contribute to the loss of the entire capital of the traders since some related statistics revealed that 90 to 95 percent of speculative traders lose their entire capital or some part of it in this market within six months to a year (Drakoln, 2008). The reason of traders' loss in this market can be the lack of basic and technical information, being unaware of mathematical and statistical models, and not controlling emotions and feelings on the one hand, and using leverage from one to a hundred times as much as the real capital or more in some cases by these traders on the other hand, cause their capital loss. It is crystal clear that using high credit and trading on margin (precautionary capital for the broker to execute transactions) in the volatile markets raise the possibility of failure and losing the capital a lot.

In the present paper the related literature is reviewed briefly in section 2; the respective theoretical principles within the framework of probability theory are discussed in section 3, Using the proposed theoretical model and the data on the transaction rates for the currency pairs, in section 4, it will be shown that statistically and experimentally a significant number of investors face the loss of some or the entire capital. Finally the conclusion is presented in section 5.

## 2. Review of Literature

In fact, there is no literature focused on the developmental mechanism of FX market. What matters is the analysis of currency volatility in different markets which- regarding the economic situation of the countries-causes fluctuation in a country's exchange rate. However, developments

in the FX market are mostly on the technical basis so that it is claimed about 90% of FX traders lose their money and quit within 2 years. There are many reasons for these failure like discipline, patience and lack of expertise among traders causing them to lose money and to quit (Jarratt, 2010). Also, some relevant statistics indicate that more than 90 to 95 percent of traders who speculate lose their entire investment in this market within just six months to one year (DraKoln, 2008).

In fact, most of analysts have a technical look at this market. They investigate fluctuations in the rate of a currency against foreign currencies based on the existing condition of currency pairs market without measuring the possibility of occurrence. Additionally, recognition of the dominant factors on the global financial markets such as insecurities of capital markets infecting the markets in FX reinforces the idea of currency evaluation.

Considering what was mentioned, FX market is a high risk market originated mainly from exchange rate fluctuations. In response to the question "Why is currency rate changing constantly?" it can be stated supply and demand curves of a country's currency shift overtime and this causes permanent changes in exchange rates. This shift may occur due to the change of people's tastes over domestic and foreign production, different economic growth, differences of inflation rates in different countries, changes in interest rates, changes in expectations and central bank intervention to implement monetary and exchange policies. Thus, the fluctuations in foreign exchange markets can be transferred to FX and lack of awareness of traders will lead to their loss. Although the FX market project is limited in terms of analysis, the following studies have examined other aspects of the FX market like profit and loss, and prediction in this market.

Osler (2005) has focused on stop-loss orders and profit-taking from the market. He has provided some evidence on the relationship between the stop-loss and the price cascades by an empirical analysis based on a period of 2 years. The results of his study support the view that the stop-loss order has a significant impact on exchange rates.

In their study, Kimiagari et al. (2008) predicted the data of FX market using fuzzy time series and simulated annealing algorithm. Morel (2012) has examined gradual evolution for three main foreign currency rates in the framework of chaos pattern. Giannellis and Papadopoulou (2006) evaluated the efficiency of FX market for the developing countries. They state that this

market is efficient when all the existing information is completely reflected. According to them, Europe FX market in Czech Koruna /Euro is not efficient, that is while exchange market in Slovak/Euro is quasi-efficient. Dewachter and Lyrio (2006) calculated the cost of rational risk aversion factors which use technical laws of business in FX market.

Also, there are studies on Foreign Exchange risk of which can refer to Evans and Kenk (2004) who compared the real and calibrated values of Foreign Exchange risk premium. They found calibrated values within a dynamic stochastic general equilibrium model of a small open economy consisting of risk aversion optimizing agents with unconventional preferences. The results showed the equilibrium foreign exchange risk premium is a function of exogenous shocks in the model. In this study, the model for evaluation of foreign exchange risk premium is calibrated by different specifications of policy uncertainty. Kitamura and Hiroya (2006) examined the effects of interest rate differentials as inflowing information into the FX market on the yen/dollar exchange rate and unexpected trading volume by a structural VAR model. The results indicated that short term interest rate differentials affects exchange rate. The effects of long-term interest rate differential on the exchange rate appear instantaneous with high trading volume, reflecting instantaneous reshuffling in international portfolio holdings of long-term assets.

### 3. Theoretical Discussion on Loss

In the FX market, any trading occurs between two currency pairs. In practice, it is the traders and not the brokers who change their owned currency basket. If it is assumed that trader A is the owner of exchange X and trader B is the owner of exchange Y, after some transactions done through a broker, only the ownership of two exchange packages is exchanged without creating a real excess for sum of the two actors (A+B). Indeed, the entire exchanges possessed by the traders in FX market will remain stable both before and after the transaction. Despite all transactions satisfied among the traders in this market, assuming the commission received by the brokers and the inflation rate insignificant or zero, the entire exchange assets of the traders at the end of each transaction period will remain the same as the beginning of the period. Therefore, foreign exchange market generally, FX market in particular, is a zero sum market (Easley et al., 2011; Haldane, 2011). In addition, this game is repetitive since actors usually enter into consecutive transactions in this market.

In addition, the mean probability of win or failure is  $\frac{1}{2}$  in every transaction. It is evident that the probability of win for relatively more professional and less professional actors is higher and lower than  $\frac{1}{2}$ , respectively, so that the mean probability of win will be  $\frac{1}{2}$  for the whole of the actors. For the micro level, the loss probability of each single actor can be estimated given the specific win and failure probability using the proposed equations. However, to evaluate and analyze the general and macro condition of the FX market, the mean probability should be calculated. To do so, in the macro-analysis of the FX market, a representative actor is used. Representative actor refers to an actor whose chance of win and failure is exactly the same as the probability of profit and loss in the market. Consequently, the mean probability for any random sample of the actors present in the market will be  $\frac{1}{2}$ . One actor whose win probability is lower or higher than the mean probability of win and failure in each individual transaction i.e.  $\frac{1}{2}$  cannot be regarded as an appropriate representative or approximation of the condition of the market in the macro level. To put it differently, the probability of loss and profit for every representative actor in this market for each transaction must be equal i.e.  $\frac{1}{2}$ .

Let assume exchange X is traded with exchange Y by A and B in the first transaction day. Since initially the transaction has been done between value y of the currency Y and value x of currency X, these two baskets will have a similar market value in terms of the exchange rate i.e.

$$V(X) = V(y) \quad (1)$$

Then, if the exchange X bought by B is reinforced, assuming the lack of arbitrage of the exchange, it can be established that the profit percentage (rate) of the trader B is obtained using the following equation (Tayebi et al., 2012):

$$\dot{P} = \frac{V_1 - V_0}{V_0} = \frac{Er_{xy}^1 - Er_{xy}^0}{Er_{xy}^0} \quad (2)$$

To obtain the loss and profit rate i.e.  $\dot{P}$  we can use its mean ( $\bar{\dot{P}}$ ) which is represented by  $\bar{\dot{P}}$ .

In the following section, firstly, assuming the commission received by the brokers and inflation rate as being zero, the sudden stop probability of those traders is analyzed that use leverage. This is followed by an elaboration of the theoretical model on loss in the FX market based on the discussed principles.

### 3.1. Leverage, Sudden Stop and Entire Capital Loss

Regarding transaction in the FX market, it is

noteworthy that the traders can face loss in two areas in this market which may seem trivial. First, there is the loss by the decrease in the power of buying exchanges because of inflation. Basically, positive or zero inflation exists in all or most economies. Although inflation in the economies corresponding to major exchanges, i.e., Dollar, Yen, Pound and Euro is little and (sometimes) zero, such slight inflation means that purchase power of such exchanges is reduced.

The second origin of traders' loss in FX market is resulted from the difference of bid-ask spread in FX market. Brokers receive commission in two ways: the first one is the fixed intermediation fee. The second one is the fee taken by the difference of bid-ask spread called spread. Brokers who work with a two-points spread receive a wage from the trader by presumed purchase of Euro versus Dollar (EUR/USD) with the bid price of 1.4701 and ask price of 1.4703 without receiving any commission in reality. The rate is calculated as below:

$$\dot{g} = \frac{Ask - Bid}{Bid} \quad (3)$$

Based on the above relation, rate of the received commission is 0.000136 that seems too little but in high volumes of transactions, a lot are paid to the broker. In this study, two limit states of 0.0001 and 0.0002 are considered for the broker's received commission rate. At last, considerations related to rollover are disregarded here.

Daily volatility of exchange rate parity is about one percent in the market. Thus, small traders may have no interest in trading in FX. The reason is that if even they can take all the rate change to their own benefit by an appropriate transaction in an appropriate time, the maximum profit will be one percent which its absolute value is insignificant for small capitals. Hence, a new facility named leverage was provided in FX market. By means of leverage, the investor can enter into a transaction up to 100 times more than their capital. This amount can be raised to 500 times. All the profit or loss of such transactions is allocated to the investor. To put it simple, if the transaction led to profit through leverage, all the profit will go to the trader. On the other hand, if the transaction ends up with loss, the loss will be taken from the trader's initial capital, i.e., the rate of loss will be multiplied by a corresponding number (ex:100) to the leverage to the extent that the absolute value of loss can be equal to the entire initial capital of the trader. That is when the transaction is closed

automatically by the broker, and the trader's capital would be zero. This condition is called sudden stop. Therefore, the provided leverage by the broker could both multiply profits of the trader and lead to so much loss that all he loses all his capital.

The trader who uses the leverage with coefficient  $L$  deals, in fact, with a capital level of  $LV_0$  despite the initial capital  $V_0$ . Based on the initial capital  $V_0$ , this trader makes a profit with the rate  $L\dot{P}$  if he wins and in case of failure, he sustains a loss with the rate  $L\dot{P}$ . On the other side, winning or losing, he/she is supposed to pay a commission with the below absolute value to the broker:

$$LV_0\dot{g} = \text{commission} \quad (4)$$

In other words, he/she pays the commission based on the initial capital  $V_0$  with the rate  $L\dot{g}$ .

First, probability of the sudden stop and losing the entire capital is examined. Based on the above analysis, the trader makes a profit with rate  $(L\dot{P} - L\dot{g})$  in each win provided that  $\dot{P} > \dot{g}$ . He sustains a loss with the rate  $(-L\dot{P} - L\dot{g})$  in each failure. But daily values of volatility of the transaction rate of the currency pairs i.e.  $\dot{P}_a$  are not the same in different transactional days. Daily volatility may be large enough in some days so that the following equations are made:

$$\begin{aligned} L\dot{P} + L\dot{g} &\geq 1 \\ -L\dot{P} - L\dot{g} &\leq -1 \end{aligned} \quad (5)$$

Then, if the trader loses in such transactional days, he will lose his entire capital, and sudden stop occurs, because

$$V_1 = (1 - L\dot{P} - L\dot{g})V_0 \leq 0 \quad (6)$$

If it is assumed that the trader faces high volatility in  $q$  days from the total  $N$  transactional days so that failure in one of the days of high volatility ( $q$ ) causes his sudden stop, then given the fact that the probability of wins in all high volatility days equals  $\left(\frac{1}{2}\right)^q$ , then probability of the sudden stop would be as follows (Tayebi et al, 2012):

$$P_{SD} = 1 - \left(\frac{1}{2}\right)^q \quad (7)$$

In absence of sudden stop whatever the individual's capital decreases, the transaction will not be lethal for him. If the trader does not encounter sudden stop in the entire  $N$  transactional days, he can continue transaction until the  $N$  times end.

### 3.2. Theoretical Model of Losing in the FX Market

To estimate theoretical probability of loss in FX market, it is possible to divide the FX market traders who engage in  $N$  transactions into 2 sub-categories which are as follows:

1- Traders that are faced with failure in one of the  $q$  times of transaction during the days of intense volatility and lose their entire capital. They are shown with set E.

2- Traders that are faced with win in all  $q$  times of transaction during days of intense volatility and as a result will never lose their entire capital. They are shown with set F.

Given what has already been mentioned, it can be concluded that:

$$\begin{aligned} P(E) &= P_{SD} = 1 - \left(\frac{1}{2}\right)^q \\ P(F) &= 1 - P(E) = 1 - P_{SD} = \left(\frac{1}{2}\right)^q \end{aligned} \quad (8)$$

Traders of set F in  $N$  times of transaction win presumably the entire  $q$  times of transaction during days of intense volatility. But in other  $N-q$  transactions, they are faced with  $n_0$  win and  $m_0$  failure. Generally, the probability of exactly  $n_0$  win is:

$$P_{n_0} = \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q}, \quad n_0 = 0, 1, \dots, N-q \quad (9)$$

$$\begin{aligned} \text{There exist totally } N \text{ transactional days that} \\ N = n_0 + m_0 + q \end{aligned} \quad (10)$$

The mean volatility of the transaction rate for the currency pair or the mean rates loss/profit in the days of intense volatility is shown with  $\dot{P}_h$ . There are  $n_0 + m_0$  transactional days in which the mean volatility of the transaction rate for the currency pair is shown with  $\dot{P}_l$  so that:

$$\dot{P}_h > \dot{P}_l \quad (11)$$

Then, assuming leverage use with coefficient  $L$  for foreign exchange assets value after  $N$  transactional days, it can be written:

$$V_N = (1 + L\dot{P}_h - L\dot{g})^q (1 + L\dot{P}_l - L\dot{g})^{n_0} (1 - L\dot{P}_l - L\dot{g})^{m_0} V_0 \quad (12)$$

In order to obtain the real break-even point in which the initial foreign exchange capital value equals the foreign exchange value after  $N$  transactional days, we will have:

$$V_N = (1 + \pi)V_0 \quad (13)$$

As a result, the following relations are obtained:

$$V_N = (1 + L\dot{P}_h - L\dot{g})^q (1 + L\dot{P}_l - L\dot{g})^{n_0} (1 - L\dot{P}_l - L\dot{g})^{N-q-n_0} V_0 = (1 + \pi)V_0 \quad (14)$$

and

$$(1 + L\hat{p}_h - L\hat{g})^q (1 + L\hat{p}_l - L\hat{g})^{n_0} (1 - L\hat{p}_l - L\hat{g})^{N-q-n_0} = (1 + \pi) \quad (15)$$

This relation is obtained by calculating the logs of both sides of the relation:

$$q \ln(1 + L\hat{p}_h - L\hat{g}) + n_0 \ln(1 + L\hat{p}_l - L\hat{g}) + (N - q - n_0) \ln(1 - L\hat{p}_l - L\hat{g}) = \ln(1 + \pi) \quad (16)$$

As a result

$$\hat{n}_0 = \frac{(q-N)\ln(1-L\hat{p}_l-L\hat{g}) - q \ln(1+\hat{p}_h-L\hat{g}) + \ln(1+\pi)}{\ln(1+L\hat{p}_l-L\hat{g}) - \ln(1-L\hat{p}_l-L\hat{g})} \quad (17)$$

where  $\hat{n}_0$  shows the least required wins to maintain the real initial value of foreign exchange assets for the investors that are not faced with sudden stop. If number of wins is less, loss and losing some part of the capital will certainly happen. Thus, probability of loss in this state is:

$$P(loss|F) = \sum_{n_0=0}^{\lfloor \hat{n}_0 \rfloor} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} \quad (18)$$

where  $\lfloor \cdot \rfloor$  is the integer sign.

On the other side and based on what was stated before, loss is certain for traders of type E:

$$P(loss|E) = 1 \quad (19)$$

Therefore, the theoretical probability of loss in FX market according to "law of total probability" is (Tayebi et al, 2012):

$$\begin{aligned} P(loss) &= P(E).P(loss|E) + P(F).P(loss|F) \\ &= 1 - \left(\frac{1}{2}\right)^q + \left(\frac{1}{2}\right)^q \sum_{n_0=0}^{\lfloor \hat{n}_0 \rfloor} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} \\ &= 1 - \left(\frac{1}{2}\right)^q \left[ 1 - \sum_{n_0=0}^{\lfloor \hat{n}_0 \rfloor} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} \right] \end{aligned} \quad (20)$$

It can be shown that the value of this probability is always theoretically higher than 1/2. We know that:

$$\sum_{n_0=0}^{N-q} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} = \left(\frac{1}{2}\right)^{N-q} \cdot \sum_{n_0=0}^{N-q} \binom{N-q}{n_0} = \left(\frac{1}{2}\right)^{N-q} \cdot (2)^{N-q} = 1 \quad (21)$$

Therefore:

$$\sum_{n_0=0}^{\frac{N-q}{2}} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} = \left(\frac{1}{2}\right)^{N-q} \cdot \frac{(2)^{N-q}}{2} = \frac{1}{2} \quad (22)$$

Since:  $\lfloor \hat{n}_0 \rfloor > \frac{N-q}{2}$  (An intermediate trader must win at least half of the transactions to maintain its initial foreign exchange capital after N-q transactions), in this way, the following equation is established:

$$\sum_{n_0=0}^{\lfloor \hat{n}_0 \rfloor} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} > \frac{1}{2} \quad (23)$$

therefore:

$$1 - \sum_{n_0=0}^{\lfloor \hat{n}_0 \rfloor} \binom{N-q}{n_0} \left(\frac{1}{2}\right)^{N-q} < \frac{1}{2} \quad (24)$$

Moreover, since the result of the multiplication of any number smaller than 1/2 by  $\left(\frac{1}{2}\right)^q$  will be smaller than 1/2 per every value of q, it can be concluded that the value of loss probability in the FX market is always greater than 1/2. Hence, the loss of most traders in FX market is theoretically inevitable (Easley et al. 2011).

#### 4. Simulation of Losing in the FX Market

In the last section of the paper, using the above-mentioned theoretical principles and the data on the volatility of the transaction rates for the currency pairs in the FX market, the percentage of the loser traders who lose some or all of their capital within the given period is simulated and calculated. These calculations are repeated in terms of various leverage levels applied by the traders as well as different amounts of commission received by brokers.

The selected currency pairs in this survey include EUR/JPY and USD/EUR. The proposed time interval covers February to October in 2013.

The results of the performed simulation using the data on the currency pair of EUR/JPY in the given period has been summarized in table 1. As these results show, the traders have not experienced a day with high volatility of transaction rates for the currency pair (a day in which a sudden stop may occur) in the leverage coefficients of 1, 20 and 30. Consequently, P(E) and P(F) will equal 0 and 1, respectively. Thereafter, the least number of wins necessary for maintaining the initial capital and the probabilities of loss i.e. the percentage of the traders facing a loss have been calculated. Although there is no day of high volatility in the mentioned leverage coefficients in the period under study, as many as 60% of the traders have experienced a loss at a leverage of 1 and a commission rate of 0.0001, while 96% have faced such a loss at a leverage coefficient of 30 and a commission rate of 0.0002. With the leverage coefficients increasing to 40 and 50, the traders have faced 2 and 7 days of high volatility in the market, respectively. Naturally, the percentage of the losers has also increased so that at a leverage of 50 and a commission rate of 0.0002, 99.99% of the traders have had a loss losing some or all of their capital. These results conform to the statistical results reported on the percentage of the traders who experience loss in the FX market. In addition, taking the obtained results into account, it can be seen that the percentage of the losers have increased at a constant leverage coefficient due to an increase in the commission value received by the brokers.

**Table 1: The percentage of loser traders in FX market at different leverage levels (EUR/ JPY transactions)**  
Year: 2013 EUR/JPY

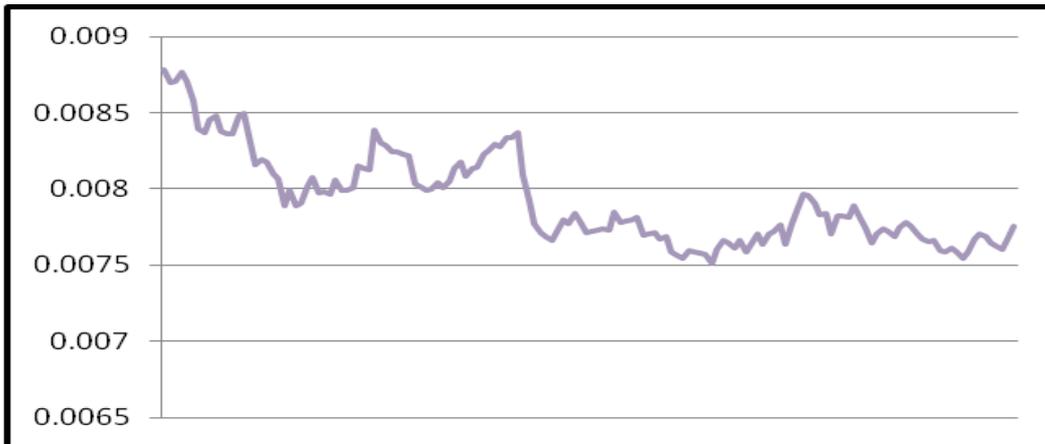
L	$\hat{g}$	$\hat{P}$	Q	P(E)	P(F)	$\hat{P}_h$	$\hat{P}_l$	$\hat{n}_0$	$q+\hat{n}_0$	P(loss E)	P(loss F)	P
1	0.0001	0.006961	0	0	1	-	0.006961	76	76	1	0.5967	0.5967
1	0.0002	0.006961	0	0	1	-	0.006961	77	77	1	0.6584	0.6584
20	0.0001	0.006961	0	0	1	-	0.006961	81	81	1	0.8558	0.8558
20	0.0002	0.006961	0	0	1	-	0.006961	82	82	1	0.8897	0.8897
30	0.0001	0.006961	0	0	1	-	0.006961	83	83	1	0.9175	0.9175
30	0.0002	0.006961	0	0	1	-	0.006961	85	85	1	0.9570	0.9570
40	0.0001	0.006961	2	0.75	0.25	0.032291	0.006618	84	86	1	0.9580	0.9895
40	0.0002	0.006961	2	0.75	0.25	0.032291	0.006618	86	88	1	0.9802	0.9951
50	0.0001	0.006961	7	0.9922	0.0078	0.024955	0.006080	83	90	1	0.9778	0.9998
50	0.0002	0.006961	7	0.9922	0.0078	0.024955	0.006080	84	91	1	0.9853	0.9999

Source: Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>

Figure 1 represents the daily transaction rates for the currency pair of EUR/ JPY from February-October 2013. The highest value and the lowest value are 0.0088 and 0.0075, respectively with their mean value being 0.079.

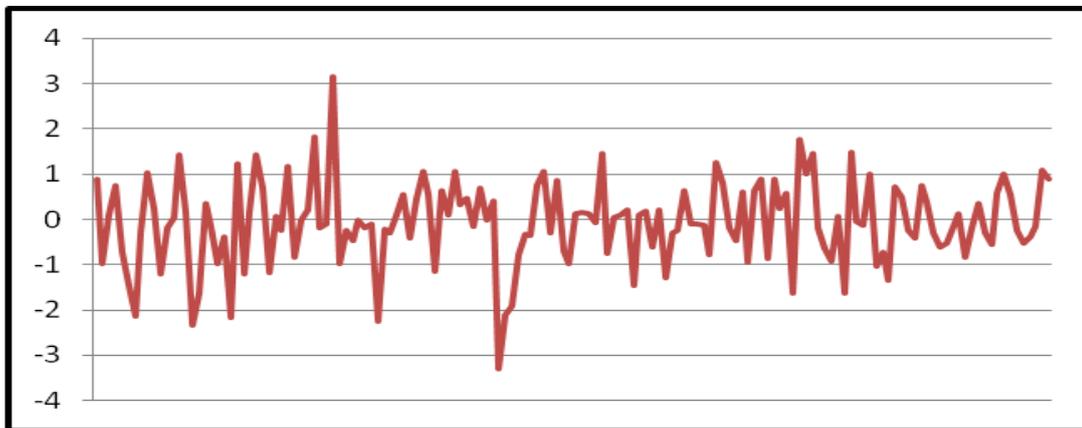
The values of the daily volatility percentages

of the exchange rate for EUR/ JPY covering February to October in 2013 have been shown in Figure 2. Ignoring the sign of the values, the highest, the lowest and the mean values are 3.31%, 0.01% and 0.70%, respectively.



**Figure 1: The Daily Transaction Rates for EUR/ JPY (2013)**

Source: Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>



**Figure 2: The Daily Values for the Volatility Percentage of Exchange Rate of EUR/ JPY (2013)**

Source: Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>

The results of the performed simulation using the data on the USD/ EUR currency pair for the period in question have been given in Table 2. As the data show, the traders have not experienced any day of high volatility of the transaction rate for the currency pairs even at a leverage level of 60. However, 66% of the traders have had a loss at the leverage level of 1 and commission rate of 0.0001. Furthermore, 98% of the traders have experienced a loss at a

leverage coefficient of 60 and commission rate of 0.0002. Those traders who have used a leverage coefficient of over 70 have had days of high volatility. Naturally, the percentage of the loser traders in the FX market has increased so that at a leverage level of 90 and commission rate of 0.0002, there are 99.99% of the traders have had loss in the market losing some or all of their capital.

**Table 2: The percentage of loser traders in FX market at different leverage levels (USD/ EUR transactions)**

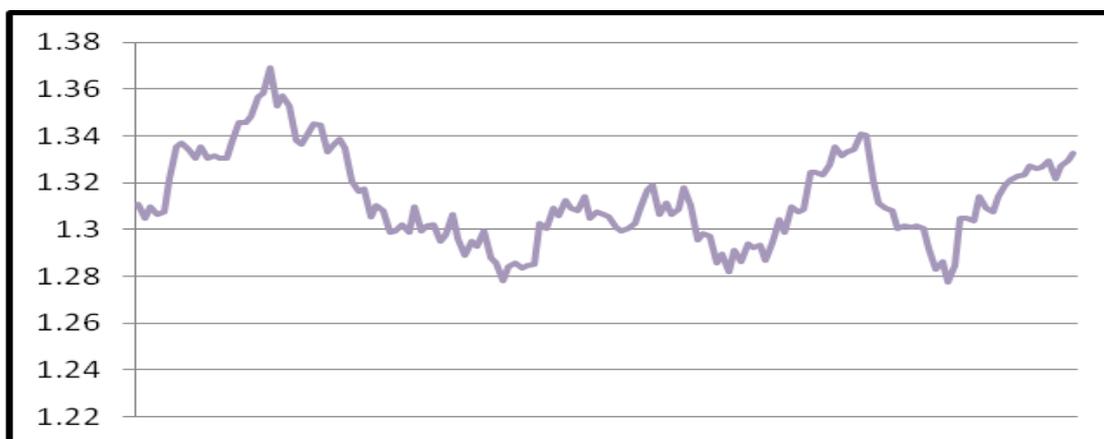
L	Year: 2013						USD/EUR					
	$\hat{g}$	$\hat{P}$	q	P(E)	P(F)	$\hat{P}_R$	$\hat{P}_I$	$\hat{n}_0$	q+ $\hat{n}_0$	P(loss E)	P(loss F)	P
1	0.0001	0.003988	0	0	1	-	0.003988	77	77	1	0.6584	0.6584
1	0.0002	0.003988	0	0	1	-	0.003988	78	78	1	0.7161	0.7161
20	0.0001	0.003988	0	0	1	-	0.003988	79	79	1	0.7687	0.7687
20	0.0002	0.003988	0	0	1	-	0.003988	81	81	1	0.8558	0.8558
30	0.0001	0.003988	0	0	1	-	0.003988	81	81	1	0.8558	0.8558
30	0.0002	0.003988	0	0	1	-	0.003988	83	83	1	0.9175	0.9175
40	0.0001	0.003988	0	0	1	-	0.003988	82	82	1	0.8897	0.8897
40	0.0002	0.003988	0	0	1	-	0.003988	84	84	1	0.9397	0.9397
50	0.0001	0.003988	0	0	1	-	0.003988	84	84	1	0.9397	0.9397
50	0.0002	0.003988	0	0	1	-	0.003988	86	86	1	0.9700	0.9700
60	0.0001	0.003988	0	0	1	-	0.003988	85	85	1	0.9570	0.9570
60	0.0002	0.003988	0	0	1	-	0.003988	87	87	1	0.9796	0.9796
70	0.0001	0.003988	1	0.5	0.5	0.015570	0.003910	86	87	1	0.9755	0.9878
70	0.0002	0.003988	2	0.75	0.25	0.014835	0.003841	87	89	1	0.9869	0.9967
80	0.0001	0.003988	3	0.875	0.125	0.014403	0.003775	86	89	1	0.9842	0.9980
80	0.0002	0.003988	3	0.875	0.125	0.014403	0.003775	88	91	1	0.9935	0.9992
90	0.0001	0.003988	7	0.9922	0.0078	0.012838	0.003555	85	92	1	0.9906	0.9999
90	0.0002	0.003988	7	0.9922	0.0078	0.012838	0.003555	87	94	1	0.9964	0.9999

**Source:** Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>

Figure 3 represents the daily transaction rates for the USD/ EUR currency pair from February to October 2013 with 1.3691, 1.2774 and 1.3129 being the highest, lowest and mean values, in order.

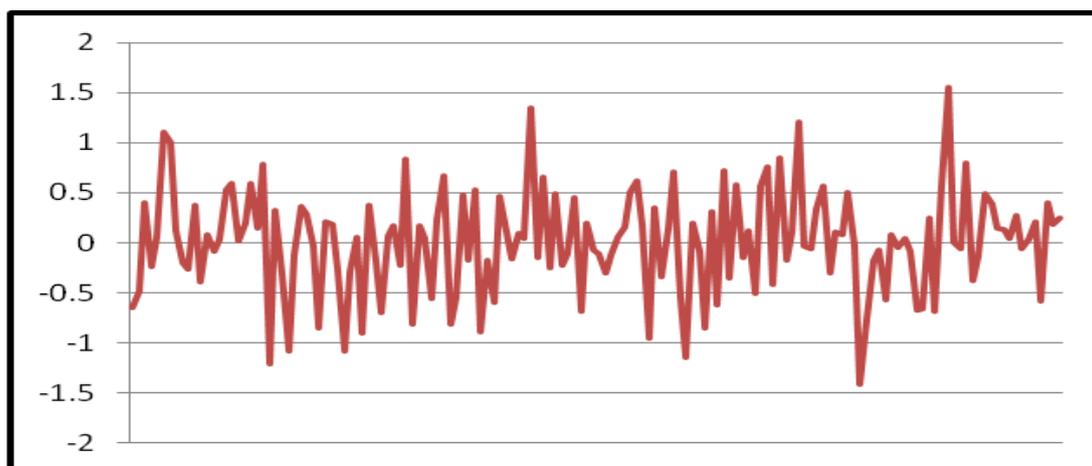
In Figure 4, the percentage values obtained

for the February-October 2013's volatilities of the exchange rate for USD/ EUR. Disregarding the sign of the values, the highest and the lowest values are 1.557% and 0.008%, respectively. The mean value is 0.399%, as well.



**Figure (3): The Daily Transaction Rates for USD/ EUR (2013)**

**Source:** Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>



**Figure 4: The daily values for the volatility percentage of exchange rate of USD/ EUR (2013)**

Source: Authors and Pacific Exchange Rate Services: <http://fx.sauder.ubc.ca/data.html>

The comparison of the results given in tables 1 and 2 indicates that the loss probability for the EUR/ JPY currency pair is higher than that of USD/ EUR which is justified by the higher volatility of daily transaction rates of EUR/ JPY compared to USD/ EUR. Considering a leverage level of 40, there are 2 days of sudden stop for the currency pair of EUR/ JPY. On the contrary, for the USD/ EUR currency pair, the traders have no sudden stop day neither at the above-mentioned leverage level nor the leverage levels of 50 and 60.

## 5. Conclusion

We can use probability theory for explaining the loss in the FX market. Hence, given the theoretical models developed based on the probability theory and using the new data, the present study tried to evaluate the inevitability of the loss of most traders in the FX market. The gathered data are related to the transaction rates for the currency pairs of EUR/ JPY and USD/EUR covering February- October 2013. Based on the findings of the study, more than 90% of the participants who used high leverage with no fundamental analysis support from the FX and currency markets have had a loss. To put it differently, the loss of most traders is one of the intrinsic attributes of this market.

In addition, based on the results, the percentage of the loser traders depends on the volatility intensity of the transaction rates for the exchange being traded, inflation rate, spread and level of leverage. Furthermore, if the number of transactions, especially sudden stop transactions, increases, the loss probability i.e. the percentage of the losers increases too.

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