CURRENCIES ANALYSIS BASED ON STABILITY USING APRIORI-ALGORITHM[1]

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Abstract

This paper presents the stability of currency that is more stable with respect to other currencies. Various currencies are studied and graphs are plotted with reference to dates on a yearly basis and analyze its patterns. The stability of a currency was determined by using Apriori-algorithm. This algorithm maneuver in continues manner unless the desired results are achieved.

Key-words: *currency conversion, data mining, decision graph*

JEL Classification: G17

1. Introduction

The stability of currency plays very important role in the economical upraise of a nation and for the investors in particular. Some one said correctly that stability of currency behaves like oxygen to the economical conditions of the country to survive. This is very important for the World economical growth which will boost up the human needs and serve as catalyst to economize and yield positive activities to support economical market as the present tsunami is expected to last for many years more. Therefore, other line of actions must be adopted to serve as a cushion for all countries economy and the governments got enough passage to handle their economical situation. Minor efforts will count a lot in this regard. This research was based on the insight of currency stability [1, 2].

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The Apriori- Algorithm determines the selection of most frequent occurring currency values in a whole year is represented by a universal (U) set. The selection from the whole set of various currencies is considered and represented by (S). In this set most frequently occurring currency with specific dates are noted down and separated from the universal set to yield the result (X) sets. The set S is further chosen with specific entries to select again more frequent entries in set S. This process continues unless desired results are achieved [3-6].

In this paper, section 2 provides the detailed explanation of exchange rates. In section 3 the methodology is discussed in detail. The simulations are carried out along with results on the algorithm in section 4. Section 5 provides conclusion and the next section communicate future work.

2. **Exchange rates**

An exchange rate is the rate at which one currency can be exchanged for another. In other words, it is the value of another country's currency compared to that of other. Let suppose if traveling to Egypt, the exchange rate for USD 1.00 is equivalent to EGP 5.50, this means that for every U.S. dollar, a five and a half Egyptian pounds is required. Theoretically, identical assets should sell at the same price in different countries, because the exchange rate must maintain the inherent value of one currency against the others [7].

2.1. *Fixed rates*

There are two ways the price of a currency can be determined against another. A fixed, or pegged, rate is a rate the government (central bank) sets and maintains as the official exchange rate. A set price will be determined against a major world currency (usually the U.S. dollar, but also other major currencies such as euro, yen, pound or a basket of currencies). In order to maintain the local exchange rate, the central bank buys and sells its own currency on the foreign exchange market in return for the currency to which it is pegged [8].

2.2. *Floating rates*

Unlike the fixed rate, a floating exchange rate is determined by the private market through supply and demand. A floating rate is often termed "self-correcting", as any differences in supply and demand will automatically be corrected in the market. This simplified model: if demand for a currency is low, its value will be less (decrease), thus making imported goods more expensive and thus stimulating demand for local goods and services. This in return will generate more jobs, and hence an auto-correction would occur in the market. A floating exchange rate is constantly changing [9].

Moreover, no currency is wholly fixed or floating. In a fixed regime, market pressures can also influence changes in the exchange rate. When a local currency does reflect its true value against its pegged currency, a "black market" which is more reflective of actual supply and demand may develop. A central bank is often forced to revalue/devalue the official rate so that the rate is in line with the

unofficial one, thereby halting the activity of the black market. Similarly, in a floating regime, the central bank may also intervene when it is necessary to ensure stability and to avoid inflation; however, it is less often that the central bank interferes in floating regime [10, 11].

3. **Methodology**

The methodology that was adopting having the following main steps:

a) Judge the stability of currency by using Apriori-Algorithm.

b) Choose data mining tools and selection of data mining techniques to visualize the decision graph about stability of currency.

c) Testing of algorithm on real market data for authenticity.

Based on the above three mentioned steps further strategies are adopted [12].

3.1. *Theoretical findings*

Our findings are based on the following data mining techniques:

a) Applying Apriori-Algorithm to currency data to check stability.

b) Testing on Apriori on real data of bank of Canada.

After achieve the results the required graphs are plotted [13, 14].

3.2. *Currency apriori pseudo code*

The proposed algorithm pseudo codes are as follows:

Currency Apriori (Cur, Year) {***input for selection of set***}
$L_1 \leftarrow$ {***Rise in transaction in the Year "Y" Set 2008***}
k← 2 {***loop factor***}
While $L_{k-1} \neq \emptyset$
$C_k \leftarrow$*Generate* (L_{k-1}) {***stability checks***}
for exchange rates t ε C
$C_t \leftarrow$ Subset (C_k, *t*) {***subset selection***}
for candidates c ε Ct
count [c]← count[c]+1
$L_k \leftarrow \{c \in C_k \mid count[c] \geq \varepsilon\}$ {***final selection***}
k← k+1
return $U_k L_k$ {***return of results***}

Codes are implemented and test for each stage.

4. **Experimental analysis and findings**

Following are the main approaches in this regard:

4.1. *Description of figure 1*

Stability and secure business dependents upon the decreases in percent loss. Figure 1 depicts about the Great Britain Pound (GBP) verses date of the year (i.e. 365 days of year 2008). The curves in the graph show that how stable is the currency. This can be viewed from the graph given below. The variation in graph absolutely shows profits and loses yearly wise. But we are stressing upon the needs of small investors to establish a low scale business with low risk factors [14]. In this

graph, the graph goes down especially in the months of June, July, September and October below 0.5 which shows instability of GBP. The probabilistic instability per year is 4/12 = 0.333 which is 33% unstable months of the whole year 2008. So investors can not rely on GBP totally.

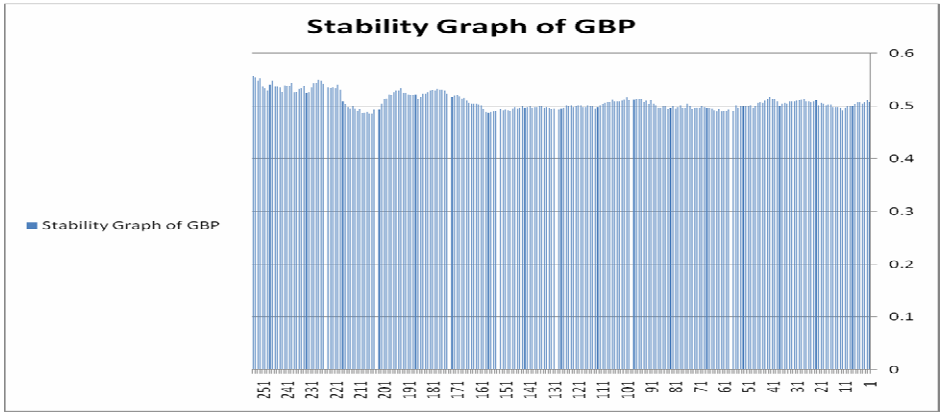

Fig. 1. *Graph of Stability of GBP in correspondence with Canadian Dollar (Year 2008)*

4.2. *Description of figure 2*

Figure 2 shows the stability of US Dollar with time span of year 2008. This graph shows instability in the last months of year especially in the months of October, November and December. These changes are abrupt so investors can not totally rely on the businesses of the US dollar. A bit hesitation is felt due to its abrupt changes by investors. So the probabilistic change is 3/12 = 0.25 which is 25% unstable months in the whole year 2008.

4.3. *Description of figure 3*

Figure 3 shows the Euro verses date of the year 2008. The curves in the graph show the stability in currency. More the variation in the currency more the instable is the currency. The implementation of Apriori-Algorithm in the scenario international currency gives more strengthened results. It is observed from the graph as it goes below line 0.6 in Figure 2. This situation reaches in the month of December but that is negligible with respect to the whole span of the year. Its ratio 1/12 = 0.083, which is about 8.3% unstable in whole year 2008. As shown in Table 2

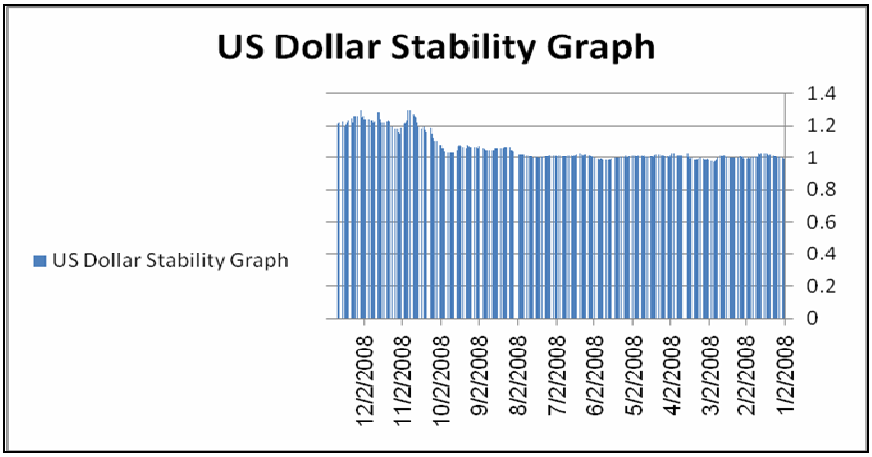

Fig. 2. *US Dollar Stability graph with perspective of Canadian dollar*

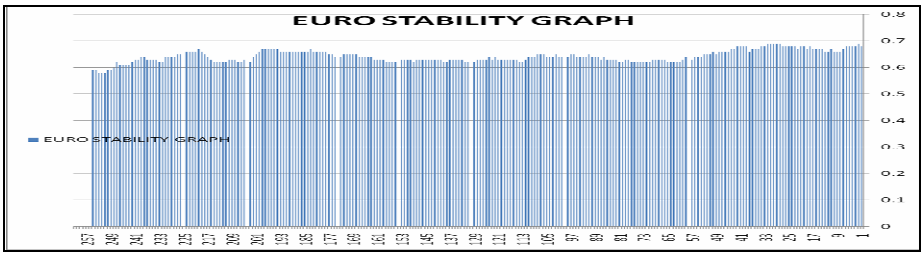

Fig. 3. *Euro Stability graph with perspective of Canadian dollar*

Table 1

Percent Probabilistic Stability

Currency	GBP	USD	EURO
Percent (%) Probabilistic Stability	100 - 33 = 67.0%	100 - 25 = 75.0%	100 - 8.33 = 91.27 %

5. **Conclusion**

It is concluded that Euro is more stable as can be observed from the Figures 1-3. This fact was also verified through the implementation of Apriori-Algorithm as shown in Table 1. In the case study of conversion, the US Dollar and GBP were not proved to be stable. Further, Table 1 depicts the percent probabilistic stability which is 91.27% in case of Euro. This proves that those who invest in Euro for currency conversion businesses, no matters small or big investors they will not only on the safe side but will have good returns on their investments.

6. Future work

The algorithm presented in this paper can be implemented in software in any desired tools i.e. VB.Net & Oracle or ASP.Net & Microsoft SQL Server. This will enhance our algorithm with respect to establish a Micro Currency Exchange data ware house.

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