

Application of Markov chain models for currency ranking among SAARC countries

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Although time series and regression models have been developed for currency exchange rate, there has been only little published work about the Markov Chain models for the currency exchange rate data. Many currency ranking methods are available. However, in the literature none of the ranking methods is based on Markov chain models. Markov chain based ranking scheme for SAARC currencies has been proposed in this work. Ten years exchange rate data which have been collected from first of January 2005 to first of January 2016 was used in this study.

There are seven SAARC countries; Sri Lanka, India, Pakistan, Bangladesh, Nepal, Bhutan and Maldives. The exchange rates of each of the above currencies were considered against strong currencies such as US Dollar, UK Pound, Chinese Yuan, Japanese Yen and Euro. Thus, we had five Markov chains for each country and hence there were 35 Markov Chains all together. Transition probabilities and steady state probabilities were obtained for the above 35 Markov Chain models. Frequency approach was used to obtain the transition probabilities. The state space of each Markov Chain is as follows: State S_1 : (Loss), Current Month's average exchange rate is greater than the previous month's average exchange rate. State S_2 : (Gain), Current Month's average exchange rate is less than or equal to the previous month's average exchange rate.

Steady state probability for the state S_2 (gain) can be used to rank the SAARC currencies. Moreover, we can rank the SAARC countries for exchange rate against each 5 currencies (US Dollar, UK Pound, Chinese Yuan, Japanese Yen and Euro). Thus, a specific SAARC country has 5 different positions in these five different rankings. Hence, an average of these ranks could be obtained for each of the SAARC country. This average rank was used to finally rank the SAARC currencies.

Maldives currency which obtained an average rank of 2.6 was obtained the first place in our ranking followed by Indian currency which obtained an average rank of 2.8. Sri Lanka with an average rank of 3.8 obtained the fourth place among SAARC countries.