

## **Stochastic Forecasting of Denominational Requirement and Replacement of Currency in India**

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*A stochastic model has been developed to generate optimal transactions of various sizes based on the size-distribution of the base year and the movement of currency in transactions either on demand or in exchange, being viewed as the stochastic process and the application of reliability theory to evaluate the economic replacement of various denominations of currency. Life distribution for the currency has also been introduced to compute the average requirement of the amount of various denominations to constitute the denominational composition of currency for the Indian economy in 1990-91 and to forecast such composition upto 1999-2000 alongwith replacement of invalid notes of various denominations and the results have been found to be fairly encouraging.*

### **I Introduction**

The task of the monetary authority, with regard to the cash transactions, consists of estimating the future requirement of various denominations into circulation. Literature is starved of standard methods that could be applied to identify the relevant explanatory variables for the demand of currency in an economy and use them to predict the requirement of the total value and the requirement of a specific denomination of currency for a given period. In their pioneer work, Coondoo, Maiti, Sarkar and Neogi (1991) attempted to develop suitable technique to forecast denomination wise requirement of currency for the given period and applied the technique to forecast such requirements for the Indian economy. Their technique consisted of a simulation model, which used deterministic, as well as, probabilistic options for determining the size of cash transaction and its currency requirement by denominations. However, they could not incorporate the life component of the various denominations of currency, that basically influences the denominationwise composition.

### **II Objectives**

The basic objective of the present study is to develop stochastic model to generate transaction of various sizes and compute the average requirement of the amount of various denominations so as to constitute the required denominational composition of currency at a given point of time. The currency composition so obtained is exposed to life expectancy and the reliability theory is applied to evaluate the economic replacement

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