

CHAPTER III

CHAPTER III

APPLICATION OF FUZZY COGNITIVE MAPS IN THE ANALYSIS OF THE FACTORS INFLUENCING INVESTMENT DECISION [12]

Introduction

Investment decision is influenced by different factors. The term investment refers to exchange of money wealth into some tangible wealth. By investing, an investor commits the present funds to one or more to be held for sometime in expectation of some future returns in the form of interest or capital gain. An investor generally uses his/her savings for investment in different avenues of his/her choice. Further funds are also generated from borrowings and sale of assets already held. However, care is taken to see that cost of borrowings is lesser than cost of borrowed capital.

While choosing a particular avenue of investment, investors need to consider various factors such as liquidity, safety of principal, rate of return, stability of return, capital appreciation and tax concessions. Here a study has been made to analyse such factors influencing investment decision of female employees working in both government and private sector undertakings using Fuzzy Cognitive Maps.

Application Of Fuzzy Cognitive Maps

In order to analyse the factors influencing the investment decision, data were collected using convenient sampling technique from fifty female employees working in both government and private sector undertakings located in Coimbatore city, Tamil Nadu, India.

Based on the opinion given by the majority of respondents the following factors were identified:

E_1 - Reputation of Financial Institution

E_2 - Reasonable Return

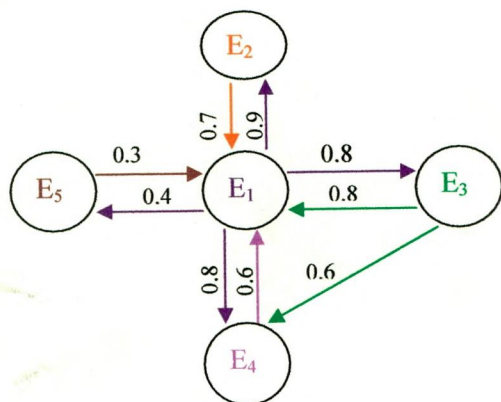
E_3 - Safety of Principal

E_4 - Liquidity

E_5 - Tax Concession

Based on the opinion given by the respondents on the causal relation between the factors (nodes), Fuzzy Cognitive Maps were framed. Here the FCM is a weighted directed graph. The weightage for each edge is the ratio between the number of respondents who opined the existence of causal relation between two nodes and the total number of respondents.

The Fuzzy Cognitive Map and Associated Connection Matrix is presented below:



$$E = \begin{matrix} & E_1 & E_2 & E_3 & E_4 & E_5 \\ \begin{matrix} E_1 \\ E_2 \\ E_3 \\ E_4 \\ E_5 \end{matrix} & \begin{bmatrix} 0 & 0.9 & 0.8 & 0.8 & 0.4 \\ 0.7 & 0 & 0 & 0 & 0 \\ 0.8 & 0 & 0 & 0.6 & 0 \\ 0.6 & 0 & 0 & 0 & 0 \\ 0.3 & 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$

Here we preferred to study the effect of the factor “Reputation of Financial Institution” on the other factors.

For this purpose, we study the effect of the state vector $X = (1 \ 0 \ 0 \ 0 \ 0)$ on the dynamical system E.

$$XE = (0 \ 0.9 \ 0.8 \ 0.8 \ 0.4)$$

after updating and thresholding we get,

$$XE = (1 \ 0.9 \ 0.8 \ 0.8 \ 0.4) = X_1 \text{ (say)}$$

$$X_1E = (0.8 \ 0.9 \ 0.8 \ 0.8 \ 0.4)$$

after updating and thresholding we get,

$$X_1E = (1 \ 0.9 \ 0.8 \ 0.8 \ 0.4) = X_2 \text{ (say)}$$

which is a fixed point.

Result

The effect of “Reputation of Financial Institution” is

0.9 degree on “Reasonable return”,

0.8 degree on “Safety of Principal”,

0.8 degree on “Liquidity” and

0.4 degree on “Tax Concession”

Similarly, results were obtained for each of the other factors and presented the same in the form of a matrix called **Factor effect matrix**.

Effect on other factors(in degree)

	E ₁	E ₂	E ₃	E ₄	E ₅
E ₁	1	0.9	0.8	0.8	0.4
E ₂	0.7	1	0.7	0.7	0.4
E ₃	0.8	0.8	1	0.8	0.4
E ₄	0.6	0.6	0.6	1	0.4
E ₅	0.3	0.3	0.3	0.3	1

Here,

The average effect of “Reputation of financial Institution” on all the other factors is 0.73.

The average effect of “Reasonable return” on all the other factors is 0.63.

The average effect of “Safety of Principal” on all the other factors is 0.7.

The average effect of “Liquidity” on all the other factors is 0.55.

The average effect of “Tax Concession” on all the other factors is 0.3.

Conclusion

Investors consider various factors to invest their hard earned money to protect themselves in the future. The above scientific and logical analysis helps such people to take right decision on their choice of investment.