A STUDY ORIENTED PROJECT REPORT

ON

DEVELOPING A DYNAMIC FRAMEWORK TO TEST THE RELATIONSHIPS AMONG STOCK MARKET RETURNS, PRODUCTION AND CONSUMPTION IN FINITE TIME

(USING EXCEL AND NEURAL NETWORKS)

By

Aalap Tripathy 2004P34PS208

For fulfillment of the

Study Oriented Project (BITS GC 323)

Birla Institute of Technology and Science - Pilani

Goa Campus

Zuari Nagar, Goa

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Abstract

This paper deals with an inverted relationship among stock market returns and finite horizon consumption growth. In the growth model, the objective is to find optimum levels of consumption and capital stock variables given the parameters of production and utility functions. A Neural Networks framework is used to fit secondary data from the stock market and find the production function parameters that permit them.

Objective of the Paper

1. To develop a framework to study a sustainable consumption pattern and provide for a terminal capital stock, made dynamic by a possibility of returns from investment in a stock market.

2. To study the possibility of perturbations in a stock market using Neural Network Modelling and develop a mechanism to predict (within limits of error) the behavior of a target stock price.

3. To relate a Cobb Douglas Production Function with Ramsey's Growth Model within a finite time constraint so as to locate macro economic equilibrium points in the correspondiong growth processes of production, investment and savings.

Key Words

Microsoft Excel, econometrics and estimation

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1. Introduction:

Microsoft Excel contains powerful procedures for solving both linear and nonlinear programming problems. As the Excel interface is such a familiar one and the specification of programming problems in Excel is relatively straightforward, there are times when it is the software of choice for solving certain types of optimization problems. The famous Ramsey model of economic growth is developed and solved using Excel. In particular, we follow the versions developed by Chakravarty (1962) and Taylor and Uhlig (1990). We employ a finite horizon version with a terminal capital stock constraint.

The model is first introduced in a mathematical form and then in a computational form. The essential economics of the simple growth model used in this chapter is a trade-off between consumption and investment. More consumption in a time period means more utility in that time period but less investment and therefore less capital stock and less production in future time periods. Thus the key elements of the model are the production function with capital being used to produce output, the capital accumulation relationship with investment creating new capital, and the utility function with consumption resulting in utility.