

Chapter 6. Summary

6.1 Overview of the Thesis

In this thesis entitled “**Some Problems in Inventory Management With Price Inflation**”, an attempt has been made to develop some inventory models under different scenarios and study the effect of inflation on the optimum policy. A brief chapter wise outlines of its contents and the findings are given below:

6.1.1 Summary of Chapter 1

Chapter one is introductory in nature. It includes introduction to inventory management, effects of inflation on inventory management, different costs associated with inventory systems, stock price dependent demand, permissible delay in payments, relation between inflation and interest rate. This chapter also presents an extensive review of the previous relevant literature and the statement of the current problem related to inflation rate.

6.1.2 Summary of Chapter 2

This chapter deals with inventory models for deteriorating items with permissible delay in payments and linear price-dependent demand under constant inflation rate. Here the demand rate is assumed to be linear in current stock price and is dependent on time and inflation rate. Shortages are allowed and completely backlogged. Inflation rate is constant over the planning horizon. This chapter is organized in three sections. The first section is concerned with the development of an inventory model for deteriorating items with permissible delay in payments. The second section studies an inventory model for deteriorating items with order quantity dependent permissible delay in payments. The third section develops an inventory model for deteriorating items with installment payment trade credit period. In all the three cases the optimal replenishment schedule exists and the total profit associated with the inventory system is found to be a concave function of T_1 , the time taken for the stock to be exhausted in a replenishment cycle for given length of the cycle. In addition, we provide numerical examples in all the sections. A sensitivity analysis with respect to the parameters of the system is also carried out. In this chapter, we find that the optimal profit associated with maintaining inventory increases as inflation rate increases. However, the optimal policy is robust to change in the interest rate charged if the inventory manager fails to repay his dues in time.

6.1.3 Summary of Chapter 3

This chapter studies inventory models for deteriorating items with non-linear stock price dependent demand under constant inflation rate. In the first section of the chapter, the demand rate is assumed to be iso-elastic which is dependent on time and inflation rate. In the second section, the demand rate is hybrid, i.e. a convex combination of linear and iso-elastic demand rates. Here we assume that the lengths of the replenishment cycles may be unequal. We find that the optimal profit is concave in the number of replenishment cycles in the planning horizon and optimal profit under unequal replenishment cycles is greater than that for equal replenishment cycles over the same planning horizon and also the profit associated with inventory increases as inflation rate increases. The model is, however, robust with respect to the changes in the backorder cost, lost sale cost, ordering cost and interest earned.

6.1.4 Summary of Chapter 4

This chapter is devoted to the development of inventory models with linear demand for deteriorating items under stochastic inflation rate. Unsatisfied demand i.e. shortages are allowed. In the first section of this chapter, the inflation rate is assumed to be a random variable and the moment generating function of the random variable exists. In the second section the inflation rate is a mixture of two probability density functions because the actual inflation rate is dependent on internal and external inflation rates. The results have been validated with the help of some numerical examples and a sensitivity analysis has also been carried out. In this chapter we have observed that the optimal profit increases as the mean of the distribution increases. However, the optimal policy is robust to change in the interest rate charged if the inventory manager fails to repay his dues in time, but sensitive to change in the other parameters.

6.1.5 Summary of Chapter 5

This chapter deals with inventory models with stock-dependent demand having different rates of inflations that have been developed. The main objective of this chapter is to study and discuss the optimum policy for the inventory models under Vasicek and Cox-Ingersoll-Ross inflation models as inflation rate and interest rate are correlated. In this chapter we have estimated the model parameters of the inflation rate model from inflation data from January, 2012 to January, 2015 in India. The results obtained from numerical examples and sensitivity analysis shows the influence of various parameters on the overall profit. Here we observed that the optimal profit increases as the initial inflation rate (mean reversion rate) increases in an economy. However, the optimal policy is robust with respect to the backorder parameter δ , ordering cost and lost sale case, but sensitive to change in the other parameters.