Chapter 11

Conclusion

The contributions of this thesis not only provide a valuable reference for decision-makers in planning and controlling the inventory of supply chain systems but also provide useful models for many organizations that use the decision rule to optimize their total operation cost/ profit. The approaches that we considered to find optimal inventory policies in the two-echelon supply chain systems are significant because the supplier/ retailer can alter the regular ordering pattern to exploit other opportunities and assess their monetary impact under some realistic conditions linking marketing as well as operations management concerns.

This thesis dealt in detail the development in the two-echelon trade credit financing under various parametric conditions, such as two-warehousing, deteriorating inventory, selling price dependent demand, credit period dependent demand and advance payment scheme, that are of major importance in the operations of enterprises in many industries. Easy-to-use mathematical theorems and numerical algorithms are proposed using which a lot of managerial phenomena are obtained. The impact of delayed product differentiation process, i.e., postponement strategy, in the retailer of a supply chain is evaluated through an EOQ-based model with non-instantaneous deteriorating items. It is shown that the postponement strategy outperforms the independent strategy.

A two-echelon supply chain model is developed therein lead time for supplier orders at the warehouse is random. Numerical results are obtained for exponentially dis-

tributed lead times. A two-echelon supply chain model is developed in which shortages are partially backlogged at the retailers with Poisson demands. We have approximated retailers' transportation time by obtaining the average waiting time of their orders at the supplier and by using Little's formula from queuing theory. A possibilistic decision model is developed for the two-echelon supply chain under fuzzy environment. Fuzzy numbers were used to model uncertain and flexible supply chain parameters. Using Interval analysis, we framed multi-objective optimization problem and determined optimal inventory policies through Pareto optimality test.

In future research, we aim to construct multi-echelon supply chains (more than two layers) under various assumptions considered in the proposed models.