Analysis Of Deteriorating Inventory/Production Systems Using A Linear Quadratic Regulator

Andijani, A; Al-Dajani, M

ELSEVIER SCIENCE BV, EUROPEAN JOURNAL OF OPERATIONAL RESEARCH; pp: 82-89; Vol: 106

King Fahd University of Petroleum & Minerals

http://www.kfupm.edu.sa

Summary

We consider an inventory-production system where items deteriorate at a constant rate. The objective is to develop an optimal production policy that minimizes the cost associated with inventory and production rate. The inventory problem is first modeled as a linear optimal control problem. Then linear quadratic regulator (LQR) technique is applied to the control problem in order to determine the optimal production policy. Examples are solved for three different demand functions. Sensitivity analysis is then conducted to study the effect of changing the cost parameters on the objective function. (C) 1998 Published by Elsevier Science B.V.

References:

1. BERTRAND J, 1980, INT J SYS SCI, V11, P589
2. BRADSHAW A, 1980, INT J SYST SCI, V11, P947
3. CAMPBELL S, 1978, INT J SYS SCI, V9, P841
4. FURUTA K, 1993, SYST CONTROL LETT, V20, P427
5. GOSWAMI A, 1991, J OPER RES SOC, V42, P1105
6. HAIPING U, 1990, EUR J OPER RES, V46, P21
7. HAMID B, 1989, J OPER RES SOC, V40, P75
8. HENG KJ, 1991, COMPUT IND ENG, V20, P187
9. LEWISS FL, 1980, OPTIMAL CONTROL
10. LUUS R, 1993, IND ENG CHEM RES, V32, P859
11. PAL S, 1993, INT J PROD ECON, V32, P291
12. SHIBBERU Y, 1994, COMPUT MATH APPL, V28, P123
13. THOMOPOULOS SCA, 1993, J DYN SYST-T ASME, V115, P535
14. WEE HM, 1993, COMPUT IND ENG, V24, P449

15. WUWONGSE V, 1983, COMP IND, V4, P381

For pre-prints please write to: andijani@ccase.kfupm.sa.edu