9. Conclusion:

All cost in the present system raise the total cost. It is observed from the table tables [1-7] that for a small change of holding cost total cost increases in a remarkable amount. Hence, the holding cost is most sensitive to raise the total cost. So, we have to take care of holding cost to reduced the expected total cost of the system.

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11. Appendix-I

By exploiting the equation x$\widetilde{A}$=0

- $(Q_1 + Q_2)x_{0001} + (\lambda+\theta)x_{1001} = 0$ (1)
- $Q_1 x_{0011} + (\lambda+\theta)x_{1011} = 0$ (2)
- $Q_2 x_{0101} + (\lambda+\theta)x_{1101} = 0$ (3)
- $\mu x_{0111} + (\lambda+\theta)x_{1111} = 0$ (4)
- $Q_1 x_{0021} + (\lambda+\theta)x_{1021} + Q_2 x_{0001} = 0$ (5)
- $\mu x_{0121} + (\lambda+\theta)x_{1121} + Q_2 x_{0101} = 0$ (6)
- $Q_2 x_{0201} + (\lambda+\theta)x_{1201} + Q_1 x_{0001} = 0$ (7)
- $\mu x_{0211} + (\lambda+\theta)x_{1211} + Q_1 x_{0011} = 0$ (8)
- $\mu x_{0221} + (\lambda+\theta)x_{1221} + Q_2 x_{0201} + Q_1 x_{0021} = 0$ (9)
- $(\lambda+\theta+Q_1+Q_2)x_{1001} + (\lambda+2\theta)x_{2001} + \mu x_{0111} = 0$ (10)
- $(\lambda+\theta+Q_1)x_{1011} + (\lambda+2\theta)x_{2011} + \mu x_{0121} = 0$ (11)
- $(\lambda+\theta+Q_2)x_{1101} + (\lambda+2\theta)x_{2101} + \mu x_{0211} = 0$ (12)
- $(\lambda+\theta+\mu)x_{1111} + (\lambda+2\theta)x_{2111} + \mu x_{0221} = 0$ (13)
- $(\lambda+\theta+Q_1)x_{1021} + (\lambda+2\theta)x_{2021} + Q_2 x_{1001} = 0$ (14)
- $(\lambda+\theta+\mu)x_{1121} + (\lambda+2\theta)x_{2121} + Q_2 x_{1101} = 0$ (15)
- $(\lambda+\theta+Q_2)x_{1201} + (\lambda+2\theta)x_{2201} + Q_1 x_{1001} = 0$ (16)
- $(\lambda+\theta+\mu)x_{1211} + (\lambda+2\theta)x_{2211} + Q_1 x_{1011} = 0$ (17)
- $(\lambda+\theta+\mu)x_{1221} + (\lambda+2\theta)x_{2221} + Q_2 x_{1201} + Q_1 x_{1021} = 0$ (18)
- $(\lambda+2\theta+Q_1+Q_2)x_{2001} + (\lambda+3\theta)x_{3001} + (\lambda+3\theta)x_{3000} + \mu x_{1111} = 0$ (19)
- $(\lambda+2\theta+Q_1)x_{2011} + (\lambda+3\theta)x_{3011} + (\lambda+3\theta)x_{3010} + \mu x_{1121} = 0$ (20)
- $(\lambda+2\theta+Q_2)x_{2101} + (\lambda+3\theta)x_{3101} + (\lambda+3\theta)x_{3100} + \mu x_{1211} = 0$ (21)
- $(\lambda+2\theta+\mu)x_{2111} + (\lambda+3\theta)x_{3111} + (\lambda+3\theta)x_{3110} + \mu x_{1221} = 0$ (22)
- $(\lambda+2\theta+Q_1)x_{2021} + (\lambda+3\theta)x_{3021} + (\lambda+3\theta)x_{3020} + Q_2 x_{2001} = 0$ (23)
- $(\lambda+2\theta+\mu)x_{2121} + (\lambda+3\theta)x_{3121} + (\lambda+3\theta)x_{3120} + Q_2 x_{2101} = 0$ (24)
- $(\lambda+2\theta+Q_2)x_{2201} + (\lambda+3\theta)x_{3201} + (\lambda+3\theta)x_{3200} + Q_1 x_{2001} = 0$ (25)
- $(\lambda+2\theta+\mu)x_{2211} + (\lambda+3\theta)x_{3211} + (\lambda+3\theta)x_{3210} + Q_1 x_{2011} = 0$ (26)
- $(\lambda+2\theta+\mu)x_{2221} + (\lambda+3\theta)x_{3221} + (\lambda+3\theta)x_{3220} + Q_1 x_{2021} + Q_2 x_{2201} = 0$ (27)
- $(\lambda+3\theta+Q_1+Q_2)x_{3001} + (\lambda+4\theta)x_{4001} + \mu x_{2111} = 0$ (28)
- $(\lambda+3\theta+Q_1+Q_2)x_{3000} + (\lambda+4\theta)x_{4000} = 0$ (29)
- $(\lambda+3\theta+Q_1)x_{3011} + (\lambda+4\theta)x_{4011} + \mu x_{2121} = 0$ (30)
- $(\lambda+3\theta+Q_1)x_{3010} + (\lambda+4\theta)x_{4010} = 0$ (31)
- $(\lambda+3\theta+Q_2)x_{3101} + (\lambda+4\theta)x_{4101} + \mu x_{2211} = 0$ (32)
- $(\lambda+3\theta+Q_2)x_{3100} + (\lambda+4\theta)x_{4100} = 0$ (33)
- $(\lambda+3\theta+\mu)x_{3111} + (\lambda+4\theta)x_{4111} + \mu x_{2221} = 0$ (34)
- $(\lambda+3\theta)x_{3110} + (\lambda+4\theta)x_{4110} = 0$ (35)
- $(\lambda+3\theta+Q_1)x_{3021} + (\lambda+4\theta)x_{4021} + Q_2 x_{3001} = 0$ (36)
- $(\lambda+3\theta+Q_1)x_{3020} + (\lambda+4\theta)x_{4020} + Q_2 x_{3000} = 0$ (37)
- $(\lambda+3\theta+\mu)x_{3121} + (\lambda+4\theta)x_{4121} + Q_2 x_{3101} = 0$ (38)

$$- (\lambda + 3\theta)x_{3120} + (\lambda + 4\theta)x_{4120} + Q_2x_{3100} = 0 \quad (39)$$
$$- (\lambda + 3\theta + Q_2)x_{3201} + (\lambda + 4\theta)x_{4201} + Q_1x_{3001} = 0 \quad (40)$$
$$- (\lambda + 3\theta + Q_2)x_{3200} + (\lambda + 4\theta)x_{4200} + Q_1x_{3000} = 0 \quad (41)$$
$$- (\lambda + 3\theta + \mu)x_{3211} + (\lambda + 4\theta)x_{4211} + Q_1x_{3011} = 0 \quad (42)$$
$$- (\lambda + 3\theta)x_{3210} + (\lambda + 4\theta)x_{4210} + Q_1x_{3010} = 0 \quad (43)$$
$$- (\lambda + 3\theta + \mu)x_{3221} + (\lambda + 4\theta)x_{4221} + Q_2x_{3201} + Q_1x_{3021} = 0 \quad (44)$$
$$- (\lambda + 3\theta)x_{3220} + (\lambda + 4\theta)x_{4220} + Q_1x_{3020} + Q_2x_{3200} = 0 \quad (45)$$
$$- (\lambda + 4\theta + Q_1 + Q_2)x_{4001} + \mu x_{3111} = 0 \quad (46)$$
$$- (\lambda + 4\theta + Q_1 + Q_2)x_{4000} + (\lambda + 5\theta)x_{5000} = 0 \quad (47)$$
$$- (\lambda + 4\theta + Q_1)x_{4011} + \mu x_{3121} = 0 \quad (48)$$
$$- (\lambda + 4\theta + Q_1)x_{4010} + (\lambda + 5\theta)x_{5010} = 0 \quad (49)$$
$$- (\lambda + 4\theta + Q_2)x_{4101} + \mu x_{3211} = 0 \quad (50)$$
$$- (\lambda + 4\theta + Q_2)x_{4100} + (\lambda + 5\theta)x_{5100} = 0 \quad (51)$$
$$- (\lambda + 4\theta + \mu)x_{4111} + \mu x_{3221} = 0 \quad (52)$$
$$- (\lambda + 4\theta)x_{4110} + (\lambda + 5\theta)x_{5110} = 0 \quad (53)$$
$$- (\lambda + 4\theta + Q_1)x_{4021} + Q_2x_{4001} = 0 \quad (54)$$
$$- (\lambda + 4\theta + Q_1)x_{4020} + (\lambda + 5\theta)x_{5020} + Q_2x_{4000} = 0 \quad (55)$$
$$- (\lambda + 4\theta + \mu)x_{4121} + Q_2x_{4101} = 0 \quad (56)$$
$$- (\lambda + 4\theta)x_{4120} + (\lambda + 5\theta)x_{5120} + Q_2x_{4100} = 0 \quad (57)$$
$$- (\lambda + 4\theta + Q_2)x_{4201} + Q_1x_{4001} = 0 \quad (58)$$
$$- (\lambda + 4\theta + Q_2)x_{4200} + (\lambda + 5\theta)x_{5200} + Q_1x_{4000} = 0 \quad (59)$$
$$- (\lambda + 4\theta + \mu)x_{4211} + Q_1x_{4011} = 0 \quad (60)$$
$$- (\lambda + 4\theta)x_{4210} + (\lambda + 5\theta)x_{5210} + Q_1x_{4010} = 0 \quad (61)$$
$$- (\lambda + 4\theta + \mu)x_{4221} + Q_2x_{4201} + Q_1x_{4021} = 0 \quad (62)$$
$$- (\lambda + 4\theta)x_{4220} + (\lambda + 5\theta)x_{5220} + Q_2x_{4200} + Q_1x_{4020} = 0 \quad (63)$$
$$- (\lambda + 5\theta + Q_1 + Q_2)x_{5000} + \mu x_{4111} = 0 \quad (64)$$
$$- (\lambda + 5\theta + Q_1)x_{5010} + \mu x_{4121} = 0 \quad (65)$$
$$- (\lambda + 5\theta + Q_2)x_{5100} + \mu x_{4211} = 0 \quad (66)$$
$$- (\lambda + 5\theta)x_{5110} + \mu x_{4221} = 0 \quad (67)$$
$$- (\lambda + 5\theta + Q_1)x_{5020} + Q_2x_{5000} = 0 \quad (68)$$
$$- (\lambda + 5\theta)x_{5120} + Q_2x_{5100} = 0 \quad (69)$$
$$- (\lambda + 5\theta + Q_2)x_{5200} + Q_1x_{5000} = 0 \quad (70)$$
$$- (\lambda + 5\theta)x_{5210} + Q_1x_{5010} = 0 \quad (71)$$
$$- (\lambda + 5\theta)x_{5220} + Q_2x_{5200} + Q_1x_{5020} = 0 \quad (72)$$

Appendix-II

x0001	**0.0255588**	**x0011**	**0.019495**
x0101	**0.019495**	**x0111**	**0.0977119**
x0021	**0.061701**	**x0121**	**0.0289591**
x0201	**0.061701**	**x0211**	**0.0289591**
x0221	**0.0161334**	**x1001**	**0.0464706**
x1011	**0.0177227**	**x1101**	**0.0177227**
x1111	**0.0932704**	**x1021**	**0.0328565**
x1121	**0.00992012**	**x1201**	**0.0328565**
x1211	**0.00992012**	**x1221**	**0.0418175**
x2001	**0.0345511**	**x2011**	**0.00567547**
x2101	**0.00567547**	**x2111**	**0.0259419**
x2021	**0.0187734**	**x2121**	**0.00300464**
x2201	**0.0187734**	**x2211**	**0.00300464**
x2221	**0.0201623**	**x3001**	**0.00959764**
x3000	**0.00011735**	**x3011**	**0.00157089**
x3010	**0.0000213436**	**x3101**	**0.00157089**
x3100	**0.0000213436**	**x3111**	**0.0102537**
x3110	**0.000869945**	**x3021**	**0.00497601**
x3020	**0.000216588**	**x3121**	**0.000748043**
x3120	**0.0000865472**	**x3201**	**0.00497601**
x3200	**0.000216588**	**x3211**	**0.000748043**
x3210	**0.0000865472**	**x3221**	**0.00487656**
x3220	**0. 00113751**	**x4001**	**0.0031666**
x4000	**0.000276612**	**x4011**	**0.000327269**
x4010	**0.000350645**	**x4101**	**0.000327269**
x4100	**0.0000350645**	**x4111**	**0.00208996**
x4110	**0.000807806**	**x4021**	**0.00131942**
x4020	**0.000272002**	**x4121**	**0.000133579**
x4120	**0.0000651198**	**x4201**	**0.00131942**
x4200	**0.000272002**	**x4211**	**0.000133579**
x4210	**0.0000651198**	**x4221**	**0.00107707**
x4220	**0.000746852**	**x5000**	**0.000626987**
x5010	**0.0000561032**	**x5100**	**0.0000561032**
x5110	**0.000753952**	**x5020**	**0.000250795**
x5120	**0.0000374021**	**x5200**	**0.000250795**
x5210	**0.0000374021**	**x5220**	**0.000334393**