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Inventory Model with Inspection under Risk*

In this paper an attempt has been made to determine the near optimal order quantity (non-defective and defective) when the probability density functions for non-defective and defective items of demand are unknown except for their means and variances.

1. INTRODUCTION

The order quantity may vary, when each item supplied is inspected and be classified as non-defective and defective categories. The defective items could have been returned by receiver to the organization from where they have been supplied but instead are accepted at a cost lower then the actual cost of the item quoted while ordering. The inspection cost per item is the same for both classes. Such problems occur quite often in readymade garment factories.

It is very rare that the demands can be predicted with certainty in reality and these demands (continuous in this paper) for both non-defective and defective items are in general probabilistic. In other words, it is quite unlikely that complete knowledge concerning the probability distribution of demand is fully known but it is also not true that the probability density function of demand may be completely unknown in real life problems.

To overcome both situations, some partial knowledge of the probability density function of demand is forecasted on the basis of past information. It has been observed by most of the different organizations, undertakings and industries that by analysing the past data it could not have been possible to fit a general distribution but it is noticed that the partial information can

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be made available about the distribution viz. the mean and the variance of demand. When **only** the knowledge of the mean and variance of demand is available, obviously we are giving up a very great amount of information as compared to the complete knowledge of the demand distribution. In fact there may be non-denumerable infinity of probability distributions with the same average and variance. If at all we know the average and the variance then any of this infinity of information may be the actual one. It is not possible to determine the optimal inventory policy in terms of any specific distribution. For discussing such models powerful Tchebycheff's inequality is being used[7] which is independent of the exact nature of the distribution.

In this paper, the near optimal order quantity has been obtained when mean and variance of the demand distribution are known.

2. PRELIMINARIES

Assumptions:

T — Fixed length of the cycle.
N — Total number of itmes received.
A — Ordering cost per unit ordered.
I — Inspection cost per item: same for non-defective and defective.

For non-defective item

r — Stochastic continuous demand with unknown probability density function with mean μ_1 and variance σ_1^2.
C_1 — Cost price per item.
C_2 — Holding cost per item per unit time.
C_3 — Shortage cost per item per unit time.
S — Selling price per item.
L — Reduced selling price for item at the end of the period ($S>L$).

For defective item

r' — Stochastic continuous demand with unknown probability density function with mean μ_2 and variance σ_1^2.
C_1' — Cost price per item.
C_2' — Holding cost per item per unit time.
C_3' — Shortage cost per item per unit time.
S' — Selling price per item.
L' — Throwaway selling price per item at the end of the period ($S' > L'$).

It is assumed that all the items are procured at the beginnning of the cycle. The procurement rate is instantaneous and lead time is finite. It is further assumed that all ordered items are supplied. Let $Np(0 \leqslant p \leqslant 1)$ and $N(1-p)$ be the number of non-defective and defective items which have been classified on inspection where the fraction of non-defective p is

a random variable with certain probability density function $h(p)$. Stochastic demands r and r' are identically and independently distributed with unknown probability density functions say; $f(r)$ and $f(r')$ respectively.

3. MATHEMATICAL FORMULATION

The expected net profit has been derived in the following four cases:

Case I $r \geqslant Np$; $r' \geqslant N(1-p)$

Expected net profit

$$= \int_{p=0}^{p=1} \left\{ \int_{r=Np}^{\infty} \left[(S - C_1 + C_3 T - I)\, Np - \frac{C_3 Tr}{2} - (C_2 + C_3) \frac{N^2 p^2 T}{2r} \right] f(r)\, dr + \right.$$

$$+ \int_{r'=N(1-p)}^{\infty} \left[(S' - C_1' + C_3' T - I)\, N(1-p) - \frac{C_3' Tr'}{2} - \right. \qquad (3.1)$$

$$\left. \left. - (C_2' + C_3') \frac{(1-p)^2 N^2 T}{2r'} \right] f(r')\, dr' \right\} h(p)\, dp$$

Case II: $r \geqslant Np$; $r' < N(1-p)$

Expected net profit

$$= \int_{p=0}^{p=1} \left\{ \int_{r=Np}^{\infty} \left[(S - C_1 + C_3 T - I)\, Np - \frac{C_3 Tr}{2} - (C_2 + C_3) \frac{N^2 p^2 T}{2r} \right] f(r)\, dr + \right.$$

$$+ \int_{r'=0}^{N(1-p)} \left[\left(S' + \frac{C_2' T}{2} - L' \right) r' - (C_1' + C_2' T - L' - I)\, N(1 - \right. \qquad (3.2)$$

$$\left. \left. - p) \right] f(r')\, dr' \right\} h(p)\, dp$$

Case III: $r < Np$; $r' \geqslant N(1-p)$

Expected net profit

$$= \int_{p=0}^{p=1} \left\{ \int_{r=0}^{Np} \left[\left(S + \frac{C_2 T}{2} - L \right) r - (C_1 + C_2 T - L - I)\, Np \right] f(r)\, dr + \right.$$

$$+ \int_{r'=N(1-p)}^{\infty} \left[(S' - C_1' + C_3' T - I)\, N(1-p) - \frac{C_3' Tr'}{2} - \right. \qquad (3.3)$$

$$\left. \left. - (C_2' + C_3') \frac{N^2 T (1-p)^2}{2r'} \right] f(r')\, dr' \right\} h(p)\, dp$$

Case IV: $r < Np\,;\quad r' < N(1-p)$

Expected net profit

$$=\int_{p=0}^{p=1}\left\{\int_{r=0}^{Np}\left[\left(S+\frac{C_2T}{2}-L\right)r-(C_1+C_2T-L-I)\,Np\right]f(r)\,dr+\right.$$

$$+\int_{r'=0}^{N(1-p)}\left[\left(S'+\frac{C_2'T}{2}-L'\right)r'-(C_1'+C_2'T-L'-I)N(1-\right. \tag{3.4}$$

$$\left.\left.-p)\right]f(r')\,dr'\right\}h(p)\,dp$$

The total expected net profit [1] becomes

$$Z(N)=2\left\{\frac{AN}{2}+\left(S+\frac{C_2T}{2}-L\right)\bar{r}-(C_1+C_2T-L-I)\,N\bar{p}+\right.$$

$$+(S+C_2T+C_3T-L)\,N\int_{p=0}^{p=1}\left[\int_{r=Np}^{\infty}f(r)\,dr\right]p\,h(p)\,dp-$$

$$-\left(S-L+\frac{C_2T+C_3T}{2}\right)\int_{p=0}^{p=1}\left[\int_{r=Np}^{\infty}rf(r)\,dr\right]h(p)\,dp-$$

$$-\frac{(C_2T+C_3T)\,N^2}{2}\int_{p=0}^{p=1}\left[\int_{r=Np}^{\infty}\frac{1}{r}f(r)\,dr\right]p^2h(p)\,dp+ \tag{3.5}$$

$$+\left(S'+\frac{C_2'T}{2}-L'\right)\bar{r}'-(C_1'+C_2'T-L'-I)\,N(1-\bar{p})+$$

$$+S'+C_2'T+C_3'T-L')\,N\int_{p=0}^{p=1}\left[\int_{r'=N(1-p)}^{\infty}f(r')\,dr'\right](1-p)\,h(p)\,dp-$$

$$-\left(S'-L'\right)+\frac{C_2'T+C_3'T)}{2}\int_{p=0}^{p=1}\left[\int_{r'=N(1-p)}^{\infty}r'f(r')\,dr'\right]h(p)\,dp-$$

$$\left.-\frac{(C_2'T+C_3'T)\,N^2}{2}\int_{p=0}^{p=1}\left[\int_{r'=N(1-p)}^{\infty}\frac{1}{r'}f(r')\,dr'\right](1-p)^2h(p)\,dp\right\}$$

which is to be maximized such that

$$\mu_1=\int_{r=0}^{\infty}rf(r)\,dr\quad\sigma_1^2=\int_{r=0}^{\infty}(r-\mu_1)^2f(r)\,dr$$

and

$$\mu_2=\int_{r'=0}^{\infty}r'f(r')\,dr'\quad\sigma_2^2=\int_{r'=0}^{\infty}(r'-\mu_2)^2f(r')\,dr'$$

also

$$\bar{r} = \int_{r=0}^{\infty} rf(r)\,dr \quad \text{and} \quad \bar{p} = \int_{p=0}^{p=1} ph(p)\,dp$$

4. SOLUTION TO THE MATHEMATICAL MODEL

Now

$$\int_{r=Np}^{\infty} rf(r)\,dr \geqslant Np \int_{r=Np}^{\infty} f(r)\,dr$$

or

$$-\int_{r=Np}^{\infty} rf(r)\,dr \leqslant -Np\int_{r=Np}^{\infty} f(r)\,dr \tag{4.1}$$

also]

$$\int_{r=Np}^{\infty} \frac{1}{r} f(r)\,dr = \int_{r=Np}^{np+\sigma_1} \frac{1}{r} f(r)\,dr + \int_{r=Np+\sigma_1}^{Np+2\sigma_1} \frac{1}{r} f(r)\,dr + \ldots\ldots$$

$$\geqslant \frac{1}{Np+\sigma_1}\int_{r=Np}^{Np+\sigma_1} f(r)\,dr + \frac{1}{Np+2\sigma_1}\int_{r=Np+\sigma_1}^{Np+2\sigma_1} f(r)\,dr + \ldots.$$

$$\geqslant \frac{1}{Np+\sigma_1}\int_{r=Np}^{\infty} f(r)\,dr - \frac{\sigma_1}{(Np+\sigma_1)^2}\left[\int_{r=Np+\sigma_1}^{\infty} f(r)\,dr\right.$$

$$\left. + \int_{r=Np+\sigma_1 2}^{\infty} f(r)\,dr + \ldots..\right]$$

or

$$-\int_{r=Np}^{\infty} \frac{1}{r} f(r)\,dr \leqslant \frac{1}{Np+\sigma_1}\int_{r=Np}^{\infty} f(r)\,dr + \frac{\sigma_1}{(Np+\sigma_1)^2}\left[\int_{r=Np+\sigma_1}^{\infty} f(r)\,dr + \right.$$

$$\left. + \int_{r=Np+\sigma_1 2}^{\infty} f(r)\,dr + \ldots.\right] \tag{4.2}$$

Similarly

$$-\int_{r'=N(1-p)}^{\infty} r'f(r')\,dr' \leqslant -N(1-p)\int_{r'=N(1-p)}^{\infty} f(r')\,dr' \ldots. \tag{4.3}$$

and

$$-\int_{r'=N(1-\bar{p})}^{\infty} \frac{1}{r'} f(r')\,dr' \leqslant -\frac{1}{(N\overline{1-p}+\sigma_2)} \int_{r'=N(1-\bar{p})}^{\infty} f(r')\,dr' +$$

$$+\frac{\sigma_2}{(N\overline{1-p}+\sigma_2)^2}\left[\int_{r'=N(1-\bar{p})+\sigma_2}^{\infty} f(r')\,dr'\right.$$

$$\left.+\int_{r'=N(1-\bar{p})+2\sigma_2}^{\infty} f(r')\,dr + \ldots\ldots\right]\ldots. \qquad (4.4)$$

Making use of (4.1) to (4.4) and on simplifying $Z(N)$ becomes

$$Z(N) \leqslant 2\left\{\frac{AN}{2} - IN + \left(S + \frac{C_2T}{2} - L\right)\bar{r} - (C_1 + C_2T - L)\,N\bar{p}\right.$$

$$+\left(S' + \frac{C_2'T}{2} - L'\right)\bar{r}' - \left(C_1' + C_2'T - L'\right)N(1-\bar{p})$$

$$+\left(\frac{C_2T + C_3T}{2}\int_{p=0}^{p=1} \frac{N^2p^2\sigma_1}{(Np+\sigma_1)^2}\left[\int_{r=Np+\sigma_1}^{\infty} f(r)\,dr +\right.\right.$$

$$\left.+\int_{r=Np+2\sigma_1}^{\infty} f(r)\,dr + \ldots\right] h(p)\,dp +$$

$$+\left(\frac{C_2T + C_3T}{2}\int_{p=0}^{p=1} \frac{Np\sigma_1}{Np+\sigma_1}\left[\int_{r=Np}^{\infty} f(r)\,dr\right] h(p)\,dp +\right.$$

$$+\left(\frac{C_2'T + C_3'T}{2}\int_{p=0}^{p=1} \frac{N^2\sigma_2(1-p)^2}{(N\overline{1-p}+\sigma_2)^2}\left[\int_{r'=N(1-\bar{p})+\sigma_2}^{\infty} f(r')\,dr' +\right.\right.$$

$$\left.+\int_{r'=N(1-\bar{p})+2\sigma_2}^{\infty} f(r')\,dr' + \ldots\right] h(p)\,dp +$$

$$\left.+\left(\frac{C_2'T + C_3'T}{2}\right)\int_{p=0}^{p=1} \frac{N(1-p)\,\sigma_2}{N(1-p)+\sigma_2}\left[\int_{r'=N(1-\bar{p})}^{\infty} f(r')\,dr'\right] h(p)\,dp\right\} \qquad (4.5)$$

The powerful Tchebycheff's inequality is being applied to (4.5) which states that for any probability distribution whatsoever there is a simple relationship expressing the probability that the given variable will differ from its mean by some multiple of its standard deviation i.e. for any random variable X with mean μ and variance σ^2.

$$P\{|X - \mu| \geqslant k\sigma\} \leqslant \frac{1}{k^2}, \quad k > 0$$

(4.5) reduces to

$$Z(N) \leqslant 2\left\{\left(\frac{A}{2} - I\right)N + \left(S + \frac{C_2 T}{2} - L\right)\bar{r} - (C_1 + C_2 T - L)\, N\bar{p} + \right.$$

$$+\left(S' + \frac{C_2' T}{2} - L'\right)\bar{r}' - (C_1' + C_2' T - L')\, N(1 - \bar{p}) +$$

$$+\left(\frac{C_2 T + C_3 T}{2}\int_{p=0}^{p=1}\left[\frac{Np\sigma_1^3}{(Np + \sigma_1)(Np - \mu_1)^2} + \right.\right.$$

$$\left.\left. + \frac{N^2 p^2 \sigma_1^3}{(Np+\sigma_1)^2}\left(\sum_{i=0}^{\infty}\frac{1}{\left(\frac{Np - \mu_1}{\sigma_1} + i\right)^2} - \frac{1}{\left(\frac{Np - \mu_1}{\sigma_1}\right)^2}\right)\right] h(p)\, dp +\right.$$

$$+\left(\frac{C_2' T + C_3' T}{2}\int_{p=0}^{p=1}\left[\frac{N(1-p)\,\sigma_2^3}{(N\overline{1-p} + \sigma_2)(N\overline{1-p} - \mu_2)^2} + \right.\right.$$

$$\left.\left. + \frac{N^2(1-p)^2\sigma_2^3}{(N\overline{1-p} + \sigma_2)^2}\left(\sum_{i=0}^{\infty}\frac{1}{\left(\frac{N(1-p) - \mu_2}{\sigma_2} + i\right)^2} - \right.\right.\right.$$

$$\left.\left.\left. - \frac{1}{\left(\frac{N(1-p) - \mu_2)^2}{\sigma_2}\right)}\right)\right] h(p)\, dp\right\}$$

or

$$Z(N) \leqslant 2\left\{\left(\frac{A}{2} - I\right)N + \left(S + \frac{C_2 T}{2} - L\right)\bar{r} - (C_1 + C_2 T - L)N\bar{p} + \right.$$

$$+\left(S' + \frac{C_2' T}{2} - L'\right)\bar{r}' - (C_1' + C_2' T - L')\, N(1 - \bar{p}) +$$

$$+ \frac{C_2 T + C_3 T}{2}\int_{p=0}^{p=1}\frac{N^2 p^2 \sigma_1}{(Np + \sigma_1)^2}\sum_{i=0}^{\infty}\frac{1}{\left(\frac{Np - \mu_1}{\sigma_1} + i\right)^2} h(p)\, dp +$$

$$\left. + \left(\frac{C_2 T + C_3 T}{2}\right)\int_{p=0}^{p=1}\left[\frac{Np\sigma_1^3}{(Np + \sigma_1)(Np - \mu_1)^2} - \frac{N^2 p^2 \sigma_1^3}{(Np+\sigma_1)^2 (Np-\mu_1)^2}\right] h(p) dp +\right.$$

$$+\left(\frac{C_2'T+C_3'T}{2}\right)\int_{p=0}^{p=1}\left[\frac{N^2(1-p)^2\sigma_2}{N(\overline{1-p}+\sigma_2)^2}\sum_{i=0}^{\infty}\frac{1}{\left(\frac{N\overline{1-p}-\mu_2}{\sigma_2}+i^2\right)}\right]h(p)\,dp+$$

$$+\left(\frac{C_2'T+C_3'T}{2}\right)\int_{p=0}^{p=1}\left[\frac{N(1-p)\sigma_2^3}{(N\overline{1-p}+\sigma_2)(N\overline{1-p}-\mu_2)^2}-\right.$$

$$\left.-\frac{N^2(1-p)^2\sigma_2^3}{(N\overline{1-p}+\sigma_2)^2(N\overline{1-p}-\mu_2)^2}\right]h(p)\,dp\Bigg\} \qquad (4.6)$$

The Euler-Meclaurin [8] formula which gives the sum of the resulting series as

$$\sum_{i=0}^{\infty}\frac{1}{(k+i)^2}\simeq\frac{1}{k}+\frac{1}{2k^2}+\frac{1}{6k^3}-\frac{1}{30k^5}+\frac{1}{47k^7}$$

to a sufficient degree of accuracy is being used in (4.6). The terms only upto 3rd degree are considered in this problem.
Then

$$Z(N)\leqslant 2\Bigg\{\left(\frac{A}{2}-I\right)N+\left(S+\frac{C_2T}{2}-L\right)\bar{r}-(C_1+C_2T-L)\,N\bar{p}$$

$$+\left(S'+\frac{C_2'T}{2}-L'\right)\bar{r}'-(C_1'+C_2'\,T-L')\,N(1-\bar{p})$$

$$+\left(\frac{C_2T+C_3T}{2}\right)\int_{p=0}^{p=1}\frac{N^2p^2\sigma_1}{(Np+\sigma_1)^2}\left[\frac{\sigma_1}{(Np-\mu_1)}+\right.$$

$$\left.+\frac{\sigma_1^2}{2(Np-\mu_1)^2}+\frac{\sigma_1^3}{6(Np-\mu_1)^3}\right]h(p)\,dp+$$

$$+\left(\frac{C_2T+C_3T}{2}\right)\int_{p=0}^{p=1}\left[\frac{(Np+\sigma_1)\,Np\sigma_1^3-N^2p^2\sigma_1^3}{(Np+\sigma_1)^2(Np-\mu_1)^2}\right]h(p)dp+$$

$$+\left(\frac{C_2'T+C_3'T}{2}\int_{p=0}^{p=1}\frac{N^2(1-p)^2\sigma_2}{(N\overline{1-p}+\sigma_2)^2}\left[\frac{\sigma_2}{(N\overline{1-p}-\mu_2)}+\right.\right.$$

$$\left.+\frac{\sigma_2^2}{2(N\overline{1-p}-\mu_2)^2}+\frac{\sigma_2^3}{6(N\overline{1-p}-\mu_2)^3}\right]h(p)\,dp+$$

$$+\left(\frac{C_2'T+C_3'T}{2}\right)\int_{p=0}^{p=1}\left[\frac{(N\overline{1-p}+\sigma_2)\,N(1-p)\,\sigma_2^3-N^2(1-p)^2\,\sigma_2^3}{(N\overline{1-p}+\sigma_2)^2(N\overline{1-p}-\mu_2)^2}\right]h(p)dp$$

On simplification

$$Z(N) \leqslant 2\left\{\left(\frac{A}{2} - I\right)N + \left(S + \frac{C_2 T}{2} - L\right)\bar{r} - (C_1 + C_2 T - L)\, N\bar{p} + \right.$$

$$+\left(S' + \frac{C_2' T}{2} - L'\right)\bar{r}' - (C_1' + C_2' T - L')\, N(1 - \bar{p}) +$$

$$+ \frac{C_2 T + C_3 T}{2} \int_{p=0}^{p=1} \frac{6N^4 p^4 \sigma_1^2 + 3N^3 p^3 \sigma_1^2(\sigma_1 - 4\mu_1) + N^2 p^2 \sigma_1^2(7\sigma_1^2 + \mu_1^2) - 6Np\mu_1\sigma_1^4}{6(Np + \sigma_1)^2 (Np - \mu_1)^3}$$

$$h(p)\, \mathrm{d}p + \frac{C_2' T + C_3' T}{2} \int_{p=0}^{p=1}$$

$$\left.\frac{6N^4\sigma_2^2(1-p)^4 + 3N^3\sigma_2^2(1-p)^3(\sigma_2 - 4\mu_2) + N^2\sigma_2^2(1-p)^2(7\sigma_2^2 + \mu_2^2) - 6N\mu_2\sigma_2^4(1-p)}{6[N(1-p) + \sigma_2]^2[N(1-p) - \mu_2]^3}\right.$$

$$\left. h(p)\, \mathrm{d}p\right\}$$

or

$$Z(N) \leqslant 2\left\{\left(\frac{A}{2} - I\right)N + \left(S + \frac{C_2 T}{2} - L\right)\bar{r} - (C_1 + C_2 T - L)\, N\bar{p} + \right.$$

$$+\left(S' + \frac{C_2' T}{2} - L'\right)\bar{r}' - (C_1' + C_2' T - L')N\,(1 - \bar{p}) +$$

$$\left. + \frac{C_2 T + C_3 T}{2} \int_{p=0}^{p=1} F(N, p)\, h(p)\, \mathrm{d}p + \frac{C_2' T + C_3' T}{2} \int_{p=0}^{p=1} G(N, p)\, h(p)\, \mathrm{d}p\right\}$$

where

$$F(N, p) = \frac{6N^4 p^4 \sigma_1^2 + 3N^3 p^3 \sigma_1^2(\sigma_1 - 4\mu_1) + N^2 p^2 \sigma_1^2(7\sigma_1^2 + \mu_1^2) - 6Np\mu_1\sigma_1^4}{6(Np + \sigma_1)^2 (Np - \mu_1)^3}$$

and

$$G(N, p) =$$

$$= \frac{6N^4\sigma_2^2(1-p)^4 + 3N^3\sigma_2^2(1-p)^3(\sigma_2 - 4\mu_2) + N^2\sigma_2^2(1-p)^2(7\sigma_2^2 + \mu_2^2) - 6N\mu_2\sigma_2^4(1-p)}{6[N(1-p) + \sigma_2]^2[N(1-p) - \mu_2]^3}$$

We assume the worst case i.e. equality; because the expected cost would obviously be smaller if the demand probability distribution were such that the indicated probability was actually less than $\frac{1}{k^2}$ i.e.

$$Z(N) = 2\left\{\left(\frac{A}{2} - I\right)N + \left(S + \frac{C_2T}{2} - L\right)\bar{r} - (C_1 + C_2T - L)\,N\bar{p} + \right.$$

$$+\left(S' + \frac{C_2'T}{2} - L'\right)\bar{r}' - (C_1' + C_2'T - L')\,N(1 - \bar{p}) +$$

$$\left. + \frac{C_2T + C_3T}{2}\int_{p=0}^{p=1} F(N, p)\,h(p)\,dp + \frac{C_2'T + C_2'T}{2}\int_{p=0}^{p=1} G(N, p)\,h(p)\,dp\right\}$$

Our aim is to determine the optimal value of N. For this case differentiate w.r.t. N; we get

$$\frac{dZ(N)}{dN} = \left(\frac{A}{2} - I\right) - (C_1 + C_2T - L)\,\bar{p} - (C_1' + C_2'T - L')\,(1 - \bar{p}) +$$

$$+ \frac{C_2T + C_3T}{2}\int_{p=0}^{p=1} \frac{dF(N, p)}{dN}\,h(p)\,dp$$

$$+\left(\frac{C_2'T + C_3'T}{2}\right)\int_{p=0}^{p=1} \frac{dG(N, p)}{dN}\,h(p)\,dp = 0$$

or

$$\int_{p=0}^{p=1}\left[\left(\frac{C_2T + C_3T}{2}\,\frac{dF(N, p)}{dN} + \frac{C_2'T + C_3'T}{2}\right)\frac{dG(N, p)}{dN}\right]h(p)\,dp =$$

$$= \left(I - \frac{A}{2}\right) + (C_1 + C_2T - L)\,\bar{p} + (C_1' + C_2'T - L')\,(1 - p)\ldots \tag{4.7}$$

and

$$\frac{d^2Z}{dN^2} < 0.$$

The objective function $Z(N)$ is a concave function of the unknown N, therefore the local maximum is also the global maximum (4.7) determines the near optimal value of N for the actual problem.

Remark 1: When the fresh items arrive and they are very much in demand in the market, the selling price may be decided by the organization. It may be said that the selling price S for nondefective is independent of the demand r. Similarly it may be explained that selling price S' for defective item is also independent of the demand r'.

Remark 2: The problem can be discussed likewise for discrete demand as well.

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UN MODELE DE STOCKS DANS DES CONDITIONS DE RISQUE

On essaie de déterminer une quantité de demandes presque optimales (articles de bonne qualité et des rebuts), lorsque les fonctions de la densité de probabilité pour les articles demandés, ne sont pas connues, á l'exception des moyennes et de leur dispersion.

МОДЕЛЬ ЗАПАСОВ В УСЛОВИЯХ РИСКА

Настоящая работа представляет собой попытку определения оптимального числа заказов (подходящего качества или забракованные изделия), при условиях, когда неизвестны функции распределения для изделий, являющихся добрыми или забракованными, но известны средние величины и дисперсии.

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