Electronic Journal of Applied Statistical Analysis
EJASA, Electron. J. App. Stat. Anal.
http://siba-ese.unisalento.it/index.php/ejasa/index
e-ISSN: 2070-5948
DOI: 10.1285/i20705948v15n2p290

Double acceptance sampling plans under truncated life tests for two-parameter Xgamma distribution

By Al-Omari, Alomani

Published: 20 June 2022

Electronic Journal of Applied Statistical Analysis
Vol. 15, Issue 02, June 2022, 290-299
DOI: 10.1285/i20705948v15n2p290

Double acceptance sampling plans under truncated life tests for two-parameter Xgamma distribution

Amer Ibrahim Al-Omari*[a] and Ghadah A. Alomani[b]

[a] *Department of Mathematics, Faculty of Science, Al al-Bayt University, Mafraq, Jordan*
[b] *Department of Mathematical Sciences, College of Science, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudia Arabia*

Published: 20 June 2022

This article considered the problem of developing double acceptance sampling plans (DASP) in terms of truncated life tests considering that the lifetime of the lot follows the two-parameter Xgamma (TPXG) distribution. The mean of the TPXG distribution is utilized as the quality parameter. The smallest sample sizes of the first and second samples desired to emphasize the identified mean life are obtained at a given consumer's confidence (CC) level. The corresponding operating characteristic (OC) values for several quality levels are found as well as the smallest ratios of the mean life to the indicated life are presented. Also, the producers risk (PR) is studied. Numerical results and examples are analyzed for illustration.

keywords: Truncated life tests; Double acceptance sampling plan; Acceptance sampling plans; Two-parameter Xgamma distribution; Consumer's risk; Operating characteristic value.

1 Introduction

The TPXG distribution is developed by Sen et al. (2018). The TPXG distribution has several survival properties and motivating structural which made it a useful distribution in modeling data sets of time-to-event. The TPXG distribution has the distribution function given by

*Corresponding author: alomari_amer@yahoo.com

ISSN: 2070-5948
http://siba-ese.unisalento.it/index.php/ejasa/index

$$H(y;\eta,\delta)=1-\frac{1}{\delta+\eta}\left(\delta+\eta+\delta\eta y+\frac{\delta\eta^2y^2}{2}\right)e^{-\eta y};\ y>0,\eta>0,\delta>0, \quad (1)$$

with a probability density function defined as

$$h(y;\eta,\delta)=\frac{\eta^2}{\delta+\eta}\left(1+\frac{\delta\,\eta}{2}y^2\right)e^{-\eta y},\quad y>0,\eta>0,\delta>0. \quad (2)$$

The TPXG distribution has survival function (SF) and hazard rate function (HR), respectively are defined by

$$SF(y;\eta,\delta)=\frac{\delta}{\delta+\eta}\left(\delta+\eta+\delta\eta x+\frac{1}{2}\delta\eta^2x^2\right)e^{-\eta y}, \quad (3)$$

$$HF(y;\eta,\delta)=\frac{h(y;\eta,\delta)}{1-H(y;\eta,\delta)}=\frac{\eta^2\left(1+\frac{1}{2}\delta\eta^2y^2\right)}{\delta+\eta+\delta\eta y+\frac{1}{2}\delta\eta^2y^2}. \quad (4)$$

The mode and the jth moment of the TPXG distribution are

$$Mode(X)=\frac{1+(1-2\eta/\delta)^{\frac{1}{2}}}{\eta},\ \ 0<\eta\leq\delta/2,\text{and zero o.w.}, \quad (5)$$

$$E\left(Y^j\right)=\frac{j!}{2\eta^j\left(\delta+\eta\right)}\left[2\eta+\delta(j+1)(j+2)\right],\ \ j=1,2,3,.... \quad (6)$$

Hence, the mean and Shannon entropy of the TPXG distribution are

$$E(Y)=\mu=\frac{\eta+3\delta}{\eta(\eta+\delta)}, \quad (7)$$

and

$$SE(h)=\frac{\eta+3\delta}{\eta+\delta}-\ln\frac{\eta^2}{\eta+\delta}-\frac{\eta^2}{\eta+\delta}\sum_{i=1}^{\infty}(-1)^{i+1}\frac{(\delta/2)^i}{\eta^{i+1}i}\left[\Gamma(2i+1)+\frac{\delta}{2\eta}\Gamma(2i+3)\right]. \quad (8)$$

The single acceptance sampling plan (SASP) technique is one of the main statistical tools in engineering, particularly in production field. The producers are motivating in the quality of the product with less effort as well as cost in time and money, while the consumers expected to find a good product with high characteristics and less prices. Therefore, to save the cost a decision regarding the product can be considered based on randomly drawn sample form the lot. The SASP are studied by many researchers, see for illustration Rao et al. (2011) for the inverse Rayleigh distribution, Al-Nasser and Al-Omari (2013) for exponentiated Frechet model, Al-Omari (2014, 2015, 2018) studied the generalized inverted exponential, the three parameter Kappa and transmuted generalized inverse Weibull distributions, Al-Nasser et al. (2018a) for the Ishita distribution, Gillariose and Tomy (2021) for the extended Birnbaum-Saunders model. Tripathi et al. (2020) for generalized half-normal distribution. Tripathi et al. (2020) for chain sampling plan for Darna distribution.

The DASP in terms of truncated life tests is considered in the literature, for example, Aslam and Jun (2009) suggested DASP for the generalized log-logistic model, Rao (2011) studied the DASP for the Marshall–Olkin extended exponential distribution, Ramaswamy and Anburajan (2012) investigated the DASP for the generalized exponential distribution, Gui (2014) offered DASP for the Maxwell distribution, Al-Omari and Zamanzade (2017) introduced DASP under transmuted generalized inverse Weibull model, Al-Omari et al. (2016) introduced DASP for the half normal distribution, Al-Omari et al. (2017) investigated the exponentiated generalized inverse Rayleigh distribution, Al-Nasser et al. (2018b) for the Quasi Lindley distribution, Sridhar Babu et al. (2021) for the exponentiated Fréchet distribution, Hamurkaroğlu et al. (2020) for the compound Weibull-exponential distribution. Also, see Tripathi et al. (2021) and Shrahili et al. (2021).

In the production field, the DASP can be employed to minimize the PR or the selected sample size if there is no a decision under the first sample. Therefore, a second random sample must be considered to have a serious decision.

In this paper, the DASP is studied in Section 2. Section 3 involves the OC function and PR. Some numerical calculations and universal examples are discussed in Section 4. Finally, the main results are given in Section 5.

2 DASP Design

The DASP under truncated life tests can be described as:

1. Chose a first sample of size n_1 randomly and test it. If c_1 or smaller failures appeared before a predefined process time t_0 the lot is accepted. If $c_2 + 1$ failures are detected before t_0, the lot is ignored, i.e., $(c_1 < c_2)$.

2. If the failures number by t_0 lie between the acceptance numbers $c_1 + 1$ and c_2, then select the second sample of size n_2 randomly and examine them within the time t_0.

3. If the whole number of failures in both samples is at most c_2, subsequently the lot is accepted. Elsewhere, the lot should be rejected and hence terminate the test.

Consequently, the DASP method can be characterized by the plan parameters $\left(n_1, n_2, c_1, c_2, \frac{t_0}{\mu_0}\right)$, provided that $c_1 < c_2$. Supposing that the lot size is large to use the binomial probability. The probability of acceptance $L(p)$ the lot based on DASP is defined as

$$
\begin{aligned}
L(p) = & \sum_{y_1=0}^{c_1} \binom{n_1}{y_1} p^{y_1}(1-p)^{n_1-y_1} \\
& + \sum_{y_1=c_1+1}^{c_2} \binom{n_1}{y_1} p^{y_1}(1-p)^{n_1-y_1} \left\{ \sum_{y_2=0}^{c_2-y_1} \binom{n_2}{y_2} p^{y_2}(1-p)^{n_2-y_2} \right\},
\end{aligned} \tag{9}
$$

where

$$\sum_{y_1=0}^{c_1} \begin{pmatrix} n_1 \\ y_1 \end{pmatrix} p^{y_1} (1-p)^{n_1-y_1}$$

and

$$\sum_{y_1=c_1+1}^{c_2} \begin{pmatrix} n_1 \\ y_1 \end{pmatrix} p^{y_1} (1-p)^{n_1-y_1} \left\{ \sum_{y_2=0}^{c_2-y_1} \begin{pmatrix} n_2 \\ y_2 \end{pmatrix} p^{y_2} (1-p)^{n_2-y_2} \right\}$$

are the probabilities of acceptance the lot beyond the first and second samples, respectively, and $p = H(t; \mu) = H\left(\frac{t}{\mu_0} . \frac{\mu_0}{\mu}\right)$ is given in (1)

Let $L(p_1)$ and $L(p_2)$ be the probabilities of accepting the lot, respectively of the sampling plans $\left(n_1, c_1, \frac{t}{\mu_0}\right)$ and $\left(n_2, c_2, \frac{t}{\mu_0}\right)$, where

$$L(p_1) = \sum_{y_1=0}^{c_1=0} \begin{pmatrix} n_1 \\ y_1 \end{pmatrix} p^{y_1} (1-p)^{n_1-y_1} \tag{10}$$

and

$$L(p_2) = \sum_{y_2=0}^{c_2=2} \begin{pmatrix} n_2 \\ y_2 \end{pmatrix} p^{y_2} (1-p)^{n_2-y_2} \tag{11}$$

For $c_1 = 0$ and $c_2 = 1$ in the DASP we get the so called zero and one failure technique, while if $c_1 = 0$ and $c_2 = 2$, we get the zero and two failure scheme. Hence, the probability of acceptance is

$P(A)$ =P(no failure arises in the 1st sample) + P(1 failure arises in the 1st sample and 0 or 1 failure arises in 2nd sample) + P(2 failures arises in the 1st sample and 0 or 1 failure arises in the 2nd sample).

3 The OC function and PR

The OC function is an essential in the ASP field in determining the probability of accepting a product or reject it upon the probability value. A good DASP that has OC function values approaching 1.

The PR is the probability of rejection of a worthy lot, i.e., $(\mu \geq \mu_0)$. For the TPXG distribution DASP with a assumed producer's risk value α, it is desired to determine the lowest quality level of μ/μ_0 to emphasize that the PR is at most α. Consequently, μ/μ_0 is the lowest positive number with $p = H(t; \mu) = H\left(\frac{t}{\mu_0} . \frac{\mu_0}{\mu}\right)$ that satisfies the inequality

$$\sum_{y_1=0}^{c_1} \binom{n_1}{y_1} p^{y_1}(1-p)^{n_1-y_1} + \sum_{y_1=c_1+1}^{c_2} \binom{n_1}{y_1} p^{y_1}(1-p)^{n_1-y_1} \left\{ \sum_{y_2=0}^{c_2-y_1} \binom{n_2}{y_2} p^{y_2}(1-p)^{n_2-y_2} \right\} \geq 1-\alpha, \tag{12}$$

4 Results and examples

Here, we explain the new DASP for the TPXG distribution with parameters $\delta = 2$ and $\eta = 3$. The optimum DASP parameters are found for $p^* = 0.75, 0.90, 0.95, 0.99$ when the ratio t/μ_o =0.628, 0.942, 1.257, 1.571, 2.356, 3.141, 3.927, 4.712 for various numbers of acceptance. These selections are consent with the values offered in Gupta and Gupta (1961), **?**, Kantam et al. (2001), and Balakrishnan et al. (2007).

Assuming that the life time test follows the TPXG distribution for a certain p^*, the OC function values and the minimum sample sizes of the sampling plans $(n_1, c_1 = 0, t/\mu_o)$ and $(n_1, n_2, c_1, c_2, t/\mu_o)$ are presented in Tables (1) and (2). Table 3 consists of the minimum ratios of μ/μ_o, while Table 4 contains the minimum values of n_1 and n_2 based on the new DASP.

The results obtained in the first two tables show that the OC values are closed to 1 for most cases as the values of μ/μ_0 get large. Further, the OC values related to the proposed DASP are larger than their competitors in Table 1 for all cases except when $\mu/\mu_0 = 2$ and $p^* = 0.75$.

To illustrate the experiment, suppose that the investigator needs to affirm that mean life μ of the product is more than $\mu_0 = 1000$ hours under the confidence level of $p^* = 0.90$.

The test is terminated at $t_0 = 628$ hours under $(c_1, c_2) = (0, 2)$ failure techniques of DASP. Therefore, the experiment termination ratio is 0.628. Hence, from Table 2, the corresponding sample sizes are $n_1 = 3$ and $n_2 = 5$. These results can be explained as follows. First of all, randomly chose 3 products from the lot and examine them within 628 hours. The lot is accepted if no failure is detected within 628 hours. Ignore the product if more than 2 failures occur within the test. If only two failures are noticed, select a second sample of size 5 and test it for 628 hours. Now, accept the lot if there no failures are detected in the second sample, and don't accept the lot elsewhere.

Now, suppose that the researcher likes to identify what quality level will introduce the PR less than 0.05. Table 4 shows that the smallest ratio for $p^* = 0.90$ and $t_0/\mu_0 = 0.628$ is 6.76. Hence, the true mean necessary of the product must be at least 6760 hours.

5 Concluding remarks

In this article, a DASP is introduced for the TPXG distribution utilizing the mean as a quality parameter. The required design parameters are determined for several values of the model parameters under given producer's risk and consumer's risk. It is found that the minimum samples sizes are decreasing as the confidence level are decreasing for fixed t_0/μ_0. Hence, the proposed DASP for the TPXG distribution are recommended to the researchers in the production sector.

Acknowledgments: This research was funded by the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University through the Fast-track Research Funding Program.

References

Al-Nasser, A. D. and Al-Omari, A. I. (2013). Acceptance sampling plan based on truncated life tests for exponentiated Fréchet distribution. *Journal of Statistics and Management Systems*, 16(1):13–24.

Al-Nasser, A. D., Al-Omari, A. I., Bani-Mustafa, A., and Jaber, K. (2018a). Developing single-acceptance sampling plans based on a truncated lifetime test for an Ishita distribution. *Statistics*, 393.

Al-Nasser, A. D., Al-Omari, A. I., and Gogah, F. S. (2018b). A double acceptance sampling plan for quasi Lindley distribution. *Journal of the North for Basic and Applied Sciences*, 3(2):120–130.

Al-Omari, A. I. (2014). Acceptance sampling plan based on truncated life tests for three parameter Kappa distribution. *Economic Quality Control*, 29(1):53–62.

Al-Omari, A. I. (2015). Time truncated acceptance sampling plans for generalized inverted exponential distribution. *Electronic Journal of Applied Statistical Analysis*, 8(1):1–12.

Al-Omari, A. I. (2018). The transmuted generalized inverse Weibull distribution in acceptance sampling plans based on life tests. *Transactions of the Institute of Measurement and Control*, 40(16):4432–4443.

Al-Omari, A. I., Al-Nasser, A. D., Gogah, F., and Haq, M. A. (2017). On the exponentiated generalized inverse Rayleigh distribution based on truncated life tests in a double acceptance sampling plan. *Stochastics and Quality Control*, 32(1):37–47.

Al-Omari, A. I., Al-Nasser, A. D., and Gogah, F. S. (2016). Double acceptance sampling plan for time-truncated life tests based on half normal distribution. *Economic Quality Control*, 31(2):93–99.

Al-Omari, A. I. and Zamanzade, E. (2017). Double acceptance sampling plan for time truncated life tests based on transmuted generalized inverse Weibull distribution. *Journal of Statistics Applications and Probability*, 6(1):1–6.

Aslam, M. and Jun, C.-H. (2009). A group acceptance sampling plans for truncated life tests based on the inverse Rayleigh and log-logistic distributions. *Pakistan Journal of Statistics*, 25(2).

Balakrishnan, N., Leiva, V., and Lopez, J. (2007). Acceptance sampling plans from truncated life tests based on the generalized Birnbaum-Saunders distribution. *Communications in Statistics—Simulation and Computation*, 36(3):643–656.

Gillariose, J. and Tomy, L. (2021). Reliability test plan for an extended Birnbaum-Saunders distribution. *Journal of Reliability and Statistical Studies*, pages 353–372.

Gui, W. (2014). Double acceptance sampling plan for time truncated life tests based on Maxwell distribution. *American Journal of Mathematical and Management Sciences*, 33(2):98–109.

Gupta, S. S. and Gupta, S. S. (1961). Gamma distribution in acceptance sampling based on life tests. *Journal of the American Statistical Association*, 56(296):942–970.

Hamurkaroğlu, C., Yiğiter, A., and Danacıoğlu, N. (2020). Single and double acceptance sampling plans based on the time truncated life tests for the compound Weibull-exponential distribution. *Journal of the Indian Society for Probability and Statistics*, 21(2):387–408.

Kantam, R., Rosaiah, K., and Rao, G. S. (2001). Acceptance sampling based on life tests: log-logistic model. *Journal of applied statistics*, 28(1):121–128.

Ramaswamy, A. and Anburajan, P. (2012). Double acceptance sampling based on truncated life tests in generalized exponential distribution. *Applied Mathematical Sciences*, 6(64):3199–3207.

Rao, G. S. (2011). Double acceptance sampling plans based on truncated life tests for the Marshall-Olkin extended exponential distribution. *Austrian journal of Statistics*, 40(3):169–176.

Sen, S., Chandra, N., and Maiti, S. S. (2018). On properties and applications of a two-parameter Xgamma distribution. *J. Stat. Theory Appl.*, 17(4):674–685.

Shrahili, M., Al-Omari, A. I., and Alotaibi, N. (2021). Acceptance sampling plans from life tests based on percentiles of new Weibull-Pareto distribution with application to breaking stress of carbon fibers data. *Processes*, 9(11):2041.

Sridhar Babu, M., Srinivasa Rao, G., and Rosaiah, K. (2021). Double-acceptance sampling plan for exponentiated Fréchet distribution with known shape parameters. *Mathematical Problems in Engineering*, 2021.

Tripathi, H., Al-Omari, A. I., Saha, M., and Alanzi, A. R. (2021). Improved attribute chain sampling plan for Darna distribution. *Computer Systems Science and Engineering*, 38(3):381–392.

Tripathi, H., Saha, M., and Alha, V. (2020). An application of time truncated single acceptance sampling inspection plan based on generalized half-normal distribution. *Annals of Data Science*, pages 1–13.

Table 1: OC values of the SASP $(n_1, c_1 = 0, t/\mu_o)$ for a certain p^* under TPXG distribution with $\delta = 2$ and $\eta = 3$

p^*	t/μ_o	n_1	$\mu/\mu_o = 2$	4	6	8	10	12
0.75	0.628	3	0.3939	0.6165	0.7207	0.7806	0.8194	0.8466
0.75	0.942	2	0.4035	0.6225	0.7243	0.7830	0.8211	0.8478
0.75	1.257	2	0.3038	0.5371	0.6542	0.7241	0.7706	0.8037
0.75	1.571	1	0.4780	0.6819	0.7696	0.8191	0.8510	0.8733
0.75	2.356	1	0.3296	0.5712	0.6819	0.7464	0.7889	0.8191
0.75	3.141	1	0.2207	0.4781	0.6058	0.6820	0.7330	0.7697
0.75	3.927	1	0.1433	0.3983	0.5384	0.6239	0.6819	0.7241
0.75	4.712	1	0.0906	0.3296	0.4780	0.5712	0.6351	0.6819
0.90	0.628	3	0.2316	0.4762	0.6083	0.6882	0.7412	0.7790
0.90	0.942	2	0.2362	0.4788	0.6098	0.6891	0.7419	0.7795
0.90	1.257	2	0.1492	0.3769	0.5185	0.6096	0.6722	0.7177
0.90	1.571	2	0.0952	0.2978	0.4418	0.5399	0.6096	0.6614
0.90	2.356	1	0.1784	0.4090	0.5458	0.6325	0.6919	0.7348
0.90	3.141	1	0.1042	0.3087	0.4499	0.5458	0.6141	0.6648
0.90	3.927	1	0.0610	0.2342	0.3721	0.4720	0.5458	0.6020
0.90	4.712	1	0.0356	0.1784	0.3087	0.4090	0.4858	0.5458
0.95	0.628	4	0.1423	0.3719	0.5154	0.6075	0.6708	0.7167
0.95	0.942	3	0.1148	0.3313	0.4762	0.5721	0.6390	0.6882
0.95	1.257	2	0.1492	0.3769	0.5185	0.6096	0.6722	0.7177
0.95	1.571	2	0.0952	0.2978	0.4418	0.5399	0.6096	0.6614
0.95	2.356	1	0.1784	0.4090	0.5458	0.6325	0.6919	0.7348
0.95	3.141	1	0.1042	0.3087	0.4499	0.5458	0.6141	0.6648
0.95	3.927	1	0.0610	0.2342	0.3721	0.4720	0.5458	0.6020
0.95	4.712	1	0.0356	0.1784	0.3087	0.4090	0.4858	0.5458
0.99	0.628	5	0.0874	0.2904	0.4367	0.5364	0.6071	0.6595
0.99	0.942	4	0.0558	0.2293	0.3719	0.4749	0.5504	0.6075
0.99	1.257	3	0.0576	0.2314	0.3734	0.4759	0.5512	0.6081
0.99	1.571	3	0.0294	0.1625	0.2937	0.3967	0.4760	0.5379
0.99	2.356	2	0.0318	0.1673	0.2979	0.4001	0.4787	0.5400
0.99	3.141	2	0.0109	0.0953	0.2024	0.2979	0.3771	0.4419
0.99	3.927	1	0.0610	0.2342	0.3721	0.4720	0.5458	0.6020
0.99	4.712	1	0.0356	0.1784	0.3087	0.4090	0.4858	0.5458

Table 2: OC values of the DASP $(n_1, n_2, c_1 = 0, c_2 = 2, t/\mu_o)$ for a certain p^* under TPXG distribution with $\delta = 2$ and $\eta = 3$.

P^*	t/μ_o	n_1	n_2	$\mu/\mu_o = 2$	4	6	8	10	12
0.75	0.628	3	6	0.2811	0.6885	0.8520	0.9201	0.9524	0.9695
0.75	0.942	2	4	0.3091	0.7156	0.8681	0.9297	0.9585	0.9735
0.75	1.257	2	3	0.2370	0.6605	0.8371	0.9116	0.9472	0.9661
0.75	1.571	1	3	0.3677	0.7486	0.8844	0.9386	0.9638	0.9769
0.75	2.356	1	2	0.3331	0.7294	0.8742	0.9327	0.9602	0.9745
0.75	3.141	1	2	0.1802	0.5788	0.7799	0.8742	0.9222	0.9488
0.75	3.927	1	2	0.0947	0.4440	0.6784	0.8046	0.8742	0.9148
0.75	4.712	1	2	0.0493	0.3331	0.5787	0.7294	0.8191	0.8742
0.90	0.628	3	5	0.3307	0.7371	0.8808	0.9373	0.9633	0.9767
0.90	0.942	2	4	0.3091	0.7156	0.8681	0.9297	0.9585	0.9735
0.90	1.257	2	3	0.2370	0.6605	0.8371	0.9116	0.9472	0.9661
0.90	1.571	2	3	0.1302	0.5292	0.7509	0.8572	0.9116	0.9418
0.90	2.356	1	2	0.3331	0.7294	0.8742	0.9327	0.9602	0.9745
0.90	3.141	1	2	0.1802	0.5788	0.7799	0.8742	0.9222	0.9488
0.90	3.927	1	2	0.0947	0.4440	0.6784	0.8046	0.8742	0.9148
0.90	4.712	1	2	0.0493	0.3331	0.5787	0.7294	0.8191	0.8742
0.95	0.628	4	6	0.1831	0.5981	0.7979	0.8874	0.9316	0.9556
0.95	0.942	3	4	0.1679	0.5858	0.7907	0.8832	0.9289	0.9538
0.95	1.257	2	4	0.1615	0.5579	0.7684	0.8679	0.9185	0.9465
0.95	1.571	2	3	0.1302	0.5292	0.7509	0.8572	0.9116	0.9418
0.95	2.356	1	3	0.1646	0.5382	0.7487	0.8529	0.9077	0.9386
0.95	3.141	1	2	0.1802	0.5788	0.7799	0.8742	0.9222	0.9488
0.95	3.927	1	2	0.0947	0.4440	0.6784	0.8046	0.8742	0.9148
0.95	4.712	1	2	0.0493	0.3331	0.5787	0.7294	0.8191	0.8742
0.99	0.628	5	8	0.0846	0.4290	0.6721	0.8027	0.8741	0.9153
0.99	0.942	4	6	0.0491	0.3437	0.5981	0.7487	0.8355	0.8874
0.99	1.257	3	5	0.0470	0.3302	0.5834	0.7368	0.8265	0.8806
0.99	1.571	3	4	0.0245	0.2637	0.5202	0.6881	0.7905	0.8540
0.99	2.356	2	3	0.0272	0.2739	0.5293	0.6946	0.7951	0.8572
0.99	3.141	2	3	0.0058	0.1304	0.3456	0.5294	0.6607	0.7511
0.99	3.927	1	2	0.0947	0.4440	0.6784	0.8046	0.8742	0.9148
0.99	4.712	1	2	0.0493	0.3331	0.5787	0.7294	0.8191	0.8742

Table 3: Minimum ratio of μ/μ_o for the acceptance of the lot with PR of 0.05 under TPXG distribution with $\delta = 2$ and $\eta = 3$

p^*	t/μ_o							
	0.628	0.942	1.257	1.571	2.356	3.141	3.927	4.712
0.75	7.78	7.15	8.10	6.46	6.66	9.76	12.86	15.95
0.90	6.76	7.15	8.10	10.71	6.66	9.76	12.86	15.95
0.95	9.45	9.59	10.30	10.71	10.92	9.76	12.86	15.95
0.99	13.17	15.24	15.71	17.46	17.20	23.69	12.86	15.95

Table 4: Minimum sample size values of n_1 and n_2 when $c_1 = 0$ and $c_2 = 2$ under TPXG distribution with $\delta = 2$ and $\eta = 3$

p^*	n	t/μ_o							
		0.628	0.942	1.257	1.571	2.356	3.141	3.927	4.712
0.75	n_1	3	2	2	1	1	1	1	1
0.75	n_2	6	4	3	3	2	2	2	2
0.90	n_1	3	2	2	2	1	1	1	1
0.90	n_2	5	4	3	3	2	2	2	2
0.95	n_1	4	3	2	2	1	1	1	1
0.95	n_2	6	4	4	3	3	2	2	2
0.99	n_1	5	4	3	3	2	2	1	1
0.99	n_2	8	6	5	4	3	3	2	2