ISSN No:-2456-2165

Moment based Estimation for the Shape Parameters, Effect it on Some Probability Statistical Distributions Using the Moment Method and Maximum Likelihood Method

Hassan Tawakol A. Fadol.
Associate Professor of Econometrics and Applied Statistic,
College of Business, Jouf University in KSA

Abstract:- The purpose of this paper was to identify the values of the parameters of the shape of the binomial, bias one and natural distributions. Using the estimation method and maximum likelihood Method, the criterion of differentiation was used to estimate the shape parameter between the probability distributions and to arrive at the best estimate of the parameter of the shape when the sample sizes are small, medium, The problem was to find the best estimate of the characteristics of the society to be estimated so that they are close to the estimated average of the mean error squares and also the effect of the estimation method on estimating the shape parameter of the distributions at the sizes of different samples In the values of the different shape parameter, the descriptive and inductive method was selected in the analysis of the data by generating 1000 random numbers of different sizes using the simulation method through the MATLAB program. A number of results were reached, 10) to estimate the small shape parameter (0.3) for binomial distributions and Poisson and natural and they can use the Poisson distribution because it is the best among the distributions, and to estimate the parameter of figure (0.5), (0.7), (0.9) Because it is better for binomial binomial distributions, when the size of a sample (70) for a teacher estimate The small figure (0.3) of the binomial and boson distributions and natural distributions can be used for normal distribution because it is the best among the distributions. For estimating the parameter of figure (0.5), (0.7), (0.9) Among distributions. The paper also issued a number of recommendations, most notably the use of binomial distribution to estimate the parameter of the figure (0.9) at the size of sample (10), (30), (50), (70). We concluded then, that The Moment Method generally gives more accurate estimates, followed by the method of maximum likelihood. The The Moment Method less satisfactorily, although in some instances the estimates derived are very similar to those of the method of maximum likelihood.

Keywords:- *Shape parameter, parameters estimation, Binomial distribution, Random Numbers, The Moment Method, Maximum Likelihood Method.*

I. INTRODUCTION

The estimation of descriptive statistical measures in terms of one of the random samples taken is one of the main reasons for analysis and decision-making. Two types of estimates can be distinguished: the point estimate is only one value for the statistical constant estimated in terms of the corresponding statistical factor, calculated from the random sample drawn from the society The estimate is to estimate the value of the statistical constant within a given field at a given probability in terms of the corresponding statistical function. Those hard into account the value of the standard error of the estimate continued to be the statistical Bdalalth value we get edged located between the highest and lowest of the most important reasons that help in the study of sampling theory is the desire to obtain information about the required study of society.

➢ *The Study Problem :*

When using any method of estimation, it is necessary to find the best estimate of the characteristics of the society to be estimated so that they are close to the estimate with the least error, since there is a set of distributions used in applied research.

- What is the best estimate of the least error to estimate the shape parameter of the distributions?
- What is the effect of the Moment method and maximum likelihood method of estimating the shape parameter of the distributions at the size of different samples at different parameter values?
- Is it possible to know the best estimate of a distribution parameter by comparing several estimates using the maximum potential method?

➢ *The Importance of Studying :*

The importance of the study was as follows:

- To emphasize the importance of compiling the data in the sizes of different samples and different probability distributions with different shape parameters, in order to avoid any problems that researchers may encounter when conducting their research on real data.
- The importance of using the sample data in estimating the parameters of the shape of binomial, biasone and natural distributions. They used the maximum method to determine the effect of this method on the shape parameter in terms of good estimation.

- Estimation of the point is the best estimate of the community parameter and it is the basis of the estimation process in the period and the tests of hypotheses.

➢ *Objectives of the study :*

The objectives of the study were as follows:

- Recognition of the values of the parameters of the shape of binomial, biasone and natural distributions, using the maximum potential method.
- Recognition of the criterion of differentiation for estimating the shape parameter in the greatest possible way between binomial, biasone and natural distributions.
- To arrive at the best estimate of the shape parameter when it is small, medium and large for binomial, biasone and natural distributions, so that this estimate is as close as possible to the value of the shape parameter of the distribution concerned.

II. METHODOLOGY OF THE STUDY

The descriptive approach was followed with regard to the theoretical aspect of the subject of the study. As for the applied side, the case study was used to generate the sample data by simulation method. The data were generated by binomial, Poisson, Normal, gamma distributions. Using the Mentab program

➢ *Simulation style:*

In some cases simulation is seen as the method that is often used when all other methods fail and the method of simulation is based on finding the means by which the researcher can study the problem and analyze it despite the difficulties in expressing it in mathematical model[(1)]. The simulation of the real system is carried out by a theoretically predictable system of behavior through a specific probability distribution. Thus, a sample of this system can be sampled by so-called random numbers [(5).] Simulation is defined as a numerical technique used to perform tests on a numerical computer that includes logical and mathematical relationships that interact with each other to describe the behavior and structure of a complex system in the real world and are finally described as the process of creating the spirit of reality without achieving this reality at all[(2)]

➢ *Concept of Monte Carlo Model:*

The basis of this model is the selection of the hypothesis elements available (probability) by taking random samples and can be summarized in the following steps[(6)]:

- Determine the probability distribution for each variable in the model to be studied.
- Use random numbers to simulate probability distribution values for each variable in the previous step.
- Repeat the process for a set of attempts.

➢ *Random Numbers:*

Is the number chosen by random quantity operation and random numbers are used to generate simulation values for many probability distributions. There are many ways to generate random numbers such as linear matching, use random number tables, and use functions ready for this purpose, such as the Rand function used in many programming languages[(1)].

❖ *The Moment Method[(7)]:*

IF (X) is a randomized or discrete random variable with a probability function of p (x) or a probability density function (f) x, and you have a probability distribution of one parameter such as binomial, Poisson, Bernoulli or more Parameter such as natural agglutination, phage distribution, beta. To estimate the parameter in these distributions, find the average variable random variable or what is known as the first one around zero, according to the following formula:

$$E(X) = \begin{cases} \sum_{x} XP(X) & ,X : Discrete \\ \int Xf(X) & ,X : contunios \end{cases}$$

In the case of distributions with two parameters, we need to calculate the variance for the purpose of finding the estimate for the second parameter, noting that:

$V(X) = \{EX^2 - (EX)^2$

Where :

EX ^ 2 is the second moment around zero for the random variable (X) and is calculated from the following relationship:

$$EX^2 = \begin{cases} \sum_{x} X^2 P(X) & ,X : Discrete \\ \int X^2 f(X) & ,X : contunios \end{cases}$$

➢ *Binomial distribution [(7)]:*

The binomial distribution is one of the intermittent distributions of great practical importance in the randomized experiments that result in one of two outcomes: the initial name - the desired success and the other the non-required failure. This distribution was discovered in the year 1700 by the world (James Bernolli).

It is said that the variable x follows the binomial distribution by the parameters (N, P) if its probability is :

$$f(X,P,N) = C_X^N P^X (1-P)^{N-X} = C_X^N P^X (q)^{N-X} \ , \ X = 0,1,\dots,N$$

This distribution is symbolized$X \sim B(N,P)$.

➢ *Distribution characteristics:*

1. Mean E(X)= P
2. Variance V(X)= npq

➢ *Estimating the shape parameter of binomial distribution in a way:*

The average of the binomial distribution community (the first determination of society around zero) is:

$\grave{\mu} = nP$

The average sample of binomial distribution (the first torque of society around zero) is:

$$\grave{m} = \frac{1}{n}\sum_{i=1}^{n} x_i = \bar{x}$$

And the equality of the sample with the reluctance of the community:

$nP = \bar{x}$

$\therefore \hat{P} = \frac{\bar{x}}{n}$

➢ *Poisson distribution[3]:*

Is an exponential probability distribution, used to calculate the probability of a certain number of successes (X) in a time unit or in a given region when events or successes are independent of one another, and when the average of success remains constant for the unit of time. By the world (Poisson).

If (x) is a random random variable followed by a Poisson distribution with an λ parameter, its probability function is:

$$P(X = x) = \frac{\lambda^x e^{-\lambda}}{x!} \quad , X = 0,1, \dots, \infty$$

Where :

X≡ number of successes.

P (X = x) ≡The probability of the given number of successes taking the value x.

λ ≡Average number of successes per unit of time.

e ≡ The basis of the natural logarithmic system e = 2.71828.

This distribution is represented by the symbol X ~ Pos (λ).

➢ *Distribution characteristics:*

1. Mean $E(X) = \lambda$
2. Variance $V(X) = \lambda$

➢ *Estimation of Poisson Distribution Parameter:[1]*

The average distribution community of Poisson (the first determination of society around zero) is: µ

=□

The average sample of Poisson distribution (the first determination of the sample around zero) is: $\grave{m} = \frac{1}{n}\sum_{i=1}^{n} x_i = \bar{x}$

By equating the intensity of the sample with the constraint of society, we find: $\hat{\lambda} = \bar{x}$

➢ *Normal Distribution[3] :*

Is one of the most frequent and most widely used probability distributions. It plays a major role in statistical theory and probability theory. This distribution was called normal distribution (or moderate or normal) because it was previously thought that any data on life should be represented and subject to this distribution , But it is now proven that this is not the case and that the belief is wrong. It is also known as the Gauss distribution, thanks to the German scientist Frederick Gauss, who developed mathematical distribution as a probability distribution in the year (1855-1777)

It is a continuous probability function, which is a gypsy shape, symmetrical around the arithmetic mean and moderate. Whenever we move away from the arithmetic mean in both directions, the normal distribution curve approaches the horizontal axis but never touches it.[2]

If x is a random variable connected to a natural distribution of the parameters (µ, σ), the distribution function is:

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \quad , -\infty \le x \le \infty$$

Where :

f (X) ≡ natural curved height.

μ ≡The mean of the distribution.

σ ≡ standard deviation.

e ≡ The basis of the natural logarithmic system e = 2.71828.

π ≡constant (π=3.14159).

This distribution is denoted by X ~ N (µ, σ)

➢ *characteristics of Distribution:*

1. Mean E(X)= μ
2. Variance V(X)= σ^2

A. Estimation of normal distribution parameters in the form of momentum [1]:

➢ *Estimation of the measurement parameter (µ):*

The average distribution community of Normal Distribution(the first determination of society around zero) is: $\grave{\mu} = \mu$

The average sample of Normal Distribution (the first determination of the sample around zero) is:

$$\grave{m} = \frac{1}{n}\sum_{i=1}^{n} x_i = \bar{x}$$

By equating the intensity of the sample with the constraint of society, we find:

$\hat{\mu} = \bar{x}$

ISSN No:-2456-2165

B. Estimating the shape parameter (σ):

The variation of the normal distribution society (the second determination of society around zero) is: $\mu_2 = \sigma^2$
The variation of the normal distribution sample (the second determination of the community around zero) is: $m_2 = s^2$
And the equality of the sample with the reluctance of the community:

$$\widehat{\sigma^2} = \frac{1}{n}\sum_{i=1}^{n}(x_i - \mu)^2 = s^2$$

- *Gamma Distribution[3]:*

It is used to study the time between the arrival of words to a particular service center, such as the arrival of the baker to a bank or the entry of patients to the hospital. A function known as Γα) As follows [3]:

1. If n is positive, the integration is approximated and is:
   i. Γ (1) = 1
   ii. Γn = (n-1) Γ (n-1)

2. If n is a positive integer, then:

$$\Gamma\alpha = (\alpha - 1)\Gamma(\alpha - 2) \times \ldots \times 3 \times 2 \times 1$$

$$\therefore \Gamma\alpha = \alpha! \qquad \text{or} \qquad \Gamma(\alpha\Gamma\alpha = \int_0^\infty e^{-X}X^{\alpha-1}\,dx$$

The general picture of the distribution is:

$$\Gamma\alpha = (\alpha - 1)\Gamma(\alpha - 2) \times \ldots \times 3 \times 2 \times 1$$

$$\therefore \Gamma\alpha = \alpha! \qquad \text{or} \qquad \Gamma(\alpha\Gamma\alpha = \int_0^\infty e^{-X}X^{\alpha-1}\,dx$$

The general picture of the distribution is:

$$f(X) = \frac{1}{\Gamma\alpha \quad \beta^\alpha} x_i^{\alpha-1} e^{-\frac{X}{\beta}} \quad , \quad x > 0 \quad , \quad \alpha, \beta > 0$$

- *characteristics of Distribution:*

1. Mean E(X)= $\alpha\beta$
2. Variance V(X)= $\alpha\beta^2$

- *Estimation of two distribution parameters[1]:*

For the estimation of the measurement parameter (α) and the parameter of the form (β) for the distribution of the azimuth method, we compare the first sample of the sample ($\acute{m}_1$) with the first determination of the society ($\acute{\mu}_1$) and the second determination of the sample ($\acute{m}_2$) ($\acute{\mu}_2$) as follows:

The first determination of the community is:

$$\acute{\mu}_1 = E(X) = \alpha\beta$$

The first momentum of the sample is: $\acute{m}_1 = \frac{1}{n}\sum_{i=1}^{n} x_i = \overline{x}$

The second goal of society is: $\acute{\mu}_2 = E(X^2) = \alpha^2\beta(\beta + 1)$

The second torque of the sample is: $\acute{m}_2 = \frac{1}{n}\sum_{i=1}^{n} x_i^2$

By equating the first moment of the sample with the first moment of society:

$$\overline{x} = \hat{\alpha}\hat{\beta}$$

By equating the second moment of the sample with the second moment of society, $\frac{1}{n}\sum_{i=1}^{n} x_i^2 = \alpha^2\beta(\beta + 1)$

From equation $\overline{x} = \hat{\alpha}\hat{\beta}$ we find that:

$$\hat{\beta} = \frac{\overline{x}}{\hat{\alpha}}$$

And compensation $\hat{\beta} = \frac{\overline{x}}{\hat{\alpha}}$ In the equation $\frac{1}{n}\sum_{i=1}^{n} x_i^2 = \alpha^2\beta(\beta + 1)$ we find that:

$$\frac{1}{n}\sum_{i=1}^{n} x_i^2 = \alpha^2 \frac{\overline{x}}{\hat{\alpha}}\left(\frac{\overline{x}}{\hat{\alpha}} + 1\right)$$

$$\therefore \frac{1}{n}\sum_{i=1}^{n} x_i^2 = \hat{\alpha}\overline{x}\left(\frac{\overline{x}}{\hat{\alpha}} + 1\right)$$

$$\hat{\alpha}\overline{x} = \frac{1}{n}\sum_{i=1}^{n} x_i^2 - \overline{x_i}^2$$

But $\hat{\alpha}\overline{x} = s^2$ To that:

$$s^2 = \frac{1}{n}\sum_{i=1}^{n} x_i^2 - \overline{x_i}^2$$

Such as :

$$\hat{\alpha} = \frac{s^2}{\overline{x}}$$

And in the same way of the equation $\hat{\alpha} = \frac{\overline{x}}{\hat{\beta}}$ And compensation in $\frac{1}{n}\sum_{i=1}^{n} x_i^2 = \alpha^2\beta(\beta + 1)$ we find that :

$$\hat{\beta} = \frac{\overline{x}}{s^2}$$

- *Maximum likelihood Method[1]:*

Maximum likelihood classification assumes that the statistics for each class in each band are normally distributed and calculates the probability that a given pixel belongs to a specific class. Unless you select a probability threshold, all pixels are classified. Each pixel is assigned to the class that has the highest probability (that is, the maximum likelihood). If the highest probability is smaller than a threshold you specify, the pixel remains unclassified.

ENVI implements maximum likelihood classification by calculating the following discriminant functions for each pixel in the image (Richards, 1999):

$$g_i(x) = 1\text{n}\, p(\omega_i) - {}^1\!/_2\, 1\text{n}\, |\Sigma_i| - {}^1\!/_2 (x - m_i)^T \Sigma_i^{-1} (x - m_i)$$

[1] Richards, J. Remote Sensing Digital Image Analysis, Berlin: Springer-Verlag (1999), 240 pp.

Where:
i = class
x = n-dimensional data (where n is the number of bands)
$p(\omega_i)$ = probability that class ω_i occurs in the image and is assumed the same for all classes
$|\Sigma_i|$ = determinant of the covariance matrix of the data in class ω_i
Σ_i^{-1} = its inverse matrix
m_i = mean vector

III. MATERIALS AND METHODS OF RESEARCH

- Distributed tracking data is generated as follows: Distributed tracking data was generated using the Minitab program as follows: Generation of the size of society M from binomial distribution X ~ B (n, P) with knowledge of (n, P) and distribution of Poisson X ~ Pos (λ) by λ and natural distribution X ~ N (μ, σ) , σ), and the distribution of X ~ Gamma (α, β) by (α, β).
- Choose a sample size (n) and denote it with the symbol j.
- Determination of parameters for both binomial distribution, Poisson, natural, and gamma.
- Repeat steps 1-3 of j = 1,2,3

➢ *Monte Carlo simulation results:*

Distributed tracking data has been generated as follows:
Generate data for binomial distribution with sample sizes 10, 30, 50 and 70 and with parameter P, 0.3, 0.5, 0.7 and 0.9, and n parameter B10.
And generate Poisson distribution trace data with sample sizes 10, 30, 50 and 70 and with parameter λ 0.3, 0.5, 0.7 and 0.9.
And generate natural distribution tracking data with sample sizes 10, 30, 50 and 70 and with the parameter σ 0.3, 0.5, 0.7 and 0.9 and the parameter μ (10).
And generate distribution trace data with sample sizes 10, 30, 50 and 70, with a parameter of α 0.3, 0.5, 0.7, 0.9 and β parameter (10).

➢ *Analysis, interpretation and discussion:*

Sample size	shape parameter	Estimator MSE	Distribution				Less MSE
			Binomial (P)	Poisson (λ)	Normal (σ)	Gamma (α)	
10	0.3	shape	0.19	0.5	0.225	16.2399	Poisson
		MSE	0.00121	0.00004	0.00056	25.408	
	0.5	shape	0.52	0.9	0.415	4.697	binomial
		MSE	0.000004	0.016	0.00072	1.7615	
	0.7	shape	0.77	0.1	0.61	20.2214	binomial
		MSE	0.00049	0.036	0.00081	38.109	
	0.9	shape	0.91	0.6	0.778	3.5919	binomial
		MSE	0.000001	0.009	0.0015	0.7246	

Table 1:- Determination of the shape parameter for probability distribution with parameter (0.3), (0.5), (0.7) and (0.9) and sample size (10):
Source: The Researcher by Minitab

From Table (1) we find that at the sample size 10 and the parameter of Fig. 0.3, the estimation of the shape parameter using the float method is best when parsing the Poisson because the estimated value of 0.5 is the appropriate and close to the value of the parameter of figure 0.3 and the lowest average error box MSE is equal to 0.00004 , We find that at the size of sample 10 and the parameter of Fig. 0.5, 0.7 and 0.9, the estimation of the shape parameter using the zoom method is preferable for binomial distribution because the estimated values are close to the parameter values of the shape and the mean mean error box MSE is equal to 0.000004 and 0.00049 and 0.000001 respectively.

Sample size	shape parameter	Estimator MSE	Distribution				Less MSE
			Binomial P	Poisson λ	Normal σ	Gamma α	
30	0.3	shape	0.3067	0.3	0.3731	8.5042	Poisson
		MSE	0.00000015	0	0.00018	2.2436	
	0.5	shape	0.48	0.533	0.4817	5.2591	Normal
		MSE	0.0000013	0.0000036	0.0000011	0.7549	
	0.7	shape	0.7067	0.467	0.682	7.8884	binomial
		MSE	0.00000015	0.0018	0.0000011	1.7224	
	0.9	shape	0.9133	0.767	0.765	5.6944	binomial
		MSE	0.00000059	0.00059	0.00061	0.7662	

Table 2:- Determination of the shape parameter for probability distribution with parameter (0.3), (0.5), (0.7), (0.9) and sample size (30):
Source: The Researcher By Minitab

From Table (2) we find that at the sample size 30 and the parameter of Fig. 0.3, the estimation of the parameter of the shape using the float method is best when parsing the Poisson because the value of the estimated 0.3 is equal to the value of the parameter of figure 0.3 and the lowest mean of the MSE error box is 0, We find that at the sample size 30 and the parameter of Fig. 0.5, the estimation of the shape parameter using the zoom method is better at normal distribution because the estimated value of 0.4817 is close to the value of the parameter of figure 0.5 and the lowest mean of the MSE error box equals 0.0000011. When the sample size is 30 and the parameter of Fig. 0.7 and 0.9, the estimation of the shape parameter using the float method is best when the binomial is distributed because the estimated values are close to the parameter values of the shape and the mean mean error box MSE is equal to 0.00000015 and 0.00000059, respectively.

Sample size	shape parameter	Estimator MSE	Distribution				Less MSE
			Binomial (P)	Poisson (λ)	Normal (σ)	Gamma (α)	
50	0.3	shape	0.296	0.24	0.304	9.4982	Normal
		MSE	0.000000032	0.0000072	0.00000000	1.6921	
	0.5	shape	0.49	0.66	0.558	11.871	binomial
		MSE	0.0000006	0.000512	0.0000067	2.5859	
	0.7	shape	0.658	0.52	0.6419	9.1149	binomial
		MSE	0.0000035	0.00065	0.0000068	1.4162	
	0.9	shape	0.926	1.000	0.804	10.3022	binomial
		MSE	0.0000014	0.0002	0.00018	1.768	

Table 3:- Determination of the shape parameter for probability distribution with parameter of (0.3), (0.5), (0.7) and (0.9) and sample size (50):
Source: The Researcher By Minitab

From Table (3) we find that at the sample size 50 and the parameter of Fig. 0.3, the estimation of the shape parameter using the zoom method is better at normal distribution because the estimated value of 0.304 is close to the value of the parameter of figure 0.3 and the lowest average error box MSE is equal to 0.0000000, That at the sample size 50, 0.7 and 0.9, the estimation of the shape parameter using the zoom method is preferable for binomial distribution because the estimated values are close to the parameter values of the shape and the mean mean error box is MSE and is equal to 0.0000006, 0.0000035 and 0.0000014, respectively.

Sample size	shape parameter	Estimator MSE	Distribution				Less MSE
			Binomial (P)	Poisson (λ)	Normal (σ)	Gamma (α)	
70	0.3	shape	0.3114	0.3429	0.29	6.2751	Normal
		MSE	0.00000019	0.0000026	0.00000014	0.51003	
	0.5	shape	0.4857	0.4286	0.403	4.5514	binomial
		MSE	0.00000029	0.0000073	0.00013	0.2345	
	0.7	shape	0.7114	0.7143	0.5802	10.9316	binomial
		MSE	0.00000019	0.00000029	0.00021	1.4955	
	0.9	shape	0.91143	0.857	0.921	21.7647	binomial
		MSE	0.00000019	0.0000026	0.00000063	6.2191	

Table 4:- Determination of the shape parameter for probability distribution with parameter of (0.3), (0.5), (0.7) and (0.9) and sample size (70):
Source: The Researcher By Minitab

From Table (4) we find that at the sample size 70 and the parameter of Fig. 0.3, the estimation of the shape parameter using the zoom method is better at the normal distribution because the estimated value of 0.29 is close to the value of the parameter of figure 0.3 and the lowest average error box MSE is equal to 0.00000014, That at the sample size 50, 0.7 and 0.9, the estimation of the shape parameter using the zoom method is preferable for binomial distribution because the estimated values are close to the parameter values of the shape and the mean mean error box MSE is equal to 0.00000029, 0.00000019 and 0.00000019, respectively.

IV. CONCLUSIONS

We have proposed a composite estimation scheme for the shape parameters of Using the Moment Method and Maximum Likelihood Method. With the proposed method, estimates of the shape parameters, the study came out with the following results and recommendations:

A. Firstly: the Results:

- For the size of sample (10) to estimate the small shape parameter (0.3) for binomial and Poisson distributions, and natural, they can use the Poisson distribution because it is the best among the distributions. To estimate the parameter of figure (0.5), (0.7)), The binomial can be used because it is preferable to double-edged distributions.
- In the sample size (30) to estimate the small shape parameter (0.3) for binomial distributions and Poisson and natural, they can use the Poisson distribution because it is the best among the distributions. Among the distributions, and to estimate the shape parameter (0.7), (0.9), the binomial distribution can be used because it is the best among the distributions.
- In the sample size (50) for the estimation of the small shape parameter (0.3) for binomial and Poisson distributions and natural, they can be used for normal distribution because it is the best among the distributions. To estimate the parameter of figure (0.5), (0.7)), The binomial can be used because it is preferable to double-edged distributions.
- In the sample size (50) for the estimation of the small shape parameter (0.3) for binomial, Poisson and natural distributions, they can be used for normal distribution because it is the best among the distributions. To estimate the parameter of figure (0.5), (0.7)), The binomial can be used because it is preferable to double-edged distributions.

B. Secondly **:***Recommendations:*

- Use a binomial distribution to estimate the shape parameter (0.9) at sample size (10), (30), (50), (70).
- Expanding the study of a number of community distributions.
- Application of a number of estimation methods for binomial distributions, Poisson, natural.
- We concluded then, that The Moment Method generally gives more accurate estimates, followed by the method of maximum likelihood. The The Moment Method less satisfactorily, although in some instances the estimates derived are very similar to those of the method of maximum likelihood.

REFERENCES

[1]. Adnan Abbas Humaidan, Matanios Makhoul, Farid Ja'ouni, Ammar Nasser Agha (2015-2016) Applied Statistics Faculty of Economics, University of Damascus.
[2]. Ahmed Hamad Nouri, Ihab Abdel-Rahim Al-Dawi (2000) Statistics for Social and Administrative Sciences, Al-Jazeera University, First Edition.
[3]. Bajja Jie, Maala, Naifah, Murad, Awa, (1998) Operations Research, translator of the Arab Center for Arabization and Translation, Publishing and Publishing in Damascus.
[4]. Hossam Bin Mohammed The Basics of Computer Simulation (King Fahd National Library, Al Rayah, 2007).
[5]. Jalal al-Sayyad Statistical Inference
[6]. Nutrition and simulation Dr. Adnan Majed Abdulrahman (King Saud University 2002).
[7]. Richards, J. Remote Sensing Digital Image Analysis, Berlin: Springer-Verlag (1999), 240 pp.
[8]. Zine El Abidine Abdel Rahim El-Basheer and Ahmed Odeh, (1997) Statistical Inference, King Saud University Press Riyadh, Saudi Arabia.