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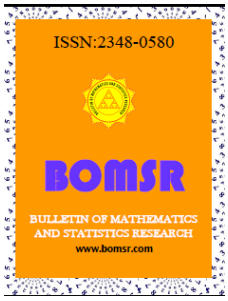
ON PROPORTIONAL ALLOCATION OF STAFF SALARY USING STRATIFIED RANDOM SAMPLING:A FOCUS ON MONIK. D NIGERIA LIMITED

ORUMIE, U.C AND AKPAN N.P

DEPARTMENT OF MATHEMATICS/STATISTICS, UNIVERSITY OF PORT HARCOURT, RIVERS STATE, NIGERIA



ABSTRACT

This research employed the stratified random sampling concepts in analysing the salary wages of workers in MONIK D Nigeria limited. From the analysis, the ratio between the salaries of the different branches, their mean (average of the salary) , their individual standard errors were obtained, alongside with their interval estimation of the salary wages for the various branches.

Keywords: stratified random sampling, wages of worker, proportisonal allocation.

1.0 INTRODUCTION

Determination of workers Salary wages requires detail analyses (analysing) of the contribution of employees in order to distribute fairly, direct and indirect monetary and non-monetary rewards within an organisation ability, pay and legal regulation.

According to Nwachukwu (2000) and Ogunbameru (2000), “wage and salary administration” implies to the development, implementation and on-going maintenance of a base pay system.

Salary wages administration in Nigeria has been a subject of controversy that if not handled will result to serious issue in the context of Nations politico-administrative setup.

This results to the need for the long distinction in class of some of these workers in companies. That is, some staff in the same company earns more than other while some earn same amount.

However, the researcher wants to apply a stratified sampling technique in Monik D Nigeria limited. This is to check whether all their branches have equal pay for their workers that are of the same category by calculating; the salary wages of workers in Monik D Nigeria limited by; computing the mean salary of the various branches, calculating their variances and standard error, calculating the sample proportion of the population i.e. the ratio between each stratum, calculating the interval estimation of the salary wages.

However, Monic D Limited .is a manufacturing company , privately owned that produces steel, aluminium roofing sheets and cooking utensils of various shapes. It was established in 1989. It has its factories at situated at WARRI, PORTHARCOURT, LAGOS, IBADAN, ABIA, and AKURE.

Frankel and Wallen (2006), observed that Stratified random sampling is a process in which certain subgroup or strata are selected for the sample in the same proportion as they exist in the population In stratified sampling, the researcher first identifies the strata of interest and then randomly draws a specified number of subjects from each stratum; either by taking equal numbers from each stratum or in proportion to the size of the stratum in the population

Fraenkel and Wallen (2006), employs that simple random sample is one which each member of the population has an equal and independent chance of being included in the random sample. If the sample is large, this method is the best way to obtain a sample representativeness of the population

According to Frankel and Wallen (2006), the advantage of random sampling is that it is very likely to produce a representative sample if the sample is large enough. The biggest disadvantage is that it is not easy to do.

According to Ary et al (2002), an advantage of stratified sampling is that it allows the researcher to study different subgroups of a population and guarantees representation of defined groups in the population. Provided that the population covered must be defined in terms of content, unit extent and time.

Section two is the background of study whereas section three is the brief history of the company. Types of sampling techniques is presented in section four. Section five and six describes methodology and the method of data collection respectively. Section seven is the analyses whereas section nine and ten are interpretation of result and conclusion.

2 Background of study

Sampling is a statistical method of selecting and using a representative part of a whole (sample) to generate or obtain the fact about the entire population. Sampling is used extensively in our everyday life to obtain the required information or to carry out a course of action.

Sampling is all about drawing inference about a population of interest. One of the important objectives of sampling is that it saves cost and if a large population is collected the data is often reliable.

The inference drawn from the sample is extended to the whole group. This is done by identifying the target population as precisely as possible and put together a list of the target population from which the sample will be collected and the list is termed as frame. We select the sample and decide the sampling technique to be used.

In statistics, a population is an entire set of objects or units of observation of one sort or another while a sample is a subset (usually proper subset) of a population selected for a particular study (usually because it is impractical to study the whole population).

3. TYPES OF SAMPLING TECHNQUES

3.1. Simple random sampling: This deals with the sample drawn from population and contain a finite number of N units if the units can all be distinguished from one another then the number of distinct samples of size n can be drawn from N units is given by

$$NC_n = N!/C\ (n!)*((N-n)!)$$

The objective here is to select n units out on N such that each number of combinations has an equal chance of being selected.

3.1.1. SAMPLING WITH AND WITHOUT REPLACEMENT

There are two choices we make when using random sampling, the first which we call ''with replacement'' sampling is such that is entirely feasible at any draw to include a unit already selected in the previous draw and the second choice which we call '''without replacement'' sampling. A given unit cannot be included in the sample a second time once already drawn in the previous draw. Thus all the N members of the population have an equal chance of being drawn only at the first draw. That is at the first draw the probability that a specific is selected is n/N at the second draw, the probability that a unit selected from the remaining (N-1) units is n-1/N-1 and so on hence a probability that all n specific units are selected is n! (N-n)!/N=1/N^{C}n.

3.2. SYSTEMTIC SAMPLING

In this method, instead of randomly selecting each case in the sample, we randomly select a starting point and systematically take every k^{th} member of the population. It is a process of selecting a sample in such a way that every unit in the population will have an equal chance of being selected. The sample procedure here is that once the first unit is randomly selected the remaining units are automatically selected. Systematic sampling is a non-commonly employed method. After numbers are allocate to everybody in the population frame the first individual is picked using a random number table and then subsequent subjects are selected using a fixed sampling interval i.e. every n^{th} person. Care needs to be taken when using a systematic sampling method in case there is some biases in the list of individual are compiled.

3.3. CLUSTER SAMPLING

Let a simple random sample of N cluster units be drawn from a population consisting of N clusters units with each cluster unit containing M equal numbers of sub-unit or elements. Let observation be made on all the elements of the entire n sampled cluster unit. Then the entire procedure is referred to as simple stage cluster sampling. Cluster sampling can be taken to be a simple random sampling in which each sampling units is a collection or cluster of elements.

The use of cluster sampling is appropriate when a good sampling frame of the population elements is not available of highly to procure and when sample cost or cost of observing the individual element increases tremendously as the distance within the element increases.

Thus cluster sampling is basically used when we have no sample frame i.e. list of all the elements in the population are clustered in large units and each unit or cluster contains several elements of the population.

3.4. DISPROPORTIONATE SAMPLING

If our objective were to compare the results of our minority group with the larger group, then we will have difficulty in doing so without using disproportionate sampling method. With disproportionate sampling the strata selected are not selected pro-rata to their size in the wider population. For instance, if we are interested in comparing the referral rates for a particular minority group with other larger group, then it is necessary to over sample in smaller categories in other to achieve statistical power that is in order to be able to demonstrate statistically significance differences between groups if such difference exist.

3.5. NON- RANDOM SAMPLING

Non-random (or non-probability) sampling is not used very often in quantitative medical social research surveys but is used increasingly in market research and commissioned studies. The technique most commonly used is called quota sampling.

3.5.1 QUOTA SAMPLING

Quota sampling is a technique of sampling whereby the researcher decides in advance on certain key characteristics which he/she uses to stratify. Interviewers often set sample quotas in

terms of age and sex. The difference of quota sampling and a stratified sample is that the respondents in a quota sample are not randomly selected within the strata.

The respondents may be selected just because they are accessible to the interviewers. Because random sampling is not employed, it is not possible to apply inferential statistics and generalize the findings to a wider population

3.5.2 STRATIFIED RANDOM SAMPLING

Stratification is a method of using auxiliary information to increase the precision of the estimate of the population characteristics. Stratified sampling is used when a population comprising different groups where elements in each group are similar to one another in some ways.

A stratified sample is one obtained by separating the population element into non overlapping group called strata and then selecting some observation from each stratum to obtain full benefit stratification, the values of N and n must be known.

Stratified sampling is useful when the population is heterogeneous and it is possible to establish strata which are reasonably homogenous within each one. In this project we shall be using stratified random sampling in analysing our data because it is going to help us gain sampling precision (reduce the variance of our estimation) as well as reduce cost of survey by treating the different group separately.

4. METHODOLOGY

4.1.1 STRATIFIED RANDOM SAMPLING

Stratification is a method of using auxiliary information to increase the precision of the estimate of the population characteristics. Stratified sampling is used when a population comprising of different groups where elements in each group are similar to one another in some ways. It involves dividing the population into homogeneous non-overlapping groups called strata. Any strata which make the unit homogeneous within and heterogeneous between are considered a good choice of strata.

Stratified sampling involves the division of population into smaller groups known as strata and the strata are formed based on members, shared attributes, or characteristics. A random sample from each stratum is taken in a number proportional to the stratum size when compared to the population. The subsets of the strata are then pooled to form a random sample.

Stratified sampling captures key population characteristics in the sample and it works well for a population with a variety of attributes. In stratified sampling the strata are non-overlapping and together they make up the entire population

4.1.2 NOTATIONS

H: number of strata in the population.

N: number of observation in the population.

N_h: number of observation in the stratum h of the sample.

P_h : The true proportion in stratum h of the population.

δ : the known standard deviation of the population

δ^2 : the known variance of the population

δ_h : The known standard deviation of stratum h of the population

X: sample estimation of the population mean.

X_h: the mean of observation from stratum h of the sample.

S_h: the sample estimate of the population standard deviation in stratum h.

S^2_h: the sample estimate of the population variance in stratum h.

n: number of observation in the sample

n_h: number of observation in stratum h of the sample.
SE: standard error
W: weight of stratum.
F: sample fraction
∑: summation symbol.
Y_{hi}: the i^{th} observation in the h^{th} stratum

4.1.3 STATUM ESTIMATION METHOD, VARIANCES AND STANDARD ERROR'S

$$\text{var } u_h = \text{var}(y_h) = \left(\frac{N_h - n_h}{N_h}\right)\left(\frac{s_h^{\,2}}{n_h}\right) \quad . \tag{1}$$

$$\text{var}(T_h) = \text{var}(N_h u_h) = N_h(N_h - n_h)\left(\frac{s_h^{\,2}}{n_h}\right) \tag{2}$$

$$\text{Where } S^2h = \sum_{1}^{nh}\left(\frac{(y_{h_j} - y_h)^2}{n_h - 1}\right) \tag{3}$$

Recall that SEs is the square roots of the variances.

4.1.3.1 ESTIMATION OF POPULATION MEAN

In order to estimate the population mean ŷ, a simple sample of size n_h is drawn without replacement from the population of N_h stratums units. Let y_{hi} be the value obtained from the i^{th} stratum

The estimate of the population mean is given by

$$\left(\bar{y}_{s_t}\right) = \sum_{h=1}^{L} W_h y_h \qquad \text{(St. stands for stratified)} \tag{4}$$

$$W_h = \frac{N_h}{N} \qquad \text{(Is the } h^{th} \text{ stratum weight)} \tag{5}$$

$$\left(\bar{y}_h\right) = \frac{1}{n_h}\sum_{i-1}^{nh} y_{h_{i_i}} \qquad \text{(is the } h^{th} \text{ sample stratum mean)} \tag{6}$$

Clearly the stratified mean y_{st} is an unbiased estimator of the population mean, since

$$E\left(\bar{y}_{s_t}\right) = \sum_{h=1}^{L} E(y) = \sum_{h=1}^{L}\left(\frac{N_h}{N(Yh)}\right) = \frac{1}{N}\sum_{h=1}^{L} Y_h = Y \tag{7}$$

$\left(y_h\right)$ is the h^{th} stratum population mean

The variance of Y_{st} is derived as follows

$$V(Y_{st}) = \sum_{h=1}^{L} W_h{}^2 v(yh) + \sum_{h=1}^{L}\sum_{j=h}^{L} W_h W_j \ \ \text{cov}(y_h, y_j) \tag{8}$$

Since sampling is independent in the different strata, the covariance term in (4.3) is zero and we have for simple random sampling without replacement

$$V(\bar{Y}_{st}) = \sum_{h=1}^{L} W_h{}^2\left(\frac{1 - f_h}{n_h}\right) S_h{}^2 \tag{9}$$

$F_h = \frac{n_h}{N_h}$ is the h^{th} stratum sampling fraction (10)

S^2h is the h^{th} stratum population variance. It follows that the precision of y_{st} depends on how far we can reduce within stratum variability

4.1.3.1 ESTIMATION OF THE POPULATION PROPORTION

For a without replacement simple random sample of size n_h in h^{th} stratum an unbiased estimator of the population proportion is

$$P_{st} = \sum_{h=1}^{l} W_h p_h \tag{11}$$

P_h is the sample proportion in h^{th} stratum

The variance of P_{st} is given by

$$V(P_{st}) = \sum_{h=1}^{l} W_h{}^2 V(P_h) \tag{12}$$

$$\text{Which from } V(P) = \left(\frac{N-n}{N-1}\right)\left(\frac{PQ}{n}\right) = \left(\frac{1-f}{n}\right)\left(\frac{NPQ}{N-1}\right) \tag{13a}$$

Where Q =1-P comes out as

$$= \sum_{h=1}^{L} W_h{}^2 \left(\frac{N_h - n_h}{N_h - 1}\right)\left(\frac{P_h Q_h}{n_h}\right) \tag{14}$$

$$= \sum_{h=1}^{L} W_h{}^2 \left(\frac{1-f}{n}\right)\left(\frac{N_h P_h Q_h}{N_h - 1}\right)$$

The unbiased sample estimator of $V(P_{st})$ is

$$V(P_{st}) = \sum_{h=1}^{L} W_h{}^2 \left(\frac{N_h - n_h}{(N_h - n_h)(n_h - 1)P_h q_h}\right) \tag{15a}$$

$$= \sum_{h=1}^{L} W_h{}^2 \left(\frac{1-f}{n_h}\right)\left(\frac{N_h P_h q_h}{(N_h - 1)(n_h - 1)}\right) \tag{15b}$$

4.2 CONFIDENCE INTERVAL ESTIMATION OF MEAN AND PROPORTION

$$\mu_{s_t} \pm t_{\alpha/2} SE(\mu_{s_t})$$

$$P_{s_t} \pm t_{\alpha/2} SE(P_{s_t})$$

4.2.1 ALLOCATION OF SAMPLE SIZE

One of the problems in stratified sampling is the choice of the stratum sample size. In allocating sample size to strata the variability within stratum, stratum population size and the cost of obtaining information per element in each stratum must be taken into account. We have various methods of allocating sample size but most suitable one we would be using will be discussed briefly below.

4.2.2 PROPORTIONAL ALLOCATION

In proportional allocation, the sample size is selected such that the size of the population is proportional to the total number of units in each stratum i.e. $n_h \infty N_h$ or $n_h \infty W_h$. if the total sample size to be allocated is n, then the stratum sample size is given as $n_h = \left(\frac{n}{N}\right)N_h = nW_h$

thus in proportional allocation

$\frac{n_h}{n} = W_h = \frac{n_h}{N_h} = \frac{n}{N} = f$ in each stratum

For practical purposes proportional allocation is easy and simple to apply and it also yields modest gain in precision.

4.3 STEPS IN TAKING STRATIFIED RANDOM SAMPLING

1. The relevant strata (population subgroup) are identified
2. The number of member in each stratum is determined
3. A random sample is taken from each stratum in exact proportion to its size.

5 METHOD OF DATA COLLECTION

I am a secondary user of the data because I collected it from vik-monik Nigeria limited. The data consists of the different branches of vik-monic, the total population of workers and their salaries.

The aim of the stratified random sample is to reduce the potential for human biases in the selection of cases to be included in the sample. As a result, the stratified random sampling provides us with a sample that is highly representative of the population being studied, assuming that there is limited missing data.

Since the units selected for inclusion within the sample are chosen using probabilistic method, stratified random sampling allows us to make statistical conclusions from the data collected that will be considered to be valid. Relative to the simple random sampling, the selection of units using a stratified random sampling procedure can be viewed as superior because it improves the potential for the units to be more evenly spread over the population. Furthermore, where the samples are the same size, a stratified random sampling can provide greater precision than a simple random sample. Because the greater the precision of a stratified random sample compared with a simple random sample, it may be possible to use a smaller sample, which saves time and money.

The stratified random sample also improves the representation of particular strata (groups) within the population, as well as ensuring that those strata are not over represented. Together, this helps the researcher to compare strata as well as makes more valid inferences from the sample to the population.

6. ANALYSIS OF DATA.

Table 1: Population of the six branches of Monik D companies in Nigeria.

S/N	STATE	NUMBER OF WORKERS
1	. **WARRI**	100
2	**PORTHARCOURT**	100
3	**LAGOS**	150
4	**IBADAN**	50
5	**ABIA**	50
6	**AKURE**	50
TOTAL		500

The six branches share the same common characteristics related to salaries therefore the six branches are treated as different strata and a random sample is drawn from each stratum.

States	numbers of workers	y_{hi}
1. WARRI	100	60000, 55000, 35000, 28000, 32000, 21100, 27850, 130000, 20510 62430, 19300, 19800 44000, 43150, 90000, 15500, 45700, 34700 65200, 47970
2. PORTHARCOURT	100	140000, 93000, 70200 20500, 20700, 16400 19,900, 61120, 66000 73100, 25000, 48000 35400, 27000, 29700 48955, 62335, 55200 33000, 92000
3. LAGOS	150	70000, 85195, 24200, 42500, 35300, 55700 59720, 63780, 30790, 42720, 42730, 42000 131000, 120000, 49500, 57000, 60500 46770, 13800, 20900 35190, 16450, 62440 50150, 78700, 60100 63000, 25600, 40500 22000
4. AKURE	50	95000, 20150, 62440 19100, 37750, 27200 40000, 55700, 22000 31000
5. IBADAN	50	30000, 45000, 26000 28100, 58900, 33000 26700, 20000, 63250 16500
6. ABUJA	50	150000, 15600, 19200 20190, 78700, 86750 38150, 47210, 40850 66790

6.1 DATA ANALYSIS AND SOLVING

The weight of each stratum W_i is given by $W_i = \frac{Ni}{N}$ ……..

$W_1 = \frac{Ni}{N} = \frac{100}{500} = 0.2$, $W_2 = \frac{100}{500} = 0.2$, $W_3 = \frac{150}{500} = 0.3$

$W_4 = \frac{50}{500} = 0.1$, $W_5 = \frac{50}{500} = 0.1$, $W_6 = \frac{50}{500} = 0.1$

Our sample size is chosen randomly to be 100 out of the total population which is 500. We will use proportional allocation of the total sample size of the 6 strata. With proportional allocation the total

sample size of 100 must be allocated to the different strata in proportion to the computed strata weights

Thus for each i, i=1, 2, 3,…..,6 we compute n_i as

$N_i = nW_i$ this gives us the following sizes

n_1 =100(0.2)=20, n_2 =100(0.2)=20, n_3 =100(0.3) =30 , n_4 = 100(0.1) = 10 , n_5 = 100(0.1)=10 , n_6 = 100(0.1) =10

Table 3 Calculation of the average salary (mean) for each branch

STRATUM	N_h	n_h	w_h	$\bar{y}_h$	$W_h y_h$	$N_h y_h = Y_h$
WARRI	100	20	0.2	44860.5	8972.1	4486050
P.H.	100	20	0.2	57395.5	11479.1	5739550
LAGOS	150	30	0.3	50874.5	15262.35	7631175
ABUJA	50	10	0.1	56344	5634.4	2817200
IBADAN	50	10	0.1	32945	3294.5	1647250
AKURE	50	10	0.1	41034	4103.4	2051700
TOTAL	500	100	1.00	283453.5	48745.85	24372925

Solving for $y_h = \frac{1}{n_h}\sum y_{h_i}$

$$for\ warri \frac{1}{20} \times 897210 = 44860.5\ others\ were\ similarly\ obtained$$

A (i). The average salary per branch is given by

y_{s_t} = N48745.85

b (i). The total salary of all branches is given by

y_{s_t} = 500*48745.85 = 24372925

This can also be seen in column 7 in table 1.0

A(ii) The estimate the variance of y_{st} is obtained using the formula in (4.4) in chapter 3. And the result is given in column 4 of table 2.0

$v(y_{s_t})$ = 6594484.64

The standard error of $y_{s_t}, se(y_{s_t})$ = $\sqrt{659448464}$ =2567.9

Table 4 Calculation of standard error for each branch.

STRATUM	$1-f_h$	S^2h	$W^2h(1-f_h)\left(\frac{s_h^2}{n_h}\right)$	$N_h(N_h - n_h)\left(\frac{s_h^2}{n_h}\right)$
WARRI	0.8	768165878.7	1229065.406	3.072663515*10^11
PH	0.8	970984560.2	1553575.296	3.883938241*10^11
LAGOS	0.8	769881059	1847714.542	4.619286355*10^11
IBADAN	0.8	180123358.3	144098.6866	3.602467166*10^11
ABUJA	0.8	1700695382	1360556.306	3.401390764*10^11
AKURE	0.8	574343004.4	459474.4035	1.148686009*10^11
TOTAL			6594484.64	1.857974604*10^11

Where $f_h = 1 - \frac{n_h}{N_h}$

$1-\frac{20}{100}=0.8$, $1-\frac{30}{150}=0.8$, $1-\frac{10}{50}=0.8$, $S^2h = S^2h = \sum_{1}^{nh}\left(\frac{(y_{h_j}-y_h)^2}{n_h-1}\right)$

For Warri we have
$(60000—44860.5)^2$ + $(55000—44860.5)^2$ + $(35000—44860.5)^2$ + $(32000—44860.5)^2$ + $(28000—44860.5)^2$ + $(19800—44860.5)^2$ + $(130000—44860.5)^2$ + $(21100—44860.5)^2$ + … + $(19800—44860.5)^2$ =768165878.7, we do same for others.

The estimate of standard error or $y_{s_t}, se(y_{s_t})$ = $\sqrt{500^2}\times 659448464 = 1.2839\times 10^{12}$

Table 5 Proportion table

STRATUM	STRATUM SIZE N_h	Sample size n_h	Sample proportion p_h	Q=1-p
WARRI	100	20	0.2	0.8
PH	100	20	0.2	0.8
LAGOS	150	30	0.2	0.8
ABUJA	50	10	0.2	0.8
IBADAN	50	10	0.2	0.8
AKURE	50	10	0.2	0.8
TOTAL	500	100	1.2	

Table 6 Calculation of the sample proportion.

STRATUM	W_h	$W_h p_h$	$\Theta_h = W_h^2\left(\frac{p_h q_h}{n_h-1}\right)$	$\Theta_h\left(\frac{N_h-n_h}{N_h-1}\right)$
WARRI	0.2	0.04	0.000337	0.0002723
PH	0.2	0.04	0.000337	0.0002723
LAGOS	0.3	0.06	0.000497	0.0004002
ABUJA	0.1	0.02	0.000178	0.0001453
IBADAN	0.1	0.02	0.000178	0.0001453
AKURE	0.1	0.02	0.000178	0.0001453
TOTAL	1.00	0.2		0.0009805

$P_h = \frac{n_h}{N_h} = \frac{20}{100} = 0.2$

Using table 6, an unbiased estimator of the population proportion is p_{s_h} = 0.2 , i.e.=20%

The estimated variance of P_{st} , $V(P_{s_t})$ as calculated in table 6 in column 5 is $V(P_{s_t})$ = 0.0009805

The estimated standard error is ; $Se(p_{st}) = \sqrt{0.0009805} = 0.03131$

6.2 INTERVAL ESTIMATION

6.2.1 INTERVAL ESTIMATION OF PROPORTION FOR THE BRANCHES.

At 95% confidence interval

$N0.2 \pm (2.079)(N0.03131)$

$N0.2 + 0.06509 = 0.2650$

$N0.2 - 0.06509 = 0.13491$

$(0.13491, 0.2650)$

6.2.2 INTERVAL ESTIMATION FOR THE AVERAGE SALARY OF EACH BRANCH

At 95% confidence interval

$N48745.85 \pm (2.079)(2567.9)$

$N48745.85 + 5338.66 = 54084.5$

$N48745.85 - 5338.66 = 43407.10$

$(43407.10, 54084.5)$

7 SUMMARY AND CONCLUSION

Based on this analysis, we are 95% sure that the average salary falls between N54084.5 and N43407.10, and for the proportion the highest percentage is between 0.2 and 0.8.

From table 1, we conclude as follows:

Warri falls within the interval estimation, and it is consider normal.

Port Harcourt does not fall within the interval estimation

LAGOS falls within the interval estimation, so we consider it normal.

Abuja does not fall within the interval estimation

Ibadan falls within the interval estimation which is also normal.

AKURE falls within the interval estimation and it is considered normal.

However, research is to check if the workers are paid equal. It can be seen that workers of all branch are not paid equal, and the reason may be due to some economic factors such as high cost of living in some branches or the turn over that they are making or high cost of labour and so on. We believe that if these factors are held constant, probably, their wages will be equal in all the branches. However, the interval estimation shows that the salary wages for all the branches is within the upper and lower limit except Port Harcourt and Abuja although the difference is not quite significant.

REFERENCES

[1]. Ary, D, Jacobs, LC and Razavieh, A (2002) introduction to research in education

[2]. Atchison, T.J. (2003). Wage and Salary Administration, in Personnel Administrator January, 2003.

[3]. Baxter L.A and Babbie E.R (2004). The basic of communication research New York: Wads Worth Thompson Belmont, (A:Wadsworth /Thompson learning).

[4]. Chatterjee (1967) A note on optimum stratification skand. Atk. 50, 40-44.

[5]. Cochran W.G. (1977). Sampling technique 3rd edition. John Wiley and sons. New York Creative research system (2007) the survey system

[6]. Fabian .C. Okafor (2002) sampling methods and technique. University of Nigeria Nsukka.

[7]. Fowler F.J (2002) survey research methods. Thousand oaks, (A: sage publication).

[8]. Frankel J.R and Wallen N.E (2006) how to design and evaluate research in education. New York: Mc Graw Hill.

[9]. Frankfort-Nachmias, c and Leon Guerrero, A (1997) social statistic for a diverse society. Thousand oaks CA: pine forges.Harcourt http://www.survey system.com/ sdesign.htm:

[10]. Kish L. (1996). Survey sampling New York: Wiley

[11]. Lindergren, B.W. (1993). Statistical theory (4th edition). Boca Raton. FL; chapman-hall.

[12]. Nwachukwu, C. C. (2000). Human Resources Management. University of Port-Harcourt Press, Port-

[13]. Ogunbameru, O.A. (2004). Organizational Dynamics. Spectrum Books Ltd, Abuja

[14]. Popham W.J (1993). Educational evaluation Needham Heights. MA: Alyn and Bacon.

[15]. Rao, P.S.R.S (2002). Sampling methodologies with application. Boca Raton FL; chapman-hall

[16]. Reniard (2006)
[17]. Stuart A (1984). The ideas of sampling (3rd edition) New York Mac Millan.
[18]. Sudman s. (1987). Applied sampling, London: Academic