International Journal of Human Resource Studies
ISSN 2162-3058
2012, Vol. 2, No. 3

Job and Work Attitude Determinants: An Application of Multivariate Analysis

Peter Josephat (Corresponding author)
Dept. of Statistics, University of Dodoma
P. O. Box 338, Dodoma, Tanzania
E-mail: mtakwimu@yahoo.com

Abbas Ismail
Dept. of Statistics, University of Dodoma
P. O. Box 338, Dodoma, Tanzania
E-mail: abbasism2003@yahoo.co.uk

Accepted: August 25, 2012 Published: September 29, 2012
Doi:10.5296/ijhrs.v2i3.2348 URL: http://dx.doi.org/10.5296/ijhrs.v2i3.2348

Abstract

This paper analyzed variables that used to measure job and work attitude of an employee in an organization. Analysis was done using multivariate analysis. Data used was collected from Dodoma and Musoma municipalities as the municipalities were randomly selected. A sample size of the study was 118. Cross sectional research design was adopted. The study found that there are five factors which influence job and work attitude. These are satisfaction, independency, teamwork, freedom of expression and supervisory relationship. All these factors are significantly positive related to dependent variable job and work attitude.

Key words: Job and work attitude, Multivariate analysis, factor analysis, Factor

1.0 Introduction

1.1 Job and Attitude in an Organization

Organization performance is influenced by work commitment. Work commitment is the second most commonly studied job attitude in industrial and organizational psychology. Work commitment affects all organizations (The Pennsylvania State University, 2011). Loscoco (1989) defined work commitment as the relative importance between work and one's self. Employee attitudes and the inclusion of their opinions and suggestions are most important in today's global and competitive work environment (Knapp and Mujtaba, 2009). Globally, governments are constantly striving to keep abreast of an ever-changing world while being challenged with rapidly changing public's needs and expectation, and who are getting affluent and knowledgeable (ACCSM, 2007).

Saari and Judge (2004) mentioned three gaps between human resource practice and the scientific research in the area of employee attitudes. These includes: the causes of employee attitude; the result of positive or negative job satisfaction; and how to measure and influence employee attitudes. Apart from these gaps, the paper found that there were limited studies focused on identifying variables to be used to measure attitude, job satisfaction or influence of employee attitude. It has been experienced that the variables involved based on theories and not data.

Basing on the importance of job and work attitude in an organization, there is a need of applying statistical tests in order to identify the factors to be involved in measuring employee attitude. Despite having theories, there is a need of using data to establish variables of measuring job and work attitude.

This paper analyzed variables used by Knapp and Mujtaba (2009) in their employee survey study with the objective of establishing variables that will be used to measure employee attitude. It is considered job and work attitude is influenced by factors such as team work, communication, independency, contribution on attitude and supervisory relationship. A total of nine (9) variables which follows under job and attitude factor were taken into account against thirty five (35) items follows in the independent factors.

Selection of variables is done using multivariate analysis. Multivariate analysis concerned with the statistical analysis of the data collected on more than one (response) variable. Multivariate analysis techniques are useful when observations are obtained for each of a number of subjects on a set of variables of interest, the dependent variables, and one wants to relate these variables to another set of variables, the independent variables (Timm, 2000).

Multivariate analysis consists of several methods such as principal component analysis, correspondence analysis, cluster analysis, multiple linear regression, canonical correlation, discriminant analysis and factor analysis. Use of each of the method depends on the nature of data. For the purpose of this study factor analysis method was adopted.

1.2 Introduction to Factor Analysis

Factor analysis is a method for investigating whether a number of variables of interest are linearly related to a smaller number of unobservable factors (Tryfos, 1997). Factor analysis removes redundancy or duplication from a set of correlated variables. After performing factor analysis fewer variables are obtained which represents the rest of the variables. This method

was preferred because some of the variables used by Knapp and Mujtaba (2009) were seem to be the same. Through factor analysis variables are identified by forming groups of variables (subsets) that are relatively independent of each other.

Factor analysis was invented in the early twentieth-century by Karl Pearson. It was developed primarily by scientists interested in psychometric measurements. Arguments over psychological interpretations of several early studies and the lack of powerful computing facilities impeded its initial development as a statistical method (Johnson and Wichern, 1992). Since then the method has been used extensively.

The essential purpose of factor analysis is to describe the covariance relationships among

many variables in terms of a few underlying unobservable random quantities called factors. Variables can be grouped by their correlations, that is all variables within a particular group are highly correlated among themselves but have relatively small correlations with variables in a different group. Each group of variables represents a single underlying construct, or factor, that is responsible for the observed correlation (Shi, 2006). Factor analysis was adopted due to the fact that job and work attitude cannot be measured by a single variable but rather with a combination of variables which need to be quality in measure.

2.0 Material and Methods

2.1 Data

Data used to examine job and work attitude determinants were collected from two municipal councils: Musoma and Dodoma. These are municipalities found in Tanzania. The selection of the two municipal councils was random. The data were collected from 118 respondents of which 58 and 60 employee were from Dodoma and Musoma Municipal councils respectively. Stratified sampling technique was adopted to select the respondents basing on department e.g. administration, education, health, works, agriculture and livestock, finance and community development. Data were obtained from cross-sectional surveys as information was collected at a single time.

2.2 Data Collection

The study used only primary data. Attitudinal data information from employee of the two municipalities was collected through questionnaire. Information was collected from five independent factors namely: team work; communication; independency; contribution on attitude; and supervisory relationship against dependent factor "job and work attitude" based on Knapp and Mujtaba (2009) idea. Items for each factor can be seen in Appendix 1.

2.3 Data Analysis

There are many methods for parameter estimation in factor analysis. The three most commonly used are Principal Component Analysis, Principal Factor Analysis, and the Maximum Likelihood Method (Johnson and Wichern, 1988). In this study the Principal Component Analysis (PCA) was used to summarize patterns of correlations among observed variables and to reduce a large number of observed variables to a smaller number of factors. PCA was adopted because the interest was empirical summary of the data set. Thereafter regression analysis was used to determine to what extent do dependent and independent variables relates.

3.0 Result

Result of the paper is presented in mainly two parts. The first part is factor analysis and the second part is regression analysis. While factor analysis is all about variables reduction, regression analysis discusses relationship between dependent and independent factors generated from factor analysis.

3.1 Factor Analysis

Analysis for dependent and independent variables is done differently. In both cases four things have been considered: correlation matrix; factor extraction; factor rotation; and decision about number of factors to be involved.

Correlation matrix is the starting point of factor analysis. Through the matrix the interrelations between variables are presented. Correlation between variables is examined by looking highly

correlated variables with a group of other variables but correlate very badly with variables outside of that group (Field 2000).

The main objective of factor extraction is to determine factors. This is a critical point in the research, in which the researcher needs to carefully consider the data and use his/her best judgment. Researchers have developed a number of ways to extract the correct number of factors which include the Guttman-Kaiser rule, Scree test, Bartlett's test, Minimum Average Partial, and Parallel Analysis. Scree test, developed by R.B. Cattell (1988), was used to determine the number of factors in this paper. The Scree test is a graphical method for determining the number of factors. The number of factors to be retained is chosen by their position on the graph. All factors that lie from above the point where the plot levels off to a linear decreasing pattern are retained (Cattell, 1978).

The interpretability of factors can be improved through rotation. Rotation maximizes the loading of each variable on one of the extracted factors whilst minimizing the loading on all other factors. Rotation works through changing the absolute values of the variables whilst keeping their differential values constant. There are two types of rotations, orthogonal rotations which include varimax, quartimax and equamax where as direct oblimin and promax are oblique rotations. In this study, Varimax orthogonal rotation was used since the factors were assumed to be independent.

3.1.1 Dependent variable

Job and work attitude is considered to be dependent variable. There are nine variables under job and work attitude factor which have been analyzed (see Appendix 1).

Correlation Matrix:

The main interest of running correlation is to identify the variables under job and work attitude factor which are not related to other variables. Variables must be related to each other for the factor model to be appropriate. Table 1 below presents correlation matrix of job and work attitude. The variable are denoted by Vi, i = 1, 2, …, 9 (refer Appendix 2).

Table 1: Correlation Matrix for Job and Work attitude Variable

Item	V1	V2	V3	V4	V5	V6	V7	V8	V9
V1	**1.000**								
V2	.748	**1.000**							
V3	.592	.508	**1.000**						
V4	.679	.494	.744	**1.000**					
V5	.666	.514	.614	.794	**1.000**				
V6	.546	.414	.438	.669	.729	**1.000**			
V7	.720	.656	.687	.671	.606	.592	**1.000**		
V8	.658	.600	.429	.506	.474	.386	.775	**1.000**	
V9	.390	.330	.415	.496	.494	.560	.608	.621	**1.000**

From the correlation matrix table it can be seen that all nine variables relate each other. Despite the fact that the correlation between variables needs to be correlated, they should not be highly correlated (normally when $r \geq 0.8$) to avoid multicollinearity. This result indicates that there is acceptance correlation among the variables and suggest that factor model is

appropriate.

Furthermore Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity test were performed. While KMO measures magnitude to observed correlation coefficients to the magnitude of the partial correlation coefficients, Bartlett's test used to test whether correlation matrix is an identity matrix i.e. all diagonal terms are 1 and all off-diagonal terms are 0 (correlation among variable is zero). Value for KMO was 0.839. This indicates high sizeable sampling adequacy as the value is close to 1. The value 0.839 is large and implies that factor analysis can give good result. For the case of Bartlett's Test, the result shows that there is significant result as *p – value* 0.000 is less than the level of significant 0.05. Basing on this result the null hypothesis that "correlation matrix is an identity" is rejected which allows computation of factor analysis.

Factor Extraction:
The nine variables are used to determined whether another factor apart from job and work attitude. Principal component (PC) technique has been adopted for initial factors. In PC analysis linear combinations of the observed variables are formed. In order to know how many factors are there, two methods have been used: eigen values and scree plot.

Eigen Values
Table 2 shows total variance explained after running PC. From the table it can be seen that there is only one eigen value which is greater than 1. This indicates that there is only one factor. The principal component combination has accounted 62.911% amount of variance.

Table 2: Total Variance explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.662	62.911	62.911	5.662	62.911	62.911
2	.921	10.237	73.148			
3	.823	9.149	82.298			
4	.557	6.193	88.490			
5	.312	3.470	91.960			
6	.263	2.922	94.882			
7	.191	2.120	97.002			
8	.164	1.823	98.825			
9	.106	1.175	100.000			

Extraction Method: Principal Component Analysis.

There is no any other factor rather than the initial one "Job and work attitude" that can be formed. Only one factor has been formed (job and work attitudes), and it explains about 62.911% of total variance. This factor score stands as single variable in dependent side which comprises of the number of items. Instead of using nine items, job and work attitude factor score is used as single dependent variable. Correlation for each variable and the factor is presented in table 3. Correlations for all items are positive.

Table 3: Component Matrix

ITEMS	Job and work attitudes
I recommend the municipal to my friends	.889
Considering everything, How would you rate your current satisfaction in your department/unit?	.855
considering everything, How satisfied with my job	.848
Considering everything, How would you rate your current satisfaction in your work location?	.831
Overall, Rate your Satisfaction with the way your management Operates	.766
I would recommend the Municipal as a good place to work	.762
As a place to work, things around the location seem to be getting better	.747
How satisfied are you with the information you receive from management on what's going on in the Company	.739
I defend the Municipal when I hear someone criticizing it	.678

Scree Plot

By visualizing the total variance associated with each factor in scree plot in Figure 1, we find that only one item shows large factor as it provides steep plot. From the second factor on

wards, it can be seen that the line is almost flat, meaning the each successive factor is accounting for smaller and smaller amounts of the total variance. There is gradual trailing off which shows that the rest of the factors are lower than eigen value 1.

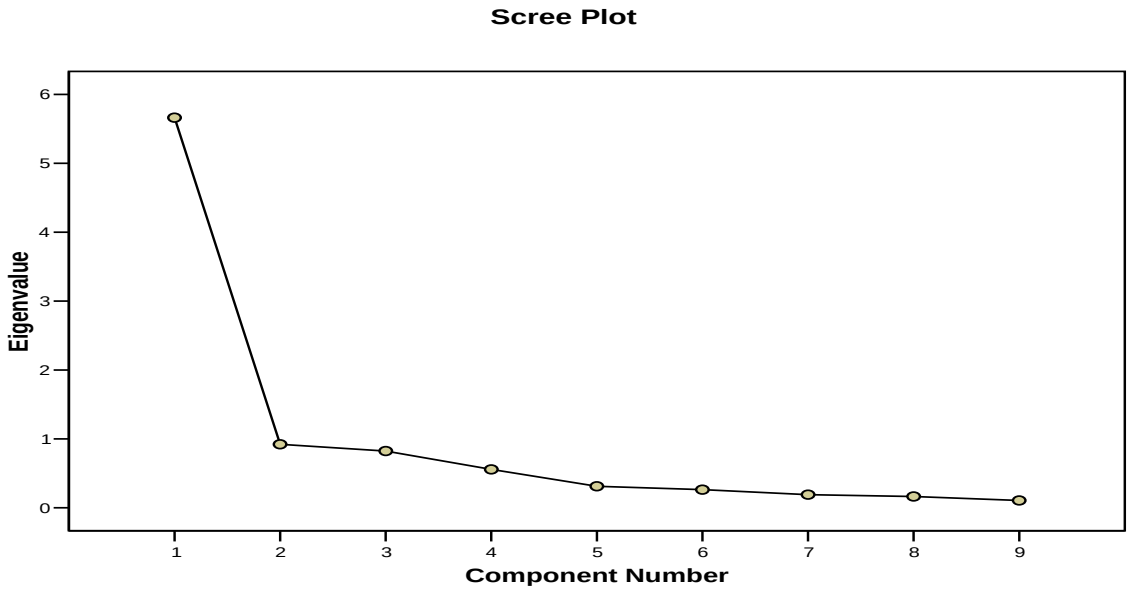

Figure 1: Scree Plot for Job and Attitude Factor

Factor Rotation

Because single factor was extracted, rotation could not take place.

3.1.2 Independent Variables

Variables that are assumed to be independent to job and work attitude are those found in categorized groups such as teamwork, contribution, independency, communication and supervisory relationships. These can also be called factors. So the initial factors are four with thirty five variables (see Appendix 1).

Correlation Matrix

By running correlation matrix of 35 variables, the result shows that there were some variables which had small correlation (correlation coefficients were approaching zero). This violates the assumption of factor analysis as the variables are required to be correlated. Those variables whose correlation values were approaching zero were discarded. After dropping those variables the new correlation matrix (see Appendix 3) shows that the variables are correlated. Also there are no highly correlated variables (≥ 0.8) which could suggest presence of multicollinearity. It can be experienced that ten variables have been dropped and remained with 25 variables. The dropped variables can be found in Appendix 4.

KMO value is 0.714 which exceed the required value of 0.5 (Field, 2005). Bartlett's test shows significant result that correlation matrix is not identity because *p –value* (0.000) is less than level of significant (0.05). These results indicate that all the preliminaries above favour the appropriateness of factor analysis in these data.

Factor Extraction

Eigen Values

Table 4 shows total variance explained after running PC. From the table it can be seen that there are 5 components whose eigen values are greater than 1. These five components have accounted 70.805% of total variance. This suggests that with 25 items, five factors have been formed (see factor rotation).

Table 4: Total Variance Explained for Independent Variables

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.865	39.458	39.458	9.865	39.458	39.458
2	2.537	10.148	49.606	2.537	10.148	49.606
3	2.138	8.551	58.157	2.138	8.551	58.157
4	1.622	6.487	64.644	1.622	6.487	64.644
5	1.540	6.161	70.805	1.540	6.161	70.805
6	.982	3.929	74.734			
7	.887	3.547	78.282			
8	.797	3.189	81.470			
9	.686	2.744	84.214			
10	.586	2.344	86.558			
11	.566	2.263	88.821			
12	.503	2.013	90.834			
13	.446	1.783	92.616			
14	.371	1.484	94.100			

15	.309	1.234	95.334			
16	.243	.970	96.304			
17	.224	.894	97.199			
18	.193	.772	97.971			
19	.115	.458	98.429			
20	.105	.422	98.851			
21	.096	.385	99.236			
22	.068	.272	99.508			
23	.061	.242	99.750			
24	.039	.156	99.906			
25	.024	.094	100.000			

Scree Plot

From Figure 2 it can be seen that there are five factors which shows steep slope before gentle slope. This also suggests that 25 variables can be combined into five groups (factors).

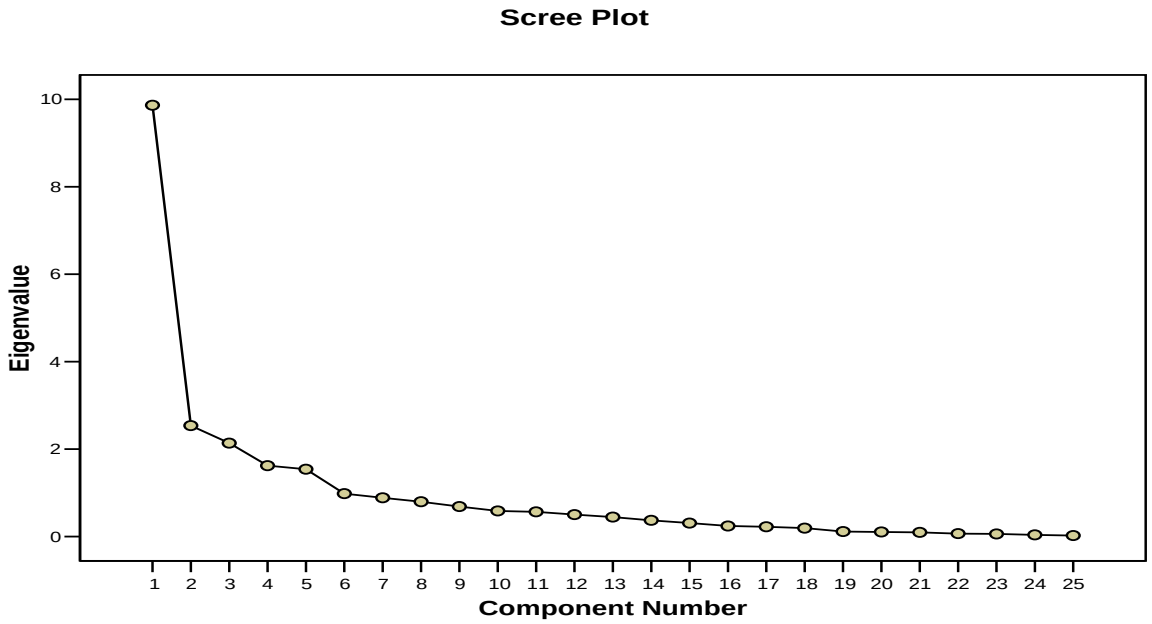

Figure 2: Scree Plot for Independent Variables

Factor Rotation

Rotation method that was used is Varimax. Varimax attempts to minimize the number of variables that have high loadings on a factor. Result for rotation is presented in Table 5. Factor 1 consists of seven variables, factor 2 has five variables, factor 3 has five variables, factor 4 has five variables and factor 5 has three variables. Although Knapp and Mujtaba (2009) had similar number of factors or groups (five) the new formed factors differ in terms of items contained. Items included in the factors come from different groups that were initially formed. This can be seen as we compare Table 5 and Appendix 1. The new formed factors are renamed as follows: factor 1 is satisfaction; factor 2 is Independency; factor 3 is teamwork; factor 4 is freedom of expression; and factor 5 is Supervisory relationship.

Table 5: Rotated factor loading of five factors after varimax rotation

Variable	Factor				
	1	2	3	4	5
My boss maintains high standards of performance	.817				
My Job makes good use of my skills and abilities	.745				
My work gives me a feeling of personal Accomplishment	.719				
My supervisor does a good job of building team work in his/her group	.696				
Those in my work group are usually easy to approach with a work problem	.659				
My boss deals fairly with everyone	.614				
The People I work with Cooperate to get the Job done	.493				
My work group puts all of their effort into their Job	.	.768			
Those in my work group get enough chances to tell higher-ups how we feel about things affecting our work		.763			
My work group is very Productive		.699			
I am told enough to help me see why things are done the way they are here		.696			
There is a free and Open flow of work Information Upwards from me to higher levels		.650			
In my area, work groups/Dept. who depend on each other Plan their work together			.747		
There is a "teamwork spirit" among those in my group		.	.723		
In my area, my work performance suffers from lack of Teamwork between Dept. or other work Groups			-.692		
Team Work in All levels in Department/Staff			.659		
On my Job, I have a chance to do something that really test my ability			.599		
Around here, we are not afraid to say what we really think				.764	
My boss stands up for his/her subordinates				.719	
My boss accepts constructive criticism from his/her subordinates		.		.590	
I can honestly tell my boss what I really think		.		.581	
Around here, there is a free and open flow of Information between the different work groups or Departments				.457	
Sufficient effort is made by higher management to get the Opinions					.741
I have enough Information to do my Job well					.676
Higher-ups in this place seriously listen to what people at my level have to say	.				.519

3.1.3 Check for Normality

One of the characteristic of factor analysis is normality of factors formed. Figures 3 – 8 present histograms with normal curve. In all the figures it can be observed that there is a fair normal distribution of the factors. Standard deviations are 1 and means approaches zero. This result justifies the adherence of factor analysis.

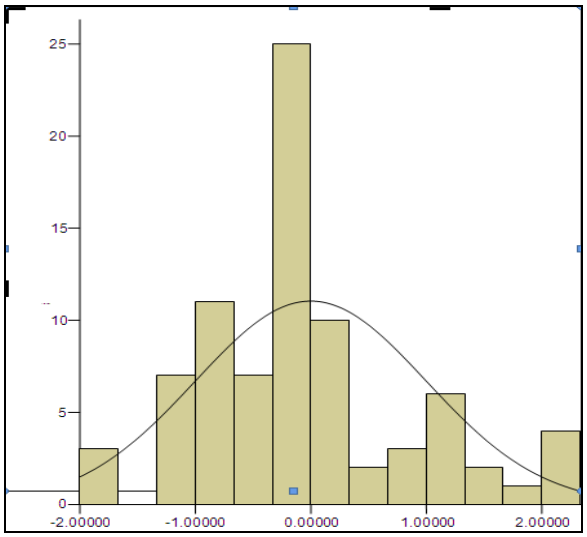

Figure 3: Job and work attitude
(Mean=-4.1633363E-17, Std.Dev=1.0000)

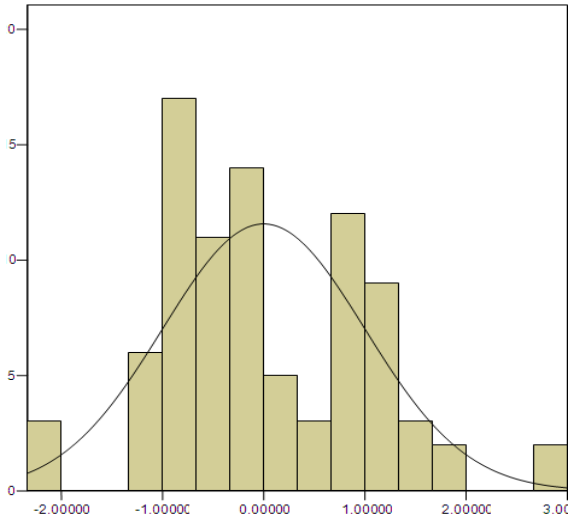

Figure 5: Independency
(Mean=-2.64533E-17, Std.Dev=1.0000)

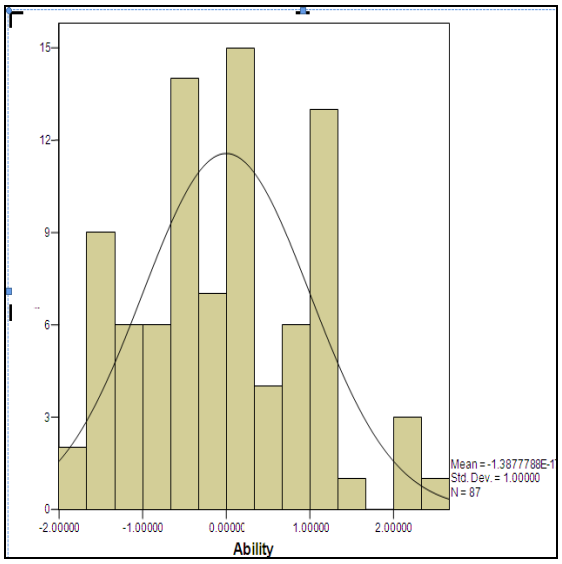

Figure 4: Satisfaction
(Mean=-3.8163916E-17, Std.Dev=1.0000)

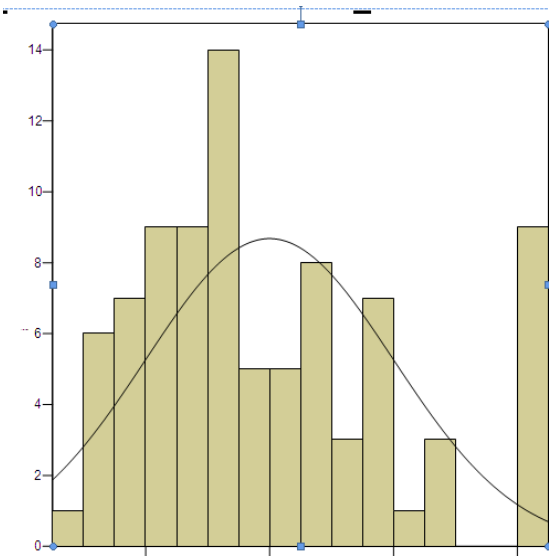

Figure 6: Team work
(Mean=-4.3877788E-17, Std.Dev=1.0000)

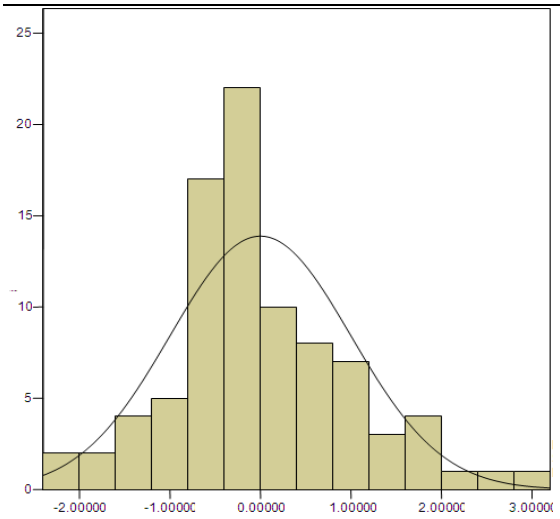

Figure 7: Freedom of expression
(Mean=1.474515E-17, Std.Dev=1.0000)

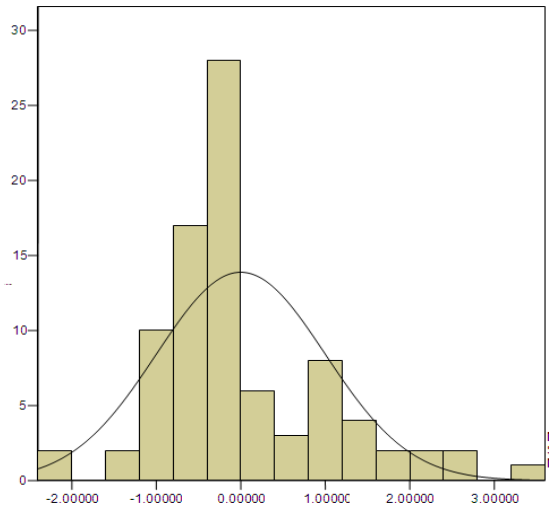

Figure 8: Supervisory relationship
(Mean=6.1582683E-17, Std.Dev=1.0000)

3.2 Fitting Multiple Linear Regression Model

Although the variables involved were not in the ratio scale, through factor analysis the variables have changed to ratio scale and linear combination which permits the use of multiple regression. Multiple linear regression is carried out to describe the functional relationship between job and work attitudes and a set of covariates. Job and work attitude is dependent variable while independent variables are: satisfaction; Independency; teamwork; freedom of expression; and supervisory relationship.

The model to fit is $Y_i = \beta_{0+} \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_p X_{pi} + e_i$

Where by Y_i = *job and work attitude*, β_0 = constant term and β_i = coefficient, X_i = covariates, i = 1, ..., 5.

Normally when factory analysis is applied, usually data become normal (refer normal curves) without the presence of collinearity. But in order to verify whether regression assumptions holds, those assumption and others such as linearity and equal variance were tested. The results shows that all the assumptions were not violated which permits the use of regression analysis.

Mode summary shows that correlation coefficient is 0.871 and R square is 0.758. This implies that the correlation among variables is strong. Because R square is close to 1 this indicates that the model fit well the data. The covariates explain the job and work attitude variable by 94%. In addition the adjusted R squared is 0.743 which indicates change of variables will not bring much difference. Analysis of variance shows that the level which independent variables explain job and work attitude is significant as the *p-value* (0.000) is less than the level of significant. The model fit the data.

Contribution of each independent variable is presented in Table 6. It can be seen that all variables are significant because their *p – values* are less than the level of significant. Also the five variables or factors have positive correlation with job and work attitude as there coefficients are greater than 0. This result implies that for the two municipalities (Dodoma and

Musoma) job and work attitude is determined by satisfaction, independency, teamwork, freedom of expression and supervisory relationship.

Table 6: Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.069	.055		-1.248	.216
Satisfaction	.645	.055	.648	11.719	.000
Independency	.397	.055	.397	7.170	.000
Teamwork	.279	.055	.278	5.023	.000
Freedom of expression	.246	.055	.247	4.470	.000
Supervisory relationship	.223	.055	.224	4.044	.000

4.0 Conclusion

The study was able to identify five factors which can be used to determine job and work attitude in an organization especially in local authorities. The factors are satisfaction, independency, teamwork, freedom of expression and supervisory relationship. These factors are formed with several variables.

Acknowledgement

The authors wish to acknowledge Rose Likangaga and Edward Malima as the study based on the data collected in their study.

Corresponding Author

Peter Josephat (Corresponding author)
Dept. of Statistics, University of Dodoma
P. O. Box 338, Dodoma, Tanzania
Mobile: 255-0787288998 E-mail: mtakwimu@yahoo.com

References

ACCSM (2007). “Client’s Charter – Towards a More Transparent and Accountable Public Service (Brunei Darussalam’s Experience)”. Bali – INDONESIA.

Causin, G. G. (2007). “A Study to Examine the Preparation and Training of Hospitality Expatriate Executives”. PhD Dissertation, Oklahoma State University.

Cattell, R. B. (1978). *The scientific use of Factor Analysis in Behavioral and Life Sciences*. New York: Plenum Press.

Cattell, R.B. (1988). The Meaning and Strategic Use of Factor Analysis. In J.R.Nesselroade and R.B. Cattell (eds.) *Handbook of Multivariate Experimental Psychology*. New York:

Plenum Press. pp 131-203.

Field, A. (2000). "Discovering Statistics using SPSS for Windows". Sage publications, London – Thousand Oaks New Delhi.

Field, A. (2005). *Discovering Statistics using SPSS* (2nd Edn). London: Sage.
Johnson, R.A., and Wichern, D.W. (1988). *Applied Multivariate Statistical Analysis* (2nd Edn). New Jersey: Prentice-Hall Inc, pp 607.

Johnson, R.A., and Wichern, D.W. (1992). *Applied Multivariate Statistical Analysis* (3rdEdn). New Jersey: Prentice Hall Inc and ISBN: 0130418072, pp 396.

Knapp, P. R. and Mujtaba, B. G. (2009). Designing, Administering, and Utilizing an Employee Attitude Survey. *Journal of Behavioral Studies in Business*, 2(1), 1-14.

Loscocco, K.A. (1989). The Interplay of Personal and Job Characteristics in Determining Work Commitment. *Social Science Research*, 18, 370-394.

Saari, L. M. and Judge, T. A. (2004). Employee Attitudes and Job Satisfaction. Human Resource Management, Vol. 43, No. 4, 395–407.

Shi, J. (2006*). Stream of Variation Modeling and Analysis for Multistage Manufacturing Processes*. CRC Press

Timm, N. H. (2002). *Applied Multivariate Analysis*. Springer-Verlag New York, Inc.

Tryfos, P. 1997. Methods for Business Analysis and Forecasting: Text and Cases. John Wiley & Sons

The Pennsylvania State University (2011). *Lesson 12: Work and organizational commitment: Introduction to Work and Organizational Commitment*. Retrieved from Lecture Notes Online Web site https://cms.psu.edu/section/cont ent/default.asp?WCI =pgDisplay& WCU= CRSCN T&ENTRY_ID=97D4659902F4475D805509F12683C53D.

Glossary

Scree Plot: Simple line section plot that shows the fraction of total variance in the data as explained or represented by each principle component.

Appendix

Appendix 1: Variables or items involved in the study

Teamwork	
1	All levels in my department or staff work together as a team
2	There is a "teamwork spirit" among those in my work group
3	Those in my work group are usually easy to approach with a work problem
4	The people I work with cooperate to get the job done.
5	Around here, work groups or departments seem to work against each other
6	In my area, work groups or departments who depend on each other plan their work together
7	In my area, my work performance suffers from lack of Teamwork between departments or other work groups.
Communications	
8	There is a free and open flow of work information down to me from higher levels
9	There is a free and open flow of work information upward from me to higher levels
10	Those in my work group get enough chances to tell higher-ups how we feel about things affecting our work
11	Around here, there is a free and open flow of information between the different work groups or departments
12	I am told enough to help me see why things are done the way they are here
13	The information I get arrives in time to help me
14	I have enough information to do my job well
15	The information I get from management is true
16	Higher-ups in this place seriously listen to what people at my level have to say
17	Around here, we are not afraid to say what we really think.
18	Sufficient effort is made by higher management to get the opinions of those who work here
19	I always know what I must accomplish on my job.
Independency	
20	I am able to change the structure and control of my own work.
21	I have sufficient say in setting my work goals.
22	I would do my job better if I had more freedom to act on my own.
Contribution	
23	My job makes good use of my skills and abilities.
24	My work gives me a feeling of personal accomplishment.
25	On my job, I have a chance to do some things that really test my ability.
26	I am less productive than I used to be.
27	My work group is very productive.
28	My work group puts all of their effort into their job.
Supervisory Relationships	
29	I can honestly tell my boss what I really think.

31	My boss accepts constructive criticism from his/her subordinates.
32	When I make a serious mistake, I am not reluctant to go to my boss for help
33	My boss deals fairly with everyone.
34	My boss stands up for his/her subordinates.
35	My supervisor does a good job of building teamwork in his/her group
36	My boss maintains high standards of performance.
Job and Work Attitudes	
37	Considering everything, how satisfied are you with your job?
38	How satisfied are you with the information you receive from management on what's going on in the company?
39	Overall, rate your satisfaction with the way your management operates
40	Considering everything, how would you rate your Satisfaction with your department/unit?
41	Considering everything, how would you rate your current satisfaction in your work location?
42	As a place to work, things around the location seem to be getting better
43	I recommend the municipal to my friends.
44	I would recommend the municipal as a good place to work.
45	I defend the municipal when I hear someone criticizing it

Appendix 2: Definition of variables for Job and Work Attitude

V1 = considering everything, how satisfied are you with your job?
V2 = How satisfied are you with the information you receive from management on what's going on in the company?
V3 = Overall, rate your satisfaction with the way your management operates.
V4 = considering everything, how would you rate your Satisfaction with your department/unit?
V5 = considering everything, how would you rate your current satisfaction in your work location?
V6 = as a place to work, things around the location seem to be getting better.
V7 = I recommend the municipal to my friends.
V8 = I would recommend the municipal as a good place to work.
V9 = I defend the municipal when I hear someone criticizing it

Appendix 3: Correlation Matrix for Independent Variables

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	X25
X1	**1.000**	0.729	0.739	0.527	0.436	0.357	0.496	0.366	0.573	0.326	0.290	0.436	0.214	0.274	0.352	0.492	0.474	0.324	0.482	0.496	0.290	0.312	0.253	0.354	0.537
X2	0.729	**1.000**	0.481	0.415	0.567	0.508	0.504	0.598	0.506	0.221	0.274	0.482	0.294	0.262	0.219	0.334	0.347	0.328	0.470	0.380	0.295	0.361	0.057	0.343	0.471
X3	0.739	0.481	1.000	0.525	0.165	0.067	0.373	0.312	0.335	0.384	0.322	0.416	0.183	0.323	0.411	0.492	0.361	0.397	0.553	0.441	0.408	0.447	0.379	0.511	0.648
X4	0.527	0.415	0.525	1.000	0.336	0.370	0.260	0.347	0.158	0.054	0.336	0.434	0.017	0.403	0.406	0.388	0.221	0.296	0.375	0.277	0.088	0.199	-0.069	0.373	0.547
X5	0.436	0.567	0.165	0.336	**1.000**	-0.449	0.237	0.132	0.263	-0.032	0.230	0.403	0.071	0.256	0.236	0.292	0.506	0.064	0.164	0.193	-0.050	0.096	-0.011	0.307	0.192
X6	0.357	0.508	-0.067	-0.370	-0.449	**1.000**	-0.247	-0.357	-0.510	-0.038	-0.322	-0.383	-0.238	-0.462	-0.172	-0.324	-0.334	-0.083	-0.098	-0.083	-0.112	-0.022	0.022	-0.102	-0.201
X7	0.496	0.504	0.373	0.260	0.237	-0.247	**1.000**	0.542	0.352	0.451	0.329	0.379	0.342	0.294	0.178	0.100	0.165	0.437	0.422	0.373	0.355	0.302	0.202	0.165	0.300
X8	0.366	0.598	0.312	0.347	0.132	-0.357	0.542	**1.000**	0.290	0.494	0.278	0.447	0.434	0.286	0.148	0.165	0.080	0.550	0.584	0.402	0.401	0.327	0.129	0.076	0.381
X9	0.573	0.506	0.335	0.158	0.263	-0.510	0.352	0.290	**1.000**	0.359	0.359	0.551	0.471	0.500	0.331	0.411	0.168	0.316	0.208	0.340	0.374	0.217	0.421	0.254	0.286
X10	0.326	0.221	0.384	0.054	-0.032	-0.038	0.451	0.494	0.359	**1.000**	0.354	0.461	0.313	0.300	0.143	0.215	0.032	0.590	0.670	0.272	0.351	0.305	0.360	0.253	0.271
X11	0.290	0.274	0.322	0.336	0.230	-0.322	0.329	0.278	0.359	0.354	**1.000**	0.531	0.196	0.662	0.380	0.412	-0.005	0.360	0.476	0.168	0.359	0.311	0.173	0.389	0.534
X12	0.436	0.482	0.416	0.434	0.403	-0.383	0.379	0.447	0.551	0.461	0.531	**1.000**	0.493	0.772	0.639	0.595	0.334	0.561	0.601	0.429	0.478	0.579	0.520	0.532	0.645
X13	0.214	0.294	0.183	0.017	0.071	-0.238	0.342	0.434	0.471	0.313	0.196	0.493	**1.000**	0.376	0.279	0.331	0.238	0.480	0.301	0.604	0.541	0.321	0.475	0.191	0.239
X14	0.274	0.262	0.323	0.403	0.256	-0.462	0.294	0.286	0.500	0.300	0.662	0.772	0.376	**1.000**	0.519	0.453	0.243	0.536	0.414	0.294	0.494	0.433	0.346	0.521	0.471
X15	0.352	0.219	0.411	0.406	0.236	-0.172	0.178	0.148	0.331	0.143	0.380	0.639	0.279	0.519	**1.000**	0.664	0.537	0.331	0.312	0.325	0.279	0.412	0.428	0.561	0.711
X16	0.492	0.334	0.492	0.388	0.292	-0.324	0.100	0.165	0.411	0.215	0.412	0.595	0.331	0.453	0.664	**1.000**	0.506	0.174	0.358	0.310	0.375	0.572	0.429	0.467	0.710
X17	0.474	0.347	0.361	0.221	0.506	-0.334	0.165	0.080	0.168	0.032	-0.005	0.334	0.238	0.243	0.537	0.506	**1.000**	0.179	0.149	0.357	0.167	0.242	0.221	0.277	0.284
X18	0.324	0.328	0.397	0.296	0.064	-0.083	0.437	0.550	0.316	0.590	0.360	0.561	0.480	0.536	0.331	0.174	0.179	**1.000**	0.700	0.546	0.700	0.350	0.336	0.382	0.356
X19	0.482	0.470	0.553	0.375	0.164	-0.098	0.422	0.584	0.208	0.670	0.476	0.601	0.301	0.414	0.312	0.358	0.149	0.700	**1.000**	0.462	0.533	0.555	0.318	0.393	0.610
X20	0.496	0.380	0.441	0.277	0.193	-0.083	0.373	0.402	0.340	0.272	0.168	0.429	0.604	0.294	0.325	0.310	0.357	0.546	0.462	**1.000**	0.568	0.434	0.466	0.185	0.384
X21	0.290	0.295	0.408	0.088	-0.050	-0.112	0.355	0.401	0.374	0.351	0.359	0.478	0.541	0.494	0.279	0.375	0.167	0.700	0.533	0.568	**1.000**	0.574	0.537	0.269	0.475
X22	0.312	0.361	0.447	0.199	0.096	-0.022	0.302	0.327	0.217	0.305	0.311	0.579	0.321	0.433	0.412	0.572	0.242	0.350	0.555	0.434	0.574	**1.000**	0.570	0.420	0.665
X23	0.253	0.057	0.379	-0.069	-0.011	0.022	0.202	0.129	0.421	0.360	0.173	0.520	0.475	0.346	0.428	0.429	0.221	0.336	0.318	0.466	0.537	0.570	**1.000**	0.342	0.493
X24	0.354	0.343	0.511	0.373	0.307	-0.102	0.165	0.076	0.254	0.253	0.389	0.532	0.191	0.521	0.561	0.467	0.277	0.382	0.393	0.185	0.269	0.420	0.342	**1.000**	0.552
X25	0.537	0.471	0.648	0.547	0.192	-0.201	0.300	0.381	0.286	0.271	0.534	0.645	0.239	0.471	0.711	0.710	0.284	0.356	0.610	0.384	0.475	0.665	0.493	0.552	**1.000**

Appendix 4: Definition of variables for Independent

X1 = Team Work in All levels in Department/Staff,
X2 = There is a "teamwork spirit" among those in my group,
X3 = Those in my work group are usually easy to approach with a work problem,
X4 = The People I work with Cooperate to get the Job done,
X5 = In my area, work groups/Dept. who depend on each other Plan their work together,
X6 = In my area, my work performance suffers from lack of Teamwork between Dept. or other work Groups,
X7 = There is a free and Open flow of work Information Upwards from me to higher levels,
X8 = Those in my work group get enough chances to tell higher-ups how we feel about things affecting our work,
X9 = Around here, there is a free and open flow of Information between the different work groups or Departments,
X10 = I am told enough to help me see why things are done the way they are here
X11 = I have enough Information to do my Job well,
X12 = Higher-ups in this place seriously listen to what people at my level have to say,
X13 = Around here, we are not afraid to say what we really think,
X14 = Sufficient effort is made by higher management to get the Opinions,
X15 = My Job makes good use of my skills and abilities,
X16 = My work gives me a feeling of personal Accomplishment,
X17 = On my Job, I have a chance to do something that really test my ability,
X18 = My work group is very Productive,
X19 = My work group puts all of their effort into their Job,
X20 = I can honestly tell my boss what I really think,
X21 = My boss accepts constructive criticism from his/her subordinates,
X22 = My boss deals fairly with everyone,
X23 = My boss stands up for his/her subordinates,
X24 = My supervisor does a good job of building team work in his/her group,
X25 = My boss maintains high standards of performance.

Appendix 5: Dropped independent variables

Around here, work groups or departments seem to work against each other
There is a free and open flow of work information upward from me to higher levels
The information I get arrives in time to help me.
The information I get from management is true
I always know what I must accomplish on my job.
I am able to change the structure and control of my own work.
I have sufficient say in setting my work goals.
I would do my job better if I had more freedom to act on my own.
I am less productive than I used to be.

When I make a serious mistake, I am not reluctant to go to my boss for help.